

BUILDING SPACE EXPERTISE

NATO'S NEWEST 'CENTRE OF EXCELLENCE' IS DEVELOPING KNOWLEDGE, ANALYSIS AND PRODUCTS FOR THE SPACE DOMAIN

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The brand-new NATO Space Centre of Excellence (COE), located in Toulouse, France, was officially accredited on July 14, 2023. Since then, the COE has been actively working to expand its capabilities and grow its staff, supported by its 15 sponsoring nations. The COE will work to improve the Alliance's expertise in the space domain, providing knowledge, analysis, and products across three operational functions: **space domain awareness, operational space support, and space domain coordination.**



The primary role of a centre of excellence is to assist NATO's Allied Command Transformation (ACT) in Norfolk, Virginia, with the transformation within the Alliance, while considering current and future operational needs, as communicated by Allied Command Operations (ACO) in Mons, Belgium.



Although not part of the NATO Command Structure, the NATO Space Centre of Excellence is designed to complement the Alliance's current resources, providing expertise in the space domain to contribute to and enhance NATO's capabilities. Headquarters Supreme Allied Commander Transformation coordinates the activities of the COE, ensuring that its outputs align with the ACT strategic priorities. Consequently, the "program of work" is agreed to each year by the COE Steering Committee, composed of representatives from each sponsoring nation.

While the overall purpose is the same for all 30 of NATO's centres of excellence, the contribution of NATO nations differs with each. The NATO Space COE currently has 15 sponsoring nations, clearly demonstrating strong international interest in the space domain. A peculiarity of the domain is the broad spectrum of related capabilities and technologies, both in space and on Earth, indicating a high level of complexity and, therefore, the need to employ personnel with advanced skills. These are challenges that the centre will face in its establishment phase.

THE ACTIVITY



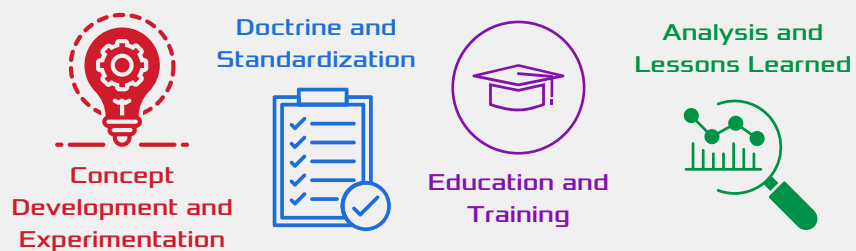
The COE achieved a key milestone by chairing its first Space pre-Annual Discipline Conference on May 26, 2023. In this role, **the COE is responsible for identifying and coordinating space education and training solutions** for all operating bodies across the Alliance. By preparing, coordinating, and chairing this event, the COE proved its ability to support the Alliance. Since then, the NATO Space COE has consistently supported and coordinated the further development of NATO's space-related education and training.

Within its core activity, **the COE assists the development of space-related doctrine and standards by accelerating Alliance work on space-related matters**, deepening and expanding its use of the space domain and supporting the integration of space concepts and technologies. It stimulates space interoperability and provides a bridge between NATO, relevant national and international space organisations and institutions, and commercial sectors and academia.

The COE is rapidly expanding its expertise, driven by a dedicated team of 33 personnel from 12 nations and led by its director, Colonel Sylvain Debarre of the French Air and Space Force. To achieve this objective, the director, deputy director and chief of staff leverage the skills of the COE's experienced personnel, managing the daily business of the centre and welcoming newcomers into the growing multinational team.

THE ORGANIZATION

New personnel are assigned to one of the COE’s four divisions (one for each of the COE pillars: concept development and experimentation, education and training, doctrine and standardization, and analysis and lessons learned), or they join its Strategy and Technology cell, advising the command team and informing all the divisions on the current technological landscape and most recent EDT (emerging and disruptive technologies).



Under the umbrella of the ACT Space Branch, the divisions contribute to NATO’s goal of evolving the implementation of the space domain within the Alliance. To this end, they support the definition and analysis of requirements, explore and outline existing solutions within NATO and its nations, and suggest optimal solutions for gaps in all areas covered by the four pillars.

Concept, Development and Experimentation



Although still in its ramp-up phase, the Space COE is already actively supporting NATO on several key issues. For instance, the **Concept Development and Experimentation Division (CD&E)** monitors space trends and examines future space concepts and capabilities that could be of interest to NATO and its partners. CD&E is actively engaged in technical exercises, supporting wargaming and the testing and evaluation of concepts through experimentation. The CD&E Team participated in the NATO Exercise CWIX 2024, supporting the ACT Space Branch, and plans to assume the role of deputy lead for the space Focus Area from CWIX 2026 on. CD&E is also a member of the Federated Mission Networking (FMN) Space Tiger Team, supporting the definition of a shared understanding of crucial topics for the Alliance, such as, as an example, the Recognised Space Picture. FMN is a NATO initiative that aims to advance the ability to train, communicate and operate among allied and partner nations.

Doctrine and Standardization

The COE **Doctrine and Standardization Division (D&S)** is responsible for creating the doctrinal framework for space, and the COE is very proud to have assumed custodianship in April 2024 of the NATO Space Operations Doctrine (Allied Joint Publication [AJP] 3.29). D&S is also working to support space integration within the broader NATO doctrine to ensure that it makes relevant connections to AJP 3.29 and to promote overall coherence. D&S achieves its aims through participation in the Allied Joint Doctrine Working Group and, more broadly, in NATO’s global doctrine development. It provides support as needed to ensure space considerations are properly integrated, including in the development of Allied Tactical Publication 102 and the NAVWAR doctrine (NAVigation WARfare, a subset of electronic warfare, is the deliberate disruption of an adversary’s use of global navigation satellite system signals for navigation).



The D&S Team also supports other COE activities by providing relevant doctrinal perspectives, such as for the COE’s contribution to the NDPP (NATO Defence Planning Process).

Education and Training



The **Education and Training Division (E&T)** actively supports the evolution of individual and collective training solutions to develop Suitably Qualified and Experienced Personnel (SQEP) for space within the Alliance. As the Department Head for the space discipline, the NATO Space COE chairs the Annual Discipline Conference participates in global programming events such as the NATO Individual Training and Education Conference and the NATO Education and Individual Training Planning Board, and is actively involved in training requirements analysis for the space discipline. In addition, E&T supports key allied exercises and educational activities and directly contributes to NATO Space-related courses when requested. Recent activities have included support for the preparation and execution of major NATO exercises, including Steadfast Deterrence/Duel 2024, both based in Stavanger (NOR), and Loyal Leda 2024 and 2025, in Bydgoszcz (POL), with E&T members operating as “Space Red Team” opposition forces – taking over this role from the Joint Air Power Competence Centre – and participation in the 2024 and 2025 editions of the French Space Command’s exercise AsterX. Finally, in accordance with the COE’s plan to become a NATO-recognised education and training facility (ETF), the E&T Team is working to define the first courses that the NATO Space COE will provide.

Analysis and Lessons Learned

The final pillar, **Analysis and Lessons Learned (A&LL)**, aims to optimise the processes followed by the other three pillars and supporting the development of space-related lessons learned within the Alliance. The division’s first position was filled in early 2025 with the appointment of its Division Head.



There is no doubt that the Space COE is already active in its pursuit of solutions to operational challenges within the space domain, working to support troops on the ground and protect allied assets in space.

TACKLING NATO SPACE CHALLENGES

NATO is an important forum where allies can share information, increase interoperability, and coordinate actions. The Alliance does not intend to develop its own space capabilities and will instead leverage national space assets for, inter alia, positioning, navigation and timing; early warning; secure satellite communications; and intelligence, surveillance and reconnaissance. Each of these technologies plays a crucial role in informing national and international situational awareness, planning and decision-making.



At the June 2021 Brussels Summit, NATO leaders stated that “attacks to, from, or within space present a clear challenge to the security of the Alliance, the impact of which could threaten national and Euro-Atlantic prosperity, security and stability, and could be as harmful to modern societies as a conventional attack.”

Coherently, the 2022 NATO Strategic Concept underlines the vital role of space for NATO’s deterrence and defence posture. Over half of all active satellites in Earth’s orbit belong to NATO members or companies based within their territories. As well as describing the increasing threats in space, the Strategic Concept also contains an Alliance commitment to enhancing the “ability to operate effectively in space [...] to prevent, detect, counter and respond to the full spectrum of threats.”

Accordingly, NATO “will boost the resilience of the space capabilities upon which we depend for our collective defence and security.” Along the same lines, in 2024, the Washington Summit Declaration acknowledged the growing significance of space by calling for the “acceleration of the integration of space into our planning, exercises, and multi-domain operations.”

The space domain is essential to every NATO operation but is also increasingly contested.

Consequently, besides ensuring the availability of optimum space support for allied operations and missions — including communications, navigation, and intelligence — NATO’s approach to space also seeks to prevent potential adversaries from challenging the space capabilities on which it relies. As space is increasingly crucial to the security and prosperity of the Alliance, as much as to each ally, the NATO Space COE is committed to anticipating future space needs and challenges. For instance, in the face of the proliferation of satellites in low Earth orbit and the evolution of counter-space technologies, the COE offers a lookout for emerging and disruptive technologies while also assessing the relevance of current and emerging threats and analysing future technologies related to security in space.

In this context, the NATO Space COE plays a vital role in enhancing the Alliance’s resilience, ensuring operational superiority, and driving innovation to address the challenges of an evolving security landscape.

Thus, the NATO Space COE is already active in its contributions to NATO, working to shape the future of the Alliance’s space operational capabilities.

CONCLUSION



As summarized by Col. Debarre,

“ The NATO Space COE can be proud of the work done so far. With the activation of the Paris Protocol in record time, the conditions are now in place for our international members from the 15 sponsoring nations to join our COE here in Toulouse, France, at the heart of a valuable space ecosystem, and to bring in their expertise. We will use the upcoming weeks to unite the constantly growing team to tackle the next challenges - together and stronger. I am very proud to be a part of this success story. ”

The NATO Space COE team looks forward to welcoming NATO members and visitors to its new premises, which will be complete in late 2025.

A new chapter of NATO Space COE history will unfold within these walls.

NATO Centres of Excellence

Space is among the newest of 30 subject areas to receive focus through an accredited NATO Centre of Excellence (COE). These international military organisations train and educate leaders and specialists from NATO member and partner countries. Here is a list of COEs.

- >>> Air Operations, Lyon, France, 2008
- >>> Civil-Military Cooperation, the Hague, the Netherlands, 2007
- >>> Climate Change and Security, Montreal, Canada, 2024
- >>> Cold Weather Operations, Elverum, Norway, 2007
- >>> Combined Joint Operations from the Sea, Norfolk, Virginia, United States, 2006
- >>> Command and Control, Utrecht, the Netherlands, 2008
- >>> Cooperative Cyber Defence, Tallinn, Estonia, 2008
- >>> Counter-Improvised Explosive Devices, Madrid, Spain, 2010
- >>> Counter Intelligence, Kraków, Poland, 2015
- >>> Crisis Management and Disaster Response, Sofia, Bulgaria, 2015
- >>> Defence Against Terrorism, Ankara, Turkey
- >>> Energy Security, Vilnius, Lithuania, 2012
- >>> Explosive Ordnance Disposal, Trenčín, Slovakia, 2011
- >>> Human Intelligence, Oradea, Romania, 2010
- >>> Integrated Air and Missile Defence, Chania, Greece, 2021
- >>> Joint Air Power, Kalkar, Germany, 2005
- >>> Joint Chemical, Biological, Radiological and Nuclear Defence, Vyškov, Czechia
- >>> Maritime Geospatial, Meteorological and Oceanographic, Lisbon, Portugal, 2021
- >>> Maritime Security, Istanbul, Turkey, 2020
- >>> Military Engineering, Ingolstadt, Germany, 2010
- >>> Military Medicine, Budapest, Hungary, 2005
- >>> Military Police, Ingolstadt, Germany, 2014
- >>> Modelling and Simulation, Rome, Italy, 2012
- >>> Mountain Warfare, Slovenia, 2015
- >>> Naval Mine Warfare
- >>> Operations in Confined and Shallow Waters, Oostende, Belgium, 2006
- >>> Security Force Assistance, Rome, Italy, 2018
- >>> Space, Toulouse, France, 2023
- >>> Stability Policing, Vicenza, Italy, 2015
- >>> Strategic Communications, Riga, Latvia

PHOTOS CAPTION

- 1/ By NATO Space COE: the fifteen NATO Space COE sponsor nations signed the Memorandum of Understanding
- 2/ By NATO Space COE: the participation to the 39th US Space Symposium in Colorado Springs, USA
- 3/ By NATO Space COE: the support to AsterX 2024 exercise of French Space Command in Toulouse, France
- 4/ By NATO Space COE: the development of doctrine and standards as part of the NATO Space COE activity
- 5/ By NATO Space COE: the support within major NATO exercises as Opposing Force (OPFOR)
- 6/ By NATO Space COE: the continuous improvement of processes through analysis and lessons learned
- 7/ By NATO Space COE: the NATO headquarters in Brussels, Belgium
- 8/ By NATO Space COE: the NATO Space COE Director was the Master of Ceremony at the first NATO Space Symposium