Deutsches Zentrum für Luft- und Raumfahrt
German Aerospace Center

30 YEARS DE-CIX

Press Release

Optically networked and intelligently interconnected: DE-CIX and the German Aerospace Center optimize satellite communications

Frankfurt (Germany), 9 September 2025. DE-CIX and the German Aerospace Center (DLR) are researching innovative solutions to optimize communication with LEO satellite constellations in low Earth orbit (LEO). The world's leading Internet Exchange operator and the DLR are working together to determine how information and data can be transmitted more reliably between space and Earth using laser links. As part of the European Space Agency (ESA) OFELIAS project, the work aims to develop protocols, algorithms, and procedures by July 2026 that intelligently optimize network utilization between optical ground stations and satellites, thereby reducing problems caused by atmospheric turbulence and cloud blockage. Although lasers allow for more bandwidth and higher data rates, they are also more susceptible to clouds, fog, and rain than conventional radio transmissions.

New approaches for weatherproof laser communication

“We are working together to find ways to increase the availability of optical satellite networks for end users,” says Hermann Bischl, Project and Group Manager at the DLR Institute of Communication and Navigation. “All-optical transmission presents us with particular challenges, which we aim to overcome through innovative approaches to signal processing and network control.”

“We want to make optical satellite communications so robust and reliable that they can be seamlessly integrated into existing terrestrial networks and can thus play a crucial role in the connectivity of the future,” says Matthias Wichtlhuber, Team Lead Research & Development at DE-CIX. “In collaboration with the DLR, we are evaluating the intelligent interconnection of satellites and ground stations with the Internet, based on our thirty years of experience in the field of network interconnection."

Interconnection of satellite operators: the basis for networked applications in space

The research conducted by DLR and DE-CIX is an important building block for the digital infrastructure of tomorrow. Whether artificial intelligence, immersive technologies, or humanoid robots – applications such as these require extremely low latency times, sometimes in the single-digit millisecond range. As space becomes increasingly important as an economic area, the demands on digital infrastructure in orbit and beyond are also growing. “Concepts from DE-CIX such as Space-IX are based on the technologies that the OFELIAS project is now helping to develop,” says Ivo Ivanov, CEO of DE-CIX. “LEO satellites play a key role in providing people and applications everywhere on Earth with information and connectivity. When operators connect to DE-CIX Space-IX, this not only enables direct access to content, cloud, and application networks, but also creates the basis on which future business models between Earth and space can be built. Together with partners like the DLR, we are working on various projects to lay the foundations – not only on Earth but also in space – required for the satellite communications of the future.”

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About DE-CIX

DE-CIX, pronounced DEE-KICKS [dˈiː-kˈɪks], is the world’s leading operator of Internet Exchanges (IXs). Founded in 1995, the company is celebrating its 30th anniversary in 2025. DE-CIX offers its interconnection services in 60 locations in Europe, Africa, North and South America, the Middle East, and Asia. Today, accessible from data centers in over 600 cities world-wide, DE-CIX interconnects thousands of network operators (carriers), Internet service providers (ISPs), content providers and enterprise networks from more than 100 countries, and offers peering, cloud, and AI connectivity, and other interconnection services. DE-CIX Frankfurt is one of the largest Internet Exchanges in the world, with a data volume of over 45 Exabytes per year (as of 2024) and close to 1100 connected networks. Close to 250 colleagues from over 35 different nations form the foundation of the DE-CIX success story in Germany and around the world. Since the beginning of the commercial Internet, DE-CIX has had a decisive influence – in a range of leading global bodies, such as the Internet Engineering Task Force (IETF) – on co-defining guiding principles for the Internet of the present and the future. As the operator of critical IT infrastructure, DE-CIX bears a great responsibility for the seamless, fast, and secure data exchange between people, enterprises, and organizations at its locations around the globe.
Further information at www.de-cix.net

The DLR at a glance

The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) is Germany’s national research and technology centre for aeronautics, space, energy, transport, security and defence. DLR’s work spans a wide range of applications, delivering results and innovations that benefit industry and business, government agencies and the public sector. At the heart of DLR’s mission is its commitment to society, which it fulfils through extensive knowledge sharing and targeted technology transfer. Therefor it is funded through federal resources. The German Space Agency at DLR is responsible for planning and implementing German space activities on behalf of the federal government. Additionally, two project management agencies at DLR manage research and industrial funding programmes.

Earth’s climate is changing, along with global mobility and technology. DLR harnesses the expertise of its 51 research institutes and facilities to develop solutions to these challenges. All 11,000 employees share a common mission: to explore Earth and space while developing technologies for a sustainable future. DLR’s technologies are not confined to the laboratory, but are transferred to wider society, strengthening Germany’s position as a prime location for research and industrial innovation.

The DLR Institute of Communications and Navigation is dedicated to mission-oriented research in selected areas of communications and navigation. Its work ranges from the theoretical foundations to the demonstration of new procedures and systems in a real environment and is embedded in DLR's Space, Aeronautics, Transport, Security and Digitalization programmes. The Institute currently employs around 255 staff, including about 190 scientists at the locations Oberpfaffenhofen and Neustrelitz and Aachen-Merzbrück.

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