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Bimonthly Journal of the Italian Air Force

OPERATION BALTIC EAGLE III

The Italian contingent in defence of the Eastern flank

POLYGONE

Final Training for the Tornado ECR of the 6th Wing at Ghedi

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Editorial

By the Editor-in-Chief

C

Dear Readers, here we are at the second 2026 issue of Rivista Aeronautica. We find ourselves in a historical moment where complexity is no longer the exception but the rule, immersed in geopolitical dynamics that are fluid, shifting, and profoundly difficult to interpret using old frameworks. We live in a world where geographical borders seem to grow increasingly thin in the face of regional crises which—fueled by a totally interconnected global economy and trade—have the capacity to instantly transform into emergencies of planetary scale, forcing us into a deep reflection on the very nature of security. In such a fragmented and unstable scenario, the aerospace instrument finds itself at a fundamental crossroads: it cannot limit itself to merely adapting to these changes, as the speed of technological and strategic transformations is such that it renders obsolete anyone unable to move in advance. For this reason, we wanted to dedicate ample space to an analysis of new operational contexts, recounting the process of a radical rethinking of the employment doctrines used until now in favor of a new capacitive approach capable of looking toward tomorrow.



This renewal does not exclusively concern doctrinal theory; it encompasses the concrete operational level, where the challenge lies in consolidating already acquired excellence to carry it toward an unprecedented technological future. An emblematic example of this transition is represented by the account of the participation of 6th Wing Tornado ECRs in the training sessions at Polygone; an experience that for decades has forged crews specialized in SEAD (Suppression of Enemy Air Defenses) missions, and which today sees that precious wealth of knowledge pass into the hands of the F-35 line—an aircraft that is redefining performance parameters

in such peculiar and complex sectors. Parallel to this, our investigation moves to the projects presented during the Innovation Day organized by the Logistic Command, an event that highlighted how artificial intelligence and computing power are no longer futuristic concepts, but realities integrated into the daily life of the Air Force to support every facet of the Armed Force.

But while our gaze is turned toward the future, our feet remain firmly planted in the necessities of the present, as evidenced by our report from the Baltic, where we closely followed the air policing missions that for over six months guaranteed the defense of a particularly sensitive and strategic European airspace. Finally, this issue does not lack the necessary references to our historical heritage and the new frontiers of exploration: one hundred years after the feats of General Nobile, we return to reflect on a page of history that continues to offer fundamental insights into human audacity, while we turn our eyes to the sky for the Artemis II mission—a decisive step for humanity's return to the Moon. A rich and multifaceted editorial selection awaits you, which we hope will accompany you with awareness through the challenges of our time. All that remains is to wish you, as always, an enjoyable read.

Emanuele Salvati

FRONT PAGE

A century and beyond: Naples embraces the Italian Air Force and its newest cadets

di Flavio Silvestrini



The breathtaking setting of Naples' Lungomare Caracciolo hosted, on April 1st, the celebration of the 103rd anniversary of the establishment of the Air Force—a milestone officially reached on March 28th but celebrated a few days later to coincide with the Swearing-in and Christening of the Grifo VI Class of the Pozzuoli Air Force Academy. Under the gaze of

the Minister of Defense, Hon. Guido Crosetto, 140 young cadets shouted their “I Swear,” a commitment of loyalty to the Republic sealed by the colored smoke of the Pattuglia Acrobatica Nazionale (Frecce Tricolori).

The Minister addressed the future officers with a touching reminder, defining their journey as a mission of awareness in a

difficult historical period where it is fundamental to “Become men and women capable of understanding the future before it happens, of recognizing the right side when no one points it out, of sensing the direction of history when everything seems uncertain.” This concept was echoed by the Chief of Staff, Gen. S.A. Antonio Conserva, who also emphasized the centrality

of the air and space domains for national security. During the event, several honors were conferred: a Gold Medal for Aeronautical Merit to the 72nd Wing of Frosinone, a Gold Medal for Aeronautical Merit to the Aerospace Operations Command, and a Silver Medal for Aeronautical Valor to the crew of an HH-139B helicopter from the 15th Wing of Cervia, protagonists of a complex night rescue in 2023.

Naples, however, was not just a formal backdrop. Since March 28th, Piazza del Plebiscito has hosted an exhibition space that allowed citizens to experience firsthand the history and capabilities of the Air Force through immersive technologies and simulators. Between the notes of the Air Force Band—which per-



formed both in the square and in an institutional concert at the Royal Palace's Court Theater—and the solidarity of the “A Gift from Heaven” project, the anni-

versary united a century-old tradition with a leap toward the future, celebrating, as Gen. Conserva stated, “human capital as the Air Force's primary weapon system.”



FRONT PAGE

May 1st: Frecce Tricolori set to kick off the 66th acrobatic season



The skies over Rivolto were once again painted green, white, and red during the traditional acrobatic training on May 1st—the symbolic event that officially marks the beginning of the Pattuglia Acrobatica Nazionale's 2026 season. In the presence of the Chief of Staff of the Italian Air Force, General S.A. Antonio Conserva, and the Commander of the 313th Acrobatic Training Group, Lieutenant Colonel Franco Paolo Marocco, the day celebrated the bond between the institutions and the hundreds of enthusiasts from the Frecce Tricolori Clubs who gathered at the Friulian base. This year, the formation welcomes the debut of Captain Tommaso Calogeri in the role of Pony 8, an entry that inaugurates a calendar full of national and international commitments. The season's first official act will take place on May

8th with a flyover over Bari for the Feast of Saint Nicholas, followed by the first full acrobatic display on May 17th in Varazze. Beyond technical prestige and institutional representation, the 2026 season stands out for its profound social commitment. The Air Force is spearheading a dual solidarity initiative: supporting the association "Il filo di Simo," dedicated to psychological support for emotional distress, and the "Un dono dal cielo" (A Gift from Heaven) project, aimed at fundraising to enhance pediatric technologies at the Buzzi Foundation in Milan, the San Pietro Fatebenefratelli in Rome, and the Giovanni XXIII in Bari. As the Chief of Staff emphasized in his closing remarks, the PAN continues to prove itself not only as an excellence in flight but as a true ambassador of the values of cohesion and generosity for the entire country.





COVER Story

The image dominating the cover of this issue takes us directly into the strategic heart of the Baltics to recount the Baltic Eagle III mission. From August 2025 to March 2026, the Italian Air Force was deployed for the third time at the Āmari air base. This image symbolizes the continuity of a commitment that began in 2014 in response to the Crimea crisis, aimed at ensuring the air defense of nations lacking their own combat component and reaffirming NATO cohesion in a highly sensitive geographical sector.

The story unfolding through the pages of this magazine delves into the complex operational architecture of this deployment, which saw the transition between two different technological excellences. First, Block 69, featuring the fifth-generation F-35s of the "Lightning" Task Group, followed by Block 70, led by the Eurofighters of the "Typhoon" Task Group. This rotation, now successfully proven, demonstrates the extraordinary flexibility of the Italian Air Force in maintaining seamless defensive effectiveness even during the handover between different aircraft and operational philosophies.



FRONT PAGE

The Italian Air Force celebrates a century of the Norge at the North Pole

di Flavio Silvestrini



There is an image that, even one hundred years later, still retains the allure of the unknown: a silver-gray airship flying silently over the infinite expanse of the North Pole ice. It all began on a spring morning in Ciampino. On April 10, 1926, the N1 airship—renamed the Norge—pointed its nose toward the sky, embarking on a journey that would write one of the boldest chapters in the history of human exploration. To celebrate the visionary feat of Umberto Nobile, the Italian Royal Air Force engineer who defied the ice, the Italian Air Force hosted the conference “The Flight

of the Norge 1926: Nobile at the North Pole” on April 14th at the Visconti Auditorium in Palazzo Aeronautica. It was a way to relive, together, that dream that became history in the Arctic skies. This was more than just a formal celebration; it was a journey through time. Across four thematic panels, historians and experts evoked the achievement of an international crew that, covering 13,000 km, combined Italian ingenuity with the mettle of explorers like Roald Amundsen and Lincoln Ellsworth. But why celebrate Nobile today? Because that mission was not

merely a challenge to the limits of physics and freezing temperatures; it was the beginning of a long tradition of scientific research. This legacy lives on today through the Italian presence in the Arctic—a fragile ecosystem that now, more than ever, requires our protection. Remembering the Norge means honoring the courage of those who knew how to look beyond the horizon, turning the impossible into reality. It is a lesson in humility and ambition that, a century later, continues to inspire anyone who looks up at the clouds, seeking their own course toward the unknown.

The future flies to Berlin: ILA 2026 between innovation and global cooperation. Rivista Aeronautica is the Italian voice of the ILA



From June 10 to 14, 2026, ILA Berlin returns, standing among the most important international exhibitions dedicated to the aviation, space, and defense sectors. Hosted at the Berlin ExpoCenter Airport, the trade fair confirms its status as a global benchmark for technological innovation and strategic dialogue, featuring over 650 exhibitors from 35 countries, more than 100,000 expected professional visitors, and approximately 100 aircraft on display. Once again this year, Rivista Aeronautica will be an official partner of the event,

reinforcing its role—a protagonist in the international press landscape for over a century—in chronicling global aviation and its evolutions. The Italian participation is particularly significant, distinguished by its quality and innovation. Among the key players stands Leonardo, which will present the new-generation AW249 attack helicopter, while numerous companies will be gathered in the Italy Pavilion promoted by ICE (Italian Trade Agency). ICE itself emphasizes the strategic importance of the national

presence. The director of the Berlin office, Ferdinando Fiore, highlights that participation represents **“a strategic opportunity to strengthen the presence of the Italian aerospace industry on one of the main international stages,”** helping to showcase the country's excellence and consolidate its role within global value chains. In a context marked by rapid technological transformations and new geopolitical challenges, ILA Berlin 2026 proves to be an essential platform for the future of aerospace and for Italy's international positioning.

Official Visit of Minister Crosetto to Qatar

"An honor to be received by the Emir of Qatar, Sheikh Tamim bin Hamad Al-Thani, to whom I conveyed Italy's closeness and greetings from the President of the Council, Giorgia Meloni, renewing solidarity with the Government and people of Qatar—a friendly nation unjustly hit by Iranian attacks. This was an opportunity to reaffirm, at such a delicate moment for the entire region, the value of cooperation. During the cordial talk, we shared the need to support every diplomatic effort useful in favoring an exit from the crisis and building a more stable and solid regional security architecture. Particular attention was also paid to the urgency of guaranteeing full freedom of navigation through the Strait of Hormuz, an essential hub for international economic and strategic balances. Finally, we reaffirmed the common will to further strengthen bilateral cooperation between our Armed Forces, in the defense industry field, and in the energy security sector," the Minister declared at the end of the meeting.



Minister Crosetto Meets the President of the United Arab Emirates, His Highness Sheikh Mohamed bin Zayed Al Nahyan

During his official visit to the United Arab Emirates, Minister Crosetto met His Highness Sheikh Mohamed bin Zayed Al Nahyan, stating: "I had the honor of meeting the President of the United Arab Emirates, His Highness Sheikh Mohamed bin Zayed Al Nahyan, as part of my official visit to the country. I first conveyed to him the greetings of the President of the Council, Giorgia Meloni, who recently visited him, reiterating her sentiments of closeness to the Emirati Government and people. With His Highness, we delved into operational and concrete initiatives to strengthen cooperation between our countries in the defense and security sectors. We also examined recent developments in the Middle East and the implications of the war with Iran for regional and international stability, as well as for navigation through the Strait of Hormuz. I expressed appreciation for the United Arab Emirates' contribution to de-escalation in the region and the hope that the ceasefire may favor a negotiated solution to the conflict." Previously, Minister Crosetto held a cordial and productive meeting with the UAE Minister of State for Defense Affairs, Mohamed Bin Mubarak Bin Fadhel Al Mazrouei. "At the center of our discussion was the grave crisis in the Middle East and the Iranian attacks, which I firmly condemned while expressing our country's closeness. In such a delicate framework, we support every attempt at de-escalation, the maintenance of the ceasefire, and ongoing effort-

81st Anniversary of the Liberation: "Freedom Must Be Defended Every Day"

The President of the Republic, Sergio Mattarella, accompanied by the Minister of Defense, Guido Crosetto, laid a laurel wreath at the Altare della Patria as a tribute to all the Fallen on the occasion of the celebrations for the 81st Anniversary of the Liberation. The ceremony took place in the presence of the highest state officials: the President of the Senate, Ignazio La Russa; the President of the Chamber, Lorenzo Fontana; the President of the Council of Ministers, Giorgia Meloni; and the President of the Constitutional Court, Giovanni Amoroso. Also present were the Chief of the Defense Staff, General Luciano Portolano, and the military leaders. Subsequently, the celebrations continued in San Severino Marche—a city awarded the Gold Medal for Civil Merit—with the laying of a laurel wreath at the Monument to the Fallen of the Resistance and, later, at the Feronia Theater for the celebratory ceremony of the 81st Anniversary of the Liberation. At the conclusion of the ceremony, Minister Crosetto moved to the Town Hall of San Severino Marche to pay honors at the Monument to the Fallen.



ts to end the conflict. I therefore reiterated Italy's support during this difficult phase. On this occasion, we signed a Letter of Intent aimed at consolidating and expanding cooperation between our countries, marking a strategic partnership that develops from training, the exchange of expertise, and dialogue between our respective Armed Forces. The UAE are central actors for the stability of the Middle East—a stability that directly affects our own security,” Minister Crosetto stated.

Official Visit of Minister Crosetto to Saudi Arabia

The Minister of Defense, Guido Crosetto, on an official visit to Saudi Arabia, held a “cordial meeting with his Saudi colleague, Prince Khalid bin Salman Abdulaziz, to whom I expressed solidarity for the suffering of Saudi citizens and for the damage to critical infrastructure caused by Iranian attacks.” At the center of the talk were the initiatives implemented by Italy in support of Riyadh during the crisis, with particular reference to the defensive military assistance provided by our country, as well as a discussion on the prospects of the conflict and the efforts underway to favor a diplomatic solution. “I

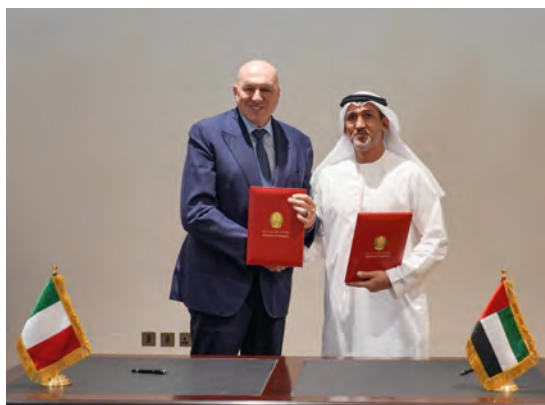
appreciated,” Minister Crosetto continued, “Saudi Arabia’s commitment aimed at avoiding further escalation of the conflict, its support for maintaining the ceasefire, and the ongoing negotiations between the United States and Iran. Further discussions were held on freedom of navigation, cooperation between our respective Armed Forces, and prospects for collaboration in the defense industry sector. National security is built this way too: by strengthening relationships with reliable partners and sharing responsibility and commitment for international stability.” Upon his arrival in Jeddah, Minister Crosetto was welcomed by the Chief of the General Staff of the Kingdom of Saudi Arabia, General Fayyad Al-Ruwaili.

Minister Crosetto Met the President of Ukraine, Volodymyr Zelenskyy

Today in Rome, the President of Ukraine, Volodymyr Zelenskyy, met with the Minister of Defense of the Italian Republic, Guido Crosetto. During the meeting, the Secretary of the National Security and Defense Council of Ukraine, Rustem Umerov, and Minister Crosetto reaffirmed the common commitment of Ukraine and Italy to strengthen bilateral cooperation in the defense sector. Both parties aim to build a stable and long-term partnership that contributes to peace and stability in Europe. Ukraine expresses appreciation for the political, military, and diplomatic support provided by Italy since the beginning of Russia’s full-scale invasion. Italy’s solidarity has contributed to Ukraine’s resilience and to broader efforts aimed at preserving peace and stability in Europe. In this



context, both parties emphasize their willingness to continue the dialogue on ways to further develop cooperation in a pragmatic and mutually beneficial manner. Future cooperation will cover various areas, such as capacity building, the exchange of expertise and lessons learned, as well as industrial cooperation in multiple sectors, including air defense, unmanned systems, ammunition, and the maritime sector, among others. Collaboration could include joint research, technological cooperation, industrial partnerships, and investment initiatives, with the aim of expanding dialogue in sectors relevant to modern defense, such as logistics, cyber security, and the protection of critical infrastructure. The Parties are working on defining a strategic partnership framework, known as the “Drone Deal” in defense matters, aimed at outlining common objectives, possible areas of cooperation, and periodic review mechanisms. This framework would provide a structured basis for constant dialogue and the gradual development of joint initiatives. Both parties reaffirm the importance of relations between the Ukrainian Ministry of Defense and the Italian Ministry of Defense and express the intention to continue developing cooperation in a balanced, mutually beneficial, and sustainable way.



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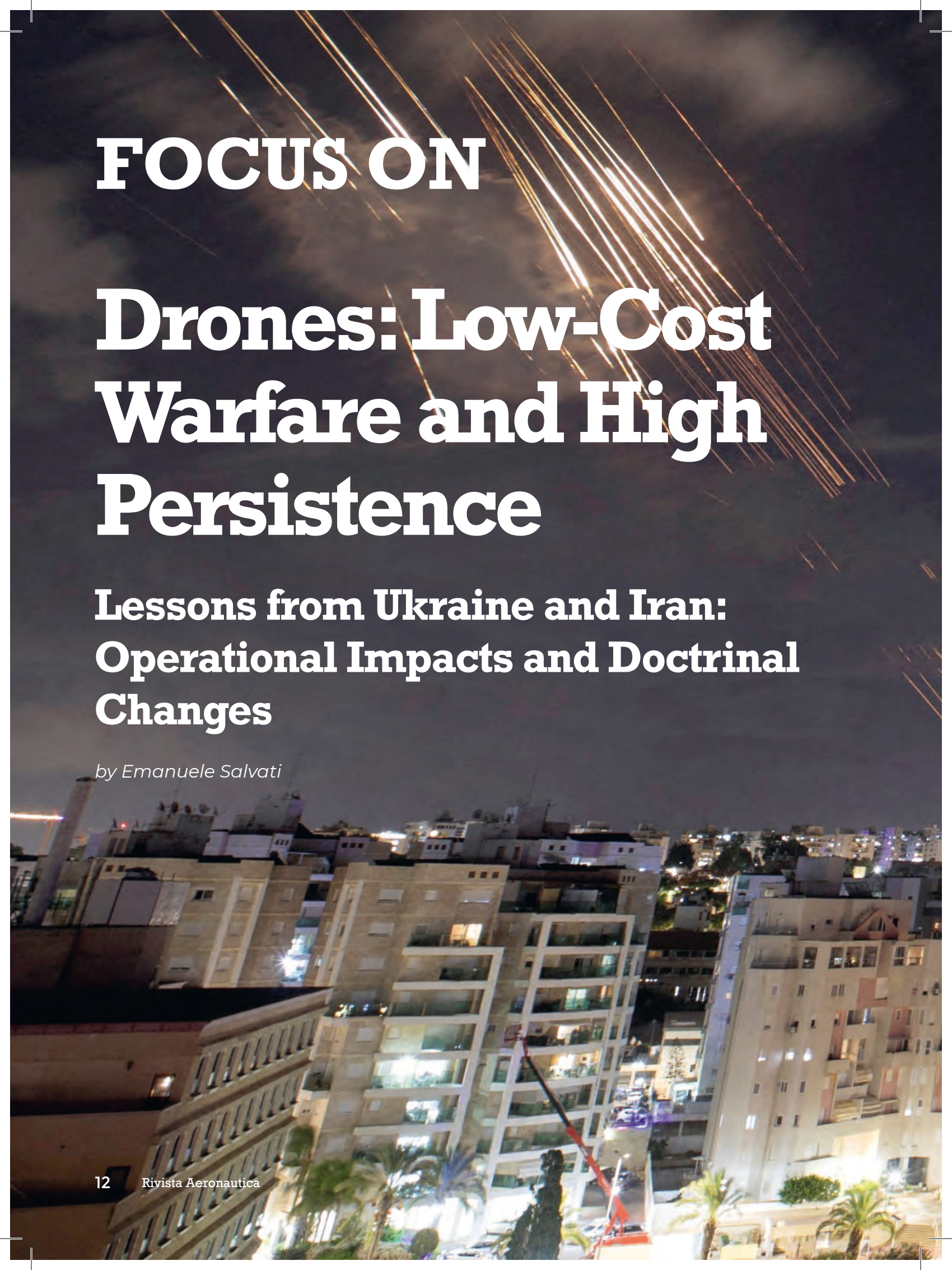


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FOCUS ON

Drones: Low-Cost Warfare and High Persistence

**Lessons from Ukraine and Iran:
Operational Impacts and Doctrinal
Changes**

by Emanuele Salvati

Just over four years have passed since the start of the war in Ukraine; a conflict that has unequivocally established a paradigm shift in modern warfare. At the center of this revolution are drones, which have transformed from a support tool for operations into actual core elements of combat strategy. From expensive platforms for reconnaissance and attack activities, they have morphed into scalable, low-cost systems capable of increasing the rate of attrition on the battlefield. FPV (First Person View) systems, born from commercial technologies, have become the most lethal weapon against tanks, artillery, and infantry (accounting for over 60% of Russian heavy equipment losses according to consolidated estimates) and have transformed the front into a kill zone reaching depths of 40 kilometers. And that is not all, as they have been used to strike strategic targets such as refineries, industrial plants in the defense sector, and critical infrastructure to decimate Russian air defenses and thus allow for increasingly structured and deep operations. Alongside the lethality of these systems is their availability in great numbers and their negligible cost: an FPV costs a few hundred euros, but it can neutralize a vehicle worth millions or interrupt fundamental production processes for many months.

Ukraine has rapidly evolved its doctrine, developing long-range one-way drones for deep strikes (Operation Spiderweb in 2025 which struck Russian airbases), Unmanned Surface Vehicles like the Magura, capable even of shooting down aircraft with adapted air-to-air missiles, low-cost interceptors, and fiber-optic drones immune to electronic jamming,

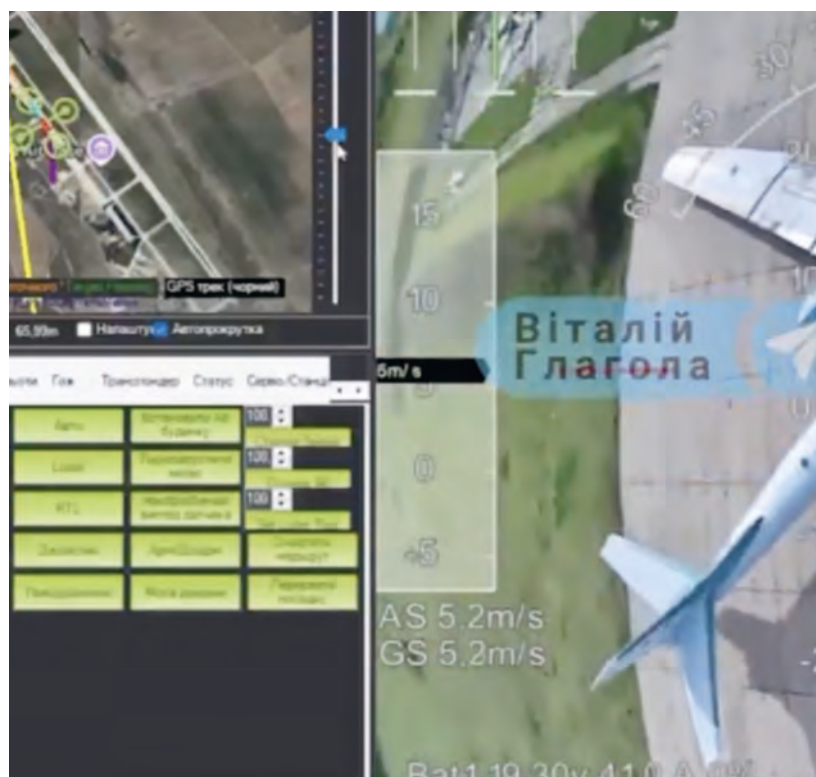
as well as the integration of artificial intelligence for semi-autonomous swarms and accelerated decision cycles. It is estimated that Ukraine's annual drone production stands at one million units. The result is a battlefield "dilated" in space, where concentrating forces becomes suicidal, traditional ground maneuvers result in obsolescence, the number of targets and infrastructures to defend is extremely high, and the exposure of supply routes at the front to continuous attacks has reshaped the concept of proximity logistics, forcing a total rethink of procurement and battle rhythm. For its part, Russia, bolstered by the transfer of technologies from Iran for the production of Shahed-136s—renamed Geran-2 by Moscow—has made extensive use of drones to keep Ukrainian territory under pressure, especially regarding energy plants.

With Iran, meanwhile, further progress in the use of drones has been observed. The massive use of these systems according to the concept of low-cost saturation has demonstrated not only the vulnerability of the Israeli air defense system, one of the best in the world, but the ability of this widespread threat to be a formidable tool of political and diplomatic pressure over a wide area. With costs estimated between 20 and 50 thousand dollars per unit and a range of up to 2,000 kilometers, it was extensively employed in the Gulf during the reprisals of 2025 and as part of the response to Operation Epic Fury. In the very first days of operations, over 2,000 drones were launched against US bases, Israel, and the Gulf States, combined with ballistic missiles. The goal of these launches was not only direct destruction but also the exhaustion of defenses: intercepting these threats with systems like



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the Patriot or Arrow—vectors that cost millions of dollars—is not only uneconomical but problematic in light of the limited availability of stockpiles in the face of threats that are so "cheap" and easily replicable. Iran has been able, despite no longer possessing a structured air force, to strike energy networks, airports, and ports, causing indirect economic damage and increasing pressure on all Gulf states. The cases of Ukraine and Iran have shown that drones have become the new element of contemporary warfare: cheap, persistent, and lethal; they have lowered the threshold for high-intensity conflict and rendered some dogmas of Western doctrine obsolete, such as classical air superiority, air defense, and large armored formations in ground operations. This is a very broad topic, and therefore we will focus only on the aspects most directly connected to the use of airspace and, above all, its defense. The main elements from which to start are the most evident: if, on one hand, the achievement of air supremacy still allows freedom of maneuver, on the other, it does not cancel out the risks associated with actions carried





On the preceding pages, the saturation of Israeli defense systems through the launch of swarms of drones and ballistic missiles highlighted the difficulty of protecting Israeli territory.

On these pages: on the previous page, the use of the concept of "mass" in Iranian attacks underscored the problem of the rapid depletion of stockpiles; in the photo to the side, an image from Operation Spiderweb, which in 2025 saw Ukraine utilize AI-trained drones to strike the Russian bomber fleet.

On the following page: at the top, the extremely mobile launch system for Iranian Shahed drones makes them targets that are difficult to locate; at the bottom, the use of drones to strike critical infrastructure, such as refineries or industrial plants linked to Defense, is one of the most significant elements of pressure in the Ukrainian defense strategy.

out by drones and, furthermore, integrated missile defenses based only on technologically advanced systems do not allow for the effective countering of a threat that makes critical mass its main characteristic. Added to this is the need to supplement current ammunition stockpiles for kinetic operations with "expendable" systems featuring high production rates and low costs. It is evident that these are deep criticalities requiring a rethink not only of military doctrine but also of the industrial and technological system of the entire defense sector. In recent decades, the aerospace industry—Western industry first and foremost—has focused on high-end platforms; technological value was, in fact, one of the main requirements for achieving and maintaining air superiority.

Platform integration, multi-domain operations, structured command and control chains, and the availability of precise information were and are the main ingredients of an air doctrine designed for the rapid achievement of air superiority in a conflict limited in time. This is no longer the case, or rather, the current context may require operations sustained over time. A first response to this challenge should come from a profound reform of procurement aimed at faster acquisition cycles. The process between defining an operational requirement and rea-

ching mass production can no longer take years. This necessity stems from objective data reaching us, for example, from Ukraine, where the operational and technical innovations of new unmanned platforms remain valid for only a few months before the counterpart develops countermeasures. To accelerate the cycle, the reform must, however, act on two subjects: the commissioning body, to streamline bureaucratic procedures, and the industrial sector, which must be able to shorten development and implementation processes. This must be accompanied by a substantial increase in production rates through scalable and large-scale projects.

The average production capacity for Patriot missiles is about 40 units per month, compared to consumption on the order of dozens of vectors per day during operations. In this sense, the LUCAS (Low-cost Unmanned Combat Attack System) program should be mentioned—the United States initiative to develop kamikaze drones based on the reverse engineering of Iranian Shahed-136 drones—or the European ELSA (European Long-Range Strike Approach), launched in 2024 by France, Germany, Italy, and Poland, later joined by the United Kingdom and Sweden, to develop long-range cruise missiles and attack drones. Recent developments have also brought to light new challenges; the production and

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supply chains must be part of a comprehensive discussion on strategic autonomy at the national level. Parallel to the quantity of means produced, their employment must be fully integrated into military doctrines at every tactical and operational level and within training dynamics. Indeed, it is essential to include operational environments contested from an electromagnetic perspective and saturated with drones into scenarios, in accordance with the lessons identified coming from Ukraine or Iran.

Training programs must be realistic and have faster update cycles, especially for the EW (Electronic Warfare) sector, which must no longer be an element of aerospace power but the backbone of the entire structure. Drones also represent, and above all, a direct threat to targets such as ports, extractive industries, military bases, and critical infrastructures, targeted by Iranian and Russian drones and ballistic missiles. Traditional defenses, based on expensive and numerically limited missiles, have proven, as stated, inefficient against low-cost swarms and require a total rethink of air defense and C-UAS systems, pushing toward the creation of layered multi-level defenses. A new approach based on layered multi-level defenses, capable of integrating mobile fire groups, rapid-fire cannons, acoustic sensors, and electronic jamming systems to create a sustainable protection network. Using low-cost interceptors and modular

command and control systems could allow for responses to threats with cost proportionality while simultaneously ensuring the long-term endurance of defensive capacity. In summary, drones do not entirely replace conventional forces but integrate them into a multi-domain system where mass production, adaptability, and electronic warfare contribute to deciding the outcome.

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L'ULTIMO MATISSE

MORFOLOGIE DI CARTA

a cura di **Vittoria Mainoldi**



28 febbraio | 28 giugno 2026

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Aerospace Power, Strategic Decision-Making, and Contemporary Conflicts

The paradox of unfulfilled superiority

by Cristina Di Silvio



The evolution of A2/AD (Anti-Access/Area Denial) systems and the employment of drones and proxies are redefining the boundaries of modern defense, extending the threat beyond conventional fronts.

Today, aerospace power represents the most advanced expression of Western military strength and, at the same time, one of the most evident manifestations of the growing gap between operational superiority and strategic outcome. Its evolution—based on the integration of distributed multi-domain C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance) capabilities, precision weapon systems, and the exploitation of the space domain—reflects a profound transforma-

tion in the nature of conflict. Conflict is increasingly defined by the ability to impact the adversary's decision-making time even before affecting the physical space of the encounter. Superiority is no longer expressed solely through control of the airspace, but through the ability to dominate the adversary's decision cycle, compressing their timing, options, and freedom of action. The integration of distributed sensors, C4ISR architectures, and precision weapon systems has enabled an unprecedented compression of the kill-chain, allowing for the detection, tracking, identification, and engagement

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of targets in extremely short timeframes. From this perspective, aerospace power acts as a tool of cognitive superiority even before it is kinetic: operating consistently within the adversary's decision cycle means altering its coherence and imposing a state of permanent reactivity. Multi-domain doctrines and the network-centric and effect-based paradigms from which they originate have consolidated this evolution, defining an integrated and continuous operational space. Yet, at the very moment of its maximum technical effectiveness, a structural limit emerges: the failure to translate operational superiority into a completed strategic result. Aerospace power has never been so high-performing on an operational level and, simultaneously, so exposed to its own strategic insufficiency. The Iranian case represents a particularly clear manifestation of this paradox. The operational environment is configured as a layered system of A2/AD (Anti-Access/Area Denial) capabilities, supported by a robust ballistic and cruise missile component, extensive use of unmanned systems, and a network of proxy actors that extends strategic depth far beyond conventional borders. This is not a system designed to compete symmetrically in the aerospace arena, but ra-

ther to absorb effects, dilute them, and transform them into a dynamic of prolonged attrition. In this context, aerospace operations demonstrate high technical effectiveness: dynamic targeting, multi-source intelligence integration, time-sensitive engagement capabilities, and the compression of the sensor-to-shooter cycle allow for the degradation of critical systems, the neutralization of high-value targets, and the maintenance of constant pressure on the adversary. However, the functionality of the kill-chain is not, in itself, decisive.

Iran does not respond on a symmetrical level, but through a model of systemic resilience based on dispersion, redundancy, adaptation, and the indirect projection of force. Vulnerability is distributed, pressure is reabsorbed, and the confrontation is progressively removed from the kinetic dimension alone, developing across different temporal, geographical, and functional planes. This results in a recurring dynamic in contemporary conflicts: operational superiority produces immediate effects, while strategic resilience dilutes its impact over time. The limit of aerospace power is not technological, but conceptual and functional. It is designed to destroy,

disrupt, and coerce: it excels at generating rapid, selective, and scalable effects on the adversary's military system, but it is not designed to control complex territories or to govern the socio-political dynamics following the kinetic phase. When such functions are implicitly attributed to it, a structural gap is created between operational success and strategic success. Experiences over recent decades confirm this continuity. In Iraq, Afghanistan, and Libya, aerospace power determined a decisive initial superiority, producing the collapse of conventional enemy forces and clear predominance in the operational and information space. However, in the subsequent phase, the conflict transformed into prolonged asymmetrical forms, where the adversary's resilience and the non-kinetic dimension progressively eroded the political translatability of military victory. Operational victory has thus become separated from the strategic result. This gap, far from being episodic, reflects a deeper discontinuity with the criteria of American strategic thought developed after Vietnam by Secretary of Defense Caspar Weinberger and later systematized by Colin Powell: clarity of interests, definition of objectives, proportionality of means, and the presence of a credible exit strategy. In the absence of these conditions, even a militarily effective tool risks operating within an incomplete strategic framework, eventually transforming from a tool of strategy into a surrogate for it. At the same time, contemporary conflict highlights a transformation in the nature of the adversary.

The asymmetric actor does not compete for conventional superiority, but for the ability to prolong the conflict, shifting it toward dimensions where time, perception, and political legitimacy play a determinant role. The center of gravity thus shifts from the destruction of capabilities to the overall endurance of the system. The Iranian strategy fits into this framework, combining distributed deterrence, indirect response, and calibrated escalation management, keeping the confrontation within a threshold of continuous pressure and avoiding a rapid decision. In the absence of a clear political definition of the end-state, the risk is one of exclusively tactical escalation management, devoid of an overall strategic direction. Aerospace power therefore retains a decisive, but not autonomous, function.

Its effectiveness is maximized when employed within a coherent strategic architecture, with clearly defined, politically sustainable, and militarily achievable objectives, and with planning that includes the post-conflict phase from the outset. Under these conditions, it acts as a multiplier and accelerator for achieving strategic goals. In the absence of such coherence, even the most sophisticated operational success remains isolated and strategically unfinished. Signs of decision-making fragility are clearly identifiable today: ambiguity of objectives, insufficient post-conflict planning, underestimation of asymmetric dynamics, and a misalignment between tools and political goals. The future of aerospace

On these pages, the integration of C4ISR systems and space technologies shifts the center of gravity of modern conflict: victory is no longer measured solely by the conquest of physical space, but by the dominance of the adversary's decision-making time (Photo: Italian Air Force).

On the following page, the Iranian case highlights how the distribution of vulnerability and constant adaptation can neutralize even the most sophisticated weapon systems (Photo: Euronews).





power will develop along increasingly advanced technological trajectories: multi-domain integration, exploitation of the space domain, artificial intelligence applied to decision support, and the ability to operate in contested and degraded environments. However, no technological evolution can compensate for a lack of strategic thinking. The central issue is no longer the ability to generate effects—now fully consolidated—but the ability to integrate them into a complete strategic architecture. Aerospace

power is not a standalone solution, but a multiplier of strategic effectiveness. Dominance of air and space allows battles to be won; the ability to transform those victories into lasting results depends on the quality of the strategy that governs them. It is in this space, between operational excellence and political coherence, that the true measure of aerospace superiority is determined today.

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STEREOTYPES AND INTERNATIONAL NEGOTIATION

Un rischio operativo per l'efficacia negoziale

*by Daniela Iacovone
photo Xnova International*



The role of stereotypes in international negotiation processes and how they can influence the different phases of the negotiation, from preparation and conflict management to reaching an agreement.



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During a training program on international negotiation at the British Ministry of Defence, participants were given a questionnaire based on standardized behavioral attributes, asking them to instinctively associate each trait with a specific country. Examples included prompts like "They are precise, punctual, and reliable," "They attach great importance to socialization," or "They are highly nationalistic." The responses, provided immediately, showed high convergence despite marginal variations.

The same tool, later used in similar contexts in Italy, produced substantially identical results. These episodes illustrate the power of national stereotypes, which operate as rapid and often unconscious interpretive frameworks. But what do they demonstrate in practice? The relevant issue is not so much establishing if stereotypes affect us—as they are a constant in human cognitive processes—but rather understanding what happens when these frameworks enter international relations and, specifically, the negotiating

process. First, it should be noted that this contribution focuses exclusively on the role of stereotypes in win-win negotiations, without further exploring biases, prejudices, and preconceptions which, though related, pertain to partially distinct phenomena. In the case of stereotypes, we are dealing with cognitive distortions that act as mental shortcuts used to classify people or situations into predefined categories. They emerge when an initial generalization, potentially useful in the preparatory phase, crystallizes into a rigid belief, applied automatically to the counterpart and no longer subjected to empirical verification (a recurring example being: "This behavior is typical of the counterpart's negotiating approach and there is nothing more to investigate"). To understand how this mechanism works in practice, it is useful to turn to social psychology and, specifically, the study of cognitive heuristics: human beings, especially in situations of urgency, uncertainty, and complexity, tend to resort to mental shortcuts that allow them to quickly resolve a situation with minimal cognitive effort. The stereotype, therefore, represents a starting point from which it is necessary to progressi-



Stereotypes operate as mental shortcuts that, if crystallized, compromise international negotiation. For a win-win approach, it is essential to replace "preemptive categorization" with objective analysis, applying the separation of relationship and merit to transform conflict into side-by-side collaboration.



vely detach oneself to avoid becoming trapped. Sometimes, under pressure and decision-making urgency, these mental shortcuts can serve an immediate adaptive function and allow for a quick decision. However, it is essential to maintain awareness of the cognitive processes at play and prevent this mode from crystallizing into an involuntary habit, leading to the systematic use of such automatisms and the abandonment—especially in negotiations—of critical thinking and a thorough, objective approach. This is particularly true in international relations, where the main schools of negotiation emphasize that reaching an agreement requires depth, reflection, clarity, and objectivity. To this end, it is also useful to understand when the stereotype may intervene in the negotiating process, influencing its dynamics and outcome.

Considering that negotiation is divided into three phases—preparation, management, and assessment—the risk emerges as early as the preparatory stage, during which it is essential to acquire as much information as possible about the counterpart. From this moment on, however, the collection and analysis of information can be distorted by the lens of the stereotype. To avoid this, it is important to try to clear one's mind ab initio from the automatic use of such frameworks through an exercise of awareness aimed at building the most objective representation pos-

sible of the counterpart, renouncing any form of "preemptive cataloging." To this end, it is also fundamental to avoid so-called "selective data collection"—an approach that leads to considering only elements that support already formed beliefs. This phenomenon is especially prevalent in the presence of negative judgments, which individuals tend to unconsciously reinforce by ignoring contrary evidence. On a practical level, it is first and foremost important to use respect and objectivity when studying cultural differences with one's interlocutor to avoid distorting interpretations and behaviors that could be inadequate or even offensive, potentially eroding mutual trust and compromising the success of the talks.

Objective and accurate preparation should also focus on analyzing similar past negotiations and delving into the fundamental principles of the counterpart's domestic system, rather than limiting oneself to acquiring generic information based on belonging to a certain geographical or cultural area, which ultimately results in mere "preemptive cataloging." The information collected must then be used with equal awareness during the management phase of the negotiation, where stereotypes tend to resurface, especially at the first sign of conflict. When the interlocutor's behavior contrasts with our own, one is prone to focusing on subjective elements, diver-

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ting attention from the merits of the negotiation. In the dynamics of conflict, there is a constant risk of overlapping the problem with the people, as well as an unconscious recourse to preconceived judgments that reduce the negotiator's clarity and their ability to identify or generate new solutions. In such circumstances, there is also the risk that the parties end up in a "face-to-face" dynamic, likely to slow down or even prevent the final agreement. To avoid such situations, the Harvard negotiation school developed the rule of "separating the people from the problem," which allows for a distinction between the objective level of the negotiating substance and the relational level. In practice, one must consciously observe the unfolding negotiating dynamics to prevent the objective and subjective dimensions from overlapping and emotional reactions from prevailing over rationality. In these cases, only by consciously keeping the two levels distinct is it possible to return to a collaborative dynamic, moving from a "face-to-face" confrontation to a

"side-by-side" collaboration—a modality that represents the cornerstone of negotiations conducted according to a win-win logic. In conclusion, a stereotype is not just a cognitive error but a true operational force capable of influencing strategies, behaviors, and thus the outcome of a negotiation. The problem can be adequately managed through accurate and conscious preparation, as well as by maintaining clarity, awareness, and self-control throughout the negotiation. While these practices do not guarantee the success of a negotiation, they significantly increase its probability. If none of the strategies illustrated prove effective, the possibility of practicing empathy remains: reflecting on the stereotypes commonly associated with one's own country or group, and focusing on the negative reactions they arouse, may help avoid falling into the same cognitive trap when called upon to evaluate the counterpart.

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Aeronautica Militare: its feats, its perception.

*by Ettore Maria Colombo
Advisor to the Minister of Defense
photo Aeronautica Militare*



In these pages, over the years, the Italian Air Force has succeeded in securing a prominent position on the international stage: a merit that is also recognized within Italy, thanks to its work "away from the spotlight" and in service to the Country.

The history of the Italian Air Force (Aeronautica Militare) is composed of glorious periods, rich in episodes balanced between daring and a passion for flight, as well as heroic feats. It is a history that has developed in parallel with that of Italy itself, sharing the moments—including tragic ones—that have characterized the last century. From the first hot-air balloons under the management of the Military Engineers—at the beginning of the twentieth century, in fact, aviators were part of the Royal Army (Regio Esercito)—to the use of the new aerial medium in warfare, first in Libya, an absolute world first, and later during the First World War. One cannot forget the heroic feat of Vienna when, in 1918, the "Vate," poet, and aviator Gabriele d'Annunzio flew a patrol of seven aircraft over the capital of the then Austro-Hungarian Empire, dropping not bombs, but propaganda leaflets; or the ace of Italian aviation, Francesco Baracca; or the adventure of the two SVA 9s (Lieutenant Arturo Ferrarin with mechanic Gino Cappannini and Lieutenant Guido Masiero with mechanic Roberto Maretti) who reached Tokyo by flight in 1920—a "sensational" feat for that era. With the birth of the Regia Aeronautica in 1923, all the skills and capabilities of Italian aviators were grouped into an independent Armed Force. A new domain, that of the air, was waiting to be discovered, requiring alongside constant technological progress a human "valor" that sought to test the limits of this new reality.

These were the years of records, such as those of Agello and Pezzi, and of great aviation feats like the epic flights across the Atlantic Ocean (Italy-Brazil and Italy-USA), under the command of the aviator and high-ranking official Italo Balbo, the father of modern aeronautics. The history of Italian military aviators has always been a narrative of successes and daring, exceptional feats—both at the squadron and individual levels—but also a story of aviators and aircraft (today among the fastest and most modern in the Western world) who have made the trait of understatement almost a sort of civil religion. The vicissitudes of the Second World War and the contribution of the Regia Aeronautica alongside the Allies marked a painful page written with the sacrifice of thousands of men always ready to serve the higher good of the nation. Reborn in 1946 as the Aeronautica Militare, it became—notwithstanding the birth and popular success enjoyed over the decades by the Freccie Tricolori—"The Great Silent One," an epithet usually reserved for another prestigious Armed Force, the Navy. Certainly, the performances and deeds

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of the PAN (Pattuglia Acrobatica Nazionale) have allowed the "spearhead" of the Blue Arm to be admired and known in Italy and throughout the world. But as much as the "Frecce" are the symbol and pride of our Air Force and of all of Italy, the Aeronautica Militare is something much more complex and structured, and its history is proof of this. It is a heritage made up of the deeds of courageous people who acted with passion, generosity, and pride, but also, and above all, by the daily contribution that the men and women in blue carry out in Italy and around the world. Professionalism and sacrifice: two aspects that recur throughout the more than one hundred years of the Air Force's history. A prime example is the Kindu massacre of 1961. In the Congo, Italian aviators of the "Congo Detachment" of the 46th Air Brigade, employed for the first time in a UN humanitarian mission since the end of the war, operated out of the airport in the capital, Leopoldville. They were entrusted with the arduous task of ensuring most of the air transport activity necessary in a nation seven times the size of Italy.

It was in this context that the tragedy of two Italian crews, "Lyra 5" and "Lupo 33," commanded by Major Amedeo Parmeggiani and Captain Giorgio Gonelli, unfolded. The news of the massacre of the 13 Italian aviators traveled around the world, shocking public opinion. To the drama was added tragedy: their bodies were not found initially but were later discovered in mass graves. The "Kindu massacre" remained vivid in the memory and history of our country, honored and remembered for a long time. Another moment of great professionalism to remember is the one that occurred during the "Sigonella crisis" of October 1985, arising from the clash between the USA, led by President Ronald Reagan, and Italy, whose Prime Minister

was the socialist Bettino Craxi: there was a moment of intense tension, fortunately resolved, which saw the VAM (Vigilanza Aeronautica Militare), supported by the Carabinieri, pitted against the USA special forces of "Delta Force." In the early nineties, we witnessed the first real operational employment since the Second World War: the First Gulf War (1990-1991). Under the aegis of the UN, Italy took part with its own contingent in the operation for the liberation of Kuwait. On the night between January 17 and 18, 1991, the Tornado of Major Gianmarco Bellini (pilot) and Captain Maurizio Cocciolone (navigator) was shot down by Iraqi anti-aircraft fire, and the two aviators had to eject to save themselves, eventually being captured. The two pilots (the only ones in the formation to reach the target and hit the objective) spent 47 days in a long, painful captivity, amidst physical violence and psychological coercion. The images of the interrogations, especially that of Cocciolone, were widely disseminated in the media, and not only in Italy. Released on March 3, only after the surrender of the Iraqi army, both servicemen were transported to a USA hospital ship and subsequently were finally able to return to Italy.

It was an episode that stirred strong emotions in public opinion. It is also impossible not to mention the constant commitment of the Air Force to the community. Consider the floods of Sarno and Quindici in 1998, when SAR (Search and Rescue) crews flew incessantly in prohibitive weather conditions to save the population. Although the contribution of the Blue Arm during COVID is well known for the transport of patients and materials, less known to the general public are the hundreds of medical flights that ensure, every day, the transport of organs or people in imminent danger of life. Beyond the aforementioned epi-





sodes, some of which were dramatic, the Air Force has distinguished itself over the decades in operational activities as "silent" as they are important, if not crucial, in many decisive theaters. It began in 1993 with Operation "Deny Flight," aimed at preventing military aircraft from flying over Bosnia. For almost three years, the Air Force provided logistical support to NATO units present at Italian bases and intervened, starting in 1995, with Tornado and AMX fighter-bombers; it then moved to the NATO airstrikes on the Federal Republic of Yugoslavia, current Serbia, in 1999 and for two months during Operation "Allied Force," implemented to end ethnic cleansing in Serbian-occupied Kosovo. From Afghanistan, with operations to counter Al-Qaeda, to Libya in 2011 for Operation "Odyssey Dawn," the Air Force has demonstrated a constant presence. A commitment that continues today in the Middle East with Operation "Inherent Resolve" to counter Daesh. These missions are a testament to an international contribution provided without pause in recent decades, which today finds a further point of strength in

the "capacitive" projection on the Eastern flank of the Atlantic Alliance. Since Russia has shown its aggressive and invasive tendencies, both toward Ukraine since 2022 and in the form of a looming threat toward NATO countries, the action and flight of Air Force planes, periodically deployed on the Eastern front, have represented a certainty and, together, a security for all Baltic countries and for the Alliance. As can be seen, therefore, the presence of the Air Force is mostly "silent," but always efficient, ready, and technologically updated, constantly providing and guaranteeing the protection of the skies of our country and those of our NATO allies. One more reason, obviously, to always be proud of it.

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BALTIC EAGLE III

Italy in Defense of the Baltic

*Special report by Serafino Durante and Luca Ricci
photos by Aeronautica Militare*



Rivista Aeronautica has returned to the Ämari Air Base in Estonia to tell the story of the vital work carried out by the Italian task force for over eight months.



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After a 50 km journey from the capital, Tallinn, we arrive at Ämari Air Base. Entry controls are tight, and the atmosphere is different from how we remembered it. Our reportage begins here. This is the third time the Italian Air Force has deployed to Estonia as part of the NATO Enhanced Air Policing mission to contribute to the Air Defense of the Baltic Republics, which lack their own combat component. This activity, it should be recalled, was introduced by the Atlantic Alliance in response to the 2014 Ukrainian crisis, when Russia's illegitimate annexation of Crimea occurred, to provide deterrence and firmly demonstrate even more vigorous cohesion and collective defense. The "script" is always the same, with Russian military aircraft traveling a wide arc of over 700 NM from St. Petersburg to the Kaliningrad enclave, through the Gulf of Finland and the Baltic Sea, within international airspace that, between Helsinki and the Estonian capital Tallinn, takes the form of a corridor just 10 miles wide. We at Rivista Aeronautica did not miss the opportunity to follow this latest operation as well, after those of 2018 and 2021. It is Baltic Eagle III, which took place from August 2025 to March 2026 and, as with the two previous ones, was managed from Ämari Air Base, the only one belonging to the Eesti õhuvägi, the Estonian Air Force. Conducting it, for the flight portion, were once again two distinct Task Groups equipped with different aircraft: indeed, the so-called Block 69 operated with the F-35s of the "Lightning" TG, the CAEW, and the SPYD-R, while the subsequent Block 70 operated with the Eurofighters of the "Typhoon" TG. This was a rotation that had already occurred, for the first time ever, during Baltic Eagle II and which demonstrated its full effectiveness without the mission's operational status being affected in the slightest.

Compared to the two previous deployments, this operation presents some new elements: above all, certainly, the new geopolitical context that has emerged since February 22, 2022, with the Russian invasion of Ukraine, a conflict that has now lasted for more than four years and seems far from a peaceful resolution. This is a situation that has certainly not favored a relaxed climate, to use a euphemism, ensuring that all the Alliance's attention was concentrated on that Eastern flank





where our country is also called upon to provide its contribution. Furthermore, also in this circumstance—we must say for the first time—there is a component of the Italian Army present, operating with the "IDRA" Task Group within the TFA (Task Force Air) with the SAMP/T (Sol-Air Moyenne Portée/Terrestre) weapon system, dedicated to missile air defense. This integration between the Air Force and the Army had a precedent last year in Lithuania, when, again in the context of Air Policing, the SAMP/T was redeployed only for a short period and for exercise purposes. In this case, however, we are talking about a real operation that allowed the air component to be integrated with the land component, in application of one of the founding principles of the NATO IAMD (Integrated Air and Missile Defence) Rotational Model, the recently approved initiative under which the Italian Army's contribution is included. Without forgetting that this advanced missile system will soon also be acquired by the Air Force, which will implement its own capabilities within its primary mission. But we will talk in detail about the "IDRA" Task Group, responsible for the SAMP/T, later through the voi-

In the opening, Operation Baltic Eagle III took place from August 1, 2025, to March 31, 2026: over 800 personnel, eight aircraft from the "32nd Wing" and "4th Wing" Task Force Air, and the SAMP/T system monitored the Baltic skies in support of NATO's collective defense.

In these pages, for the first time in a real-world operation within the TFA, a SAMP/T component of the Italian Army was deployed; Col. Fabio De Michele, Commander of the "4th Wing" TFA.

ces of those who employed it during Baltic Eagle. Finally, still within the scope of "novelties," thanks to the expertise of the CIS (Communication Information System) nucleus, part of the STL (Supporto Tecnico Logistico) Group with the task of managing all infrastructural connections both with the Motherland and within the base, with the go-ahead from the functional security authority, an information architecture was created for the first time in an operational theater outside national borders capable of carrying high-classification services through the commercial network pro-

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vided by the Host Nation. This was a significant advantage compared to past experiences, ensuring a much faster and more secure connection. But let's return to our visit to Ämari. This time, too, we were lucky because we arrived in the middle of a meteorological truce, given that in the previous weeks, the Tallinn area was hit by a wave of frost and snow: we believe the opening image of this reportage can adequately testify to this. On the path leading us to the TFA "4th Wing" area, we realize how much the Estonian base has been transformed over the last five years, featuring new and technologically advanced structures. The Commander, Col. Fabio De Michele, a long-time acquaintance of Rivista Aeronautica since his service at the Reparto Sperimentale di Volo, awaits us and immediately takes us with him to the morning briefing with the other section heads to get into the heart of the activities.

«As you know – he tells us – we are here, as part of NATO's Assurance Measures, to defend the Air Space from possible intrusions and to perform a deterrence function, as well as to strengthen the integration of the Alliance's components in this Baltic area. Our capability package has the task of supporting Air Shielding activities to discourage air and missile threats, performing both the Air

Policing and Reinforcement parts, namely training, an essential component of the entire operation. In addition to Alpha Scramble missions – Col. De Michele continues – tasked by the CAOC (Combined Air Operations Centre) in Uedem, Germany, to intercept aircraft or assets in “no squawk,” no radio, and no flight plan conditions, we also perform joint activities with other NATO countries operating in this area». The Commander is referring to the so-called FDO (Flexible Deterrence Options), specific training missions in which various types of air packages participate to show even more eloquently, if necessary, the level of cohesion and integration among the Atlantic Alliance's air forces. Even with the aircraft constantly in "Hot" configuration, therefore always armed and ready to be tasked for a real scramble, the training part is absolutely significant and here in Estonia has mainly embraced three macro areas: Tango Scramble, JTAC (Joint Terminal Attack Controller), and Counter UAS (Unmanned Aircraft System), seeking to organize missions in a range that also "involves" the SAMP/T component, which responded in an exemplary manner. «The real Air Defense activations – the Task Force Commander resumes – throughout Baltic Eagle III were more than 40, of which eight were with the F-35s of the TFA “32nd Wing” and the remain-



On the facing page, at the top, there were more than 40 real Air Defense activations in total; the technical personnel of the "4th Wing" TFA come from the Italian Air Force's four Eurofighter Wings.

On this page, on the right, the F-35As guaranteed the surveillance of the Baltic skies during the initial period of Baltic Eagle III, before giving way to the Typhoons; below, during the operation, several exercises were conducted by Italian aircraft with other Alliance assets.



der with the F2000s. Of these real activations, 25% concerned fighter assets, with absolutely safe and professional behavior from those intercepted. We performed – De Michele adds – an important activity, exceeding 1,300 total flight hours». While the Commander steps away for urgent matters, we take the opportunity to move to the operational area and visit the QRA (Quick Reaction Alert) building, the heart of the "Typhoon" Task Group. Welcoming us is its Commander, Maj. Pilot Valerio C., who receives us during one of the rare moments of pause. «Here in Åmari – he tells us while accompanying us on a quick tour of the structure – the activity is very intense. It is a perfect location, a true enabling factor, where everything is concentrated in a few meters. The quarters, briefing rooms, and hangars are connected by a simple corridor; the system, in fact, is designed to minimize reaction times. If a scramble is triggered, we are

ready even before the formal order». Pilots and technicians share 24-hour shifts, with integrated common spaces and rest areas. The Task Group Commander shows us the room reserved for personnel on alert, the environment where pilots spend the hours of waiting between activations. Then, leading us toward the hangars, he emphasizes the extraordinary proximity to the aircraft in operational readiness: just a few meters, designed to guarantee immediate reaction times. These are cutting-edge environments in which every aspect is handled in the smallest detail: heated environments, green and red light video-traffic light systems, and even a laser apparatus to deter birds when the hangar doors open. «These are small precautions – the Major emphasizes – but they make the difference. Here everything is designed to be rapid, safe, and effective, and we have appreciated this very much». The Task Group totals





about 70 people of whom, at the time of our visit, seven are pilots, coming from the three F2000 units of the Air Force, with four Eurofighters (two from Grosseto and two from Trapani) in H24 operational readiness, supported by two additional reserve assets in Italy. Should the “lead” aircraft be unavailable, an interconnection door between the two bays allows for a quick switch to the reserve one without losing precious time. The pace is intense and it is necessary to always maintain the highest level of operational efficiency: «It is a choral effort – Major Valerio C. emphasizes – for which every component is essential to ensure mission continuity».

Having left the commander of the “Typhoon,” we head toward the maintenance hangar, where we find an aircraft engaged in routine checks. The technicians explain to us how the Eurofighter is responding very well to the intense operational activity, without being affected by the particular-

ly rigid climatic conditions recorded in Estonia: during the winter, in fact, temperatures dropped even below -20 degrees. Here in Ämari, mainly first-level maintenance activities are carried out, strictly in support of flight. It is more or less about replicating the maintenance capacity of a Flight Group, providing everything needed immediately to keep the aircraft efficient and ready. In detail, pre- and post-flight inspections, corrective interventions with component replacement, and limited scheduled activity, always attributable to the first technical level, are performed. It is necessary to ensure operational continuity without entering into the more complex tasks typical of the second level. Furthermore, the personnel are able to manage armament, including any configuration changes (the so-called role change), and have all necessary ground support at their disposal. In essence, with a team of about fifty technicians, everything needed to guarantee efficiency and readiness is reproduced in the operational theater. We take the car again and move to the opposite side of the base to get a close look at one of the Task Force's novelties: the SAMP/T system. The snow, which until a few weeks earlier covered everything, has now almost completely melted, leaving space for damp and occasionally muddy ground, especially in the isolated area where the system has been deployed. Meeting us is Army Lt. Col. Umberto Orlandi, Commander of the “Idra” Task Group, who allows us access to the restricted area, introducing us to the capabilities and role of this asset within the operational device. The SAMP/T system today represents one of the most advanced assets of the Italian Inte-





On the facing page, at the top, the four Eurofighters of the "4th Wing" TFA come from the 4th Wing in Grosseto (two) and the 37th Wing in Trapani (two); below, another image of the Italian Army's SAMP/T component that took part in the Baltic operation.

On the left, the Chief of Staff of the Italian Air Force, Gen. S.A. Antonio Conserva, meets with TFA personnel during his visit to Āmari; below, a group photo of the TFA together with General Conserva.



grated Air and Missile Defense, created to counter multiple threats, from aircraft and drones to cruise and short-range ballistic missiles. «We operate – the Commander explains – in a structure that, by its operational nature, is the one among the Army components that integrates most with the air defense mission institutionally assigned to the Air Force, and this allows us to be immediately interoperable in every scenario, national or international. If the fighters intercept threats in the skies, the SAMP/T operators simultaneously and in synergy with the flying assets guarantee continuous coverage from the ground through advanced radar and tactical links». Its SBAMD (Surface-Based Air and Missile Defense) nature allows it, in fact, to operate in full integration with air forces, sharing data, alarms, and procedures in real time. A crucial element that emerged precisely in this latest operational mission: for the first time, the SAMP/T was employed within an air task

force in a real NATO context, contributing to the Baltic Air Policing mission. Operational for almost nine months with a stable contingent of about one hundred units, the SAMP/T is a unique platform, composed of a complex set of integrated subsystems: the command module, the search radar, the fire control, and the ground launch subsystem with the missiles. Components that work in synergy to guarantee detection, engagement, and neutralization of the threat. «The fire control – Lt. Col. Orlandi explains to us – is the brain of the system, also called the Engagement Module. Here the Tactical Control Officer and his assistant manage, control, and finalize the identification and eventual engagement of targets. The command module, on the other hand, is responsible for Air Defense planning and tactical monitoring of the mission». All modules are connected via a fiber optic network, while the launch component can also be integrated via radio. Fundamental is



A TFA specialist performing checks on an Eurofighter.

On the facing page, Italian and Estonian female personnel during one of the many "social" moments held in Ämari; below, since last March 31st, the Italian flag has returned home, officially concluding Operation Baltic Eagle III.

the role of the radar, supported by its own dedicated generator set. «Our sensor – Orlandi specifies – guarantees surveillance of the airspace, but here we also operate with more advanced assets that significantly expand the detection capacity. For the first time, in fact, we have deployed in operation the new Kronos Grand Mobile High Power radar, which will be part of the new generation of the SAMP/T. This sensor allowed us to significantly extend the system's capacity and to test the new technology in the field, greatly expanding the information provided to the Estonian CRC (Control Reporting Centre). The true strength of this operation, in fact, is integration: we share the same information as our colleagues in flight and we alert in unison when a threat emerges. We are finally putting into practice what we have studied for years, and this experience is making the personnel grow, both from a technical point of view and in the ability to operate in a truly joint context. We believe – the Idra Commander concludes – it is the right direction, already taken by other countries, not least Estonia itself, where it emerges that effective air defense is integrated by definition; only in this way is it capable of responding to the increasingly complex scenarios that are asserting themselves».

During our stay, we also wanted to visit the CRC in Tallinn, located in the city center, where a Battle Management Cell is present with our personnel to support all the activity of our assets, and in particular that of the SAMP/T, redeployed at the Ämari base. Also present, outside the cell, are two Italian Army non-commissioned officers for the

link with the missile battery. Last, but certainly not least, the Technical Logistic Support Group, which we know well is fundamental in operations of this type. In particular, it handles the direct management of all aspects related to logistics, support for the Motor Pool component, and that relating to movements to and from the Motherland. One of its branches is the MDLP (Multi Data Link Processor) nucleus, a component of the Mobile Command and Control Department of Bari Palese, which created a true citadel in Ämari within which services are provided that allowed the TFA to perform all those command and control activities and the relay of radar tracks toward Italy, to the 22nd GRAM in Licola, to the COA (Aerospace Operations Command), and to the recently established Joint Operations Center of the COVI (Inter-force Summit Operational Command), the operations room that coordinates all operations outside national borders. Our visit to Estonia is about to end, but before leaving, we stop to say goodbye to Col. De Michele, who is busy with the demanding organization of the redeployment phase, which is certainly more complicated than others, given that the land component is added to the air component. Further complicating the withdrawal is the fact that another Air Policing operation is not scheduled for the next four months to which materials and acquired knowledge could be "passed on," thus lacking that continuity between one TFA and the next. «I would like – he tells us – to make two brief considerations: one of an operational nature and the other more emotional on this experience that is coming to an end. The airspace surveillance activity here in

Estonia – he tells us – was very interesting and highly formative. These guys, some of them very young, demonstrated that they possess a professionalism, preparation, and self-control that are absolutely high and, as a leader of the Armed Force, I am truly proud of them. As a Commander, I am extremely calm because I see them as masters of the subject. It is evident that they are used to dealing with very complex international scenarios in real operations. And this – De Michele continues – demonstrates how the Air Force has made an extraordinary leap forward in capacitive and technological terms over the last 15 years. And now we come to evaluations of a more general nature. This experience in OFCN was something I wanted to do. It is not easy to condense ideas, choices, difficulties, and emotions into just four months of operational activity. I tried to manage the Task Force like a large family, making sure that all branches, including that of the Army, interacted and blended among themselves, to work in harmony and close collaboration, supporting each other. Succeeding in this “feat” – the Commander bids us farewell – was not a given. I am happy to have succeeded!».

We want to close this reportage with a look at aspects that fall outside of operations and go beyond the technical issues recounted so far. Yes, because the military contingent in Estonia, as is in the best Italian traditions, found the time to give a moment of lightheartedness and a few smiles to those less fortunate. There were many social ini-



tiatives organized by the TFA personnel. Among all of them, just to name a few, was the Befana with the children of a kindergarten in Vasalemma, a small village near the Ämari base, who do not have our tradition and to whom they donated a swing, as well as the pizza evening at the Keila Social Centrum, a care center that hosts people with mental disabilities. With the lowering of the flag on March 31, Operation Baltic Eagle III ends. The Task Force Air “4th Wing” passes the baton to the Portuguese Air Force with its F-16s to continue the Air Policing mission in Estonia. Months of intense activity and an effort much appreciated by the Estonian authorities, who thanked the Italian contingent for the precious and effective contribution provided in ensuring the security of Allied Air Space.

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POLYGON

**The 155th ECR Squadron bids farewell
to the range after 30 years**

*by Francesco Nacca
photo Aeronautica Militare*



Magnum!!! Magnum!!!», the code transmitted via radio to announce the launch of an anti-radiation missile and the imminent suppression of a threat, “echoed” in the skies of Polygone for the last time. Last March, in fact, the 155th ETS (Electronic Warfare & Tactical Suppression) Group of the 6th Wing bid a final farewell to the Electronic Warfare range in Germany, where hundreds of flight crews have trained for decades. It is a moment that marks the conclusion of a long training cycle which, for years, saw the “Black Panthers” of the 155th as protagonists. In one of the most challenging scenarios in the European sphere, they faced simulated threats and extremely realistic operational contexts to develop and consolidate advanced capabilities in the electromagnetic domain—a decisive factor in ensuring effectiveness, survival, and tactical supe-

riority in aerial operations. In an increasingly complex operational environment, the achievement and maintenance of air superiority depend growingly on the ability to neutralize integrated air defense systems. SEAD/DEAD (Suppression/Destruction of Enemy Air Defences) missions constitute an essential enabling function, especially in increasingly sophisticated and changing scenarios and, therefore, less permissive and more lethal. In this field, the Italian Air Force has developed an absolute top-level capability over time precisely around the 155th Group, a leader in electronic warfare for over three decades with the Tornado ECR (Electronic Combat Reconnaissance). This specialization was built progressively, starting from the operational lessons learned during the Gulf War, when the need to systematically address enemy air defenses to ensure the effectiveness of air operations emerged clearly.



Starting from the 1990s, this path experienced a significant acceleration: from the integration of the AGM-88 HARM (High speed – Anti Radiation Missile) on the Tornado IDS (InterDiction and Strike), to the development of dedicated procedures, up to the training of highly specialized Aircrew personnel. In 1995, the 155th Group, then part of the 50th Wing in Piacenza, was designated as an ETS unit, and starting from 1998, the Tornado ECR was introduced—a platform specifically conceived for electronic warfare. This rapid and constant growth allowed the Italian Air Force to be, along with Germany, the only European country to have a dedicated platform for SEAD operations.

This was also possible thanks to the contribution of the multinational MAEWTF (Multinational Aircrew Electronic Warfare Tactics Facility) center in Polygone, one of the most advanced in Europe for training against radar and missile threats, which together with the PISQ (Salto di Quirra Interforce Range) in Sardinia, represents an excellence within the Atlantic Alliance for electronic warfare preparation. The March mission, therefore, represents much more than a training activity: it is the synthesis of a heritage of skills, experience, and innovation built over

On the preceding pages, Tornado ECRs returning from a mission at the Polygone MAEWTF.

On these pages, the range is located along the Franco-German border and offers a unique operational scenario for Electronic Warfare Training. Through high-fidelity radar threat simulators, the center allows for the testing of jamming tactics, the use of Chaff/Flares, and evasive maneuvers: a perfect operational environment for SEAD/DEAD missions.

On the following pages, in the top right, the commemorative patch of the Italian Tornados' latest training campaign; the other photos show various moments from the Italian aircrafts' mission.

time. The training environment of Polygone, despite being controlled, faithfully reproduces real operational conditions and transforms every mission into a deeply immersive experience. In this context, electronic warfare is not an abstract concept, but an operational reality in which every radar emission represents a tactical variable to be interpreted and managed in real-time. The electromagnetic spectrum thus becomes a true sector of aerospace operations, in which perception, analysis, and decision merge into a continuous process. The Tornado ECR has embodied this operational philosophy for decades. More than a simple platform, it has been a doctrinal tool capable of defining the European approach to SEAD. Penetrating "contested" airspace, identifying hostile emissions, and contributing to their neutralization through the integrated use of sensors and anti-radiation armament represented the heart of its mission. In this framework, the 155th Flight Group played a central role, contributing to the construction of a SEAD culture fully integrated within the NATO environment. Italian flight crews operated in multinational contexts, sharing experiences and developing tactics, techniques, and procedures that strengthened interoperability and operational standardization. This capability did not remain confined to the training sphere.

During Operation Allied Force, the 155th Group was employed intensely against the Serbian air defense system, contributing to its progressive degradation through high-intensity suppression missions. Similarly, in 2011, during NATO operations in Libya, the Italian Tornado ECRs once again operated as "first in" assets, opening the way for other aircraft and ensuring the freedom of action of the allied air component. In both cases, the Unit demonstrated high decision-making capacity, adaptability, and full interoperability with Alliance forces. Electronic warfare and SEAD represent one of the most complex domains of modern air combat, in which the technological component is intertwined with a deeply cognitive dimension. Tornado ECR crews operated in an environment characterized by high electromagnetic density, dynamic threats, and extremely reduced decision times. The role of the Weapon System Officer was central in managing the EW spectrum, identifying threats, and employing armament, while the support of electronic warfare specialists and intelligence personnel guaranteed the continuous update of threat libraries and the evolution of operational tactics. Today, the recent activity at Polygone takes on a meaning that goes beyond the single mission. It is indeed positioned among the last for the Tornado ECR in this training



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context, symbolically marking the closing of an operational and doctrinal cycle. For over thirty years, this iconic aircraft has been synonymous with SEAD, low-altitude penetration, and a highly specialized operational community. Stepping down the ladder after one of these missions means sensing the transition in progress—a passage that involves not only technology but also the culture and professional identity of the flight crews. The adherence to the JSF (Joint Strike Fighter) program, which led to the development and acquisition of the Lockheed Martin F-35A Lightning II, marks the entry into a new phase of electronic warfare. In this platform, SEAD capability is no longer concentrated in a dedicated asset, but distributed and integrated within a broader system, based on sensor fusion, connectivity, and stealth architecture. The management of the electromagnetic spectrum thus becomes a native function, an integral part of the conduct of the “electronic attack” mission and no longer a specialization in itself.

Despite this technological evolution, the legacy of the Tornado ECR remains a fundamental element reflected in the procedures, the operational mentality, and the wealth of experience accumulated over decades. Polygone, in this sense, is not only the theater of the last missions but the symbolic place where this legacy was consolidated and passed down from generation to generation. In a strategic context marked by the return of peer-to-peer competition and the growing sophistication of air defenses, the ability to control the electromagnetic spectrum and deny the enemy the effectiveness of their sensors will continue to represent an essential condition for the success of air operations. The end of the





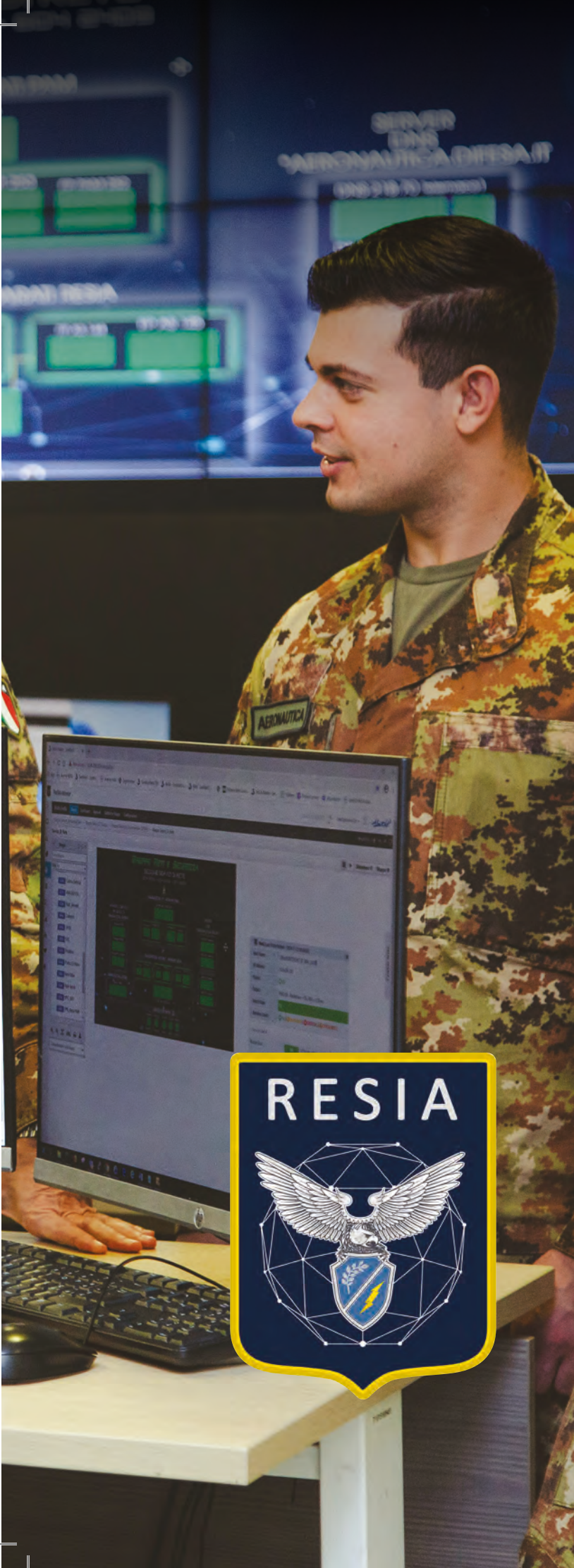
Tornado ECR's operational cycle does not, therefore, represent a conclusion, but a transformation and a new beginning. Italian SEAD capability enters an even more advanced phase, bringing with it a unique heritage of experience and competence. In this transition, the contribution of the 155th ETS Group continues to live on, not only in operational memory but in the future capabilities of the Italian Air Force and the Atlantic Alliance.

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Digital Sovereignty and Innovation: The Strategic Role of ReSIA

*by Flavio Silvestrini
photo Aeronautica Militare*



I Imagine living in a beautiful house with transparent glass walls, where every comfort responds to our mere thoughts. This is the magic of the digital dimension in our collective life—a world where distances vanish and everything is manageable from a small smartphone. But this modern house, magnificent as it may be, lacks traditional locking systems. Indeed, we have traded old iron locks for invisible wires, as fast and thin as spider webs. This very transparent fragility exposes us to the concrete possibility of suddenly finding ourselves stranded at an airport with every flight canceled, unable to return home; of discovering that access to our email or online banking is blocked because an intrusion has violated our identity, isolating us from the digital world; or, even worse, of suffering—in the midst of an emergency—the tragedy of a hospital with paralyzed machinery and clinical data encrypted by hostile malware demanding a ransom to restore our hope of life. These are not sequences from a movie, but our new, precarious reality. If technology today represents the nervous system of modernity, cybersecurity is the skin that covers it, and every "caress" of progress can turn into a lethal blow to our peace of mind. In this world in perpetual transformation, technology moves faster than any other sector, redefining the rules of our daily lives. The transition from analog to digital has eased our existence, but this simplification hides a "flip side"—an insidiousness that has opened new breaches for silent and widespread vulnerabilities capable of creeping into the folds of our dependence on connected systems, exposing our flank to threats that are as invisible as they are concrete. If today it is possible to book transoceanic flights, consult specialists, or manage international summits while sitting at a desk, this same architecture that eliminates distance offers hostile actors the gateway to strike remotely. Brute force is no longer required; a code is enough. While on one hand the limit of innovation seems to be only the imagination, on the other, our vulnerability has increased. The network is an interconnected organism. A failure or an attack thousands of miles away can generate a domino effect capable of instantly reverberating even in other countries, Italy included, which rely on those same digital systems and interconnections. In this context, the Defense has adopted an in-

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egrated framework of technical and procedural countermeasures to equip the Armed Forces with the ability to operate effectively in the field of technological innovation, while maintaining a clear necessity to implement all actions required to effectively counter the vulnerabilities inherent in the digital domain—a domain characterized, by its very nature, by extreme pervasiveness and the absence of physical boundaries. We discussed this with Colonel Claudio Passalacqua, Commander of ReSIA (Automated Information Systems Department), to whom we addressed a few questions to delve deeper into the topic.

Commander, in a varied and complex context like today's world, where innovation and cybersecurity now form an inseparable pair, where does ReSIA position itself?

ReSIA is the technological heart tasked with ensuring the efficiency and operational availability of all non-classified systems and applications of the Italian Air Force. Operating under the 3rd Division of the Logistic Command and established on July 1, 1988, the Department is headquartered in the "Acquasanta" locality along the ancient Appian Way—a place where millennial history intertwines with cutting-edge technological excellence. Its mission is defined by clear strategic objectives: to promote innovation in the ICT (Information Communication Technology) sector through research and experimentation, and to design, implement, and maintain the systems and telemetric networks that enable the functional automation of the Armed Force, always guaranteeing a solid cybersecurity framework. This commitment is expressed in specific areas of competence ranging from Data and Service Management to software application development, and from managing the supercomputing platform to cyber security. These four pillars, interdependent and constantly monitored, represent the organization's *raison d'être* and consolidate its role as the primary ICT provider for the Armed Force.

Can you tell us more about Data and Service Management?

Data and Service Management is divided into the strategic management of information assets—Data Management—

Opening and throughout these pages: the Automated Information Systems Department, established in 1988, operates under the 3rd Division of the Logistic Command. Its mission is to design, implement, and maintain the services and systems for the IT automation of functional areas, as well as to promote innovation through the research and testing of new technologies. Furthermore, the Department serves as the Armed Force's primary IT and cyber hub and plays a key role in the continuous digital transformation process, while simultaneously ensuring the Cyber Security framework for the Air Force's IT infrastructures.

On the facing page: since September 2025, Colonel Claudio Passalacqua has been in Command of the Automated Information Systems Department.





and the structured delivery of technological services—IT Service Management. ReSIA oversees the entire data lifecycle, from collection and organization to protection and analysis, transforming static resources into dynamic tools for decision support. Simultaneously, service delivery aims to maximize the operational availability and efficiency of systems and applications, optimizing the quality of support provided to the Armed Force's end-users. A primary challenge in this field is the management of legacy systems, which use older, and therefore less secure, logic and communication mechanisms. These systems, no longer supported by manufacturers with security updates, possess intrinsic vulnerabilities that the Department mitigates through rigorous compensatory measures and a layered perimeter defense. This approach ensures operational resilience while awaiting migration toward new architectures based on the "secure-by-design" paradigm, which integrates cyber security from the earliest stages of design. This clearly highlights the interdependence between data management, software development, and cyber protection—an integrated ecosystem where every component contributes to the global stability and security of the infrastructure.

Regarding the second pillar, software application development, can we say that ReSIA operates as an institutional software house whose core business is translating the functional ne-

eds of the Armed Force into robust digital solutions?

Through accurate and skillful coding, the Department transforms complex logical-operational requirements into application tools that combine ease of use with the highest security standards. The entire process is governed by the rigorous Software Development Life Cycle model, a methodological path that starts from requirements analysis and resource planning to arrive at the definition of scalable technical architectures. During the development phase, coding is accompanied by strict testing and validation protocols, which are indispensable for ensuring software reliability before release into the operational environment. However, the Department's added value does not end with the delivery of the product; it extends to constant corrective and evolutionary maintenance. This continuous support ensures the resilience of applications over time and the integration of new features, allowing the Armed Force to adapt with agility to the changing challenges of the digital domain.

We know that since 2015, ReSIA has been at the center of the Italian Air Force's computational strategy through the management of the HPC (High Performance Computing) supercomputing platform. What does this entail?

Thanks to an infrastructure that generates power in the range of TeraFLOPS (one trillion floating-point operations per second), the De-



partment ensures the massive data processing necessary to support the Armed Force's critical functions. The most significant example is precision meteorology. In addition to ensuring flight safety, this indispensable asset allows the Armed Force to fulfill its institutional task as the National Meteorological Service. This activity provides vital support to the community and Civil Protection, enabling accurate forecasts essential for saving lives and managing emergencies across the territory. Today, HPC has become the fundamental engine for the integration of Artificial Intelligence and Machine Learning—technologies that allow for the analysis of monumental volumes of data (Big Data) for cutting-edge applications, from intelligent surveillance to predictive equipment maintenance, while ensuring that the final decision always remains firmly under human control (human-in-the-loop). Looking at the challenges of the next decade, the Armed Force aims for a generational leap in its computational power, seeking to overcome current technological limits to master advanced frontiers such as quantum cryptography and proactive Cyber Defense. In this perspective, ReSIA does not limit itself to the role of infrastructure manager but evolves into an open innovation hub—a catalyst of excellence capable of fostering the exchange of know-how through strategic collaborations with academia, research centers, and other institutional entities, consolidating the Italian Air Force's position at the pinnacle of innovation.

Within the fourth pillar you mentioned, cyber-

security, how important is it that ReSIA was the first military entity to achieve ISO 27001:2017 certification for its Information Security Management System?

Through the SOC (Security Operations Center), the Department guarantees the digital sovereignty of the Air Force via three interconnected operational directions. Perimetric Defense acts as the first shield, monitoring all data flows 24/7 to intercept intrusion attempts and phishing campaigns before they become critical. When a threat is detected, Incident Management comes into play; a team of specialists neutralizes the attack in real-time using EDR (Endpoint Detection Response) platforms and forensic analysis, coordinating system restoration and the collection of digital evidence. Simultaneously, Proactive Security works to anticipate the adversary. Through continuous vulnerability assessments and Adversary Emulation activities, this team simulates realistic attack scenarios to identify and heal infrastructure weaknesses before they can be exploited. This defense ecosystem, tested annually in complex national activities such as the "Cyber Eagle" exercise, transforms protection from a passive response into a dynamic strategy capable of evolving as rapidly as global cyber threats. The 2025 edition of "Cyber Eagle" consolidated the Air Force's cyber command and control chain through a crucial synergy between Defense and the industrial sector. The exercise transformed theory into operational competence, elevating the capacity for timely reaction to

Throughout these pages, cyber vigilance and resilience are now an integral part of the Department's mission.

In this sense, ReSIA is not merely a technical entity, but a stronghold of knowledge, innovation, and security, whose work transversally impacts all of the Armed Force's operational capabilities.



complex threats. This integrated model ensures a posture of deterrence and resilience fundamental to guaranteeing the country's innovation and cutting-edge readiness.

Given the complexity of the current scenario, how does ReSIA manage to maintain its position as a technological center of gravity and ensure the security of the transformation process?

Its mission goes far beyond technical maintenance; it is a daily exercise in protecting that "nervous system" upon which the operational readiness of every pilot, wing, or command and control center depends. Through data management, secure software development, and the computing power of HPC, ReSIA ensures that the Air Force's technological advantage remains a concrete and unassailable asset. Furthermore, the Department's ability to converge human ingenuity with the frontiers of supercomputing and Artificial Intelligence transforms it into an innovation incubator, where constant training and exercises forge cutting-edge skills ready to respond to emerging challenges—from the defense of critical infrastructure to next-generation cryptography. ReSIA thus confirms itself as the technological sentinel of the Italian Air Force, a bastion of excellence that transforms digital complexity into operational certainty.

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INNOVATION DAY 2026

A window to the future

*By Stefano Cosci
photo Aeronautica Militare*



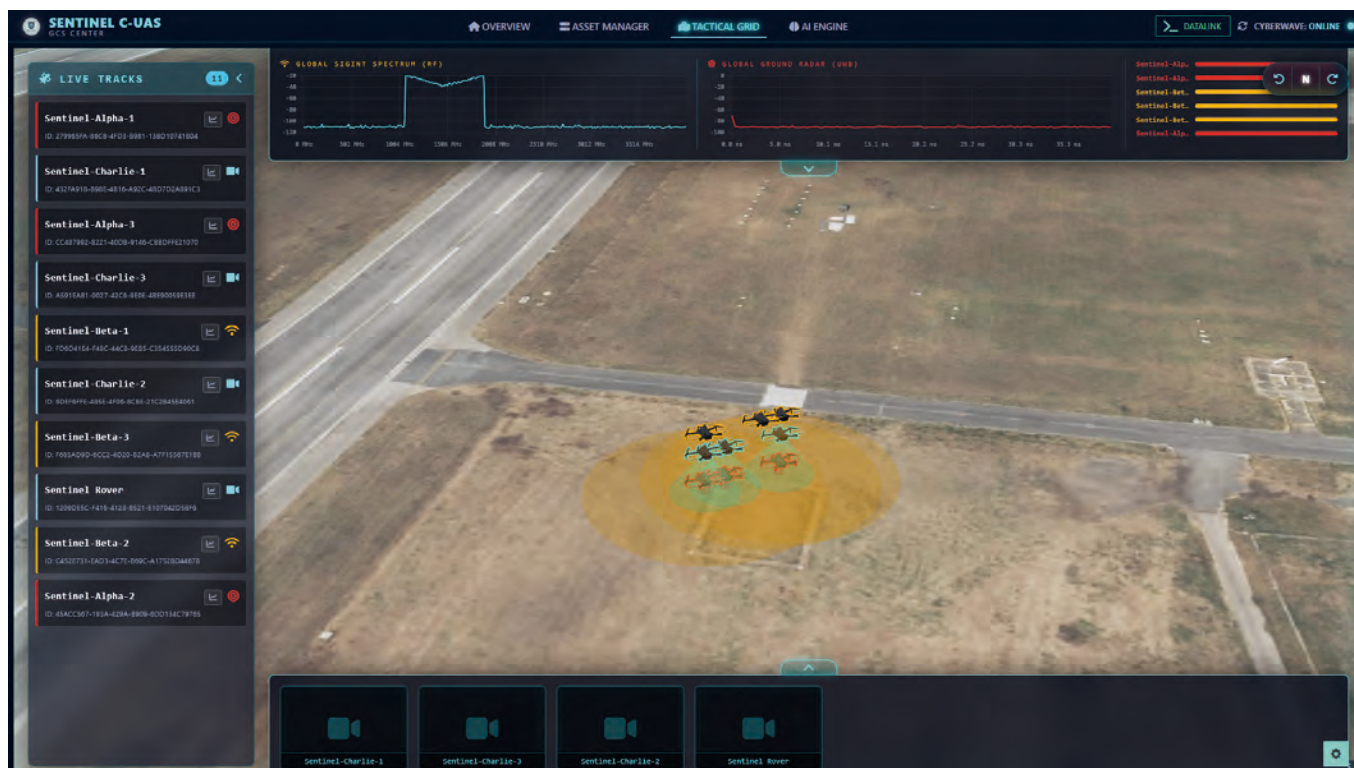
Changing now to ensure we are ready for the challenges of the future." This is the "categorical imperative" that the Chief of Staff of the Italian Air Force, Gen. S.A. Antonio Conserva, invited everyone to reflect upon while concluding his speech at Innovation Day. This event, dedicated to technological innovation and digital transformation, was organized by the 3rd Division of the Air Force Logistic Command and held at the Palazzo Aeronautica Auditorium on March 27th. In presenting the initiative, Brig. Gen. Pietro Spagnoli, Commander of the 3rd Division, spoke of "an increasingly complex, interconnected, and competitive operational context, in which superiority is measured not only in terms of platforms or traditional capabilities, but in the ability to generate, understand, and utilize data in a fast, secure, and intelligent way." However, "to transform complexity into





novative projects developed by the Armed Force. Starting with SeNTINEL, developed by the ReGISCC (Command and Control Systems Innovation Management Department) to identify inactive, "dormant" drones, stemming from a capability gap identified by the Air Fleet Command. For Maj. Giuseppe Valentino of ReGISCC, this was "a complex problem approached with an engineering mind-set" that involved not only experts in sensors and unmanned systems but also the Italian startup Cyberwave Engineering. This led to a "product" that can support Special Forces and Force Protection units, functioning offline in limited connectivity environments and being deployable anywhere. It remains, however, a prototype not yet ready for use, as "there is still work and development to be done."

Opening: The greeting address by the Air Force Logistic Commander. To the left, during his speech, Gen. Conserva highlighted how innovation is fundamental for the Air Force to face the challenges of the future. Below, the SeNTINEL swarm during a simulation of a search for a "dormant" drone within an airport perimeter. On the facing page, the presentation of the Smart Wing Mission Planner.





A practical simulation was shown in the Auditorium in response to a drone intrusion at an airfield—a typical Force Protection situation. This was useful for understanding how SeNTINEL was developed starting from the "characterization of the inactive drone," which "is in itself something very challenging." This led to the choice of a swarm of drones equipped with three different types of sensors: a radio frequency scanner, a UWB (Ultra-Wideband) radar, and an optical sensor. The UWB allows for the discovery of a "suspicious" object by evaluating its heterogeneity compared to the surrounding environment, but it is the radio frequency tracking that can detect an emission compatible with that of a drone. Finally, the optical sensor provides visual confirmation.

The simulated mission was just one example of what the swarm can be trained to perform, with SeNTINEL automatically tele-operating the assets while always ensuring the possibility of operator intervention. "Once the drone is in flight, however, someone is needed on the other side to understand what is actually being observed, and that is where the so-called analyst station, which we developed internally at ReGISCC, comes in." This station has access to the sensor stream associated with the swarm, with the ability—in the case of multiple entities coordinated by the same platform—to select those of interest. It also receives real-time telemetry from the CyberWave platform, which acts as an

intermediary between the flying objects and the analyst station. Both utilize Artificial Intelligence applications: CyberWave for scenario generation—whenever a mission changes or the swarm must react to a specific event, the AI automatically maintains constraints regarding any no-fly zones, recalculating the best flight path. In the analyst station, AI supports classification. This capability required significant training effort, especially regarding the UWB, which, due to the difficulty of finding complete datasets, followed an approach based on synthetic generation. A similar process was used for the radio frequency component, while the optical analysis also required specific training.

Following this, Lt. Col. Francesco Vergani of the 46th Air Brigade presented the Smart Wing Mission Planner, a project developed in collaboration with IBM with contributions from the personnel of the 46th. This tool is capable of reading and understanding directives, constraints, and training and operational requirements to support the programming and planning of flight activities. Documents are processed using Generative AI and retrieval technologies to automatically extract details from the training plans of various flight lines and make them available to the planning engine. Furthermore, it can simulate alternative scenarios and generate proactive suggestions, making Mission Planner a true decision support system. If something changes—as often happens in the De-

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partments—the software can update the proposal and suggest an alternative solution in real time within minutes. It is a system that improves efficiency, readiness, the quality of the decision-making process, situational awareness, and organizational sustainability, allowing for a more equitable and rational distribution of the workload. However, Smart Wing Mission Planner "does not claim to automate command action" because "the system proposes, explains, and motivates; then the operator supervises, validates, modifies, and ultimately decides." Dr. Cristian Cerelli of IBM emphasized that the decision-maker has full awareness of every choice, avoiding one of the major risks associated with Large Language Models: the "black box" effect, where there is no awareness of the path that led to the solution.

There is also a digital assistant which, through direct questions, transforms regulatory and training knowledge into concrete decision-making capability. The data in the demo was fictitious; in any case, it remains within the Air Force data center, thanks to a hyper-converged infrastructure installed at the Automated Information Systems Department (ReSIA), which allows for the use of on-premise

AI, ensuring the highest confidentiality of information. Although it is currently only a prototype, Smart Wing Mission Planner "is much more than software; it is a paradigm shift, the transition from current planning—which is fragmented and sometimes reactive—to intelligent, integrated, and adaptive planning. It is the point where data becomes knowledge and enables the decision."

ReSIA also developed ADAM, an acronym for Air Force Digital Agent (Agente Digitale Aeronautica Militare), a solution that, as Maj. Mario Petrone explained, will support personnel in daily activities and in the management of operational and administrative processes. Technically, it is a conversational platform based on Artificial Intelligence that allows for dialogue with the Armed Force's information systems through natural language, both textually and vocally. The live demo conducted by Capt. Candido Festa and Lt. Antonio Romano showed how the system, thanks to voice-to-text functionality, transforms into a "digital colleague" from the next desk answering our questions: from the simplest ones requiring correlation with directives and regulations, to full situation reports, perhaps accompanied by real-time generated





On the facing page, a C-130J from the 46th Air Brigade during training. Smart Wing Mission Planner is designed to support the intelligent consultation of manuals, the planning of flight activities, the simulation of scenarios, and the harmonization of crew commitments.

On the left, through ADAM, the user can query the platform via voice or text interaction, accessing data and documents within the Armed Force's information infrastructure in real time.

graphs. Residing in the Air Force supercomputer, ADAM uses the best AI algorithms to process information from heterogeneous sources, including directives and, above all, the databases of the applications that Armed Force personnel use routinely. Primarily, access occurs through an application installed on the user's PC, allowing them to consult ADAM even while writing an email or working on a Word document or spreadsheet. The system can also be asked to draft an email to be forwarded to recipients "tagged" according to specific criteria. ADAM retains these functionalities, albeit limited to a base set, even in offline mode. In this case too, we can speak of a paradigm shift, especially in its ability to adapt to the user's way of working. At a strategic level, it produces reports, summarizes documents, and provides the informational context to support decision-making. At an operational level, it provides real-time summaries of regulations and procedures, supporting the comparison between information sources. Finally, at a tactical level, it provides immediate answers to those acting in the field. In compliance with the Armed Force's cybersecurity posture, the system operates entirely in an on-premise environment. Furthermore, the "need to know" principle and visibility cones ensure that the user accesses only the information they are authorized to see.

The project presentations were followed by in-depth discussions on specific themes. The session on Artificial Intelligence and digital sovereignty saw an interesting parallel between the principles followed by a company like IBM—which managed

the panel—and the AI strategy used by the Ministry of Defense. Dr. Noemi Ferrari, a member of the Center for Military Aerospace Studies (CeSMA) and Chief Technology Officer of the company Quantum Ket, then provided a strategic perspective on the potential of Quantum Technologies in the defense sector, focusing particularly on applications in computation, sensing, and secure communication, and outlining evolutionary scenarios for the medium-to-long term to maintain technological superiority. Finally, the company Netgroup presented HORUS, an AI-driven Cyber Defence platform that also performs intelligence, a capability for which a real-time demonstration was provided, with the system formulating predictive analyses regarding ongoing conflicts. What more can be said? A decidedly "dense" day—in which "we truly saw a bit of the future," as Gen. Cazzaniga commented in the moment—which serves as a starting point, not a destination. A moment to share decisions, systematize experiences, and build a common trajectory. This was also hoped for by the Chief of Staff of the Air Force who, after reiterating that Defense and the Armed Forces will "either succeed in transforming themselves in a short time or they will fail to achieve their objectives," urged everyone not to "accept the status quo, the 'it's always been done this way'" because, as Gen. Spagnoli had anticipated at the opening of the works, quoting management guru Peter Drucker: "The greatest danger in times of turbulence is not the turbulence itself, but to act with yesterday's logic."

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“MULTI RADII UNA LUX”

**The young men and women of
ASTRO II take their oath**

*by Serafino Durante
photo Troupe Azzurra*



On April 18th, in the presence of the Undersecretary of State for Defense, Senator Isabella Rauti, the Chief of the Defense Staff, Gen. Luciano Portolano, and the Chief of Staff of the Italian Air Force, Gen. S.A. Antonio Conserva, the Swearing-in and Christening ceremony of the "Aquila VI" Class of the "G. Douhet" Military School took place in the splendid setting of the Institute of Aeronautical Military Sciences in Florence.

Although it is not something we do often, this time we made an exception. We did not want time to erase the emotions and the beautiful sensations these young people gave us. When the spotlights of the ceremony faded, leaving the Parade Ground deserted and silent, we immediately set out to put into words the moods, the involvement, and the feelings we had experienced just moments before. We looked them in the eye, one by one. They are all between fifteen and sixteen years old, yet they possess incredible grit and determination. They are the "junior" Students of the "Douhet"—the first-year class, so to speak—but they already have a very clear vision of the path ahead. They chose it without hesitation, knowing full well it will be a winding, uphill road filled with demanding challenges.

Challenges they have, in fact, already begun to face and overcome, as they are about to conclude their first year—certainly the most impactful and difficult. They belong to the "Astro II" Class, the first of the school's second generation of courses. For them, this is an important day, and despite their young age, they are fully aware of its weight. They shouted it to the sky with pride and energy so that it could be heard loud and

clear. They swore allegiance to our Republic and committed themselves for life. Underscoring this act of courage was Senator Isabella Rauti, who wished to convey a powerful message to them: "Your 'I swear!'"—she said—"that cry in unison, is a personal act of conscience, but also a shared commitment and a pact with Italy. To swear means choosing to serve the Motherland, taking on a profound responsibility. A choice," the Senator continued, "that requires sacrifice, dedication, study, and discipline. You chose to put yourselves to the test, to measure yourselves against something demanding, to 'throw your heart over the obstacle,' and if you are here today, it is because you have done well; because you are the best. From today, you no longer represent only yourselves, but the Defense, the Institutions, the Nation, and the Tricolor.

The school's motto, 'Per Scientiam ad Astra'—"Through knowledge toward the stars"—immediately summarizes its identity and that of the Air Force: knowledge as the way, the sky as the horizon, the stars as the goal. Students of the 'Astro II' Class," Senator Rauti concluded, "I wish you the best, and I am certain you will successfully face every task and challenge that comes your way." The Swearing-in ceremony of the "Douhet" Upper Secondary School marked the beginning of a new cycle of class naming with





the introduction of "Astro II." This year marks the twentieth anniversary of the Institute's inauguration, which has seen over 600 students, both boys and girls, undertake this educational path. The curriculum covers the final three years of Classical and Scientific high school and is accessed via public competition. The educational plan aims for an ambitious balance between different disciplines: on one hand, the strengthening of classical languages—Latin and Greek—and STEM (Science, Technology, Engineering, and Mathematics) subjects; on the other, the teaching of English and French, with some subjects taught directly in a foreign language using the CLIL (Content and Language Integrated Learning) methodology. But it is outside the classroom that the "Douhet" reveals its most distinctive identity. Every student is required to practice at least one sport—from athletics to swimming, from volleyball to air pistol shooting—with a program designed to channel their energies and bu-



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ild that esprit de corps fundamental to looking toward the future with optimism. Indeed, the Class motto, "Multi radii una lux" ("Many rays, one light"), emphasizes this inclination to overcome together the difficulties, small and large, that will be encountered along the way. As we are in the Air Force, particular attention to the world of flight could not be missing: with the "Young Eagles Project," a three-year path was designed to strengthen this passion in young students and increase their aviation culture. First-year students fly gliders at the 60th Wing in Guidonia. In the second year, they move on to the Siai S.208/M motorized aircraft, accompanied by instructor pilots. At the end of the program, the most deserving have the opportunity to take a reward flight on the Armed Force's operational aircraft.

Mention must also be made of the sea and mountain survival courses, which are highly formative in managing psycho-physical stress and consolidating the inclination to help others. In short, a school that aims to train citizens even before future military personnel. After this necessary "digression," let us return to the day of the Swearing-in. During their stay at the Florentine In-



stitute, these young people will have the chance not only to study but also to live according to the values of duty, discipline, and respect, learning that giving, as General Conserva told them, comes before receiving, and that together one flies higher. The Chief of Staff of the Air Force, in his speech, also recalled the figure of Giulio Douhet, the military theorist after whom the school is named—a man who had the audacity to look beyond the horizon of his time, understanding that aircraft would rewrite the rules of conflict. Effectively a visionary. But vision without discipline remains an illusion, and discipline without vision is sterile labor. At the "Douhet," they will learn to develop both, to have a mind open to the future but also the structure and pragmatism necessary to achieve change. "Give space to your ideas," General Conserva urged them, "and have the courage to defend them even when it will be difficult to do so. Continue to dream and listen to your heart; do not seek shortcuts or easy success—seek the fulfillment that comes from hard work, sacrifice, the will to test oneself, and to improve, never settling."

Finally, it is right that this report closes with them, the true protagonists of this day. We spoke to them in the heat of the moment, while the adrenaline was still flowing and hearts were beating fast, sharing the joy and emotions felt: "The choice we made," Dennis told us, "is for me a starting point to grow and mature. This school is teaching us and will teach us so much more; over time, it will make us better citizens and, for those who wish to continue, excellent soldiers. Since I was a child, I have always wanted to be a military pilot. The first time I saw the Frecce Tricolori live was an indescribable emotion, and seeing them pass by today at my swearing-in made me relive that intense moment."

Opening: The students of the "Astro II" Class formed up on the Parade Ground of the ISMA (Institute of Aeronautical Military Sciences) in Florence. In all other photographs, moments from the Class's Oath of Allegiance ceremony and daily life within the "Giulio Douhet" Military School.

And again: "I was looking for something deeper," Bianca emphasized, "compared to the superficiality I saw around me outside. Being in here, I understood even more that this is my path. I swore the oath," Bianca concluded, "because I wanted it strongly; it was something I felt inside, and today it still doesn't seem real: I have crowned a dream, something truly great!" The time has come to leave the Students of the "Astro II" Class to their parents and families to enjoy the beauty of these moments together—moments so intense and unrepeatable. Godspeed, everyone!

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La **C.G.T. Elettronica S.p.A.** opera fin dal 1985 nel settore degli impianti elettronici e dell'integrazione di sistemi telematici e multimediali. Grazie ad una crescita costante nel tempo, sia dal lato tecnico che commerciale, la C.G.T. si è successivamente affermata come integratore di sistemi di sicurezza e multimediali che, unitamente a capacità progettuali, costruttive e logistiche, le hanno consentito di affermarsi quale fornitore chiavi in mano di sistemi e servizi per clienti quali Difesa, Enti Governativi, Enti Statali, Utilities ed Industria. Negli ultimi anni, in particolare, l'attenzione di C.G.T. si è rivolta sempre di più al mercato della Difesa, dove le partecipazioni a rilevanti programmi delle FF.AA, quali per es. SILEF e FADR, caratterizzati dall'impiego di soluzioni tecnologiche all'avanguardia e da elevati standard in termini di qualità e sicurezza, hanno consentito di mettere in evidenza le capacità e l'affidabilità dell'azienda. L'azienda opera prevalentemente nel settore dell'impiantistica elettrica ed

elettronica sia per forniture di apparecchiature che realizzazione di sistemi, con particolare professionalità ed esperienze maturate, negli specifici settori.

Impianti elettronici

- Sistemi di sicurezza (controllo accessi, impianti antintrusione, rilevazione incendi, TVCC);
- Sistemi audio-video (videoconferenze, traduzione simultanea, banchi regia, control room);
- Telecomunicazioni e telematica (reti trasmissioni dati, ponti radio, centralini telefonici, realizzazione CED);

Applicazioni elettroniche

- Progettazione e realizzazione di apparecchiature elettroniche prototipi
- Customizzazione macchine e apparati
- Monitoraggio impianti
- Manutenzione di impianti, sistemi ed apparecchiature elettriche ed elettroniche
- Cablaggio di rack per sistemi di comando e controllo

Impianti elettrici

- Impianti elettrici industriali MT e BT
- Cabine di trasformazione
- Sistemi di alimentazione di Emergenza

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Wings and Engines

Aeronautica Militare

and Ferrari

The Ferrari WEC team visited the 313th Acrobatic Training Group, the home of the Frecce Tricolori, to share and strengthen the bond that links two examples of Italian excellence.

by Emanuele Salvati
photo Troupe Azzurra



«An unforgettable experience» were the first words from Antonio Giovinazzi upon returning to the hangar aboard the Pony 6 aircraft, piloted by Captain Fanfarillo, at the end of a flight

alongside his teammates Alessandro Pierguidi, Antonio Fuoco, and Nicklas Nielsen. We are in Rivolto, the headquarters of the 2nd Wing and home of the Frecce Tricolori, and today is a rather special day; the aircraft that just performed had four of the six Ferrari team pilots from the WEC (World Endurance Championship) on board as special "guests." Another guest of honor was the Ferrari 499P in its new livery—the car that brought the Maranello stable back to the top of endurance racing starting in 2023, securing seven overall victories and three consecutive wins at the 24 Hours of Le Mans. A 680 HP powerhouse featuring a centrally mounted V6 twin-turbo internal combustion engine and a 200 kW (272 HP) electric system on the front axle, powered by an 800V battery. A masterpiece of technology that had the chance to speed along the Rivolto runway for a brief photo shoot to commemorate the day. We return to the hangars

of the 313th Acrobatic Training Group to hear the immediate impressions of the Ferrari pilots who, despite being accustomed to speed, ventured for the first time into a jet aircraft and, above all, into aerial acrobatics. "It was fantastic, but I had some difficulty during the first maneuvers; then Federico explained some tricks to counter the G-forces, and I started to fully enjoy the flight," said Antonio Fuoco, who flew as the "fanalino di coda" (tail-ender) of the 4-ship diamond formation with the PAN soloist, Major De Cecco.

Providing an explanation for this "discomfort" felt by pilots who are nevertheless used to high speeds and sustaining Gs was the Commander of the Frecce Tricolori, Lieutenant Colonel Franco Paolo Marocco, who had Alessandro Pierguidi on board during the flight. "The Gs that racing pilots experience have a different direction, from right to left or vice versa depending on the circuit, whereas in flight, they go from top to bottom. This situation impacts blood circulation, which is pushed toward the extremities of the body. During the flight," he added, "I explained to Alessandro that by contracting the muscles of the glutes and legs, you counteract this process."

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In the preceding pages, two examples of Italian excellence on the Rivolto runway: the PAN (Frecce Tricolori) and the Ferrari 499P.

On these facing pages, at the top, the Ferrari 499P, the Hypercar that has won the 24 Hours of Le Mans for three consecutive years and was the protagonist of the world titles in the 2025 FIA WEC; below, the two teams with their "jewels" in a souvenir photo; above, the interior of the Ferrari 499P, which appeared at Rivolto with its new livery for 2026.

Beyond the difficulties related to flying, the Ferrari team's experience aboard the Frecce was absolutely positive, and one didn't even need to ask to realize it, as the expressions on their faces were worth more than a thousand words. Even from the outside, as spectators, this flight held a special meaning. Seeing two Italian excellences, Ferrari and the Frecce Tricolori, together was undoubtedly a source of pride. It was the same feeling felt by everyone trackside who saw the Ferrari 499P racing on the Rivolto runway under the tricolor smoke trailed for the occasion by four PAN Ponies. A day that marked another chapter in the deep relationship linking the Italian Air Force and Ferrari, which goes far beyond the simple pairing of flight and speed. There is something deeper between these two excellences, and to understand its origins, we must go back over a century. We are on the front lines of the First World War, and the first aviators—true knights of the sky—used to paint symbols or designs on the fuselages of their airplanes to make them recognizable. On the SPAD XIII of Francesco Baracca, the "Ace of Aces," stood a black prancing horse as a tribute to his past in the "Piemonte Reale" Regiment. A symbol that became an integral part of the legend of the great aviator and his flying skills. 1923 is, in a sense, the "year zero" of this story; at the Savio circuit, Baracca's mother, Countess Paulina Biancoli, presented Enzo Ferrari with her son's emblem for his cars as a good omen. Ferrari added the Modena yellow and straightened the tail while maintaining the intrinsic meaning of that horse: the pursuit of the limit.

In that same year, the Regia Aeronautica was born as an independent air force. The newly formed Armed Force gathered the personnel and aviation expertise gained up to that point and, naturally, the traditions of the early aviators. Among these was the prancing horse, the symbol of the Ace of Aces, which remains today one of the most iconic symbols of the Armed Force—serving as the emblem of glorious units like the 4th and 9th Wings, or flying groups such as the X and XII. A few years passed, and history continued to intertwine, this time turning red. At the beginning of the 20th century, the AIACR (which would later become the FIA) assigned colors to Grand Prix cars based on nationality: blue for France, green for Great Britain, white (later becoming silver) for Germany, and red for Italy. A color that, in addition to Ferrari, was also chosen by Macchi to paint the aircraft designed for the Schneider Trophy at what was then the High Speed Unit in Desenzano. The most famous of



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the racing seaplane family, the MC.72—which was unable to participate in the Schneider Trophy—set the world speed record at 709.202 km/h under the command of Warrant Officer Francesco Agello, a record that remains unbeaten to this day for piston-engine seaplanes. A bond, therefore, that goes beyond the logo and has strengthened over the years. On November 21, 1981, on the runway of the Istrana airport, Gilles Villeneuve's Ferrari 126 CK—stripped of its wings to reduce air resistance—and the Italian Air Force's F-104 Starfighter faced off in a speed challenge. In front of 100,000 spectators, the Canadian pilot managed to beat the "Starfighter" by just 10 hundredths of a second over 1,000 meters, proving that, in a short sprint, the Maranello bolide was faster even than the afterburner. Following the challenge, the Air Force decided to honor Enzo Ferrari with one of these legendary fighters after subjecting it to a restyling. The airplane, repainted in the classic red of Maranello cars with the "27"—Gilles Villeneuve's race number—on the tail, is still on display today on a pedestal within the Fiorano Modenese complex, near the track entrance. Twenty years later, in 2003, it was Michael Schumacher's turn. In Grosseto, his F2003-GA measured itself against the Eurofighter Typhoon, the Italian Air Force's new fighter which had recently entered service, piloted by Maurizio Cheli. A "race" set over three rounds at different distances; in the first round over 600 meters, Ferrari confirmed its superiority thanks to the initial thrust of the V10 engine with over 850 HP. In the two subsequent tests, the first over 1,200 meters and the second over 900, there was nothing the Maranello car could do, even thou-





gh in the final challenge the gap was only 2 tenths of a second. A relationship that has since continued thanks to the Freccie Tricolori, which over the years have "colored" the Monza sky on the occasion of the Italian Grand Prix. A century-long story that has been built on the same common thread: representing the best that Italy has to offer.

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On the facing page, the historic challenge at the 51st Wing between Villeneuve, aboard the Ferrari 126 CK, and an Air Force F-104; alongside it, after winning his sixth world title, Schumacher brought his Ferrari F2003-GA to the 4th Wing's runway to "challenge" the state-of-the-art Eurofighter Typhoon.



13VOLTE
INSEGNA DELL'ANNO.
13VOLTE
GRAZIE A TUTTI
I PET LOVERS.

Per il tredicesimo anno consecutivo L'Isola dei Tesori è stata nominata Insegna dell'Anno Italia nella categoria Prodotti per Animali. Un risultato straordinario che dedichiamo a tutti i pet lovers d'Italia e ai loro pet.



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Development underway for the Meteor successor

The United Kingdom and France have officially expedited their timeline for maintaining future European air superiority by signing a Memorandum of Understanding (MoU) for the development of the successor to the Meteor, the current long-range air-to-air missile considered among the most advanced in the world. The agreement, which is part of the strategic framework of the Lancaster House Treaty 2.0, aims to strengthen defense collaboration between the two nations to ensure NATO's operational capabilities and the security of the continent. The initiative involves the launch of a joint 12-month study that will analyze the evolution of aerial threats and develop new missile concepts to meet the challenges of future warfare scenarios. During this period, the work will examine critical technologies to be integrated into the new weapon system and establish a precise roadmap for its industrial development. The Meteor, produced by the MBDA consortium alongside partners such as Saab and Indra, is currently a fundamental pillar for the Royal Air Force, which deploys it on Typhoons and is finalizing its integration onto the F-35B, and for the Armée de l'Air et de l'Espace, which uses it on Rafale fighters. In addition to the technological component, the partnership includes the creation of a new joint office intended to coordinate missile programs, with the goal of improving operational efficiency and facilitating cooperation with other allied States interested in participating in these advanced defense programs.

Flavio Silvestrini



India pushes forward with the Ghatak UCAV

The Indian Ministry of Defense has authorized the program for the acquisition of 60 Ghatak strike drones, which will form four new squadrons of the IAF (Indian Air Force). Developed by the DRDO (Defence Research and Development Organisation), this unmanned combat aerial vehicle represents a fundamental technological leap for New Delhi, as it integrates advanced stealth capabilities thanks to a tailless flying-wing configuration and a structure composed of 80-90% carbon fiber—a solution that drastically reduces its radar cross-section. The chosen power plant is the locally produced Kaveri turbojet in its non-afterburning version. The roll-out of the full-scale prototype is expected by the end of the year, following positive tests conducted on smaller-scale demonstrators. With a weight of approximately 15 tons and an operational ceiling exceeding 9,000 meters, the Ghatak is designed for deep-strike missions and the suppression of enemy air defenses, maintaining invisibility through an internal weapons bay for missiles and precision bombs.

The system is distinguished by its ability to operate in fully autonomous mode, utilizing artificial intelligence algorithms for navigation even in satellite-denied environments. Furthermore, it is evolving into the role of a loyal wingman within the Combat Air Teaming System to operate in synergy with Tejas Mk2 fighters and the future AMCA, meeting the specific IAF requirement for an operational range of at least 500 nautical miles in highly contested environments.



The Netherlands orders its fifth Patriot system

The Netherlands has significantly accelerated the reinforcement of its air defense architecture with the order of a fifth Patriot system, formalized through a direct commercial sales contract valued at \$627 million awarded to Raytheon, an RTX company. The supply, which includes advanced radars, launchers, and command and control stations, aims to consolidate national and collective protection within the NATO framework against the full spectrum of aerial threats, including tactical ballistic missiles, drones, and latest-generation cruise missiles. The Patriot system, in service with the Koninklijke Luchtmacht (Royal Netherlands Air Force) since 1987 and currently based on the use of PAC-2 and PAC-3 missiles, guarantees simultaneous multiple interception capabilities up to an altitude of 20 kilometers and a range of 60 kilometers for ballistic missiles. This acquisition became necessary to prevent deliveries of the fourth battery, ordered last year, from slipping beyond 2033 due to the intense pressure on global manufacturers resulting from ongoing conflicts, with the goal now set to complete the deliveries by 2030. Currently, the Dutch commitment to security is at its peak, with two of the three operational batteries deployed in Poland to guard the Eastern borders of the Atlantic Alliance, while parallel logistical and military support to Ukraine continues. This support, which began in 2022, includes sending components and co-financing new systems to counter missile offensives in the Eastern European theater.

Flavio Silvestrini



Gripen E: First aircraft produced in Brazil presented

The Brazilian aerospace sector celebrated a historic milestone with the official presentation of the first Saab Gripen E supersonic fighter assembled entirely in Brazil. The ceremony took place on March 25 at Embraer's industrial complex in Gavião Peixoto, in the presence of President Luiz Inácio Lula da Silva and top military and industrial leaders from Saab and Embraer. The event marks the success of technology transfer and cooperation between Sweden and Brazil, consolidating a national production chain that will see the construction of another 14 aircraft following the same industrial model before subjecting them to the rigorous flight tests required for final delivery. The program, based on a 2014 contract for the total supply of 36 Gripen NG aircraft—divided into 28 single-seat E models and 8 twin-seat F models—has already seen the delivery of 11 units starting in 2020. The first aircraft have been operational since last February, conducting quick reaction alert missions at the Anápolis Air Base. Thanks to advanced integrated technologies for multi-role missions ranging from air defense to reconnaissance and strike, the Gripen E currently represents the pillar of the modernization of the Força Aérea Brasileira, ensuring the country has cutting-edge air defense capabilities and a significant increase in the technical expertise of the local defense industry.



Switzerland reduces its F-35 order

The Swiss Federal Council has announced a significant upward revision of the costs for the acquisition of Lockheed Martin F-35A fighters, confirming that the number of aircraft originally planned will be reduced due to strong inflationary pressure and the rising cost of raw materials. Despite the request to Parliament for an additional credit of 394 million francs as part of the 2026 Army Message—which brings the total allocation to a maximum ceiling of over 6.4 billion—the Federal Department of Defense estimates that this sum will allow for the purchase of only 30 units compared to the 36 initially programmed. This contraction is also attributable to the timing of Switzerland's entry into the Joint Strike Fighter program, which excluded the country from the favorable conditions of production lots 15-17 negotiated before the global economic crisis. The decision raises concerns regarding national security, as reducing the fleet below the critical threshold of 36 fighters will have negative repercussions on the Confederation's operational capability and resilience in conflict scenarios. Simultaneously, the downsizing of the order will have a direct industrial impact on the Cameri FACO in Italy, where 28 of the 36 aircraft destined for the Swiss Air Force were originally scheduled to be assembled, thus reshaping the workload volumes for the European center of excellence.

Flavio Silvestrini



Sentinel: First launch scheduled for 2027

The landscape of United States strategic deterrence is undergoing a phase of radical transformation with the development of the LGM-35A Sentinel, the new intercontinental ballistic missile (ICBM) destined to replace the now-obsolete LGM-30G Minuteman III, which has been in service since the 1970s. Northrop Grumman and the U.S. Air Force aim to conduct the first flight in 2026-2027 to achieve full operational capability in the early 2030s, adopting a transformative acquisition approach based on a digital ecosystem that optimizes production speed and efficiency. Thanks to an overall investment estimated at \$140.9 billion in research and infrastructure—a significant portion of which is dedicated to solid-propellant rocket motor technology—the system will utilize a three-stage booster made of lightweight composite materials capable of offering greater precision, flexibility, and superior payload capacity. The program involves over 500 industrial partners and a workforce of 10,000 professionals, working simultaneously on infrastructure prototyping and the modernization of launch silos. As emphasized by the Vice President of Northrop Grumman, Sarah Willoughby, the initiative aims to rapidly deploy an extremely advanced weapon system, constantly validating critical guidance and control hardware to ensure the maximum reliability of the future ground-based component of the nuclear Triad.



LA RICERCA NON SI FERMA LA RICERCA SI FIRMA

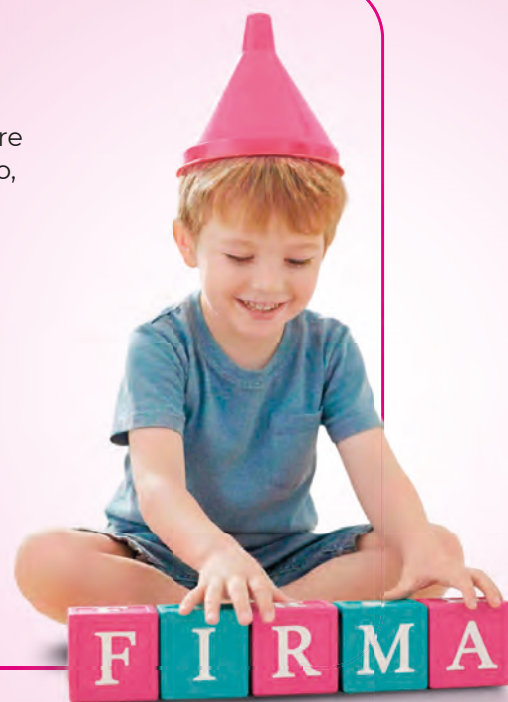
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SAI COS'È IL 5X1000?

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neuroblastoma.org/come-aiutarci/5x1000



25 years since Mir's farewell Argotec "lands" in Florida

On March 23, 2001, the plunge into the ocean of the Soviet Union's space station "Mir" (meaning both "peace" and "world/community" in Russian) marked the end of its incredible 15-year adventure around the Earth, with a controlled reentry that held the world in suspense. Launched in February 1986, the Mir was not just a collection of metal and modules; it was a survival laboratory. Its objective was ambitious: to understand if human beings could truly inhabit the cosmos on a permanent basis. With its eight modules completed in 1996, it became a bridge between once-hostile nations, hosting American and European astronauts alongside their Russian colleagues. Without the lessons learned within the walls of the Mir, the ISS (International Space Station) would never have been possible. Although the official farewell seemed final as early as the summer of 1999, the Mir had one last, romantic surge. In 2000, the Soyuz TM-30 mission attempted to rewrite its destiny: funded by private capital—a rarity for the time—it aimed to transform the station into a destination for space tourism. Cosmonauts Zalyotin and Kaleri went segments aboard for a final inspection, but time and maintenance costs had become too heavy a burden. Thus, with the help of the Progress M1-5 spacecraft, the "Old Lady of Space" began her assisted descent. Most of the structure turned into a trail of fire in the sky, while the surviving fragments sank into the silence of the South Pacific. Just as the Mir was fading away, a few kilometers higher up, the ISS was welcoming its first residents, picking up a torch that continues to race through the stars today.



Argotec, the Turin-based Italian space company specializing in the design and production of small satellites and advanced space systems, inaugurated its new manufacturing headquarters in April in Melbourne, Florida. Located in the heart of the U.S. Space Coast and just 65 km from the Kennedy Space Center, the move represents a strategic investment exceeding \$25 million. The choice of Florida is highly intentional. The region recorded 109 launches in 2025 and maintains a pipeline of over 220 aerospace projects valued at \$6 billion, confirming its status as the industrial and technological epicenter of the American space sector. The facility currently employs 20 people, with a hiring plan aimed at exceeding 60 units within 24 months. Argotec's Melbourne site is already operational on several programs, including the launch of the seven HEO satellites for IRIDE—the Earth observation constellation commissioned by the Italian Government and managed by the European Space Agency and the Italian Space Agency. Simultaneously, the facility is working on the miniCOR scientific mission, with a launch scheduled for the fourth quarter of 2027. "This is a decisive step in Argotec's growth and our expansion path," says David Avino, CEO and Founder of Argotec. "We have worked," Avino continues, "with our American colleagues to bring our DNA to the United States, where the market demands even greater speed and forward-looking technology, even for the world's largest space groups. We are proud to bring Italian excellence to the world and to consolidate Italy's role in the American space sector; it will be a great development opportunity for us and for the country."



65 years ago: The first man in Space

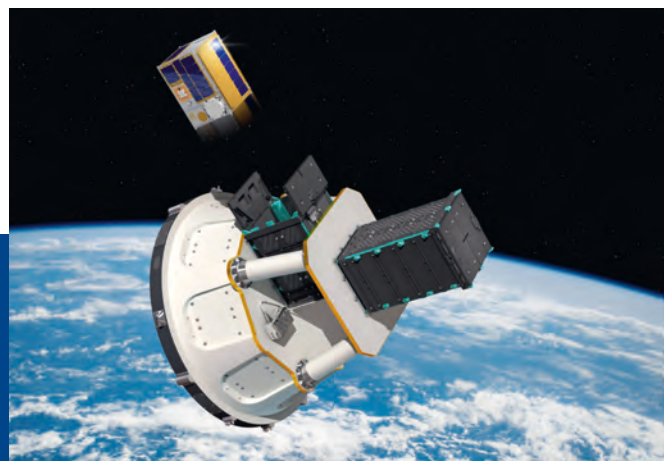
April 12, 1961, is a historic date—the moment humanity stopped viewing the sky as a limit and began considering it a destination. Exactly 65 years have passed since Yuri Gagarin, a young Soviet pilot, settled inside the tiny Vostok 1 capsule to be launched toward the unknown. In just 108 minutes, Gagarin completed a full orbit around the Earth at an altitude of 302 km. At the time, nothing was known about the effects of zero gravity, and Yuri was the brave “guinea pig,” the pioneer who proved that the human heart could withstand the violent force of liftoff. From that “Poyekhali!” (Let’s go!) shouted at takeoff, it has been a long road: from Sputnik to Neil Armstrong, all the way to today’s Artemis missions. His statement, “From up here, the Earth is beautiful, without frontiers or borders,” went down in history. Yuri Gagarin was launched into space in total secrecy at 9:07 AM from the Baikonur Cosmodrome in Kazakhstan. Because a failure was feared, the Soviet Union did not announce the event until the Vostok 1 mission was completed. The cosmonaut, who descended by parachute into the fields of the Saratov region, brought home not just himself, but the realization that borders, seen from up there, simply do not exist. Since 2011, that historic mission has been celebrated worldwide with the UN (United Nations) establishment of the International Day of Human Space Flight. Since that first flight, space exploration has taken enormous strides: permanent space stations, missions to Mars in preparation, and telescopes observing the very edges of the universe.

Flavio Silvestrini



Celeste’s first “ring” from Space

European satellite navigation has just received an important message. The Celeste IOD-1 satellite has transmitted its first signals to ESTEC, the ESA (European Space Agency) technology center in the Netherlands. Launched on March 28 from New Zealand, the small satellite passed its operational tests by sending dual-frequency data in the L and S bands. This is not just a technical success, but the beginning of a new era in which the “dialogue” between different orbits will make our GPS much more precise and resilient. While the Galileo system operates in MEO (Medium Earth Orbit), the satellites of the Celeste constellation—11 nanosatellites in total—streak through LEO (Low Earth Orbit), much closer to us. This proximity is the key: being closer to Earth, Celeste’s signals are stronger and penetrate better where we struggle today, such as among skyscrapers, in canyons, or through dense vegetation. By integrating with Galileo, Celeste ensures constant coverage even in remote or polar areas, offering the essential robustness required for autonomous driving and emergency response management. The project sees Thales Alenia Space Italy at the forefront as the lead for the space segment, confirming our country’s excellence in the sector. “This is a first step,” stated Roberto Prieto-Cerdeira, ESA’s Celeste Program Manager, “in a mission that aims to demonstrate how a satellite navigation constellation in low Earth orbit can further meet the current and future needs of users, complementing the current European Galileo system in medium Earth orbit.”



A large, white, fixed-wing military drone is being transported on a green military truck during a parade in China. The drone has a red stripe on its nose and is mounted on a specialized trailer. The truck is moving along a wide, paved parade route. In the foreground, two Chinese soldiers in green uniforms and black hats are standing at attention, facing the truck. A person in a dark shirt is also visible, holding a camera and taking a photo of the drone. In the background, a large, grey, classical-style building with many windows and red flags flying from the roof is visible. The sky is clear and blue.

TECNICS

Drones for a China as an increasingly global power

*by Paolo Mauri
Journalist for Il Giornale/InsideOver
photo South China Morning Post*



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he People's Republic of China (PRC) confirms its will to modernize its armed forces through the pervasive introduction of UAS (Unmanned Air System). In issue 4/2025 of Rivista Aeronautica, we explained how Beijing had entrusted, over the years, the development of these systems to various universities, research institutes, and aeronautical industries, in addition to sporadic private initiatives. Most of these entities operate on behalf of the PLAAF (People's Liberation Army Air Force), while some work for the PLAN (People's Liberation Army Navy) and the army. Chinese industry and research centers develop drones for a wide range of activities: ISR (Intelligence, Surveillance and Reconnaissance), ELINT (Electronic Intelligence), maritime patrolling, land and naval attack, air-to-air combat, anti-submarine warfare, suppression of air defenses, EW (Electronic Warfare), communications, transport, logistical support, emergency medical rescue, firefighting, and information operations, including psychological warfare. Beijing's military parade on September 3, 2025, held to commemorate the victory over Japan in the Second World War, showed several innovations in the field of UAS. In particular, it confirmed how



these tools are increasingly integrated into the Chinese armed forces, complementing the capabilities of classic weapon systems and, in some cases, replacing them or introducing unprecedented ones. More generally, the breadth of recent developments in military aviation indicates that the PRC is accelerating the enhancement of the fundamental capabilities of the PLA (People's Liberation Army). The goal is to significantly update the armed forces by 2027 and substantially complete their modernization by 2035. These short-term targets, supported by five-year plans, lead to the most ambitious goal: becoming a "world-class military power" by 2049, the centenary of the founding of the PRC.

In this journey, UAS occupy a fundamental role. During the parade, new collaborative combat aircraft (CCA) were observed, designed to operate alongside manned fighters, and multi-role platforms capable of performing ISR, attack, and EW missions. Standing out among the various drones were three tailless aircraft (provisionally named Type A, B, and F) with low observability and large dimensions: they are roughly equivalent to the J-10 medium fighter and capable of superso-



nic speeds, as suggested by the design of the air intakes. These vehicles are equipped with EOTS (Electro Optical Targeting System), laser warning sensors, and a dorsal panel for IR/laser sensors. Overall, it is believed these are high-performance UCAVs (Unmanned Combat Aerial Vehicle) with stealth technology, likely new types of CCA. Also during the parade, another CCA-type UAV was noted, equipped with vertical tail fins, reminiscent of the Feihong FH-97. This is an all-weather multi-role drone with a stealth design first shown in 2021, credited with a range of 1,000 km and near-supersonic speeds. The latter features an air intake on the back of the fuselage, swept wings, and dimensions comparable to the U.S. Air Force's XQ-58A. A few months later, around December, images emerged of this UCAV aboard the new Type 076 Sichuan-class drone carrier unit. This ship is formally an LHD (Landing Helicopter Dock) but, unlike similar units, possesses an electromagnetic catapult (EMALS). The Sichuan has a displacement of approximately 44,000 tons, equal to that of the U.S. Navy's America-class LHAs (Landing Helicopter Assault). The unit, unique in its kind,

was launched in December 2024 and completed sea trials in November 2025. In February of this year, the ship was observed with a second drone on board: the naval version of AVIC's GJ-11 Sharp Sword, which is also a CCA for the 5th generation J-20 fighter. According to the official designation, this UCAV has taken the name GJ-21. If its characteristics remain unchanged compared to the Sharp Sword, it uses a turbofan engine, has a wingspan of 14 meters, and a maximum takeoff weight exceeding 10 tons. It can carry over 2 tons of bombs, reaches a cruising speed of Mach 0.8, and has a maximum autonomy of 1,500 km.

Unlike the land version, it has folding wings to be stowed in naval hangars. Returning to the first CCA spotted on the Sichuan, provisionally named Type C, it would seem optimized for air-to-ground missions, although ISR and EW roles are plausible. It is not yet clear whether the drones observed on the new LHD were mock-ups or production aircraft; in any case, it is evident that the PLAN is carrying out compatibility tests in anticipation of future flight tests. The presence of the EMALS system will allow

At the opening, on the facing page, and on the subsequent ones, the GJ-11 "Sharp Sword" is a long-range stealth UCAV capable of performing CCA functions for fifth-generation fighters; furthermore, during the parade in Beijing last September, new medium/large-sized drones were seen that could be a new generation of CCA. In recent years, the PRC has given significant impetus to the development of a panoply of UAVs/UCAVs covering various roles: from ISR to ground and anti-ship attack.

On these pages, the Sichuan, launched in December 2024, is the first amphibious assault ship in the world to feature an electromagnetic catapult.

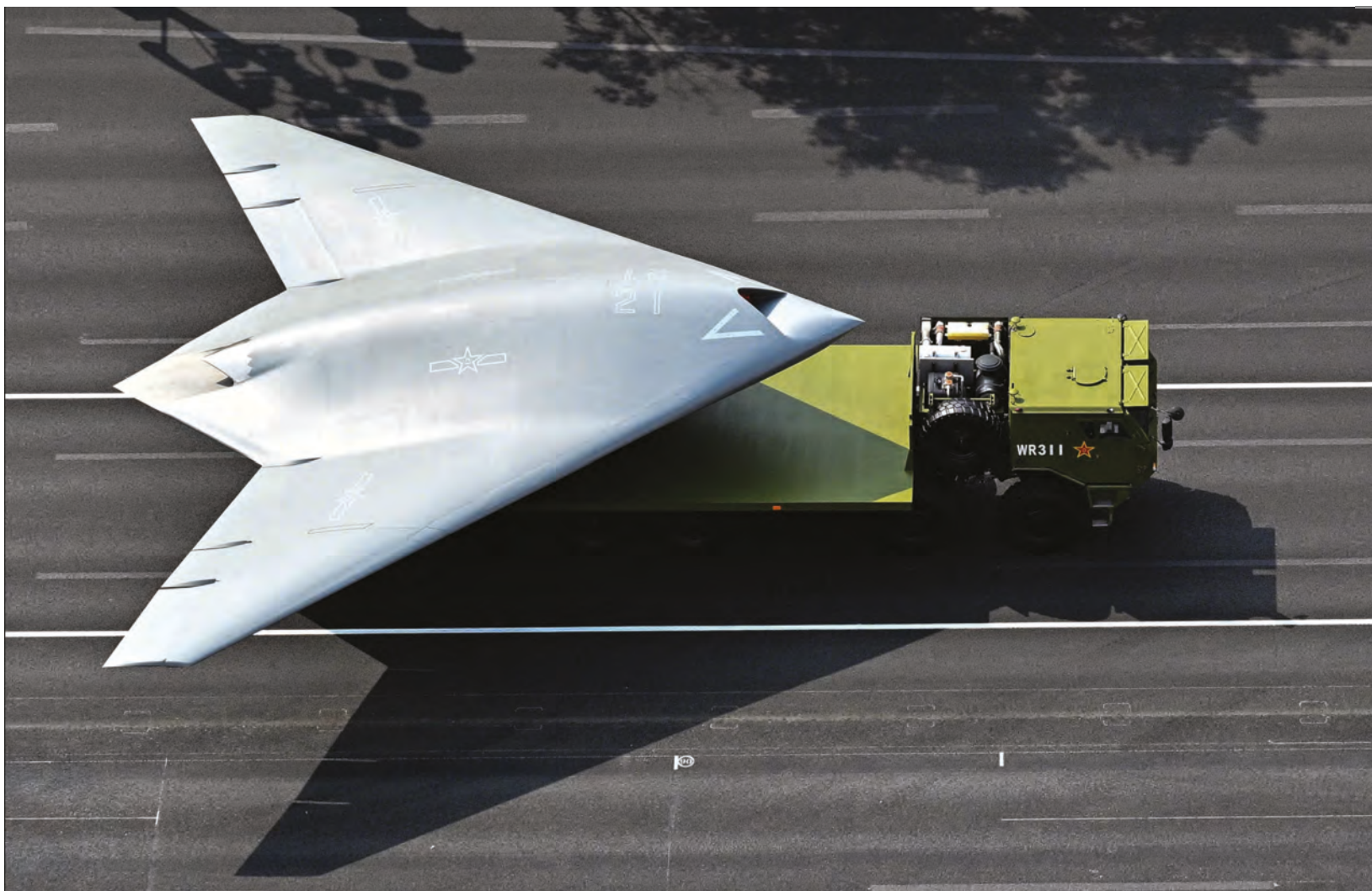
On the following pages, the aircraft carrier Fujian, China's "Type 003" warship inaugurated in 2022; in the image above, between late January and early February, images emerged on Chinese social media of what appears to be a mock-up of the GJ-21 stealth UCAV.



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the Sichuan to operate with various already supplied navalized UAVs/UCAVs, such as those of the Cai Hong (CH) and Wing Loong series. Furthermore, their use aboard the latest aircraft carrier to enter service, the Fujian, is very likely, as well as in future units planned by 2035, when Beijing aims to reach a fleet of six aircraft carriers. According to official Chinese sources, the Sichuan can accommodate up to six GJ-21s in addition to amphibious forces, about 1,000 soldiers, and two LCACs (Landing Craft Air Cushion). In this regard, it is interesting to note that the PRC has resumed series production of LCACs derived from the Zubr class (Type 958 in the PLAN), obtained from Ukraine starting in 2014. The Sichuan and future ships of its class could use the GJ-21 to support long-range deployments of large naval groups, improving their survival and attack capabilities. It is believed that these units can compensate for the limited power projection of the Shandong and Liaoning carriers, which do not have catapults or embarked AWACS aircraft. The Sichuan could therefore escort these carriers, using the GJ-21 for reconnaissance and intelligence tasks, improving the situational awareness of the naval group far from land bases. These developments, combined with the momentum in shipbuilding and drone production, suggest that Beijing intends to have a naval and amphibious force by the next decade capable of exercising deterrence toward the United States and regional allies. The goal is to project power into the Indo-Pacific and increase the effectiveness of interdiction zones (A2/AD – Anti Access/Area Denial) in the “First Island Chain,” already reinforced by new cruise missiles and hypersonic ballistic missiles (ALBM). The development of long-range stealth UCAVs highlights a doctrinal shift: air forces are no longer intended only for the defense of the continent but are now capable of penetrating adversary defenses for attack and ISR missions. In this sense, the recent conflict in the Persian Gulf demonstrates the fragility of Early Warning networks (hit by drones and ballistic missiles) and the risk of attacks on USA infrastructure in allied territory: a lesson the PLA is assimilating. The PRC has also intensified the integration of unmanned systems in amphibious landings. The use of the GJ-21 or Type C on the Sichuan follows this trend, although this unit seems destined more for long-distance operations than for short-range amphibious support (the task of the Type 075). The GJ-21 could conduct preliminary operations, such as reconnaissance or





precision attacks against coastal defenses, exploiting its stealth technology to penetrate enemy air networks. Although both drones can serve as CCAs for the J-20, it is likely they can also collaborate with the naval version of the new J-35 fighter, already seen on the aircraft carrier Fujian. If so, the PLAN would be the first navy in the world to simultaneously operate with an embarked fighter and CCA. Beijing is therefore enhancing information gathering and Command and Control (C2) capabilities, focusing on artificial intelligence and high-speed data connections to minimize warfare risks. Despite the importance of drones, the Chinese effort is not exclusive: innovations in piloted aircraft and naval units suggest that the PLA is structuring a military tool for high-intensity operations at great distances, where the autonomous component is fundamental but not yet preponderant. In any case, the PRC is currently the only nation to deploy a ship capable of embarking medium-heavy drones. The only similar unit, the Turkish Anadolu, currently operates only with Bayraktar TB3s (waiting for the Kizilelma).

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New life for the IVIAM Ro.41

*by Serafino Durante
photo MUSAM*



**Another unique specimen in
the world at the MUSAM.**

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Following a restoration that lasted more than thirty years, the IMAM Ro.41 biplane trainer—which trained entire generations of Regia Aeronautica pilots during the 1940s—is being returned to collective memory as it joins the collection of the Vigna di Valle Historical Museum.

It has reclaimed the place it deserves within the collection of the Historical Museum of the Air Force, filling that gap present in the Italian aeronautical heritage from the Second World War era. And it did so at the end of a difficult journey that saw it as the protagonist of a record-breaking restoration, lasting more than thirty years. A restoration desired and initiated in the early 90s by the GAVS (Gruppo Amici Velivoli Storici) with the decisive support, especially in the final period, of the Maintenance and Restoration Section of the Vigna di Valle Museum. Seemingly a mad undertaking, given that it started from a few battered pieces cast aside in a hangar. But what made the difference was precisely the foresight of that time to see a complete airplane in those scraps. But let us go in order, and before delving into the phases of the restoration, let us frame the IMAM Ro.41 from a historical point of view. Designed by Eng. Giovanni Galasso on behalf of Industrie Aeronautiche Romeo (IAR), subsequently renamed Industrie Meccaniche Aeronautiche Meridionali (IMAM), this single-engine

biplane flew for the first time in June 1934. From a structural point of view, the Ro.41 sits perfectly in the middle of that transition taking place in the 1930s, when from entirely wooden constructions with fabric covering, in perfect First World War style, there was a shift to completely metallic ones with stressed skin, which would become standard a few years later. "Our" Ro.41, therefore, features a fuselage and tail units made of welded steel tubes, wooden wings, and fixed landing gear, with a 430 HP Piaggio P.VII radial engine. Initially conceived as a light interceptor fighter, although it had already equipped twenty Fighter Squadrons, the inadequacy of its performance for the assigned task soon emerged, which is why in 1936 the Regia Aeronautica selected it as an advanced trainer, also developing the two-seater Ro.41B version: there would be 15 Flight Schools in Italy where it served to complete the final phase of the training program. Total production reached 919 aircraft, built not only by IMAM but also by AVIS and the nascent Agusta, which produced the last specimens in the post-war period before moving definitively to rotary wings. And the abandoned

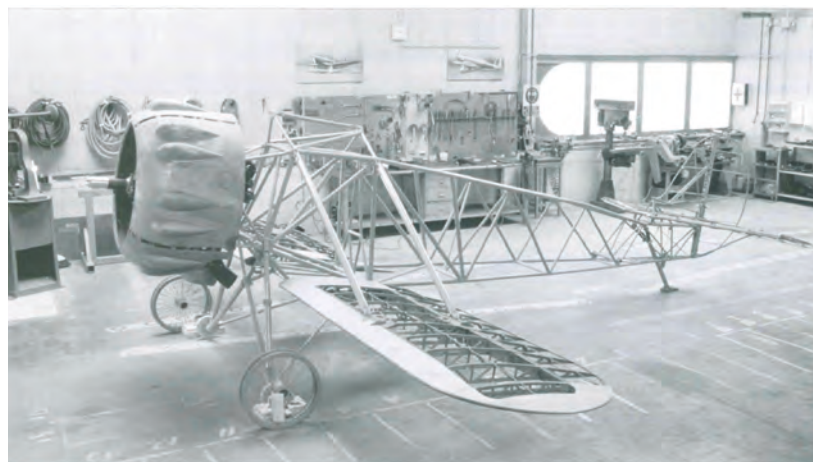




remains of the Ro.41 from which this "project" started come precisely from one of these Agusta machines. Let us look, then, in more detail at the different phases of the restoration. The goal was to save the last remaining components of the Ro.41 from oblivion, starting with the reconstruction of the heavily damaged original wings, thanks to the skill of the model-maker member Gianluigi Gazzera. Subsequently, they moved on to the creation of a frame for the fuselage, a fundamental piece to which all the restored original components and others of new manufacture would have to be "attached." This work was entrusted to the expertise of Giancarlo Zanardo, whom we all know today for his flying replicas (Blériot XI and Ca.3), through small drawings found in maintenance manuals. The Ro.41 restoration project is underway... In the following years, the work continued inside the Badoni Hangar, right in the exhibition area of the Museum, where visitors could admire such a particular and fascinating activity. The parts of the tail units and the gull-wings with 21 ribs, each different from the other, were restored and, where necessary, reconstructed; the covering fabric was applied, sewn, and treated on them; the fabric covering of the fuselage was carried out: all operations performed with the utmost respect for the good technical standards of the time. Donations of components arrived that enriched the original content, such as a tank, the propeller, and the

wheels. Other standard IMAM pieces came from the wrecks of Ro.37s recovered in Afghanistan in 2006 by the Air Force contingent. The airplane began to take shape. An emotion we wish to entrust to the words of 1st Warrant Officer Paolo Liberati, head of the Historical Aircraft Maintenance and Restoration Section of the Air Force: «It is at this point – he told us – that the restorer begins to align his heartbeat with what the work itself transmits. Because one can clearly see not only the object but can begin to hear the sound of the wind passing through the bracing».

And now comes the most complicated phase, for which it is necessary to move the airplane inside the Tricampate Hangar, the beating heart of all MUSAM restoration activities. It is at this precise moment that the project undergoes a decisive acceleration that would lead, in just two years, to closing a restoration that had lasted three decades. The union between the Air Force and GAVS grew even stronger, and the team spirit emerged even more powerfully: the goal is to give a new life to the IMAM Ro.41. It is close, but it is not easy. The metal covering of the engine mount and the fuselage spine, with their particular curvatures that determine the exterior shapes of the aircraft, require uncommon technical skills and professional mastery. «The creation of the duralumin panels – explained Paolo Belpane, Vice President of GAVS and one of the project coordinators – caused us sleepless nights. Achieving perfect correspondence when compared with photographic documentation was a critical and very demanding task». A task for which the restoration team required the manual skill of an expert tinsmith, managing together to finish the sheet metal parts and



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give the airplane its real forms. And then there is the painting which, although facilitated by a rare Agfacolor from the era, required an in-depth study to determine the correct color tones to apply. In the end, they opted for the livery of the airplanes in service at the Flight School of Capua, where the cadets of the Air Force Academy of Caserta trained: the same livery, imagine, of a model S.79 kept in a display case in the Badoni Hangar, suitably brought out and studied in detail. For the serial number, since the few original pieces provided no identification, MM.2907 was chosen, which was that of the first production Ro.41. And, finally, we come to the assembly, what they define here at MUSAM as a "silent ritual" during which everyone holds their breath, hoping that all the components of this complex puzzle align perfectly. Mission accomplished! From those few and battered scraps, a splendid specimen has emerged, returned forever, with pride, to the history of Italian aviation. All this was made possible thanks to the competence, professionalism, but above all the vision of those who believed in this undertaking. A famous quote attributed to the writer Patrick Snow, so dear to those who are the architects of such an important restoration, captures the idea of this "miracle" well: «Only those who can see the invisible – he says – can accomplish the impossible». And then there is another ingredient



without which such an arduous mission would have been difficult to complete: passion. And of passion for what he does, we see it in his eyes and perceive it in his tone of voice when he speaks to us, we guarantee that 1st Warrant Officer Paolo Liberati has plenty to spare: «The work of a restorer of historical airplanes – he insists on saying – cannot be reduced to a simple technical gesture or manual ability. It is something that goes beyond. Touching true "works of art" with your own hands makes you take a leap into the past, through a sort of time machine that leads you to work side by side with men of other eras. Because reproducing a historical detail means thinking like them. Technical manuals – Liberati continued – are not enough. It is a competence that we will not find written in any book, but which has matured over the years and has been transferred to us as craftsmanship by those who preceded us. Imagining working shoulder to shoulder with pilots and specialists like Baracca, Cappannini, Baracchini, Campanelli is something unique. Without history there is no future: we must understand where we came from so as not to lose the founding values of the Air Force».





At the opening, the IMAM Ro.41, at the conclusion of a long restoration lasting more than thirty years, finally joins the collection of the Air Force Historical Museum.



On the previous pages, two moments from the ceremony held last April 16 at the MUSAM to "unveil" the result of the difficult restoration; at the bottom right and on the facing page, the various phases of the restoration, carried out by the GAVS (Historical Aircraft Friends Group) and the Maintenance and Restoration Section of the Air Force. On this page, above, the Chief of Staff, Gen. S.A. Antonio Conserva, admires with satisfaction the "new" Ro.41 of the Air Force Museum, which is on display inside the Badoni Hangar (photo on the left).



Today, the Maintenance and Restoration Section of the Armed Force is assuming an increasingly important role at the national level, establishing itself as a true focal point for the restorations of historical aircraft. Certainly a significant change of pace that makes the specialists, military and civilian, of Vigna di Valle even more proud and responsible. And that spurs them to always give their best and to already look toward the next restoration project. After all, they define themselves as a historical operational Department, with 80 airplanes that do not fly but that must be maintained.

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GIORNATA METEOROLOGICA MONDIALE 2026

100 students hosted at the Vigna di Valle Historical Museum

*by Angela Celozzi
photo Troupe Azzurra*



At the opening, the Poster created for the celebration of World Meteorological Day 2026 held at the Vigna di Valle Historical Museum. A morning dedicated to discussing this year's theme: "Observing today, to protect tomorrow."

On the following pages, Brigadier General Giuseppe Addesa, Italy's Permanent Representative to the World Meteorological Organization, during the opening speech of GMM 2026; the launch of Pilot balloons for atmospheric monitoring by the students attending the event.

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he future of the Planet is decided today and depends on the ability to precisely observe what happens above our heads. In short, this was the message delivered to 100 students from the scientific high school

and the Aeronautical Institute of Bracciano present at the Historical Museum of the Air Force in Vigna di Valle on the occasion of GMM26 (World Meteorological Day 2026) last March 23rd. "Observe today, protect tomorrow" is the theme chosen for this edition of the initiative, which every year celebrates the anniversary of the founding of the WMO (World Meteorological Organization), which took place on March 23, 1950. World Meteorological Day represents a moment of global reflection on atmospheric and environmental challenges; for some years now, the Air Force has celebrated this anniversary by organizing meetings with high school students and Italian institutional and scientific excellences. The choice of the theme is not accidental and fits into a precise strategic urgency. From the topics proposed over the last three years, a clear and strong desire emerges to sensitize institutions and public opinion to the crucial role of observation for the early detection and mitigation of extreme weather events. In an increasingly vulnerable global context, capillary and timely observational data represents the first true line of defense.

It is precisely to respond to this need that the WMO is promoting and investing massively in structural projects such as WIGOS (WMO Integrated Global Observing System), WIPPS (WMO Integrated Processing and Prediction System), and the SOFF fund (Systematic Observations Financing Facility). These are fundamental pillars for optimizing data processing, filling observational gaps in less-covered areas of the planet, and ensuring that every country has the tools to feed warning systems. In this context, students were offered the opportunity to engage directly with the main Italian institutional and scientific excellences active on the front line. MUSAM, a place that preserves the history of flight and aerospace innovation, proved to be the ideal stage to talk about the future: the ability to observe our Planet, both from Space and from the Earth's surface, is indeed the indispensable prerequisite for guaranteeing its safety. The meeting allowed for the exploration of these themes, outlining a complete picture of the technologies and strategies put in place by institutions, thanks

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to interventions by exceptional speakers. The first contribution, by the Director of the CTM (Technical Center for Meteorology) of Vigna di Valle, Lt. Col. Fabrizio Ciciulla, illustrated the complex and fundamental activities of the Center. Founded in 1910, the CTM represents a true flagship for the Air Force: in 2018, it was recognized by the WMO as a Historical Observatory for its over one hundred years of precious and uninterrupted measurements. In addition to this important Italian record, the facility boasts, among its various tasks, the job of testing, certifying, and calibrating all detection instruments before their installation. Furthermore, the Center constantly monitors atmospheric ozone via sounding balloons and hosts a center of excellence for the study of precipitation.

The space horizon was traced by Dr. Paolo Ruti, Chief Scientist of the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT). Ruti illustrated to the young audience, using dynamic and engaging language, the potential of latest-generation space programs, such as the 3rd Generation Meteosat (MTG) satellites and the 2nd Generation polar Metop (EPS-SG), explaining their vital importance. Meteorological satellites today represent a critical infrastructure, real “eyes” in Space, indispensable for monitoring atmospheric dynamics and providing timely data. The perspective from orbit was then physiologi-

cally integrated with ground analysis thanks to Dr. Monica Campanelli of CNR-ISAC (National Research Council-Institute of Atmospheric Sciences and Climate). The researcher introduced the students to the functioning of the PANDORA and PREDE systems, advanced sensor networks fundamental for the study of atmospheric aerosols and trace gases. She explained how PANDORA spectrometers monitor air quality and gases such as ozone, while PREDE photometers analyze suspended particles. The doctor concluded by showing how Italian research actively contributes to the development of high-precision calibration networks. But how does this mass of data translate into concrete actions to protect citizens? This fundamental question was answered by Dr. Silvia Puca, coordinator for satellite and space aspects of the Civil Protection Department. Her intervention focused in particular on the international EUMETSAT-HSAF (Satellite Application Facility on Support to Operational Hydrology and Water Management) project, an excellent example of how satellite observations are used operationally for the evaluation of precipitation parameters, snow cover, and soil moisture.

Knowledge of such data is essential for issuing alerts for hydrogeological risks and planning emergency interventions. Finally, the focus shifted from short-term monitoring services to long-term ones with Dr. Stefano Mariani of ISPRA (Institute





for Environmental Protection and Research), coordinator for Italy of Copernicus C3S. Through the explanation of this program, young students understood how the free availability of decades of historical observations, atmospheric reanalysis, and high-quality climate services is of great support to the adaptation and mitigation policies of the European Union and national governments, providing consistent and authoritative information on climate change. To crown the day, theory gave way to practice. The students indeed had the exciting opportunity to participate personally in the launch of "Pilot" balloons for atmospheric monitoring, living the direct experience of measuring meteorological parameters along the entire air column through a small "weather station" which, attached to an aerostatic balloon free to rise into the atmosphere, performs direct observation and measurement of thermodynamic parameters (such as pressure, temperature, and humidity). This moment in the field allowed the students to perform a real operational act, experiencing as protagonists one of the daily and most fascinating activities of meteorology. To emphasize the importance of the meeting and chart the course for the future, the words of Air Brigadier General Giuseppe Addesa, Permanent Representative of Italy to the World Meteorological Organization (WMO): «Celebrating World Meteorological Day 2026 here at MUSAM allows us to ideal-

ly unite past and future, perfectly embodying the theme "observing today to protect tomorrow." We have the certainty that information from the past is the key to facing tomorrow: proof of this is Machine Learning, the engine of Artificial Intelligence systems, today indispensable for meteorological and climatological forecasts, which feeds precisely on historical memory. Today, two generations are compared: the hope is that the experience outlined by the more mature and expert one can ignite the spark of innovation in you young people, the first true digital natives, by nature more open to change.» The event hosted in Vigna di Valle went far beyond simple scientific dissemination, transforming into a precious moment of generational comparison. The students had the opportunity to discover how Earth observation is not an abstract concept, but the direct expression of what they learn every day at school. From mathematics to physics, the students understood how the study of scientific subjects finds a concrete and indispensable application to face the challenges and problems of daily life. In this context, the strong synergy between Research Entities, Civil Protection, and the Defense sector represents the winning model to face the complex environmental challenges that await us.

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GEOFFREY

The giraffe that conquered the skies to support sick children

by Luca Giandomenico Polidori
photo Giraffes On Tour

Imagine a rainy weekend, without any commitments, with the simple desire to relax on the sofa. You hold your phone and start scrolling aimlessly through social media when suddenly an image catches your attention: a stuffed giraffe aboard an Eurofighter. A bizarre idea, perhaps hard to believe, but it is not a fantasy or an internet prank. This is "Geoffrey" the giraffe, the official mascot of the Giraffes On Tour organization, whose main objective is to raise funds for the Great Ormond Street Hospital for children in London. Founded four years ago by Ian, father of Louise, an English girl who tragically passed away in 2013 due to severe leukemia, this original initiative was born from a story that intertwines pain and hope. It all began when Louise, at the age of eight, started com-

plaining of pain in her legs and eating strangely. Her parents, worried but hopeful that it was just a passing ailment, did not imagine how serious the situation was. A blood test, however, revealed the sad truth: Louise had a form of leukemia with a 50% survival probability. With this shocking news, the world of this ordinary family was suddenly overwhelmed by tragedy. Louise was immediately transferred to Great Ormond Street Hospital in London. There, her parents bought a small stuffed animal, a giraffe that Louise named Geoffrey.

Geoffrey immediately became her roommate, bringing her security and companionship in a completely new and frightening environment. The following months were marked by treatments, tests, and a bone marrow transplant

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donated by Louise's brother, followed by a cell transplant. Despite the efforts, the disease proved relentless, with severe side effects and alternating moments of hope and periods of great pain. Geoffrey accompanied Louise everywhere. For example, when a British fashion designer made a special visit to the hospital, Louise had the opportunity to spend time with her, designing clothes and creating a t-shirt decorated with giraffe patterns.

It was evident how special Geoffrey was to Louise: he was not simply a stuffed animal, but a reassuring point of reference that allowed her to find a bit of normalcy in a difficult period, marked by suffering and worry. Unfortunately, Louise's situation did not improve: the doctors informed her parents that there were no more therapeutic options and that Louise would soon be brought home, with a life expectancy of one or two months at most. Unfortunately, those few months granted by the diagnosis proved even shorter.

Geoffrey and Giraffes On Tour have now become iconic figures in the world of aviation, both civil and military. Thanks to a vast network of supporters who have embraced the cause, these stuffed giraffes have become a symbol of global solidarity.

The initiative came to life on a Facebook group called "Giraffes On Tour," initially created by family friends to support and comfort the parents in the memory of their daughter, and subsequently dedicated by Louise's parents to launching a fundraiser for the Great Ormond Street Hospital. It was in this very hospital that little Louise had been treated before passing away due to a rare and aggressive form of leukemia.

Through images of the stuffed animals flying on various aircraft, the campaign has transformed Louise's memory into concrete help; to date, in fact, over 120,000 pounds have been raised and entirely donated to the hospital facility to support research and the care of other children.





ter than feared. A few days later, on February 9, 2013, Louise passed away at Great Ormond Street Hospital at the age of only nine, leaving a deep void in the hearts of those who loved her. On the day of the funeral, Geoffrey, her last playmate, was placed beside her, transforming their bond into a symbol of eternal love. A replica of Geoffrey was engraved on the tombstone to preserve the memory of his affectionate company forever. For years, Ian and his family avoided talking about Louise, fearing that her name would reawaken unbearable pain. Yet, fate has the power to rejoin what seemed far apart forever. One day Ian, who had been passionate about planes since childhood, was looking at aviation images on Facebook and noticed a surprising detail: some members of a group had jokingly added photo composites of giraffes in their airplane photos.

That light and creative gesture immediately reminded him of his daughter's stuffed animal, sparking a sweet nostalgia. In the group chat, without thinking too much, he wrote a simple comment explaining how much those giraffes brought him joy and told the story of Louise and Geoffrey to strangers for the first time. Meanwhile, by pure chance, some family friends surprised Ian by creating a Facebook group called "Giraffes On Tour," where they had begun posting

images of stuffed giraffes flying on various aircraft. The next step was almost natural: Ian decided to use the group to start a fundraiser for Great Ormond Street Hospital. Louise's parents understood that, through the memory of their daughter and her beloved stuffed animal Geoffrey, they could help other children affected by similar diseases, supporting both families and medical research. The story of Giraffes On Tour spread rapidly among aviation enthusiasts in different countries and, soon, pilots, Air Forces, and aerobatic teams began carrying Geoffrey the giraffe aboard their aircraft. Today, Geoffrey boasts dozens of flight hours in his "logbook" aboard planes and helicopters. Among his many adventures, he has performed landings on aircraft carriers aboard Spanish Harriers, assisted in aerial refueling operations with German Tornados, observed the Earth from the legendary U2 reconnaissance plane, participated in exercises with USAF F-22s, F-35s, F-15s, and B-2s, and flown in formation with aerobatic teams such as the Red Arrows, the Patrulla Aguila, and the Saudi Hawks.

Furthermore, he was able to experience massive accelerations (G-force) with the Eurofighter of the RAF (Royal Air Force) Typhoon Display Team, the Danish F-16 Solo Display Team, and the Ca-



nadian CF-18 Demo Team. Geoffrey also had the good fortune to have wonderful experiences with our Armed Forces, meeting personnel from the RSV (Experimental Flight Department) of the Air Force, observing F-2000A and T-346A aircraft up close, and flying alongside the pilots of the C-27J Spartan. He also traveled aboard the Harriers of the GRUPAER (Carrier-Based Aircraft Support Group of the Navy) and even the legendary FIAT G.91. Giraffes On Tour also continues to organize numerous special events in collaboration with the Royal Air Force.

«One of the most unique initiatives we realized with the RAF was the “Flight of the Giraffes.” In one of these editions – Ian tells us – an A330 MRTT Voyager took off from Brize Norton with as many as 330 stuffed giraffes on board, participating in a refueling flight». The charitable initiative allowed the public to “reserve” a seat for their own giraffes, raising funds for the Great Ormond Street Hospital. At the end of the flight, the giraffes were returned to their respective owners, accompanied by a commemorative certificate that transformed the experience into a special moment of play and solidarity. The official crew of Giraffes On Tour consists of about ten people, but if we consider all of Geoffrey's friends who

have accompanied him in flight, the number grows to hundreds: among civilians and military personnel, many have decided to contribute to this extraordinary project. Ian and the other volunteers are often present at airshows and other aeronautical events. «The initiative has sparked invitations and international interest, from Europe to North America, all the way to New Zealand. Unfortunately, however – Ian says – we all have jobs as well, and the time to dedicate to stands, events, social media activity, and organizing initiatives is never enough. Fortunately, many friends, including military and civilian pilots, contact us to contribute to this splendid project, taking Geoffrey with them on their adventures and sharing the experience on social media and in the media». Every new volunteer is always welcome, because it is precisely through everyone's contribution that the initiative can grow and reach more and more people. Geoffrey, for his part, is always ready to leave for a new adventure: every takeoff adds hours to his impressive flight log, but above all, it broadens the scope of the project, bringing it to new places and before new eyes.

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1926: NOBILE AT THE NORTH POLE

*by Angelo Gionti
photo Aeronautica Militare*



Centenary anniversary of the 1st North Pole flyover accomplished by the airship Norge.

At the opening and on the last page, the Fram Museum, the most important in Oslo, houses the ship Fram, built in 1892, which was used for thrilling and adventurous polar explorations.

On the following pages, the airship Norge, the route, and the crew of the Arctic expedition. On the far right is General Umberto Nobile holding his little dog Titina.

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t is a moment in history when the white silence of the Arctic stops being an impassable border and becomes a destination reached by human ingenuity. It is 1926, and at the center of this feat is an Italian: Umberto Nobile.

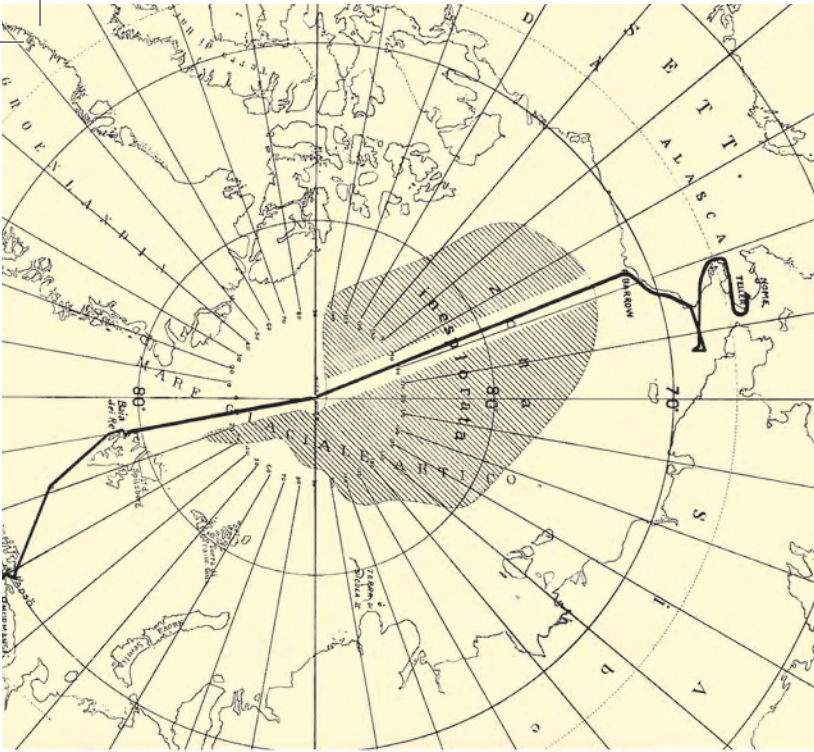
The date handed down to history books is May 12, when the great Norwegian explorer Roald Amundsen finally realizes his ancient dream of exploring the Pole by air. After several unfortunate attempts made with seaplanes, Amundsen decides to attempt the feat with a more stable vehicle—the lighter-than-air—and Umberto Nobile represents for him the key figure who makes this extraordinary undertaking possible. Already known as an expert and qualified Officer of the Regia Aeronautica, an airship designer, and director of the Aeronautical Construction Plant in Rome, Nobile designed and built the "N" type airship, a semi-rigid aircraft considered among the most advanced of its time for stability, lightness, and reliability. Amundsen, after carefully studying its possibilities, proposes to the Norwegian aero club to purchase the aircraft, which for the occasion is renamed Norge.

The N1 Airship, built in 1924 and piloted by Nobile himself, is not only particularly suitable for the expedition thanks to its greater maneuverability compared to the large German rigid airships, but appropriately modified for the circumstance with innovative structural solutions, it highlights the technical and design creativity of Italian ingenuity. Lightened in its structure and improved in its propulsion system, the airship is equipped with an advanced radio system developed by the Marconi company. It is, furthermore, covered with a three-layer waterproof fabric designed by Pirelli to with-



stand the harsh Arctic temperatures. The Norwegian team, led by Amundsen, brings with it vast experience and expertise in organization and survival in Arctic environments. Finally, no less important is the contribution of the American Lincoln Ellsworth who, as the sponsor of the expedition, handles the financial and logistical-organizational aspects. The Norge takes off from Ciampino on April 10, 1926, to cross half of Europe with a multinational crew. Once the North Pole is reached, the flags of Italy, Norway, and the United States are dropped from the Airship to symbolize the joint contribution of the three countries. This is the brief summary of an extraordinary feat, made possible only by the special synergy created between men of different nationalities—and with very different personalities—but united by a common goal. It was not only a geographical conquest but also a victory for engineering, planning, and courage. A cooperation beyond flags in which a young country like Norway



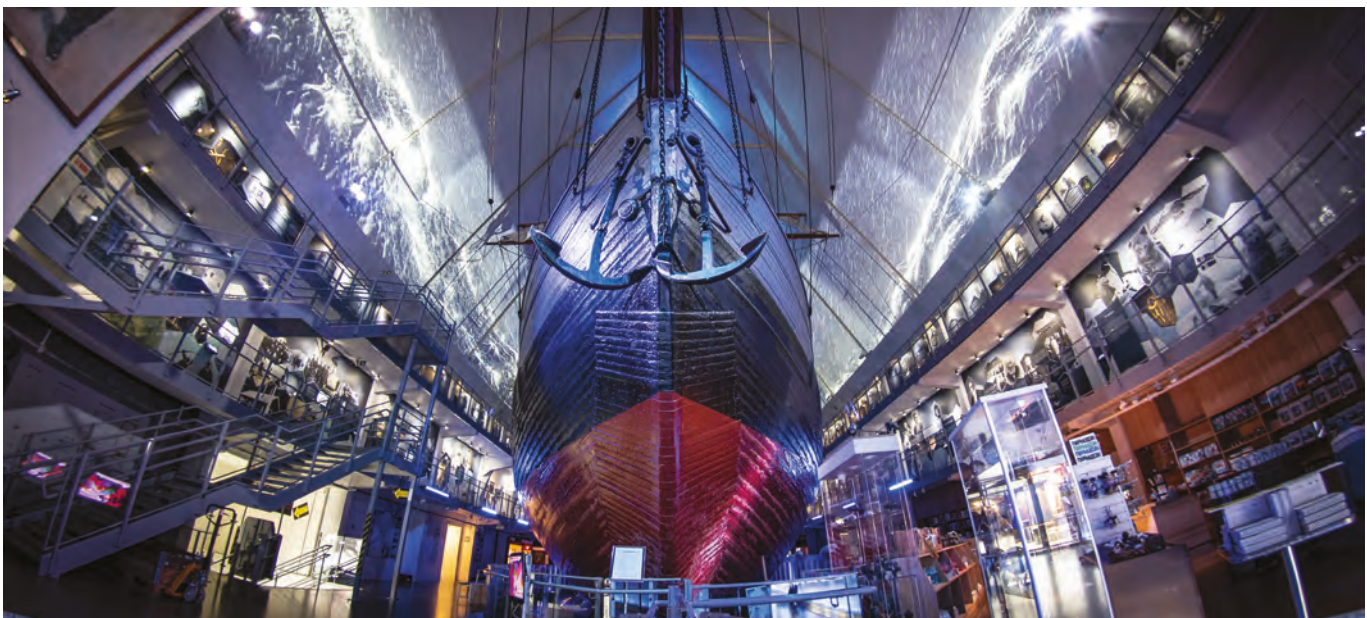


cemented its national pride with the adoption of its explorer hero, and a young Regia Aeronautica which, through the achievement of records and milestones, vigorously established itself as a protagonist of Italy's technological, scientific, and cultural development. Today, as it was a century ago, the meaning of that mission is more relevant than ever, and multiple events are being promoted to commemorate its importance.

Significant is the conference titled "One hundred years over the North Pole," organized on March 19 by the Italian Embassy in Oslo in collaboration with the Fram Museum and the Italian Air Force. During the evening, which saw the participation of the Norwegian Minister of Research and Higher Education, Sigrun Gjerdøw Aasland, speeches followed by the Director of the Norwegian Polar Institute, Camilla Brekke, and the director of the Institute of Polar Sciences of the CNR (National Research Council), Prof. Giuliana Panieri, who presented the volume published by the CNR on the centenary of

the feat and its scientific implications. 2nd Lt. Michele Palumbo and Lt. Col. Paolo De Vita of the Air Force, in turn, focused on the Italian aerial technology that contributed decisively to the success of the mission. H.E. Ambassador Stefano Nicoletti emphasized that «the expedition of the airship Norge represents one of the most significant pages in the over-century-long history of Italy in the Arctic. It has been consolidated in the last thirty years thanks, in particular, to the stable presence guaranteed by the multidisciplinary research station Dirigibile Italia, managed by the CNR on the Svalbard Islands. The event on the Norge – Nicoletti added – also allowed us to highlight Italy's renewed commitment to this region through the new national strategy for the Arctic and, finally, the organization in Rome of the recent Arctic Circle Forum – Polar Dialogue, a high-level international event where the complexity of the multiple challenges affecting the Arctic, the Antarctic, and the so-called Himalayan Third Pole was discussed». The evening concluded with a speech by the Norwegian Minister, highlighting how today the Arctic is no longer just a frontier to be explored, but a fragile ecosystem that requires our collective protection. «The collaboration between the Norwegian Polar Institute and the Italian CNR is the direct heir to that spirit of 1926. Research and higher education are the tracks on which our ability to understand climate change runs: without data, without shared science between Oslo and Roma, we could not face the geopolitical challenges that this region places before us. The contribution of the Air Force reminds us that technological innovation has always been the engine of knowledge. One hundred years ago it was the airship Norge, today it is satellites, cutting-edge laboratories, and the minds of our researchers».

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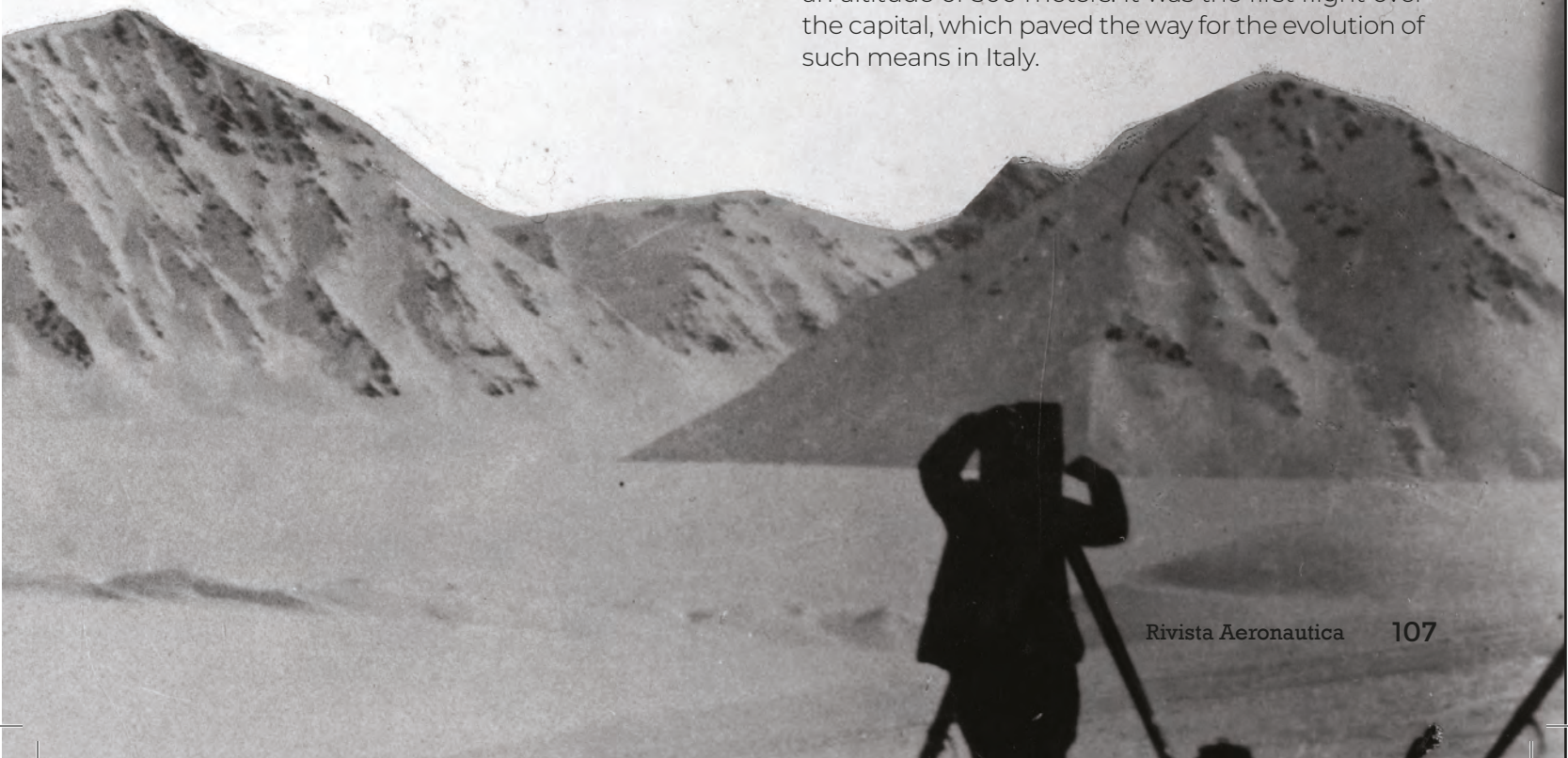
The return of the airship

*by Michele Palumbo
photo Troupe Azzurra*



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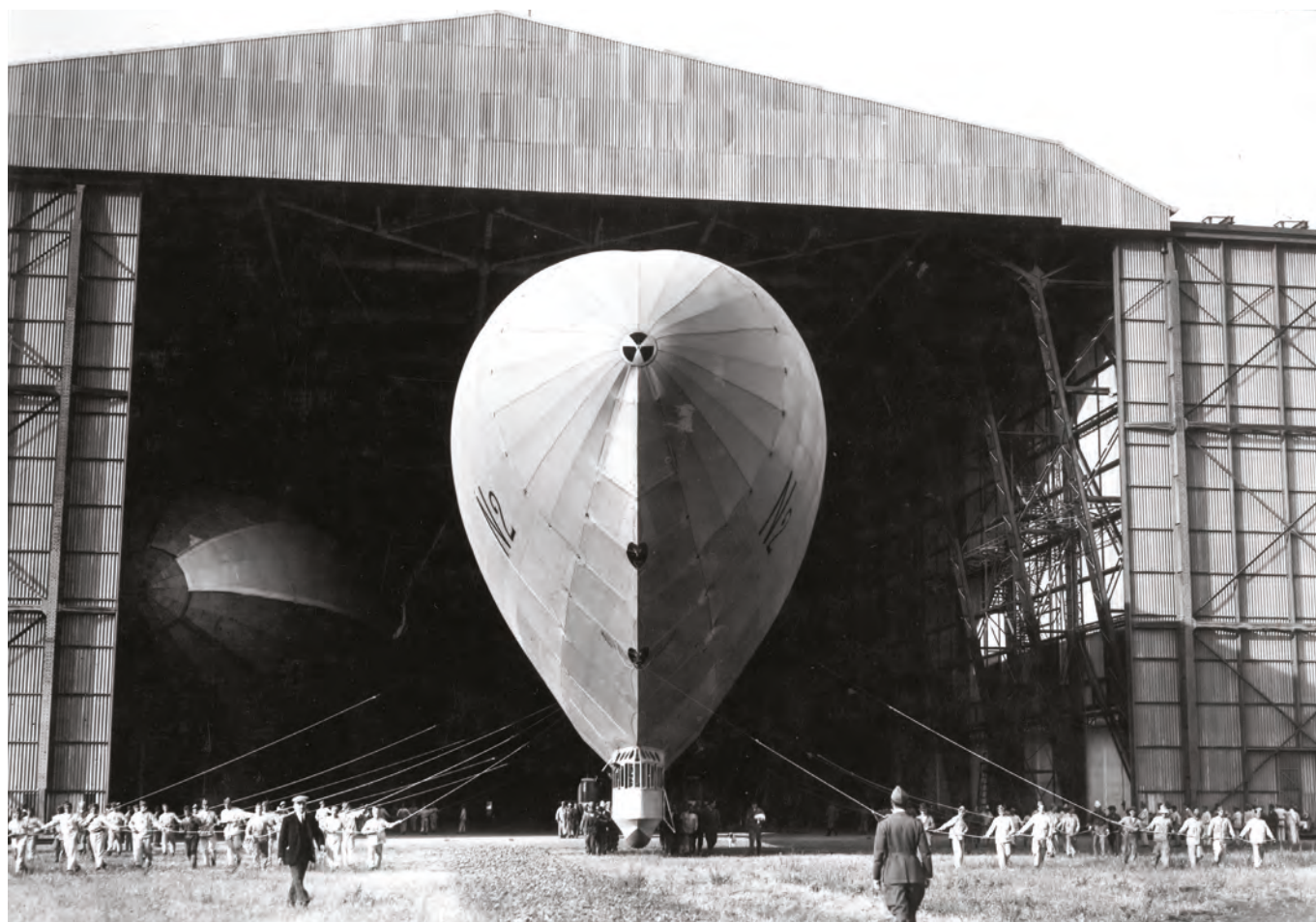
The renewed interest of the industry in "lighter-than-air" craft, driven by current sustainability needs, recalls the origins of flight, when airships such as those of the DELAG (DEutsche Luftschiffahrts-AktienGesellschaft) embodied the first form of scheduled air transport. They were imposing rigid-type aerostats supported by a complex metal framework that gave them a characteristic elongated and tapered shape. They were the "dirigibles" created by Count Ferdinand von Zeppelin and, later, by the visionary Hugo Eckener. In Italy, on October 31, 1908, Gaetano Arturo Crocco flew the N.1 prototype from Vigna di Valle to Rome and back, covering about 80 kilometers in an hour and a half at an altitude of 500 meters. It was the first flight over the capital, which paved the way for the evolution of such means in Italy.

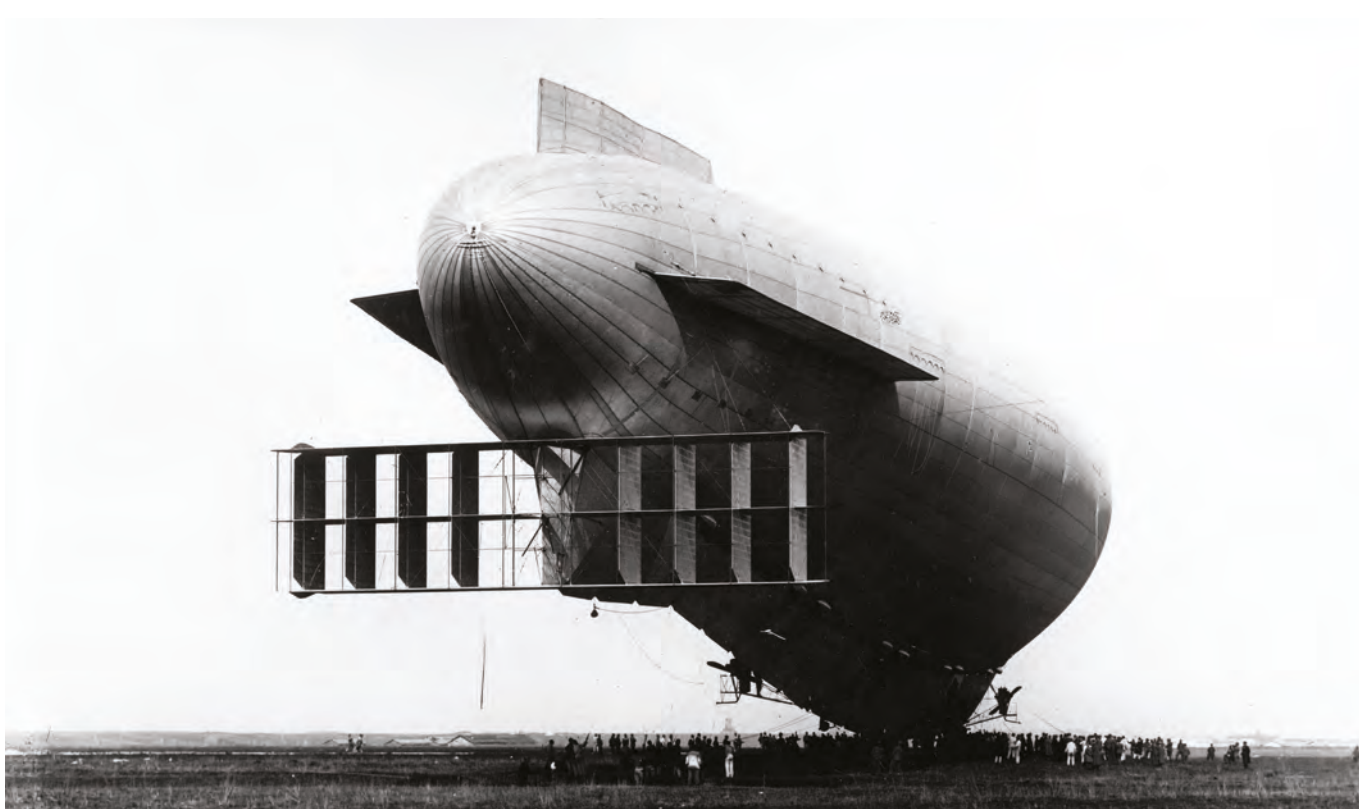


Crocco was soon joined by his most brilliant student, Umberto Nobile. Together they contributed to the creation of about thirty airships, employed during the Great War but proven to be of little strategic versatility. This assessment led to orienting their development toward civil and commercial uses, culminating in the T-34 project. With a length of 125 meters and a diameter close to 25, it reached dimensions never equaled for an Italian airship. An unprecedented box-structure tail group gave the craft an unmistakable appearance which, however, became one of the main points of friction between the two designers. The name derived from the theoretical cargo capacity, about 34 tons, or 100 passengers. The airship had been conceived for intercontinental connections, particularly on the Europe-South America route. The Atlantic remained the ideal horizon, after the British R-34 had deprived the feat of its absolute novelty on July 2, 1919, by covering the route from Scotland to the United States in five days with 28 passengers and the kitten Wopsie on board. He was not the only "airship animal" because in the following years, the little dog

Titina, Nobile's inseparable companion, would take part in all his feats, becoming a symbolic presence in polar explorations. Meanwhile, the Italian airship T-34, renamed "Roma," was sold to the United States and on February 21, 1922, a terrible accident caused its destruction and the death of 34 people. Among the causes was the replacement of the six Ansaldo engines with more powerful Liberty L-12s, which led to an increase in speed and stress on the keel structure. Umberto Nobile remained convinced, however, that the decisive cause of the disaster was the box-structure tail rudder, a design element he had always contested and considered an unmistakable signature of Crocco.

The Roma thus marked the definitive conclusion of their collaboration. Despite the accidents, the aerostat continued to be presented as a tool of progress and international cooperation, so much so that it was defined as an "angel of peace" in the speech delivered by US President Calvin Coolidge on October 12, 1924, on the occasion of the arrival in the United States of the German airship ZR-3, which cross-





At the opening, the crossing of the Norge in 1926 stands as an unprecedented feat in the fields of aviation and polar exploration.

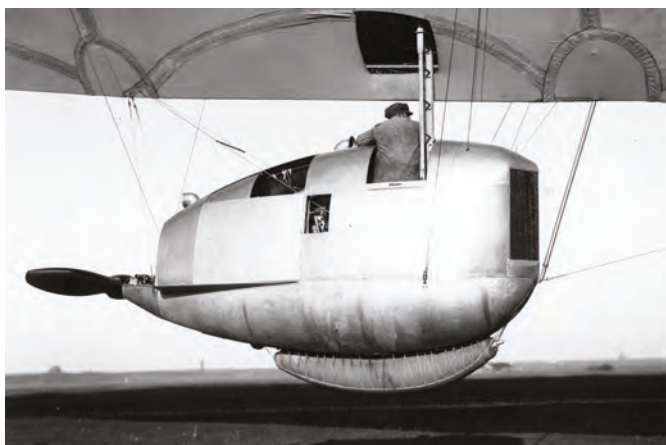
On the facing page, the semi-rigid airship N2 is towed out of the Ciampino hangar by ground crew; on this page, the T34 "Roma" reached dimensions never equaled by any other Italian airship.

On the following pages, top left, the stern car was one of the three gondolas suspended from the Norge's structure by steel cables, each housing a 245 HP Maybach engine. Top right, the control cabin was the natural forward extension of the load-bearing metal keel; below, the Pathfinder, the new-concept airship designed by the visionary Sergey Brin. Imposing structures and advanced materials combine in a project that aims to demonstrate, through contemporary technologies, the operational rebirth of large-scale airships.

sed the ocean in just three days. The evident signs of progressive deterioration in relations between the various governments did not help the sharing of knowledge and discoveries, with serious consequences for safety standards. Despite the temporal advantage accumulated over heavier-than-air craft, progress remained limited and airships ended up growing mainly in costs, dimensions, and ambitions. Titanic constructions consisting of enormous mooring pylons sprang up at various latitudes, such as that of Howden, in England, where the R-100 series airships were built. Felice Trojani, a brilliant Italian engineer, was instead responsible for the construction of the hangar in the ice of Kingsbay: a hangar without doors or a roof, so as to make the sheltering of the airship extremely essential, while simultaneously reducing the risks of pylon mooring. In the face of these imposing structures and the breadth of the vessels, the environments dedicated to passengers remained surprisingly small and uncomfortable. In 1925 Nobile, now entirely emancipated from Crocco's influence, continued to be

convinced that the future of the sky belonged to lighter-than-air craft. In his Ciampino hangar, he built airships that were more agile and simpler to produce at the expense of size. They were of the semi-rigid type, characterized by a lower keel that gave the airship considerable robustness and lifting capacity, while the gas pressure was tasked with maintaining its shape.

Among the orders came that of the famous Norwegian polar explorer Roald Amundsen, financed by the American heir Lincoln Ellsworth, who wanted to cross the polar region from Kingsbay to Point Barrow in Alaska, passing through the North Pole. The N1, designed as a luxury airship for Mediterranean cruises, was converted to fly over the Arctic: the "Norge." Nobile reduced the weight, reinforced the structure, and adapted it to the extreme conditions of the Arctic. To communicate with the rest of the world, a radio apparatus was installed with a range of about two thousand miles, which used very long, particularly sensitive antennas that were



towed behind the airship to pick up meteorological bulletins from all over the circumpolar area. A small external propeller provided for the recharging of the electrical system, ensuring operational continuity even in extreme conditions. In this context, the contribution of Algeri Marino, an officer of the Aeronautical Engineers, and that of the telegraph operator Birger Lund Gottwaldt were precious. The entire radio system, developed by the Marconi Company, guaranteed reliable technical dependability, conferring further authority on the entire undertaking.

It was a decisive moment for polar exploration, for the evolution of aviation, and even more so for the fascist regime, ready to claim the glory of the feat for propaganda purposes. Mussolini's first official act as Minister of Aviation was precisely the signing of the agreement for the sale of the NI. At one-thirty in the morning on May 12, 1926, the Norge arrived to fly over the North Pole at an altitude of 200 meters, above the absolute 90° North: an unprecedented feat. Yet Nobile's fame is more spontaneously associated with the disaster of the subsequent expedition involving the airship Italia. It was a decisive cause for the deterioration of the airship's image in public opinion and political debate. To consolidate that distrust, the Hindenburg catastrophe arrived a few years later, marking the definitive epilogue of lighter-than-air craft. The idea of conquering the sky using what was probably the most effective tool in terms of the lift-to-drag ratio was abandoned. Airships were the only means capable of sustaining themselves thanks to aerostatic thrust, resorting to aerodynamics almost exclusively for advancement, with practically negligible induced resistance. They consumed very little and were ideal for long-distance transport. Today, visionary investors aim to resurrect the airship thanks to new technologies



and materials such as carbon, titanium, fireproof fabrics, sensors, computerized controls, steerable electric motors, and AI interfaces, which offer more flexible systems for regulating thrust. Systems covered by strict industrial secrecy, as in the case of the 40E Sky Dragon, which promises to manage flying warehouses—true refueling hubs for fleets of drones delivering e-commerce packages to companies and individuals around the American "West Coast." Even more ambitious is the project of Google founder Sergey Brin, who proposes his Pathfinder, a helium-propelled airship with 12 electric motors and financed with LTA Research funds. The





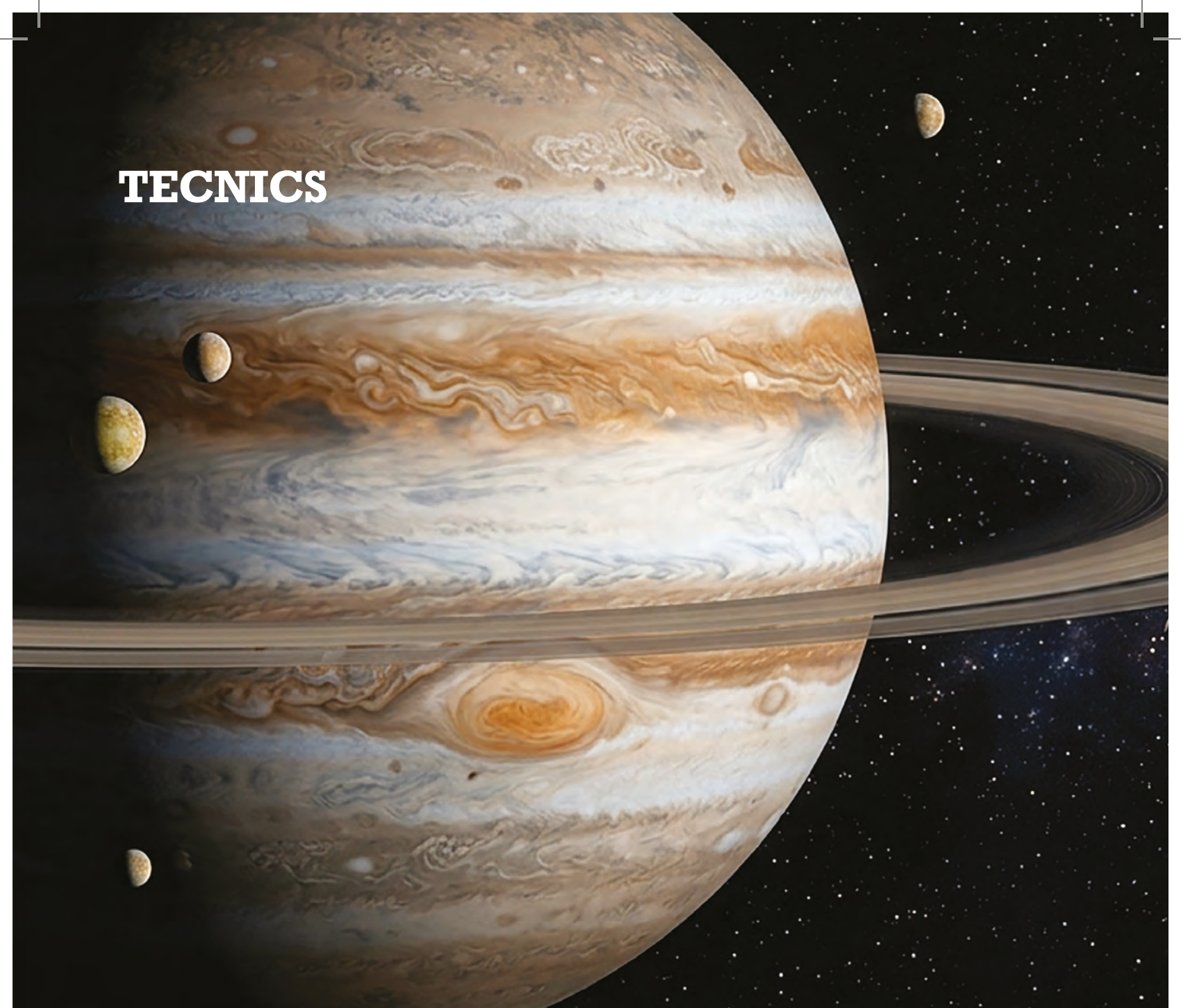
philosophy is to return to drawing from the history of airship design, in collaboration with the University of Akron to recover techniques, materials, and historical documentation to be integrated into new projects. Brin wants to demonstrate that rigid and majestic models like the old Zeppelins can be reborn thanks to modern materials and advanced technologies. Among the lessons learned is the need to make maintenance more accessible by allowing the rotation of the entire structure in the hangar. Thus, the acrobatic high-altitude work and dizzying scaffolding, often mocked by detractors of lighter-than-air craft, are abandoned. Alongside the return of airships in the classic sense, solutions are appearing that reinterpret lighter-than-air craft in radically different forms. This is the case with "aerostatic balloons," unpiloted, helium-propelled stratospheric systems about 75 meters long, which exploit thin air and solar energy to maintain their position with minimal consumption. Capable of stationing in the stratosphere at an altitude of about 20 km, they operate in an environment with an atmospheric density much lower than at sea level, which allows for

stable and prolonged stays. The aerodynamic shape reduces resistance and contributes to lift even in the presence of wind. A single platform can cover vast areas, on the order of hundreds of thousands of square kilometers, offering connectivity and communication services similar to those of a satellite, with drastically lower costs and much lower latency. Furthermore, an aerostatic balloon can be recovered, maintained, and returned to service, while a satellite is destined to be decommissioned at the end of its operational life. The aerospace industry, increasingly seeking green solutions, therefore looks to lighter-than-air craft with renewed and growing interest. Anyone operating in the sector, at any level, knows, however, that they must proceed with the utmost caution, because historical memory often tends to privilege tragedy over triumph. This is why the hell of the Hindenburg is remembered, but not the world tour and the 144 ocean flights completed by the Graf Zeppelin, or the disaster of the airship Italia and not the crossing of the Norge.

In the course of 2026, 100 years after that expedition, the Air Force is promoting the re-reading of a crucial passage of its history through a series of events dedicated to the Norge. The centenary of the feat allows attention to be returned to a phase in which lighter-than-air craft represented a technically mature solution to problems of autonomy, exploration, and global connection. Reconsidering that experience today means questioning how cultural paradigms and development priorities oriented technological choices more than real operational limits. Of that season, only fragments remain, scattered among the ice of the North, whose charm is hidden in the dream of their lost integrity.

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A composite image of Jupiter and Saturn in space. Jupiter is the large, orange-banded planet on the left, with several of its moons visible. Saturn is on the right, showing its iconic ring system. The background is a deep black space filled with stars.

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HIBERNATION FOR SPACE TRAVEL

by Paola Verde

photo Dipartimento di Scienze Biomediche e Neuromotorie - Università di Bologna



Science, not science fiction

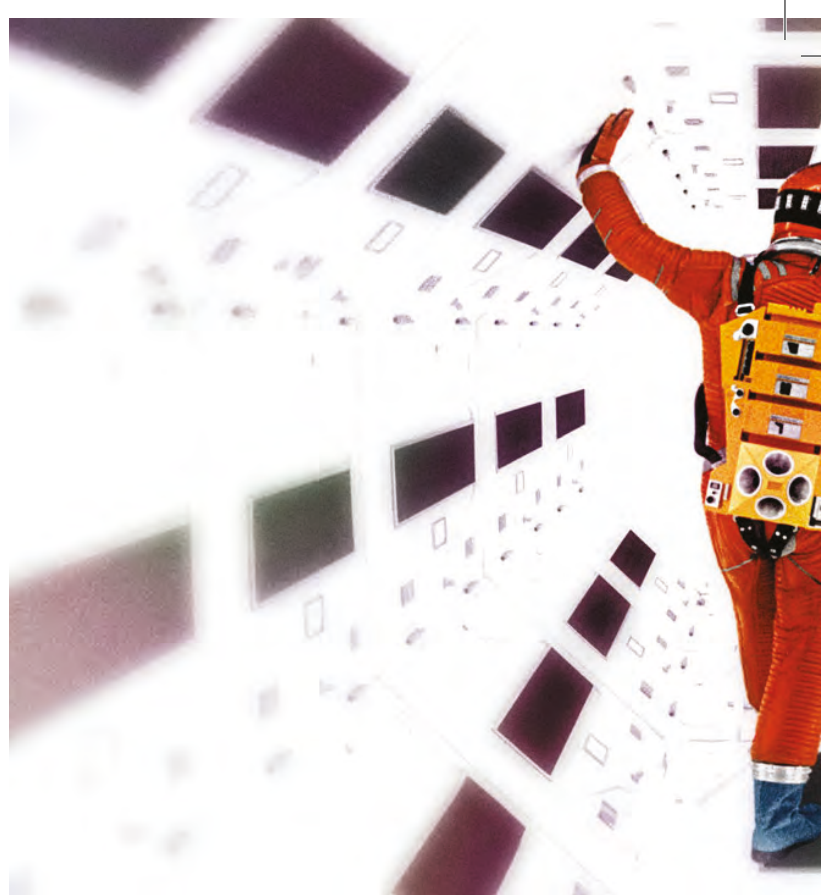
All science fiction fans will certainly remember Stanley Kubrick's "2001: A Space Odyssey," particularly the iconic scene in which the crazed computer, HAL 9000, kills the three hibernating astronauts by deactivating their life support while the ship Discovery is traveling toward Jupiter. The film dates back to 1968 and, at that time, the concept of hibernation belonged exclusively to genre literature; since then, however, giant leaps have been made. The idea that a human being can preserve themselves by implementing a condition of "energetic stand-by" is no longer so remote. In medicine, the possibility of inducing a pharmacological coma in the operating room for hours,

or in intensive care for days, already exists, but we certainly could not use prolonged anesthesia for space travel. Patients in a pharmacological coma, in fact, require intravenous fluids to avoid dehydration, require caloric intake so that muscles and organs do not atrophy, and need constant monitoring of heart rate, blood pressure, oxygen saturation, ventilation, and temperature. An astronaut sedated with normal anesthetics for months or years would continue to age, would become dehydrated, and would lose muscle mass in a short time. The goal, rather, is to achieve the condition that in technical terms is defined as "suspended animation": a temporary slowing or stopping of biological functions aimed at preserving physiological capabilities. We

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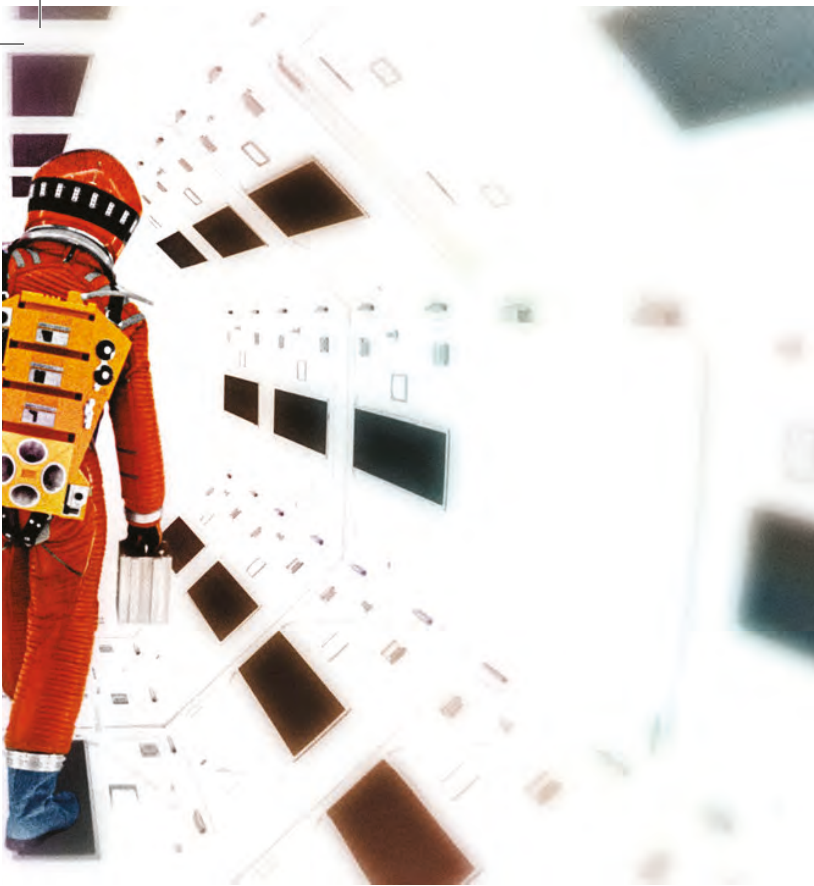
know that some mammals are capable, under certain circumstances, of cooling down and drastically reducing their metabolism; a condition called hibernation (or more commonly torpor), typical of animals such as bears or squirrels. The most fascinating feature of this process is that the animals wake up completely healthy.

Could a man do the same? Current knowledge suggests that hypothermia is the most promising strategy. While human embryos can be preserved by rapidly freezing them in liquid nitrogen at -140°C , for an adult this would lead to immediate death due to thermal shock and cellular damage. However, there are cases of accidental hypothermia in extreme contexts that did not lead to death, but acted as a protective factor. As Professor Matteo Cerri of the University of Bologna, one of the leading experts in the sector, would say, «Man could imitate the squirrel!». Famous is the case of Anna Bågenholm, who fell into an icy lake and remained in freezing water for 80 minutes: after being resuscitated from the hypothermic coma, her vital organs were intact. Although her body temperature had dropped to 13.7°C , her brain was absolutely intact because her basal metabolism had been reduced to only 10%, thus requiring very little oxygen. Similarly, the cases of Beck Weathers and Lincoln Hall, who inexplicably survived nights of hypothermic coma on Everest, are famous. Historically, cooling the patient is already used in cardiac surgery. For decades, aortocoronary bypass operations have been performed by anesthetizing the patient, stopping the heart and connecting them to a heart-lung machine, while the patient was cooled by 4-5 degrees Celsius to decrease oxygen demand during the operation. Furthermore, in the last twenty years, deep hypothermic arrest experiments have been successfully conducted on animals. In 2005, the University of Pittsburgh tested the procedure on dogs, replacing the blood with a cold solution and resuscitating them after three hours of clinical death. In 2006, Harvard University did the same with pigs, causing vascular lesions that simulated road trauma or gunshot wounds: after the repair of the vessels and warming, the animals showed no functional damage. On human beings, the issue is more complex. At the end of 2024, NASA commissioned Dr. Clifton Callaway and his team at the University of Pittsburgh to



study the mechanism of hibernation on several healthy volunteers. To one of them, in particular, a drug was administered to induce a superficial sedation capable of suppressing shivering (the body's natural response to maintain heat). The temperature dropped from 37°C to about 35°C : heart rate and pressure fell, while metabolism, and therefore the need to intake food and oxygen and eliminate carbon dioxide, was reduced by 20%. Despite the state of torpor, the subject was able to get up for physiological needs or ring a bell to ask for water or food. He was dazed, but reactive in case of emergency: just like a bear. A state of hibernation similar to that of a bear could, in long-duration space travel, alleviate the symptoms of confinement and limit conflicts between crew members. The reduced metabolism would allow for carrying fewer supplies (food and oxygen) and, consequently, would require less fuel.

Furthermore, the slowing down of cellular replication processes could mitigate the damage of cosmic radiation, one of the main unknowns for the health of astronauts. Studying hibernation also means understanding the molecular changes of "torpor": a reversible state characterized by lethargy, lowering of temperature, metabolism, and vital parameters. During torpor, the lack of oxygen is better tolerated, muscles do not atrophy, and blood does not clot despite



In apertura e in questa pagina, sotto, l'ibernazione è da tempo studiata dalle agenzie spaziali per applicazioni nei lunghi viaggi nello Spazio, una possibilità reale, benché ancora lontana (foto AI).

At the opening and on this page below, hibernation has long been studied by space agencies for applications in long-duration space travel—a real possibility, albeit still far off (AI photo).

On these pages, the film "2001: A Space Odyssey" is considered one of the greatest masterpieces in cinema history. With incredible visionary foresight, it highlights the current, and sometimes problematic, relationship with artificial intelligence and the theme of human hibernation (Instagram photo).

a drastic lowering of the heart rate. In humans, such a slowed heartbeat would cause dangerous thrombi, but in bears this does not happen because platelets are also reduced. Researchers hypothesize the existence of a “central switch” in the brain that simultaneously activates these beneficial phenomena. Reproducing this state could reduce the severity of “reperfusion injuries,” i.e., the devastating inflammatory damage that occurs after a cardiac arrest when blood flows back into the tissues. It could also help us understand how bears activate and deactivate insulin resistance during and after hibernation,

opening new paths for the treatment of diabetes. One of the most surprising pieces of data concerns muscle mass: bears in hibernation not only do not suffer atrophy, but even seem to develop new musculature. Scientists Vadim Fedorov and Anna Goropashnaya, University of Alaska, discovered that the genes involved in muscle building, instead of reducing their activity to save energy, increased it. Recently, researchers at the University of Bologna, including Professor Domenico Tupone, made fundamental discoveries by identifying the brain circuits of thermoregulation during sleep. By temporarily



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inhibiting a small area of neurons at the base of the brain in common rats, animals that do not naturally go into hibernation, they succeeded in inducing a state of deep hypothermia. After six hours in this condition, once warmed up, the rats returned to normality without damage. Their brain waves showed the same pattern as hibernating animals. Subsequent studies led to the discovery of "thermoregulatory inversion." By severing some nerve bundles that transmit thermoregulation signals from the brain to the body, Tupone observed that, instead of eliminating the ability to react to cold or heat, it was inverted, facilitating the lowering of temperature in case of cold and the raising in case of heat. The results suggested the existence of a second brain circuit, previously unknown, capable of modulating body temperature, a circuit that facilitated the transition from the state of hibernation to that of awakening. But where exactly was this circuit located and how could it be activated?

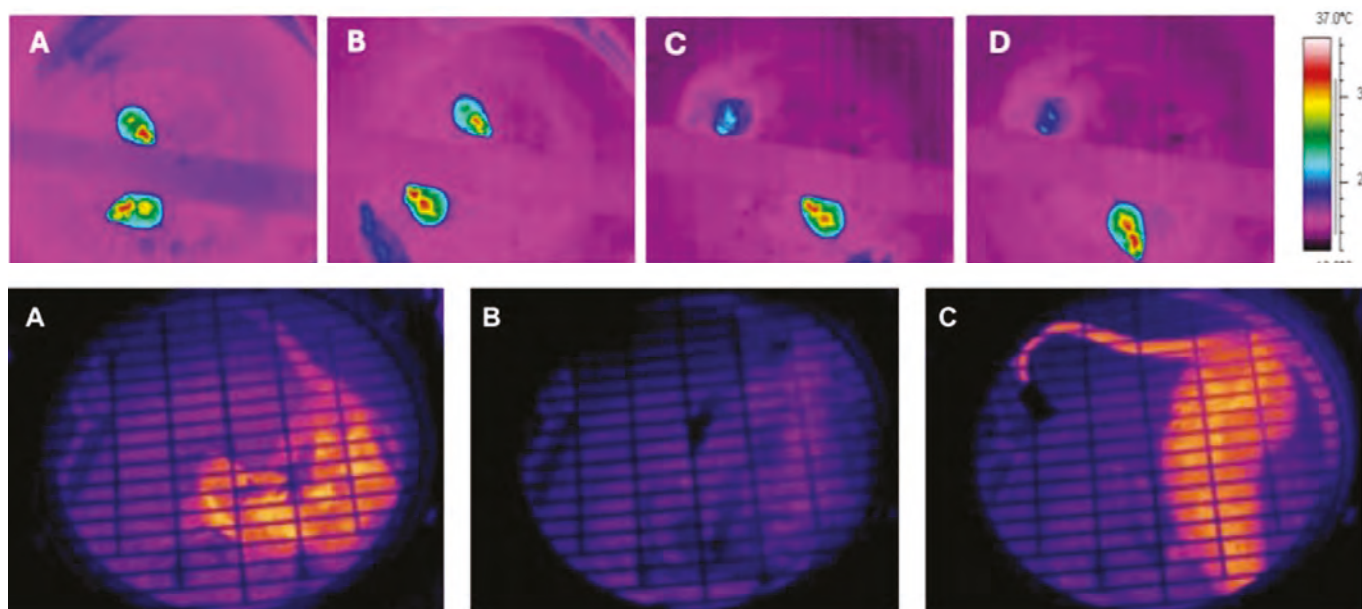
Last year, Tupone and Morrison announced the discovery of an area of the hypothalamus that, if activated, in addition to acting as a real "torpor switch," slowing metabolism and triggering brain waves and heart rhythms typical of hibernation, also initiates the phenomena that reverse the normal thermoregulation system, facilitating the transition from torpor to hibernation. Scientists believe that this circuit is an evolutionary remnant present in many mammals, including man, but "disconnected" from the



automatic activation system. The next step will be to identify a drug capable of reactivating this switch without resorting to invasive brain surgery. If in 1968 hibernation was pure cinematic suggestion, today it is a concrete field of research. When the last mysteries of neurophysiology are revealed, not only will emergency medicine improve drastically, but the human being will no longer be the "limiting factor" in the exploration of the sidereal distances of deep Space.

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On this page, above, hibernation is a surprisingly sophisticated evolutionary strategy that allows many animals to survive when food is scarce or environmental conditions become extreme (Pixabay photo); below, thermographic images (A-D) of two mice acquired at 30-minute intervals. The top mouse, in a state of negative energy balance, shows a progressive reduction in body temperature until entering torpor. The bottom mouse, under control conditions, maintains a stable body temperature; at the bottom, thermographic images of a rat acquired 30 minutes before the induction of synthetic torpor (A), at the nadir of body temperature during torpor (B), and 30 minutes after the return to euthermia (C).





Snap-on Tools Italia, venticinque anni nell'Aerospazio e nella Difesa



Negli anni Settanta le attrezzature della multinazionale americana Snap-on approdano in Italia grazie ai programmi di manutenzione dei velivoli F-104S e C-130. Tuttavia, è solo a partire dal 1999, con la creazione della Snap-on Tools Italia s.r.l., che la Snap-on Incorporated avvia un percorso di crescita sul suolo italiano. Significativi investimenti economici, un'oculata gestione societaria e un'accurata selezione del personale permettono una crescita nel mercato dell'utensileria specifica per la manutenzione e la produzione di velivoli e veicoli della Difesa. I risultati raggiunti sono stati possibili grazie a tre fattori: il prodotto, la società, le persone. Gli utensili si distinguono per la

qualità, l'affidabilità, l'ampia scelta e l'innovazione tecnologica. Il risultato più fulgido della continua innovazione di Snap-on è, ad oggi, ovviamente, l'affermatissimo, carrello "intelligente" ATC (Automated Tool Control); un carrello dotato di un'unità computerizzata e di un sistema di controllo visivo che permettono la gestione, il prelievo, l'assegnazione e la restituzione, di centinaia di attrezzi, senza rallentare l'attività dei tecnici. L'avvento di questo dispositivo ha reso obsoleto il classico carrello di attrezzatura dei singoli operatori, sostituendolo progressivamente con una trousse di squadra, interconnessa ai sistemi informativi, efficiente, capace di ridurre significativi costi ausiliari della produzione e offrendo la miglior risposta agli sfidanti standard del controllo FOD. Il secondo pilastro della crescita della Snap-on è la gestione unita alle scelte strategiche di mercato. La possibilità di essere annoverati tra i fornitori ventennali delle Forze Armate e dei maggiori player dell'aerospazio è dovuta sia ad una forte solidità economica della società, sia all'essersi focalizzati in un settore specifico e molto particolare. Investire in questo mercato, ha voluto dire approfondire la conoscenza delle necessità, degli standard di qualità, della terminologia e dei mezzi in uso nel mondo aerospaziale e della difesa. Il terzo elemento portante sono le persone che lavorano in Snap-on. Il team è stato costruito nel tempo con pazienza e meticolosità, ricercando risorse con i giusti skill e una passione personale per i velivoli, gli elicotteri e i mezzi prodotti dall'industria aerospaziale e della difesa italiana e impiegati dalle diverse forze armate. La complessità e la vastità tecnologica di questo settore hanno portato alla creazione sia di un ottimo background del personale sia di esperti nelle varie discipline tecniche come la dinamometria, l'avvitatura, il FOD control e il lean-manufacturing. Oggi giorno, Snap-on Tools Italia serve più di trenta siti produttivi dell'aerospazio italiano e altrettante basi operative appartenenti alle Forze Armate e alle Forze dell'Ordine. Ha sviluppato soluzioni per quasi tutti i velivoli in uso, dai caccia di quarta e quinta generazione, ai velivoli da trasporto agli addestratori. Nel campo elicotteristico fornisce da lungo tempo kit di supporto e dotazioni di produzione per i più moderni elicotteri da trasporto civile, militare e da combattimento; non mancano le collaborazioni nel campo della difesa navale e terrestre e dello spazio sia per la nascente Stazione Spaziale che per i numerosi programmi satellitari.





SPACE

RITORNO ALLA LUNA!

With Artemis II, the United States wins the first round of the new race to conquer our satellite, which sees China as the only other protagonist.

by Giorgio Di Bernardo Nicolai
Aerospace Journalist
photo NASA



M

More than half a century after the last crewed lunar mission, Apollo 17 in 1972, the Artemis II mission has finally reopened the path to human flight toward our

satellite with different objectives, technologies, and a new, completely unexpected competitor underestimated by NASA: China! An open race, characterized, in short, by an agency in crisis on one side—due to budget cuts, program changes, inappropriate choices, and billions of dollars spent on a rocket, the SLS (Space Launch System), built with parts taken from the shelves of the Shuttle and even Apollo eras, albeit modified—and on the other, a nation that started very late, but with a method, planning, and progression that are impressive for their clarity of approach, technological development, and records, even if currently achieved with robotic probes.

Artemis II

Launched in April 2026, Artemis projected four astronauts on a journey of about 10 days around the Moon, without a lunar landing, using a “free-return” flight profile based on an orbit that brought the Orion spacecraft back toward Earth by exploiting lunar gravity (fly-by). In detail, the key points of the mission were: the launch, on April 2, 2026, and the insertion of the Orion capsule into a terrestrial parking orbit for initial systems checks; the TLI (Trans-Lunar Injection) maneuver carried out on April 3, about 25 hours after launch, with the main engine of the European Service Module remaining on for about 5 minutes and 55 seconds; the Earth-Moon cruise of about four days to verify life support systems, navigation, and communications from deep space beyond 36,000 kilometers from Earth; the lunar fly-by at about 7,000 kilometers from the lunar surface and reaching the furthest point from our planet on April 6, 2026, at 406,000 km—a new distance record from Earth for humans, with the previous record belonging to the crew of Apollo 13; the return toward Earth, about four days; atmospheric reentry on April 11, 2026, at about 40,000 km/h, the most critical phase of the flight due to the thermal stress on the ablative shield which, in the previous mission, had cracked while still maintaining its function; the splashdown on April 11 in the Pacific Ocean, with recovery via helicopters instead of ship transport due to adverse sea conditions. In practice, from an

SPACE

engineering point of view, Artemis II was not an operational mission but a complete test: verification of life support systems, navigation, communications, and human behavior in deep space.

Capsule Innovations

Compared to the previous uncrewed mission, the Orion capsule underwent substantial modifications to allow for a human presence. The most important change is the introduction of active life support systems: oxygen, water, thermal control, and internal atmosphere management were fully operational. These systems are powered by the European Service Module (ESM), developed in collaboration with ESA (European Space Agency), which also provides propulsion and energy. A critical element that received particular attention was Orion's heat shield, which in the first flight (Artemis I) had shown potentially dangerous problems, specifically erosion and micro-fractures, leading to changes in the composition of the ablative material (Avcoat) and a change in the trajectory and reentry angle to improve heat dissipation. From a structural point of view, Orion maintains a configuration similar to the Apollo module, but with larger dimensions and updated technologies, including advanced digital systems and greater operational autonomy. In particular, it can carry four to six

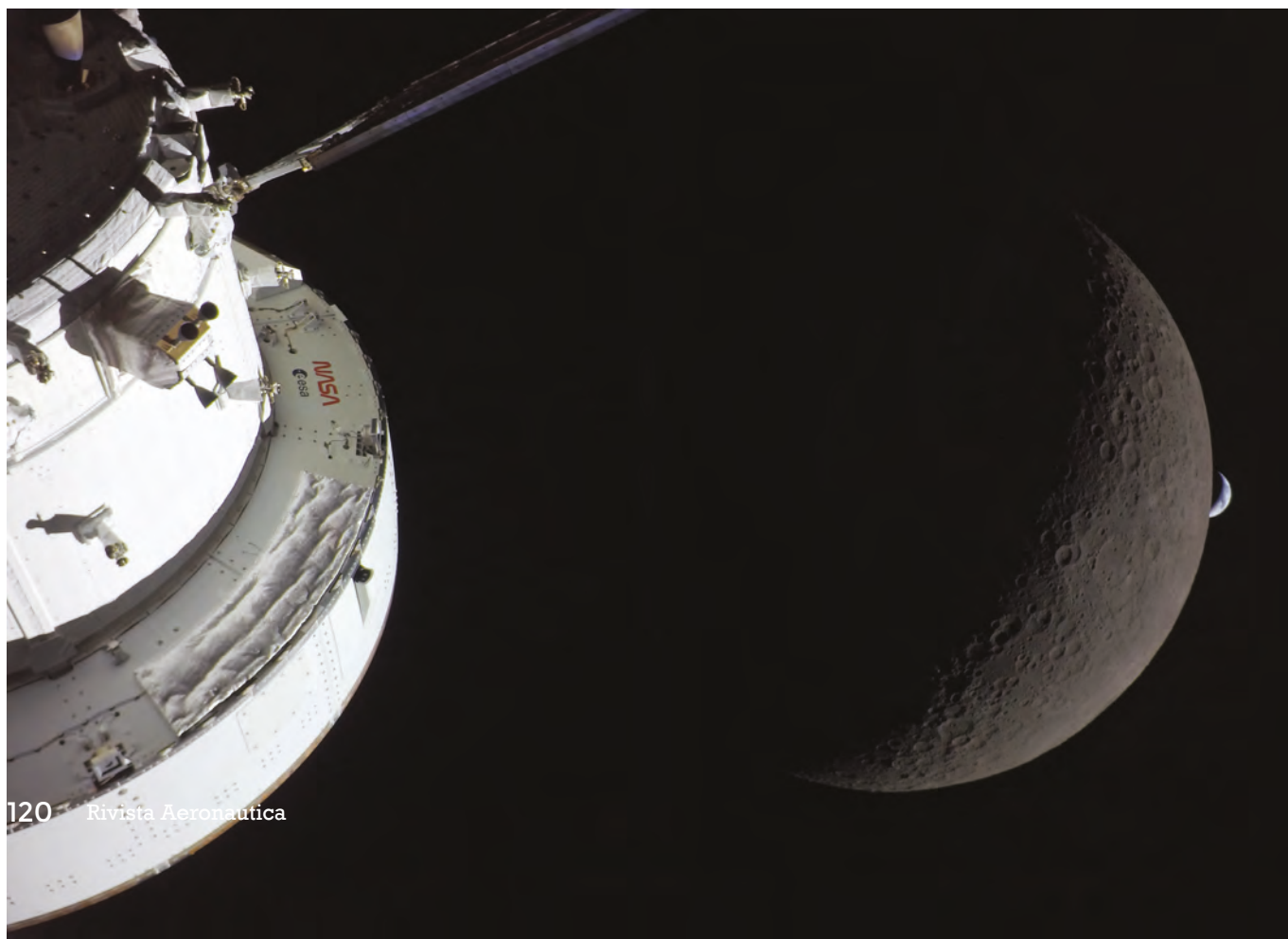
astronauts toward our satellite, compared to the three of the Apollo missions. Furthermore, although equipped with a toilet for hygiene and other comforts for the astronauts—now mixed crews—the system showed uncertainties that will need to be resolved in view of subsequent missions. Here arises the problem of delays accumulated by the program and the very recent modifications to it.

Delays and Changes to the Artemis Program

The Artemis program has undergone a series of significant delays and revisions in recent years. Among the most relevant problems were hydrogen leaks in the SLS rocket's fueling system during tests, anomalies in the Orion capsule's pres-

In the opening and on these pages: with the Artemis II mission, humanity saw the far side of the Moon for the first time in history.

Mission Specialist Christina Koch was the first woman to travel to the Moon and to set the record for the farthest distance from Earth.





surization systems, helium flow problems, and complexities in integration operations, in addition to the already mentioned heat shield issues. These factors led to successive postponements of the first launch with astronauts on board until 2026. Added to these are the delays in the development of lunar landers by SpaceX and Blue Origin. This prompted NASA to reorganize the entire Artemis program. In particular, the Artemis III mission, which was to include the first lunar landing since 1972, was transformed into an intermediate Earth-orbit test mission for docking with the lander, and the first lunar landing was postponed to 2028 with Artemis IV. The revision also includes structural elements, most notably the upper stage. Currently, the SLS rocket uses the ICPS (Interim Cryogenic Propulsion Stage), built by ULA (United Launch Alliance), which for landing missions was to be replaced by the EUS (Exploration Upper Stage), under construction by Boeing, which the American space agency decided to abandon due to costs and delays. At the moment, an alternative to the EUS has not yet been defined, and SpaceX and Blue Origin could also come into play. A further “blow” to the American aerospace giant, whose reliability has dropped to an all-time low in recent years. This replanning and technological revision is aimed at building progressive capabilities with reduced time and risks, as in the time of the Apollo missions, and has also resulted in the delay of the

Lunar Gateway program, prioritizing the establishment of a permanent base on the lunar soil.

Comparison with the Chinese Approach

China joined the ranks of space powers with crewed capabilities only in 2003, more than 40 years after the United States and the USSR. This led to a tremendous underestimation of the capacity for phased planning and the organizational and engineering potential of the Asian power, which has announced its intention to send a citizen to the Moon by 2030, but perhaps even sooner. The perfect cadence of the Chinese space program and the successes achieved in both the human and robotic spaceflight sectors now suggest that they might be the first to arrive. Let's look at some steps that give an idea of the speed





of approach to American capabilities: after the first piloted flight in 2003, on September 29, 2011, China launched its first space station (Tiangong 1); in November of the same year, it performed its first automatic docking in orbit; Tiangong 2 followed in 2016 and, with eleven flights between 2021 and 2023, the Space Station was completed. Flights with astronauts on board the Shenzhou spacecraft now follow regularly, and the Long March 10 launcher, designed specifically for piloted lunar missions, is currently in the testing phase. Simultaneously, the approach to the Moon began with automated missions, all characterized by successes and records: Chang'e 1 in 2007, the first Chinese lunar mission and first high-resolution global mapping; Chang'e 2 in 2010, the first Chinese mission to reach the Earth-Sun L2 Lagrangian point and demonstration of deep-space navigation (1.5 million kilometers from Earth); Chang'e 3 in 2013, the first Chinese lunar landing, first Chinese lunar rover (Yutu); the first soft landing after 37 years (since the Soviet Luna 24); Chang'e 4 in 2019, the first mission in the world to land on the far side of the Moon, first operational use of a relay satellite (Queqiao), and first biological experiment with germination on the Moon; Chang'e 5 in 2020, the first Chinese mission with the return of lunar samples and first lunar sampling since 1976 (Luna 24).



This mission marked a series of incredible records indicating extraordinary robotic capabilities: automatic collection of samples, takeoff from the lunar surface, automatic rendezvous in lunar orbit, automatic sample exchange with the reentry vehicle, and reentry from deep space. A scientifically even more important mission followed: Chang'e 6 in 2024, the first in history to return samples from the far side of the Moon, collected in the South Pole-Aitken basin. Subsequent missions outline, for those who have not yet understood, the phases and objectives for landing on the Moon and exploring the lunar South Pole with very close timing: Chang'e-7, scheduled for this year, will study resources such as ice, indispensable for permanent bases and for missions departing from our satellite (hydrogen and oxygen), and Chang'e-8 (2028), intended to test technologies for the use of in-situ resources, such as lunar soil, to create structures using 3D printers, in view of the construction of a lunar base. The planning is absolutely stringent!

Conclusion

The Artemis II mission represents a crucial step, but this does not mean that the Americans will set foot on the Moon again before the Chinese. NASA's expensive and slow approach, if it does not change very quickly, will prove unsuccessful compared to a growth by methodically planned phases to build the path toward our satellite step by step. Victory will not only mark a point of prestige and media success, but also an enormous advantage for the seizure and exploitation of massive resources (some new and recently discovered by the Chinese) that our satellite can offer. We can say nothing else: may the best one win!

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In these pages, the splashdown occurred on April 11 in the Pacific Ocean, with the recovery of the astronauts carried out via helicopters due to adverse sea conditions.

On this page, a photo of Chang'e-6 was captured and autonomously transmitted to Earth by a mini-rover deployed by the lander-ascender complex of the Chang'e-6 probe on the far side of the Moon. The ascender then took off carrying the collected samples, a feat never before attempted (Photo: CNSA).



HISTORY

An abstract collage artwork featuring a complex arrangement of geometric shapes, primarily triangles and polygons, in a palette of blue, red, black, white, and grey. The composition is layered, with some areas showing a sky with clouds, suggesting a celestial or aerial theme. The word 'HISTORY' is prominently displayed in the upper left quadrant.

THE ART OF TULLIO CRALI AT PALAZZO AERONAUTICA

by Barbara Martorelli
photo Troupe Azzurra

On the previous page: Tullio Crali, "Festa tricolore in cielo" (Tricolore Celebration in the Sky), 1986, oil on canvas, 142.5x194 cm (Private collection).

On the following pages, top right: Tullio Crali, "I poeti dello spazio (Poesia della velocità)" (Poets of Space [Poetry of Speed]), 1992, oil on canvas, 150x150 cm (Private collection); bottom right, the handover ceremony of the artworks, granted to the Italian Air Force on a five-year loan for use. From left: Barbara Martorelli, curator of the exhibition "Tullio Crali: The Evolution of Flight"; Gen. Urbano Floreani, Head of the 5th Communications Department; and Anna Bartolozzi Crali, daughter-in-law of the Futurist master (Photo: Michele Monteleone); on the left, Tullio Crali, "Le Frecce Tricolori", 1987, oil on canvas, 143.5x195 cm (Private collection).

Palazzo Aeronautica, officially inaugurated in 1931 with the aim of uniting and streamlining the functions of the youngest of the Armed Forces, is not only the institutional center of the "Blue Arm" (Arma Azzurra) but also a building of extraordinary significance for Italian cultural heritage. Open to the public during Transparency Days, FAI (Fondo Ambiente Italiano) events, and the Open House architecture festival, the Palace houses a rich artistic heritage that has demonstrated a surprising modernity since the initial stages of its construction. The elegant architectural composure, designed by architect Roberto Marino, is striking for its essential lines and a refined balance between grandeur, lightness, and austere elegance. From the design phase of the Palace's construction, particular attention was paid to decorative aspects and a sensitivity toward hosting works of art which, over time, have enriched the rooms, expressing a constant artistic vocation intended as a form of communication and enhancement. The presence of these works thus contributed not only to beautifying the spaces but also to humanizing them, turning them into places where the aesthetic dimension intertwined with the emo-

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tional and symbolic, positively influencing spirits, softening tensions, and offering a sense of balance and harmony even in the most complex moments. Among these works, for instance, is the cycle of nine mural temperas commissioned by Italo Balbo himself from Marcello Dudovich, the famous painter and poster artist, which decorated the canteen and bar areas.

This cycle, titled "The Pilots' Paradise"—partially lost and partially preserved and restored—continues to stand out for its beauty and symbolic power. Also of absolute importance are the painting by Carlo Maratti (1625–1713) depicting the "Miraculous Translation of the Holy House" and the more famous *Celeste metallico aeroplano* (Metallic Celestial Airplane, 1931) by Giacomo Balla—donated to the Air Force by his daughters Elica and Luce in 1983—which has graced the Palace's Grand Staircase of Honor since 1999. It is within this context that the loan of the three works dedicated to the Frecce Tricolori by Tullio Crali fits. The unveiling ceremony took place last March 25 in the foyer of the Visconti Auditorium in the presence of Gen. Urbano Floreani, Head of the 5th Communication Department of the Air Force General Staff, the exhibition curator Barbara Martorelli, and the heirs of Tullio Crali. The loan is a direct consequence of the success of the exhibition "Tullio Crali: The Evolution of Flight," held in the spring of 2025, first in the Historical Rooms of the



Air Force Palace in Rome and later at the Historical Museum in Vigna di Valle. Those who had the chance to visit the exhibition of the great master of aeropainting will remember the room dedicated to the large canvases created at the end of the 1980s—a period in which the artist, then nearly eighty years old, found a new and intense inspiration while spending time with the National Aerobatic Team at the Rivolto base in Friuli. This experience proved profoundly regenerating and led him to engage with a pictorial format unprecedented for him: monumental large-scale canvases. In 1987, the Air Force commissioned Crali to create some li-





thographs dedicated to the Frecce Tricolori, but the artist responded with a counter-proposal: large-format works (approximately 2 x 1.5 meters) capable of capturing the entire dynamic of the MB.339's smoke trails. In his writings, Crali describes this experience as a total immersion: not the simple representation of an image, but the rendering of a state of mind—that of someone who, while remaining on the ground, feels projected into the cockpit, within suspended trajectories and radio dialogues charged with energy. He would write in his diaries: "The sky is full of wonders waiting to be caught [...]. The body frees itself from weight, acquires space, is invaded by it, loses its profiles, fills with light: then atom, electron, universe."

Works such as *Festa tricolore in cielo* (Tricolor Celebration in the Sky, 1986), *Frecce Tricolori* (1987), and *Poesia della velocità* (Poetry of Speed, 1992) represent an effective synthesis of the final evolution of aeropainting language, defining a new expressive code based on rigorous graphicism, solid color fields alternating with portions of sky, and a strong dynamic sense. Despite his advanced age, Crali still felt the need to physically approach the aircraft to fuel his creative process: "I don't want to be a spectator, but to feel the vibration of the structures upon me,

the scream and violence of the jet engines, to participate in the speed of the spaces, to enjoy mechanical intimacy."

In the canvases dedicated to the Frecce Tricolori, a full expressive maturity emerges, composed of synthesis, rigor, and awareness. The graphic mark, supported by almost mathematical precision, joins a contemporary sensitivity, giving life to images of great transparency and formal tension. The aerobatic flights cancel out any landscape reference: the distance from the earth disappears, while space asserts itself through simultaneous perspectives, perfect curves, and an almost geometric lucidity. These are compositions that leave no room for improvisation but express a controlled and absolute virtuosity. In 1990, Tullio Crali spent a day at Rivotto with the pilots, watching the drills and speaking with Commanders Lorenzetti and Montanari. He left an intense testimony of that experience: "Wonderful pilots, stunning machines. What a joy to be in the midst of this Italy made of serene, daring, conscientious, expert young people, open to space, to friendship, to solidarity, and to commitment, where it is not rank that counts, but mutual respect."

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HISTORY

In the Sky with Sheath Dress and Suitcase

The era of Italian commercial aviation began one hundred years ago with the birth of the first airlines

by Maurizio Fochi



«I

n a Sheath Dress and with a Suitcase" is the title of the report published by the newspaper La Stampa regarding the inaugural flight of the first Italian airline on April 1, 1926. It perfectly summarizes the great novelty of that day: the airplane was no longer just a vehicle for daredevils or undaunted sky warriors, but a means of transport accessible to normal passengers in civilian clothes with hats and suitcases. With the end of the First World War, the development of aviation toward commercial services, such as the transport of mail and passengers, represented an outlet for converting the aeronautical industry, which had suddenly been deprived of military orders. In several European countries, the first passenger services

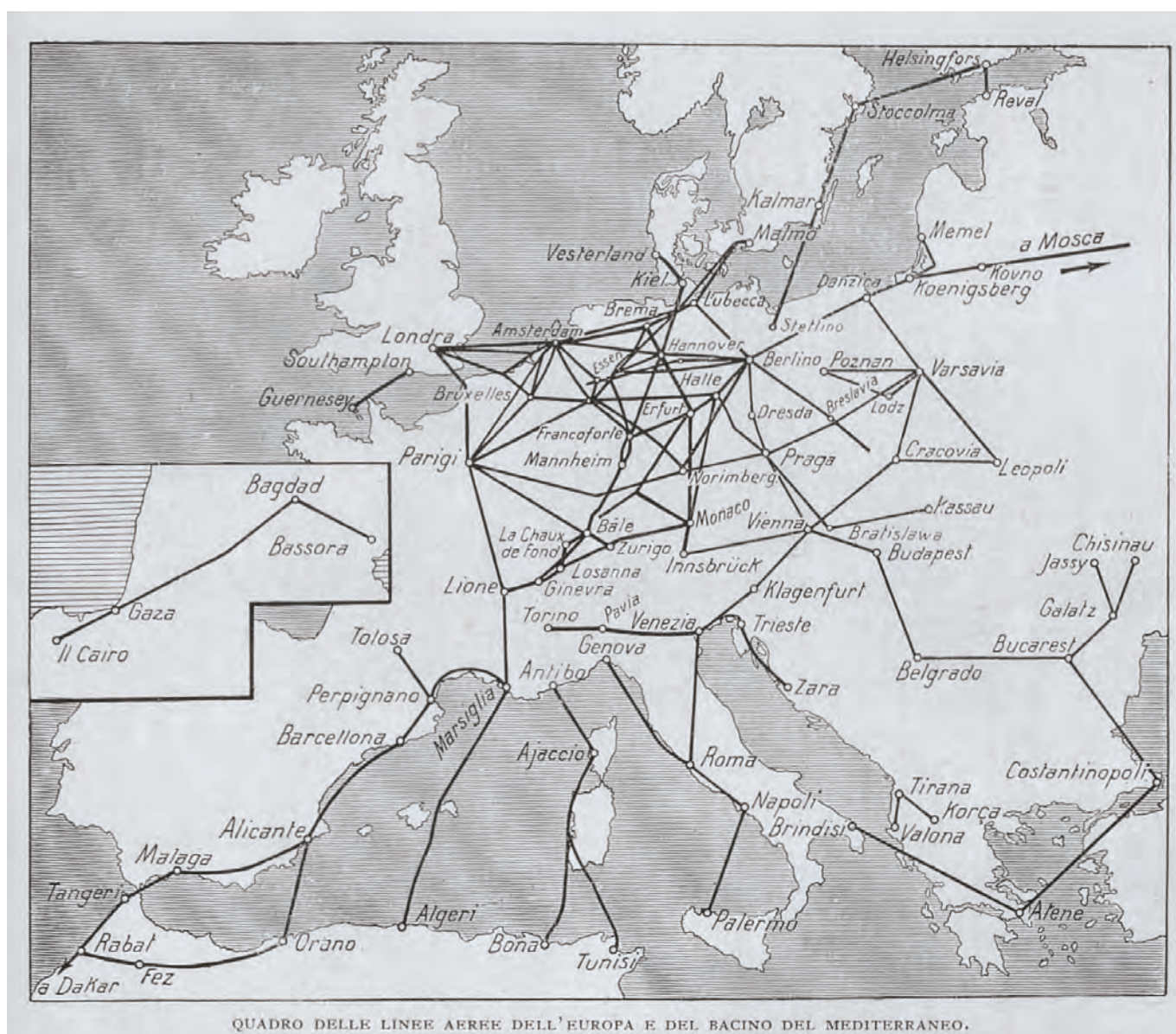
began as early as 1919, but in Italy, a combination of technical, economic, and political factors slowed progress in that sector. Despite an abundance of proposals, the political instability and financial distress of the post-war period—aggravated by short-sighted leadership—ended up paralyzing every initiative, depriving it of the necessary support. An example was the failure to join the Convention for the Regulation of Aerial Navigation, agreed upon in Paris on October 10, 1919, on the sidelines of the Peace Conference, which set out the general principles relating to air navigation that are substantially still valid today. Action was limited to repealing the flight ban imposed during wartime, delegating the granting of relevant permits, on a case-by-case basis, to a General Directorate for Aeronautics established within the Ministry of Maritime and



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Railway Transport. The reorganization of aeronautical services began after the advent of Fascism to power. Three months after the birth of the Regia Aeronautica, the equal positions of the General Commander of the Regia Aeronautica (for the purely operational side) and the General Intendant of Aeronautics (with technical-logistical tasks) were established. The latter also headed an Air Traffic Office, later renamed the Civil Aviation and Air Traffic Office. It was this office that coordinated and prepared all the conditions for the opening of the first national air lines. The first steps were the adherence to the Paris Convention and the so-called "Italian Aeronautical Law" (Royal Decree of August 20, 1923, n. 2207, containing the "Provisions for Air Navigation"), which established the State's sovereignty over national airspace, the rules and controls applied

to flight activities, aircraft documentation, the qualifications of flight and ground personnel, and so on. This was followed by Royal Decree-Law of October 18, 1923, n. 3176, with the norms for the "Granting of transport services operated by aircraft"—the rules for stipulating concessions, but also the government's power to provide subsidies. Foreign experience, in fact, had shown that this was the only way to incentivize private investors in the face of the high initial and operating costs of the first airlines. However, it took two years to convert all those decrees into law (January 31, 1926, n. 753) and define the remaining details: from routes to inter-ministerial agreements, from the organization of airports open to civil traffic to related services (customs, weather stations, radio-telegraph services, etc.). The fastest to start operations was SISA (Società Italia-





In the opening, SISA built two seaplane bases in Turin and Pavia, consisting of an elevated hangar with a ramp for aircraft storage (Photo: Civic Museums of Pavia - Chiolini Archive).

On the opposite page, the map from the magazine "Le vie del mondo" shows the European airlines at the beginning of 1927; Italian civil aviation immediately set two records: the first line to regularly cross the Alps even in winter, the Venice–Vienna route, and the longest line over open sea, the Naples–Palermo route.

On this page, alongside, the advertising poster from late 1927 featuring the "Milan (Pavia)" stop foreshadows the practice of today's low-cost airlines, which pair the names of major cities with secondary airports (General Catalog of Cultural Heritage); below, postcards were a propaganda channel widely utilized at the time.

na Servizi Aerei) owned by the Cosulich brothers, an important family of shipowners of Dalmatian origin with interests in the coastal hotel sector. In 1921, they purchased the first war-surplus seaplanes to offer tourist flights to the guests of their hotels in Portorose and occasionally transport them to the port of Trieste. Simultaneously, they founded SISA for the management of aircraft and a seaplane pilot school, also based in Portorose.

The convention between the State and SISA, signed on April 3, 1925, for a line between Trieste and Turin, provided for a state subsidy equal to 50% of the cost per kilometer (calculated at 22.88 lire/km over a distance of 575 km), plus a sum of 500,000 lire for the transport of mail up to a maximum of 28,500 kg per year and with a limit of 80 kg for a single flight (any excess would be paid extra). It even detailed the seaplanes to be used: the Cant 10 ter, capable of carrying four passengers, produced by the Officine Aeronautiche del Cantiere di Monfalcone. Technical setbacks and the onset of winter postponed the start of flights to the following spring. As they were seaplanes, the route from Trieste included a stop in Venice and continued along the Po



with another stop in Pavia, from where Milan could be reached by a car service included in the ticket price. Finally, on April 1, 1926, the day of "Air Line No. 1" arrived. In Trieste, a strong Bora wind prevented seaplane operations in the harbor. Authorities and passengers were transferred by land to Portorose, in a more sheltered bay, where the two aircraft I-OLTC and I-OLTD were positioned. Takeoff took place late, between 12:02 and 12:05. Meanwhile, two other Cant 10s (I-OLTB and I-OLTE) had regularly taken off from Turin at 10:55 and reached Pavia. Here, the four planes were scheduled to meet for the actual inauguration ceremony in the presence of the Head of Government, Mussolini.

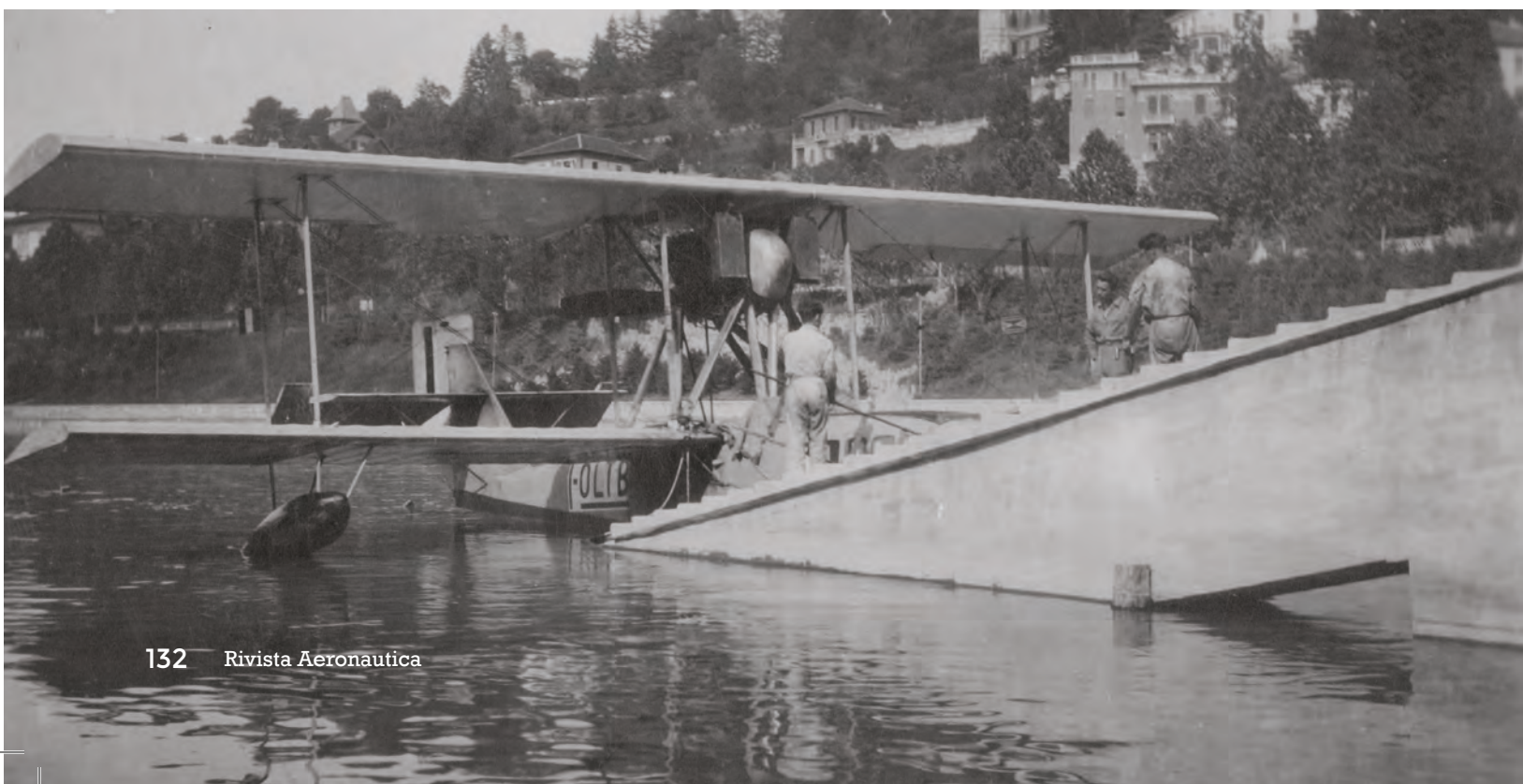
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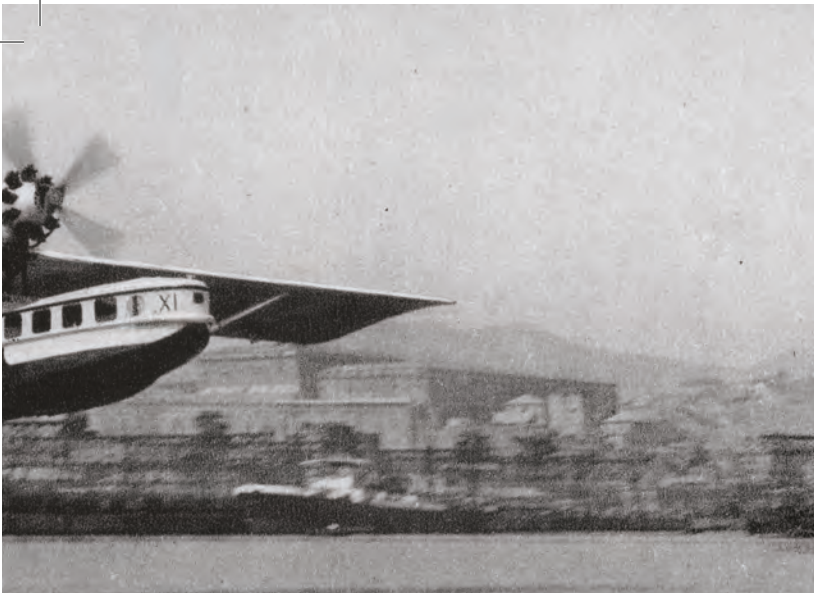
However, they had to wait until the arrival of the two from Portorose, around 3:00 PM. The real problems began after the ceremony. The Lorraine-Dietrich 12Db engines of the Cant 10s had difficulty starting, with frequent and dangerous backfires: I-OLTB suffered one of these breakdowns and failed to take off. I-OLTC had to return a few minutes after takeoff due to a fuel pipe bursting. Both would depart the next day. Of the other two, only I-OLTD managed to complete the journey within the day, alighting in Turin at 4:30 PM, while I-OLTE stopped in Venice due to darkness, resuming flight the following morning. Despite the inconveniences, the inauguration was considered a success, and regular connections began on April 5, first on alternate days and then from Monday to Saturday. In the summer, flights increased to two a day, and Portorose was added as a terminal continuing from Trieste. On October 15, connections between Turin and Venice were suspended due to fog, which at the time was much more persistent than today. Simultaneously, however, the service was extended eastward to Lussinpiccolo and Zara, becoming "Air Line No. 2." Upon resumption in April 1927, the Ministry confirmed the connection from Turin as far as Zara.

SISA shortly preceded three other Italian companies. On April 7, SANA (Società Anonima Navigazione Aerea) of Genoa began the connection between the Ligurian capital, Rome (Ostia Seaplane Port), Naples, and Palermo. The company was partially owned by Piaggio and CMASA (Costruzioni Meccaniche Aeronautiche Società Anonima), which built the Dornier J Wal seaplanes; the choice of the 9/10-seat Wal-Cabina model was



therefore unsurprising. The official inauguration of "Air Line No. 3" was held in Ostia, but Mussolini could not attend because he was wounded by the pistol shot fired by Violet Gibson. After the ceremony, one Wal took off for Genoa and another for Naples and Palermo. Regular scheduled flights began on April 13. In practice, the service was divided into three independent legs, each served by a seaplane (plus one in reserve) that flew the outbound journey one day and the return the following day. "Air Line No. 4," also known as the "Levant Line," was the first international one, from Brindisi to Athens and Constantinople. The related convention with Società Anonima Aero Espresso Italiana (a name suggested by Gabriele d'Annunzio) had been the first to be signed, but the start of flights was delayed by laborious negotiations with foreign governments. The aircraft were the Savoia Marchetti S.55C, the first civil variant of the famous seaplane with 4/5 seats per hull, also propelled, however, by the unreliable Lorraine engines. The inauguration took place on August 1; an aircraft took off from Brindisi for Athens with only mail





and no passengers. Simultaneously, another flew from Athens to Büyükdere (the granted stop on the Bosphorus 35 km from Constantinople) and a third from the latter toward the Greek capital. The first complete flight from Brindisi to Constantinople was completed on August 9, followed on August 15 by the reverse flight. Operations were plagued by technical and meteorological problems. There was also an emergency water landing (on September 30) in which the I-A-FER was lost, fortunately without consequences for the occupants, who were rescued by a passing ship. The service continued with only one weekly flight until December 31. It resumed on May 1, 1927, but with the new Dornier J Wals (powered by Isotta Fraschini Asso engines). The first "land" line was also the last to be inaugurated in that memorable year of 1926. This was the Venice-Vienna route, operated by the Società Anonima Italiana di Navigazione Aerea Transadriatica or, more simply, Transadriatica, founded a year earlier in Ancona and then moved to Venice. The planes were the Junkers F 13, single-engine monoplanes of all-metal construction, decidedly cutting-edge for the

time, with a closed cabin for four passengers. Decisive was the request of the Austrian company ÖLAG (Österreichische Luftverkehrs A.G.) to operate the same service. Until then, Italy had refused transit to foreign airlines, but the times were now ripe to open its skies by focusing on reciprocity agreements. The inaugural flight took off from the Venice Lido on August 18; the frequency increased from three times a week to daily (Monday to Saturday), thanks to the alternation between Transadriatica and ÖLAG. The line was strategic because connections for Germany and Central Europe were available from Vienna, ideal for Italian businessmen and Northern European tourists attracted to the lagoon city. To meet demand, the larger three-engine Junkers G 24 with nine passengers was introduced from October. From February 1927, the line was extended to Rome, following, depending on weather conditions, the Venice-Ancona-Rome routes (with a technical stop in Ferrara) or Venice-Florence-Rome (with a stop in Foligno).

Thanks to the statistics published by the Civil Aviation and Air Traffic Office based on reports required by the conventions, we know that in 1926, a total of 3,991 passengers, 1,572 kg of mail and newspapers, and 40,908 kg of luggage and goods were transported on the Italian civil network. The network spanned 3,844 km, and the flight hours totaled 3,524 (equal to 523,122 km traveled). Overall, that first year of operation could be considered positive and provided the basis for the consolidation of services, the expansion of lines, and the birth of new companies.

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On the opposite page, the Cant 10 ter I-OLTB is seen in front of the ramp at the Turin seaplane base. The latter, located near the Isabella Bridge, was later used as a restaurant before being demolished in 1954.

On these pages, an advertising postcard from SANA shows a Wal seaplane taking off. The company had initially focused on the Rome-Genoa-Marseille-Barcelona line, but delays in obtaining permits from other countries forced it to redirect toward domestic routes.

On this page, alongside, a Cant 22—still without registration markings or insignia—is pictured in front of the Monfalcone shipyards. The three-engine aircraft could carry nine or ten passengers and was added to the SISA fleet starting in 1928.



HISTORY

On the trail of the Breus

by Valentina Papa



The 8th Group was officially established on July 5, 1916, at Venaria Reale. Initially equipped with Farman aircraft, the Group immediately distinguished itself during the First World War in reconnaissance and light bombing operations.

It all began in 2022, when Aldo Allegra—at the time the oldest living pilot of the 8th Flight Group, at the venerable age of 101—gave me his collection of memoirs, letters, and articles regarding the "Eighth's" activities during the Second World War. Within this documentation, I came across an article by Adelmo Rigoli, another former pilot of the Group, in which he recounts how the current symbol was born after the armistice. During my time with the Group, I never had the chance to learn the history of this emblem, the Knight Breus, nor its meaning; I simply imagined that whoever conceived it—and at the time I had no idea who that was—had chosen it to represent the valor and courage of its personnel, but for me, the story ended there. Rigoli's article explains that after the Armistice of September 8, 1943, the Group's pilots left all their belongings in Sarzana to depart with their Macchi 200s on a mission marked by a series of stages—called "Apocalypse" for this reason—to reach Sardinia, as their aircraft, the Macchi 200s, were considered obsolete.

The entire personnel felt humiliated and dishonored, despite having obeyed the orders issued following the chaos of the Armistice. Upon their arrival in Capoterra, the experience was even more negative due to the desolation and the malaria that plagued those lands. The words from Adelmo Rigoli's book, 1943, *Takeoff into the Unknown*, describe those moments: "[...] in everyone there was the sadness of feeling useless, forgotten... It was agonizing to know nothing of our loved ones, and before us lay only the unknown. [...] Until one cold, rainy day, in that little room with the fireplace where we took refuge to talk and vent our anxieties, Fulvio Andrei recited the Breus to us." Breus is a tale set in Cornwall during the Middle Ages. Morvan, then a boy, saw a knight pass through the forest—proud and valiant, covered in armor. Fascinated by this figure, he left his family and his castle to follow the knight and become like him. After several years Morvan, having become the brave Breus, "the Knight of Knights," returned to his family, but found neither his home, by then destroyed, nor his loved ones. "[...] When Andrei's warm voice fell silent, a long silence filled the room, and some had tears in their eyes because that was our story: wandering knights like Breus. Then there was a clamor of voices, and the

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unanimous idea was born to make it our emblem. Mario Bacich sketched a first draft, and then with suggestions from one and another, the drawing became final, and the emblem was painted above the fireplace: a knight with a lance at the gallop above the clouds, and the motto 'the lance is thirsty and drinks where it reaches.' [...] The lancer had been born to give us a jolt of enthusiasm; we felt that things had to change, and thus an aerobatic team blossomed on the Decimomannu airfield, stunning the Italian and Allied High Commands. Finally, we returned to Italy; our Breus was painted on the Macchi 202s, and the Lancers went into action." In General Giuseppe Pesce's book, I found confirmation of that special event: an image of the Breus painted on the aircraft with a caption reading, "insignia of the 8th Fighter Group conceived and created in the period November 1943 - June 1944 by the Group's pilots at Capoterra airport."

On the same page was an image of the farmhouse showing the writing "94a Sq" on a wall. Rigoli's memory matched Pesce's perfectly, both in location and the creation of the symbol. Intrigued, I began some web research and came across an article by Roberto Copparoni, President of the Amici di Sardegna Association, describing the airfield. There was nothing left to do but set out.

Adelmo Rigoli's book contained descriptions of both the place and the drawings in the famous room. I felt fate was pushing me toward Sardinia. Helping me in this adventure were three people I met once I arrived in Cagliari: Tony Roma, a non-commissioned officer of the Italian Air Force; Ferdinando Orrù, a former military pilot and local history expert; and Roberto Copparoni, a journalist. During the car ride, Rigoli's words came back





On these pages: in 1940, the 8th Group (part of the 2nd Fighter Wing) was among the first units to be deployed to North Africa. Initially equipped with Fiat CR.42 aircraft, it was later outfitted with FIAT G.50s and Macchi C.200s (Photo: Troupe Azzurra).

Above: an aerial shot of the remains of the structures serving the Capoterra airfield, which were used by the personnel of the "Eighth" (Photo: Massimiliano Zara).

to me: "[...] thus squeezed together we arrived in Capoterra, [...] there is nothing, only a farmhouse and dilapidated sheepfolds where we must set everything up." In the open countryside, along a narrow avenue, we see a U-shaped structure used as a farm; on the right side, one can barely read "Centro colonico" (Colonial Center). We have arrived; now we just have to find some trace of the 8th Group's passage. Inside the largest courtyard, we see the sign "94^a Sq." painted inside an old room. Analyzing historical photos, we understand that this space was originally enclosed by a wall that has since collapsed, as documented in a photo from General Pesce's book. Along the entire wall, we glimpse several drawings, including an airplane that appears to be an MC.200—the same used by the 8th Group until early 1944—with a caricature of a pilot on top.

A little further on, we find another courtyard, smaller and in a worse state of decay than the first. Given the condition of the structure, hopes of finding anything else are quickly fading. There, in the most dilapidated corner, we find a small room with an old fireplace. Mold and water leaks dominate the environment, but they do not stop us from taking a closer look at the fireplace. With a makeshift stick found on the ground, we



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The testimonies of General Pesce and the memoirs of Aldo Allegra have made it possible to reconstruct the facts that characterized the events of the 8th Group following September 8, 1943.

start scratching the surface of the plaster, and the paint slowly comes away until a precise line appears. My heart stops for a moment; the line is clearly painted, and as we bring it back to light, first a fairly wide "V" appears, and then the head of a fish, colored in bright red.

"Work continues at the field, and it's a way to drive away thoughts. In what will be the recreation room, completely repainted, an insignia stands out: a triangle of sky, a white cloud, and an open tin can flying with two beautiful wings. It has a label with a red fish and the writing 'Concentrate of Superaereo' ... Yes, Superaereo, the High Command, the one that continued to produce utterly obsolete airplanes [...]" Rigoli recounts in his book. Cleaning all around the image, we find a magnificent royal crown with clear writing on the sides: "8° Gruppo Caccia – MC.200."

As I continue cleaning the wall, my two traveling companions, Tony and Nando, begin inspecting the other walls. Before long, green begins to show beneath the rotting paint; it is the 93rd Squadron,

and shortly after, the 92nd and 94th emerge as well; all three squadrons of the 8th Group are there. "I have the task of painting the glorious Squadron insignia of the Great War: for the 92nd, a ram in a red field; for the 93rd, a white feather in a green field; and for the 94th, a star in a white field [...]" Bit by bit, pencil drawings appear—sinuous female figures that seem to lean against the fireplace to warm themselves, names of people; a story 80 years old comes back to light.

On the wall opposite the fireplace, which is much barer, our inspections bring more painted straight lines to the surface. At the end of each line is a small black dash with barely perceptible writing next to it: Littoria, Guidonia, Castiglione del Lago, Decimomannu, Sciacca, Agrigento, Korba (Tunisia), Galatina, Leverano, Catania, Chinisia (Trapani), Decimomannu. These are the stops the Group made after the Armistice before arriving in Capoterra. Along a barely visible path, the green silhouette of 14 airplanes with a dot above them can be seen. It is confirmation of what was written

in the book: "our sparse little group, our 14 surviving airplanes, that's the entire 8th Group." Only the figure of Breus was missing. Nando begins inspecting above the painting of the squadrons, and something starts to come out. The drawing that appears, executed by a skilled hand, is not the only one present, because in the end, we find three knights' heads—one for each squadron. We are standing before the first Breus figures drawn exactly as described by the texts and written testimonies.

Now the room has a different, more familiar atmosphere; every corner tells not only the history lived by those boys but also that of the 8th Group. Fortunately, that old paint somehow protected the Group's memories, which were preserved despite the weather and the complete abandonment of those places. Above the fireplace, we find nothing more than a few undefined dark marks; perhaps the painting done then has been lost, but the first Breus figures have been found in the room and now reign with their colorful manes. It

was an experience, an adventure that served to bring back to light the reason that led to the choice of the Breus as the symbol of the valor of the 8th Group pilots and the brotherhood that bound them. At the end of his article, Adelmo Rigoli wrote a thought on the death of Andrei, the pilot who recited Pascoli's Breus: "Recently Fulvio Andrei, pilot and exceptional man, ascended up there, into the aviators' sky, to find his Macchi and his Breus; up there, one day, all the old lancers of the 8th Group will reunite, and the three squadrons—92nd, 93rd, and 94th—will fly in formation once again to the honor and glory of the Lord of the Heavens, whom we invoke so many times in the fiery days of War." With Aldo, who joined them up there in 2024 at age 103, all the old lancers are finally together. It is like seeing them in that little recreation room, all united, supporting one another, far from families and loved ones, drawing their journeys and their dreams on those walls made so personal, so much theirs and, now, so much ours.

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TESI (Tecnologie e Servizi Innovativi), fondata nel 1973, è un'azienda italiana con oltre cinquant'anni di esperienza nella progettazione, ingegnerizzazione e produzione di assiemi e componenti in leghe metalliche (principalmente alluminio, acciaio e titanio) e materiali compositi (fibre di carbonio e aramidiche, fibra di vetro) per i settori Aerospazio e Difesa. Con sede nell'area industriale di Cicerale, in provincia di Salerno, nel cuore del Cilento, TESI opera su più stabilimenti produttivi, per una superficie complessiva di 25.000 metri quadrati, di cui 11.000 coperti.

Al centro dell'offerta TESI si colloca una solida funzione di progettazione che supporta i Clienti fin dalle prime fasi dello sviluppo del prodotto. Il team tecnico di TESI è in grado di tradurre requisiti funzionali e vincoli operativi in soluzioni complete ed ottimizzate, con un focus sulla producibilità e l'efficienza economica. Questo approccio consente a TESI di operare non come semplice fornitore, ma come autentico partner, in grado di contribuire alla definizione del prodotto, alla selezione dei materiali e alla validazione del design per la produzione.

Il punto di forza distintivo di TESI è la capacità di gestire internamente l'intero ciclo di vita del prodotto, dalla progettazione fino all'integrazione finale. Anziché esternalizzare fasi critiche, TESI mantiene il controllo diretto su approvvigionamento, trattamenti termici e superficiali, verniciatura e controlli, garantendo la piena tracciabilità di ogni fase. Questa integrazione end-to-end riduce significativamente i rischi, comprime i tempi di consegna e i costi e offre ai Clienti un unico interlocutore.

Lo stabilimento produttivo è dotato di un'area di collaudo dedicata che supporta metodi di ispezione sia distruttivi sia non distruttivi, tra cui prove di trazione, analisi metallografiche, prove in camera a nebbia salina e ispezione con liquidi penetranti fluorescenti, garantendo l'assicurazione qualità internamente, senza dipendenza da laboratori esterni.

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Il Sistema Qualità di TESI è riconosciuto e approvato dai principali Prime contractor aerospaziali a livello mondiale, in conformità ai più stringenti quadri normativi e regolamentari del settore. L'azienda è titolare dell'Approvazione di Organizzazione di Produzione (POA) rilasciata dall'Agenzia dell'Unione Europea per la Sicurezza Aerea (EASA), che ne conferma l'autorità a produrre e svincolare componenti aeronautici in conformità agli standard europei di aeronavigabilità. TESI è inoltre certificata secondo le norme AQAP-2310, ISO 9001, AS/EN 9100, ISO 45001 e ISO 14001, coprendo la gestione della qualità per applicazioni sia civili sia nel settore difesa, nonché la responsabilità in materia di sicurezza, salute e ambiente. I processi speciali, inclusi trattamenti termici, trattamenti superficiali e ispezioni non distruttive, sono certificati dall'ente terzo NADCAP.





Manufacturer Requirements

Microsoft Flight Simulator – PC or Xbox.

MSFS2020 or MSFS2024

CPU: Quad-core processor or higher

GPU: At least 6 GB of memory or more

RAM: 8GB minimum

Hard Disk: 4GB of free space

A-1 SKYRAIDER

The most powerful piston-powered all-rounder

The A-1 Skyraider, born from the late 1940s requirement for a successor to the Dauntless scout bomber, is a legendary aircraft famed for its versatility and extraordinary payload capacity. As the last piston-engine machine embarked by the U.S. Navy, it became famous for its close air support missions, particularly in the Korean and Vietnamese theaters, where it even managed to shoot down a MiG-17 with its cannon during a dogfight. With 3,000 units produced, the A-1 Skyraider proved to be a true multi-role workhorse throughout nearly 40 years of aviation history. A low-wing monoplane built around the powerful Wright R-3350 engine, it featured seven wing pylons on each side; despite the massive loads it carried, it maintained remarkable maneuverability. Among the numerous modifications made, the armor plating stands out, designed to minimize damage from enemy ground fire; overall, it is a well-armed,

maneuverable, and safe aircraft, suitable for both close support missions and as an escort for Combat SAR (Search and Rescue) missions. Its spacious fuselage also allowed for the development of new versions for diverse roles, ranging from cargo transport and ambulance service to electronic jammer or night fighter, with crews of two or three people depending on the configuration. The A-1 remained in service until the early 1970s, utilized also by the RAF (Royal Air Force) and the French Air Force, while U.S. naval forces replaced it with the A-4 Skyhawk. The aircraft was also a protagonist in the film “Flight of the Intruder” (Italian title: L’assalto dei Gary Owen), based on the novel by Stephen Coonts, a former U.S. Navy A-6 pilot who describes flight sequences in his work with precision and detail. A highly detailed version of the A-1 is available in the Microsoft Flight Simulator marketplace.

The cockpit interior, featuring photorealistic graphics, includes all controls on the center and side panels, which are capable of operating all aircraft systems. A retractable tray can be pulled out from the center section to view a navigation chart and the menu for loading the designated weapons. Due to the internal rules imposed by the FS platform, the armaments are purely aesthetic and cannot be used in any way, although the aircraft’s performance is affected by their weight. The 18-cylinder radial engine is carefully simulated and includes failures resulting from exceeding specific limits. It is therefore necessary to avoid exceeding the maximum operating temperature, regulating it not only with engine RPMs but also through the use of “cowl flaps”—louvers that allow for the regulation of airflow to



the engine and can also be set to “auto.” Additionally, it is necessary to monitor “manifold pressure” values and time limits during inverted flight: the gravity-fed fuel system, not being pressurized, guarantees an autonomy of only a few seconds in this attitude. The throttle quadrant also includes controls for the fuel-air mixture and related cooling injectors, as well as propeller pitch, the supercharger, and all controls necessary for optimal engine management. The cabin also features a fuel selector, an autopilot panel, and a set of period-style navigation and communication radios. “Modern navigators” can also use a secret key to activate a recallable GPS, which can be installed in free or premium versions from the

pms50.com/msfs website. The aircraft is equipped with a tailhook for naval operations and, given its bubble canopy design that allows for high visibility, it is particularly suitable for use with VR headsets. A robust and maneuverable plane that has carved out a place in aeronautical history by carrying out various types of missions across different scenarios with high efficiency. These features allow for the recreation of the era’s atmosphere and the use of a true “wild horse,” enabling highly evocative flights in different parts of the world; in short, a delight for all historical aviation enthusiasts.

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Basilio Di Martino, Enrico Pino, Paolo Pozzato, Giorgio Spagnol

Il crollo delle certezze in Medio Oriente 1967-1973

Edizioni Chillemi/Roma 2025/ pp. 638/ Euro 24,00



The essay "The Collapse of Certainties in the Middle East 1967-1973" represents a dense and masterful analysis of one of the most turbulent periods in contemporary history—a volume that distinguishes itself through its ability to weave the rigor of military chronicle with profound psychological and geopolitical reflection.

The authors, leveraging their vast technical expertise, guide the reader through the timeframe separating the lightning Israeli victory in the Six-Day War from the existen-

tial trauma of Yom Kippur, identifying this six-year period as the moment when the myth of the IDF's (Israel Defense Forces) invincibility definitively crumbled. The core of the work lies in the thesis that the 1967 triumph produced a doctrinal arrogance that prevented the leadership in Tel Aviv from correctly reading the signals of change coming from the Arab world, especially during the lesser-known but fundamental War of Attrition.

The authors describe with surgical precision how Sadat's Egypt managed to rebuild its national pride and martial effectiveness through the integration of new Soviet technologies, such as SAM missiles and anti-tank weapons, which threw the pillars of Israeli defense into crisis. The essay excels in describing the failure of intelligence services, trapped in cognitive biases that led Israel to underestimate the imminent threat of 1973, transforming that clash into a true watershed that forced the Jewish state to reconsider its national security strategy.

In the background, the authors outline the role of the superpowers, highlighting how the region served as a laboratory for the Cold War in a delicate balance between Washington and Moscow. Despite the abundance of technical details which may be demanding, the narrative style remains consistently lean and analytical, offering a balanced perspective that avoids ideological bias to focus on factual reality. Ultimately, the text emerges as an essential read for understanding not only the military dynamics of the past but also the deep roots of current tensions in the Middle East, reminding us that a tactical victory on the field almost never coincides with lasting political stability if not accompanied by an understanding of the limits of force.

Emanuele Salvati

Alberto Trevisan, Anatoly P. Borovik

Bombardieri in picchiata sovietici

IBN Editore /Roma 2025/ pp. 186/ Euro 29,00



The book "Soviet Dive Bombers," written by Alberto Trevisan and Anatoly P. Borovik and published by IBN Editore, is a specialized essay dedicated to a seldom-discussed topic: the development and deployment of dive bombers in the Soviet Union during the Second World War.

The text focuses on a very specific area of aeronautical history, analyzing both the technical and operational aspects of these aircraft. It explains how dive

bombing represented a particularly effective technique for hitting pinpoint targets, such as ships or fortified installations, due to its greater precision compared to traditional bombing. The authors reconstruct the Soviet path in this sector—initially uncertain and characterized by numerous prototypes and failed attempts—until the creation of aircraft that proved their worth in the field.

In terms of style, the book is clearly oriented toward an enthusiast or already informed audience: the language is technical, rich in data, acronyms, and specific references to aeronautical engineering and military history. Consequently, this is not a light popular read, but rather an in-depth work, almost a reference book, enriched by photographs, drawings, and iconographic materials that help the reader better understand the aircraft described.

One of the main strengths is the specificity of the subject matter: the book fills a gap in Western bibliography, where Soviet aviation is often treated in less detail than its German or Allied counterparts. Furthermore, the approach is systematic and well-documented, making it useful for scholars, modelers, and history buffs alike. As a limitation, however, it can be noted that the heavy technical component and analytical structure make the reading less fluid for those not already familiar with the topic. It also lacks a broad narrative component, as the book prioritizes data and descriptions over the storytelling of events or human experiences. Overall, "Soviet Dive Bombers" is a solid and rigorous work, ideal for those wishing to delve into a specific aspect of 20th-century military history. It is not a book for everyone, but for enthusiasts, it represents a precious and well-documented source.

Serafino Durante

Maria Luisa Suprani Querzoli

Ritratto di Francesco Baracca

Edizioni bookness/ 2026/ pp. 429/ Euro 19,50



Much has already been written and published about Francesco Baracca. Indeed, the author herself highlights this in the introduction to this updated edition of her book. However, we might point out that “much” certainly does not mean “too much.” On the contrary, a work such as this is most welcome; despite the vast existing bibliography, it offers further interesting insights for reading and reflection.

The figure of the Ace is analyzed with great sensitivity from every perspective, set within a meticulous and precise contextual framework. Above all, the man himself is brought into focus, stepping outside the rigid categorization imposed by patriotic rhetoric. In this way, we get to know Francesco: from his youth, when he passionately embarked on a military career—“challenging” his father’s authority (who had another future in store for his son) and his mother’s anxieties regarding the dangers of the profession—to the outbreak of the First World War, by which time he had become an exceptionally skilled pilot and the respected commander of the 91st Squadron. The text, which is clear and flows easily, uses documents and photographs to guide us through the stages marking his transformation into a Hero and, ultimately, a Legend. Particularly effective is the tight narration of the wartime period, paced by the succession of credited aerial victories. When reaching the 34th, a chill will run through every reader; from that point, the inexorable countdown of Baracca’s earthly journey begins. What follows is imperishable glory. As mentioned, one appreciates the “multidimensional” approach to the protagonist—his virtues, skills, fears, the intimacy of his affections, and the light and shadow inherent in every human life. The final part is deeply engaging, dedicated to the mysteries, hypotheses, and conjectures that still surround his death. Suprani Querzoli approaches this almost like a “cold case,” analyzing and comparing evidence, testimonies, reports, and depositions. In the end, what remains is the portrait of an extraordinary Italian whose emblem—the Prancing Horse—continues to fascinate us and fill us with pride.

Francesco Maurelli

Roberto Bassi

“Ca.2328”

Gli eroi di Flumignano

Aviani & Aviani editori/ Udine, 2025 / pp. 152 / Euro 18,00



Sometimes History with a capital “H”—the kind found in great treaties or among famous figures—ends up overshadowing the small, yet immense, human stories. This book, edited by Roberto Bassi with the support of the Flumignan in Fieste Association and the Municipality of Talmassons, was born from a geographical and sentimental paradox: a street dedicated to soldiers whose faces, and even their exact number, had been lost to time.

In fact, the volume takes its cue from an inconsistency that the author noticed almost by chance. In Flumignano, there has always been a “Via dei Tre avieri” (Street of the Three Airmen), but historical research revealed a different truth. On that Italian bomber, shot down by a German fighter on November 1, 1917, there were actually four young men on board. This is not, therefore, a simple wartime essay, but an act of poetic and historical justice. The author does not stop at listing technical data about the conflict; he delves into the lives of these young men in their early twenties, seeking to give a face and an identity to those who, for over a century, remained a collective shadow in the memory of this small community. The beauty of this volume lies in its humility and intellectual honesty. As Veronica Versolato, President of the Association, emphasizes: “Here you will not find geopolitical analyses, but the daily pain of a community overwhelmed by the fury of the Great War.” According to the Mayor of Talmassons, Fabrizio Pitton: “Cultivating collective memory is one of the most precious gestures a community can perform for itself and for future generations.”

In this sense, the author has managed to transform—with historical rigor and great passion—a cold street sign into a living story, urging us not to walk distracted through the streets of our towns, because every name engraved on a plaque or a memorial stone is a “piece of memory” that we risk losing.

I highly recommend this reading, not only to local history enthusiasts but to anyone who believes that a man’s dignity is found through his name and the remembrance of his sacrifice.

Flavio Silvestrini

Giuliano Giubilei

Giovinezza.

La guerra e la prigionia di una generazione tradita

Edizioni Solferino/ Milano 2024/ pp. 429/ Euro 19,50



Andrea Monteschi, a “Black-shirt” who later repented after a re-examination of his life and choices, set off as a volunteer for the Second World War. His three brothers—Leo, Ettore, and Giuseppe—also fought in the same war, but on different fronts. Andrea is none other than the father of the author, a journalist who, in this historical novel narrating the story of the Monteschi brothers, sought to pay tribute to his family and to the 600,000 soldiers taken

prisoner by the Allies across various fronts. Andrea's lot was the Libyan front, where, on New Year's Day 1941 in Bardia, he fell prisoner to the British. “He had set off for war, not for captivity [...]. He had not accounted for imprisonment [...]. Imprisonment was an uncertain, mediocre end. Perhaps the most grueling outcome to endure.” He was held in the Bairagarh camp in India and, subsequently, in an Australian camp, where the battle was against “boredom, starvation, and the feeling of being totally useless. These are the most insidious adversaries.” One day at the Bairagarh camp, the loudspeakers broadcast the news of Mussolini's arrest and the appointment of Marshal Pietro Badoglio as head of government. On September 8, the news of the armistice followed. While an agreement for the release of Allied prisoners was reached immediately, there was nothing regarding a change in status or a liberation date for the Italian prisoners. Among the relatives waiting at home, a suspicion spread: that the government did not want to give them the chance to vote in either the referendum or the general elections because they were so angry about their treatment. This suspicion was confirmed by the fact that the prisoners began returning between the end of summer and the autumn of 1946, only after the voting had concluded. “Soldiers who had left at twenty, transformed by defeat and captivity into shadows [...]. No one liked them, and they were of no use because they bore the face of a gloryless defeat. Many had fought as Fascists [...]. How would that disillusioned and angry mass have voted? Could democracy be rebuilt upon those faces?” After embarking in Melbourne on the ship Empire Clyde and landing in Naples on February 2, 1947, Andrea Monteschi finally became a free man again after six years of captivity. Gianlorenzo Capano

Walter Ferrari, Antonio Lo Campo

Marte. La nuova frontiera dello Spazio

IBN Editore /Roma 2026/ pp. 224/ Euro 20,00



The book “Mars: The New Frontier of Space” by Antonio Lo Campo, co-authored with Walter Ferrari, is a comprehensive and well-structured work of scientific popularization dedicated to the planet Mars and its exploration. The text takes the reader on a journey starting from the earliest observations of the planet in antiquity, through theories developed over the centuries, up to modern space missions and future prospects for

colonization. One of the most interesting aspects of the book is its ability to merge the historical dimension—rich in curiosities and the scientific errors of the past—with current technological reality, showing how knowledge of Mars has evolved over time thanks to scientific progress. The style is clear and informative, designed to be accessible even to those without a deep scientific background, while simultaneously maintaining an excellent level of precision and rigor. The authors succeed in explaining complex concepts without becoming tedious, although the reader might need to pay closer attention to some of the more technical sections. The book is neither a narrative nor a dramatized account, yet it remains engaging thanks to the intrinsic interest of the subject and the passion that emerges in the writing. Key strengths include the completeness of the information, the balance between past and present, and the in-depth look at space missions, which allows the reader to truly understand how central Mars is to the future of human exploration. The volume is further enriched by a vast amount of data; while this may prove demanding for those seeking a lighter read, it provides an essential scientific foundation for anyone wishing to study the topic in depth. Overall, it is a solid and well-documented essay, particularly recommended for astronomy enthusiasts or anyone who wishes to seriously explore the theme of Martian exploration.

Luca Ricci

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www.aeronauticamilitarebags.it



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PIONEERING AEROSPACE



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