The *ITU Journal on Future and Evolving Technologies (ITU J-FET)* is an international journal providing complete coverage of all communications and networking paradigms, free of charge for both readers and authors. The ITU Journal considers yet-to-be-published papers addressing fundamental and applied research. It shares new techniques and concepts, analyses and tutorials, as well as learning from experiments and physical and simulated testbeds. It also discusses the implications of the latest research results for policy and regulation, legal frameworks, the economy and society. This publication builds bridges between disciplines, connects theory with application, and stimulates international dialogue. Its interdisciplinary approach reflects ITU's comprehensive field of interest and explores the convergence of ICT with other disciplines. The ITU Journal welcomes submissions at any time, and on any topic within its scope.

Special issue on
Space computing and space AI
Call for papers

Space computing and space Artificial Intelligence (space AI) are emerging as foundational technologies for next-generation space systems and space-ground integrated networks. Space computing extends cloud-edge computing paradigms into space environments, enabling distributed processing across satellites, high-altitude platforms, space stations and ground infrastructures. Space AI further enhances these systems by enabling autonomous perception, decision-making and control for complex space missions. Together, they provide the computational and intelligent backbone for applications such as satellite constellations, space situational awareness, deep-space exploration, Earth observation, space robotics and space-air-ground integrated networks.

Recent advances in large-scale satellite constellations, inter-satellite networking and onboard intelligence have highlighted both the opportunities and challenges of space computing and space AI. Space systems must process heterogeneous, high-volume data streams from remote sensing instruments, navigation payloads, scientific sensors and communication networks under extreme constraints of power, bandwidth, latency and reliability. AI models deployed in space must be efficient, robust and adaptive, combining physics-based models with data-driven and hybrid learning approaches, and supporting online learning, federated learning and collaborative inference across distributed space-ground resources. At the same time, computation, communication and control must be tightly coordinated across space, air and ground segments to enable real-time or near-real-time services.

As space infrastructures become more autonomous and intelligent, critical issues arise in system architecture, resource orchestration, resilience, security, privacy and trust. Space AI systems must operate reliably in harsh environments, tolerate faults and radiation, and ensure safe and explainable decision-making for mission-critical tasks. Clear performance and quality metrics are needed, such as computing efficiency, inference latency, energy consumption, model accuracy, autonomy level, coordination overhead and recovery time. In addition, standardization, interoperability and governance will play a key role in enabling large-scale deployment of space computing and space AI across international and multi-vendor ecosystems.

This special issue on space computing and space AI invites contributions that address these challenges for space information networks and intelligent space systems. We welcome original research papers, surveys and position papers on architectures, platforms and algorithms for space computing and space intelligence, as well as experimental platforms, testbeds, simulations and real deployments. Interdisciplinary studies linking space systems with communications, networking, robotics, remote sensing, autonomous systems and policy are particularly encouraged.

Suggested topics (but not limited to):

Infrastructure	• Space-borne hardware • Space-based distributed operating system
Space-based AI architecture	• AI computing units • In-space edge computing and processing of data
Space-based AI models	• Model compression technique • Autonomous decision-making • Autonomous anomaly detection • Embodied AI model • Foundational models and LLMs for earth observation
Remote sensing	• High-resolution image segmentation, object detection, and change detection • On-orbit analysis of multispectral, hyperspectral and SAR data

Keywords
Space computing, space AI, on-orbit computing, space–air–ground integrated network, distributed AI, federated learning, autonomous satellites, inter-satellite networks, Earth observation, space situational awareness, resource orchestration, resilience, security, trust, standardization, testbeds

Deadlines extended
Paper submission: 4 May 2026
Paper acceptance notification: 15 June 2026
Camera-ready paper submission: 15 July 2026

Paper submission
This special issue calls for original scientific papers. Submitted papers should not be under consideration for publication elsewhere. Submissions must be made electronically using ScholarOne Manuscripts at: https://mc04.manuscriptcentral.com/itujournal, where templates and guidelines are also available.

Publication
Papers will be published in the ITU digital library.

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