Russian Academy of Sciences

IAA · International Academy of Astronautics

RUDN university

TECHNICAL PROGRAM

7th SciTech Forum

on Space Engineering and Operations Support

NOVEMBER 24-26, 2026



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ABOUT THE FORUM

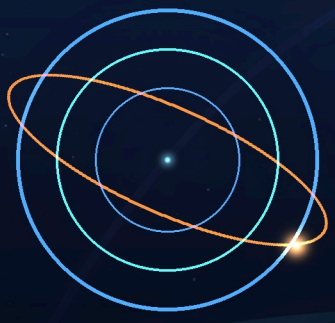
Welcome to Moscow

The 7th SciTech Forum on Space Engineering and Operations Support takes place on November 24–26, 2026 at RUDN University, Moscow. The Forum is organized by the Russian Academy of Sciences, the International Academy of Astronautics and RUDN University.

Hybrid format: on-site and online.
Working languages: English, Russian (simultaneous translation)

FORUM IN NUMBERS

40+ countries	**300+** participants	**170+** papers
3 roundtable meetings	**26** highlight lectures	**16** technical sessions



SPECIAL GUEST

Aarti Holla-Maini

Director, United Nations Office for Outer Space Affairs (UNOOSA)

Russian Academy of Sciences

RUDN university

TECHNICAL PROGRAM

7th SciTech Forum

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CONTENTS

01 **Plenary Sessions** 2

02 **Roundtable Meetings** 5

- RT1 Global Governance of Outer-Space Activities: COPUOS Agenda 5
- RT2 International Space Research and Education Cooperation: New Challenges 6
- RT3 Global Engineering the Orbital Grid: Technical and Economic Challenges in Space Solar Energy 7

03 **Highlight Lectures** 8

04 **Technical Sessions** 13

- TS1 Space Flight Mechanics 1 13
- TS2 Spacecraft Materials & Structures 1 13
- TS3 Space Architecture & Habitats 1 13
- TS4 Space Policy, Law & Economics 1 13
- TS5 Spaceports, Ground Infrastructure & Operations 1 14
- TS6 Solar System Exploration 14
- TS7 Space Power & Propulsion 14
- TS8 Earth Observations 1 14
- TS9 Small Satellites, Space Sensors & Actuators 1 14
- TS10 Spaceports, Ground Infrastructure & Operations 2 14
- TS11 Space Flight Mechanics 2 13
- TS12 Spacecraft Materials & Structures 2 13
- TS13 Space Architecture & Habitats 2 13
- TS14 Small Satellites, Space Sensors & Actuators 2 14
- TS15 Earth Observations 2 14
- TS16 Space Policy, Law & Economics 2 13

05 **Speakers, Moderators & Chairs** 15

NOVEMBER 24–26 · HALL GALAXY

Plenary Sessions

Place: Hall Galaxy

TUE November 24 TUESDAY

08:00 – 10:00 **Registration**
6, Miklukho-Maklaya Str. Moscow, RUDN University, main building

PLENARY SESSION 1 Moderator – **Yury Razoumny**, RUDN University, Russia

10:00 – 11:30 **Opening Ceremony**

- Yulia Ebzeeva, First Vice-Rector – Vice-Rector for Education, Acting Rector of RUDN University, Russia
- Aarti Holla-Maini, Director of UNOOSA, Austria
- Sergey Chernyshev, Vice President of the Russian Academy of Sciences, Russia
- Sergey Ryabkov, Deputy Minister, Ministry of Foreign Affairs of the Russian Federation, Russia
- Sergey Saveliev, Deputy General Director of State Corporation "Roscosmos", Russia
- Jean-Michel Contant, General Secretary of International Academy of Astronautics, France (online)
- Yury Razoumny, Director of Engineering Academy of RUDN University, Chair of International Program Committee of SciTech Forum

11:30 – 13:30 **Meeting with Aarti Holla-Maini, Director of UNOOSA, Austria (by invitation only)**

PLENARY SESSION 2 Moderator – **Meena Laad**, Symbiosis Institute of Technology, India

11:30 – 12:00 HL 1 **Science Fiction, Science, Technology & Spaceflight**
Giancarlo Genta, Polytechnic University of Turin, Italy ABSTRACT p.8 →

12:00 – 12:30 HL 2 **The International Cislunar CubeSat Constellation (C3) Project and Its 12U Micro Satellite Prototype Platform Development**
Shufan Wu, Shanghai Jiao Tong University, China ABSTRACT p.8 →

12:30 – 13:30 Lunch (MOON VILLAGE HALL)

13:30 – 15:00 ROUNDTABLE MEETING 1 DETAILS p.5 →
Global Governance of Outer-Space Activities: COPUOS Agenda
Moderator: **Aarti Holla-Maini**, Director of UNOOSA, Austria

15:00 – 15:45 **Meeting of RUDN and MGIMO students with Director of UNOOSA Aarti Holla-Maini**
(RUDN Space Mission Control Center, by invitation only)

PLENARY SESSION 3 Moderator – **Ravinder Rena**, Durban University of Technology, Republic of South Africa

15:00 – 15:30 HL 3 **Quantifying the Economic Multiplier Effect of Indigenous Satellite Data: A Case Study of the NigeriaSat Fleet in National Development**
Francis Chizea, National Space Research and Development Agency, Federal Republic of Nigeria ABSTRACT p.8 →

15:30 – 16:00 HL 4 **Design and Optimization of Small Satellite Constellations for Different Applications**
Antonio Prado, National Institute for Space Research, Brazil ABSTRACT p.8 →

16:00 – 16:30 **HL 5** **Position Statement of the International Academy of Astronautics on the "Declaration of Principles Concerning the Conduct of the Search for Extraterrestrial Intelligence (SETI): 2026 Update"**
Leslie Tennen, Sterns and Tennen, USA ABSTRACT p.9 →

16:30 – 17:00 **HL 6** **Space at a Crossroads: Operating Sustainably in Space through Decisions, Cooperation, and Shared Responsibilities**
Bocar Ba, World Space Sustainability Association, President, UAE ABSTRACT p.9 →

WED November 25 WEDNESDAY

PLENARY SESSION 4 Moderator – **Renuganth Varatharajoo**, Universiti Putra Malaysia, Malaysia

10:00 – 11:30 ROUNDTABLE MEETING 2 DETAILS p.6 →
International Space Research and Education Cooperation: New Challenges
Moderator: **Ravinder Rena**, Durban University of Technology, Republic of South Africa

11:30 – 12:00 **HL 7** **Neuro-Symbolic AI for Space Exploration and Applications**
Ketan Kotecha, Symbiosis Institute of Technology, India ABSTRACT p.9 →

12:00 – 12:30 **HL 8** **Self-Learning Fuzzy Control for Satellite Attitude Regulation**
Renuganth Varatharajoo, Universiti Putra Malaysia, Malaysia ABSTRACT p.9 →

12:30 – 13:00 **HL 9** **Space-Based Technology Integration on Indian Development Programmes**
Tarun P. Singh, Symbiosis Institute of Geoinformatics, India ABSTRACT p.9 →

13:00 – 14:00 Lunch (MOON VILLAGE HALL)

PLENARY SESSION 5 Moderator – **Shufan Wu**, Shanghai Jiao Tong University, China

14:00 – 14:30 **HL 10** **Enhancing Agricultural Resilience in Southern Africa through Satellite-Based CropWatch Monitoring**
Emmanuel Mashonjowa, University of Zimbabwe, Zimbabwe ABSTRACT p.10 →

14:30 – 15:00 **HL 11** **From Vision to Orbit: DIT's Journey in Advancing Tanzania's National Space Programme**
Petro Ernest Pesha, Dar es Salaam Institute of Technology, Tanzania ABSTRACT p.10 →

15:00 – 15:30 **HL 12** **An Analysis of the Economic and Strategic Impact of Africa's Skewed Historic Narrative in Space Innovations and Applications**
Doreen Agaba, Ministry of Science, Republic of Uganda ABSTRACT p.10 →

15:30 – 16:00 **HL 13** **Lightweight Polymer Composites for Next-Generation Space Systems**
Meena Laad, Symbiosis Institute of Technology, India ABSTRACT p.10 →

16:00 – 16:30 **HL 14** **Integration of Artificial Intelligence and Space Technology in India: Emerging Developments, Applications and Future Prospects**
Narendra S. Chaudhari, Assam Science and Technology University, India ABSTRACT p.10 →

16:30 – 17:00 **HL 15** **Tree Ensembles Outperform Deep Learning for Label-Scarce Winter Wheat Mapping: Evidence from Planet-NICFI Time Series in Zimbabwe**
Davis Shekede, Zimbabwe National Geospatial and Space Agency, Zimbabwe ABSTRACT p.10 →

17:00 – 17:30 **HL 16** **Staged Mission Planning for Gradual Deployment of Multipurpose Digital Sky Megaconstellation**
Dmitry Monakhov, L5 Ltd., Russia ABSTRACT p.11 →

THU November 26 THURSDAY

PLENARY SESSION 6 Moderator – **Antonio Prado**, National Institute for Space Research, Brazil

10:00 – 10:30 **HL 17** **Pulsating and Oscillating Flows on Spiked Blunt Bodies with Various Forebody Bulges and Spikes at Supersonic Speed**
Sudip Das, Birla Institute of Technology, India ABSTRACT p.11 →

10:30 – 11:00 **HL 18** **Space Technology for Societal Benefits**
Prakash Chauhan, Indian National Space Promotion and Authorization Centre, India ABSTRACT p.11 →

11:00 – 11:30 **HL 19** **From NewSpace to Deep-Space Consortia: A New Economic Model of Cooperation in Far-Space Exploration**
Maria Ulyanova, Institute of Oriental Studies of the Russian Academy of Sciences, Russia ABSTRACT p.11 →

11:30 – 12:00 **HL 20** **International Virtual Observatory**
Oleg Malkov, Institute of Astronomy of the Russian Academy of Sciences, Russia ABSTRACT p.11 →

12:00 – 12:30 **HL 21** **The Foundation of International Space Law and the Challenge of Space Sustainability**
Narkhanim Orujova, Space Agency of the Republic of Azerbaijan, Azerbaijan ABSTRACT p.11 →

12:30 – 13:00 **HL 22** **Investment in Space: Accelerating Global Space Technology**
Ray Zimmerman, Global Investment Administration, USA ABSTRACT p.12 →

13:00 – 14:00 Lunch (MOON VILLAGE HALL)

PLENARY SESSION 7 Moderator – **Tarun P. Singh**, Symbiosis Institute of Geoinformatics, India

14:00 – 14:30 **HL 23** **Beyond the Rocket Equation: the Spin-Density Model as a Physical Basis for Future Space Capabilities**
Yury Razoumny, RUDN University, Russia ABSTRACT p.12 →

14:30 – 15:00 **HL 24** **Legacy of “Intercosmos” Association and Modern International Cooperation in Space Science**
Anatoli Petrukovich, Space Research Institute of the Russian Academy of Sciences, Russia ABSTRACT p.12 →

15:00 – 15:30 **HL 25** **Detailed Study of the GR-Caused Distortions of Quasi-Elliptic Trajectories in the Vicinity of the Sun**
Aleksandr Yefremov, RUDN University, Russia ABSTRACT p.12 →

15:30 – 16:00 **HL 26** **Opportunities and Challenges for Space Solar Systems**
John Mankins, Artemis Innovation Management Solutions, USA ABSTRACT p.12 →

16:00 – 17:30 ROUNDTABLE MEETING 3 DETAILS p.7 →
Global Engineering the Orbital Grid: Technical and Economic Challenges in Space Solar Energy
Moderator: **Vyacheslav Sinyugin**, Professor of Russian Presidential Academy of National Economy and Public Administration, Russia

ROUNDTABLE MEETING 1 · HALL GALAXY

Global Governance of Outer-Space Activities: COPUOS Agenda

Place: Hall Galaxy

TUESDAY, NOVEMBER 24 | 13:30 - 15:00

MODERATOR

Aarti Holla-Maini
Director of UNOOSA, Austria

SPEAKERS

Sergey Chernyshev
Vice President of the Russian Academy of Sciences, Academician of the Russian Academy of Sciences, Russia

Sergei Belousko
Ministry of Foreign Affairs of the Russian Federation, Head of Russian Delegation at UNOOSA, Russia

Vasily Gudnov
Head of Department, State Corporation “Roscosmos”, Russia

Anatoli Petrukovich
Director of Space Research Institute of the Russian Academy of Sciences, Academician of the Russian Academy of Sciences, Russia

Antonio Prado
Deputy Director of National Institute for Space Research, Republic of Brazil

Francis Chizea
Deputy Director of National Space Research and Development Agency, Federal Republic of Nigeria

Painos Gweme
Director of Zimbabwe National Geospatial and Space Agency, Republic of Zimbabwe

Narkhanim Orujova
Space Agency of the Republic of Azerbaijan, Republic of Azerbaijan

Yury Razoumny
Director of Engineering Academy of RUDN University, Chair of International Research Cooperation at Space Council of the Russian Academy of Sciences, Chair of International Program Committee of SciTech Forum, Russia

DESCRIPTION

The roundtable discusses the evolution of global space governance in the context of the current agenda of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS). The rapid growth of satellite mega-constellations, the entry of new spacefaring nations and private operators, and the return to the Moon challenge the international community to keep outer space safe, secure and sustainable. Participants will address the implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities, space debris mitigation and space traffic coordination, frameworks for space resource activities and the role of national space legislation. Special attention will be paid to capacity building and access to space for developing countries, cooperation within BRICS and with African space agencies, and ways to strengthen the dialogue between governments, space agencies, academia and industry in shaping the rules of the new space age.

ROUNDTABLE MEETING 2 · HALL GALAXY

International Space Research and Education Cooperation: New Challenges

Place: Hall Galaxy

WEDNESDAY, NOVEMBER 25 | 10:00 - 11:30

MODERATOR

Ravinder Rena
Durban University of Technology, Republic of South Africa

SPEAKERS

Lorant Czaran
Chief of Space Application Section, UNOOSA, Austria

Svetlana Agasieva
Deputy Director of Engineering Academy of RUDN University, Russia

Doreen Agaba
Head of Space Office, Ministry of Science, Republic of Uganda

Adolf Mkenda Faustine
Minister, Ministry of Education, Science and Technology, Tanzania

Tarun P. Singh
Symbiosis Institute of Geoinformatics, India

Oleg Malkov
Institute of Astronomy of the Russian Academy of Sciences, Russia

Antonio Prado
Deputy Director of National Institute for Space Research, Brazil

Emmanuel Mashonjowa
University of Zimbabwe, Zimbabwe

Augustine Amadikwa Uwakwe
Vice Chancelor, Gregory University Uturu, Federal Republic of Nigeria

Catherine Wangari Kuria
General Manager of Skylinks International Holdings, Republic of Kenya

DESCRIPTION

The roundtable focuses on how international cooperation in space research and education can respond to the challenges of a rapidly changing space sector. The growing number of emerging space nations, the demand for qualified engineers and scientists, and the expanding use of space data for sustainable development call for new models of academic partnership. Participants will discuss joint educational programmes and double degrees, student satellite and CubeSat projects, shared ground infrastructure and open access to space data, as well as the role of universities, space agencies and international organizations in capacity building. Attention will be given to the contribution of space technologies to raising living standards and economic development in developing countries: satellite services for agriculture, food and water security, disaster risk reduction, telemedicine and distance education in remote areas, digital connectivity, and the creation of high-tech jobs and national space industries through education and research partnerships.

ROUNDTABLE MEETING 3 · HALL GALAXY

Global Engineering the Orbital Grid: Technical and Economic Challenges in Space Solar Energy

Place: Hall Galaxy

THURSDAY, NOVEMBER 26 | 16:00 - 17:30

MODERATOR

Vyacheslav Sinyugin
Professor of Russian Presidential Academy of National Economy and Public Administration, Russia

SPEAKERS

Alexandr Sigov
President of MIREA – Russian Technological University, Academician of the Russian Academy of Sciences, Russia

John Mankins
President of Artemis Innovation Management Solutions, USA

Yury Razoumny
Director of Engineering Academy of RUDN University, Russia

Renuganth Varatharajoo
Vice-Rector of Universiti Putra Malaysia, Malaysia

Shufan Wu
Dean of the School of Aeronautics and Astronautics, Shanghai Jiao Tong University, China

Preksedis M. Ndomba
Rector of the Dar es Salaam Institute of Technology, Tanzania

Ketan Kotecha
Dean of Faculty of Engineering, Symbiosis Institute of Technology, India

Igor Shakhray
General Director of Unigreen Energy, Russia

Eugeniy Terukov
Ioffe Physical-Technical Institute of the Russian Academy of Sciences, Russia

Nikolay Evtikhiev
President of VPG LaserONE, Russia

DESCRIPTION

The roundtable addresses space-based solar power as a source of clean, continuous energy and the engineering and economic challenges of building an orbital power grid. Recent in-orbit demonstrations of wireless power transmission, progress in lightweight photovoltaics and falling launch costs have moved space solar energy from concept towards realistic national roadmaps. Participants will discuss architectures of large orbital power stations and their in-space assembly, microwave and laser power beaming, ground receiving infrastructure, safety and spectrum regulation, as well as life-cycle costs, investment models and public-private partnerships. The discussion will also consider power beaming for lunar bases, satellites and remote areas on Earth, and prospects for international cooperation in creating a global orbital energy infrastructure.

HALL GALAXY

Highlight Lectures

Place: Hall Galaxy

TUE November 24 TUESDAY

01 HL

Science Fiction, Science, Technology & Spaceflight

11:30 - 12:00 HALL GALAXY

Giancarlo Genta · Polytechnic University of Turin, Italy

Space exploration and colonization are common themes in science fiction novels, movies, TV series, cartoons and video games. These works have motivated many young people to pursue STEM studies, but they also tend to trivialize real technological achievements and make them seem obvious. In some cases, ideas from science fiction have inspired scientists to introduce new technologies. Yet the main value of science fiction is not predicting technological innovations, but exploring how such advances can influence human lives and behavior.

02 HL

The International Cislunar CubeSat Constellation (C3) Project and Its 12U Micro Satellite Prototype Platform Development

12:00 - 12:30 HALL GALAXY

Shufan Wu · Shanghai Jiao Tong University, China

The International Cislunar CubeSat (C3) project is a pioneering grand science program initiated by the Deep Space Exploration Laboratory (DSEL), International Deep Space Exploration Association (IDSEA) and supported by the Asia-Pacific Space Cooperation Organization (APSCO). It consists of 30 standard 12U CubeSats and 4 small satellites of 200kg class for lunar resource exploration. It calls for multiple national participation to share the exploration results. This report will brief the C3 project scope and status, and present its 12U CubeSat platform prototype design and development status, including its system configuration and subsystem design and engineering implementation.

03 HL

Quantifying the Economic Multiplier Effect of Indigenous Satellite Data: A Case Study of the NigeriaSat Fleet in National Development

15:00 - 15:30 HALL GALAXY

Francis Chizea · National Space Research and Development Agency, Federal Republic of Nigeria

Data from the NigeriaSat Earth observation satellites (NigeriaSat-1, NigeriaSat-2 and NigeriaSat-X) have supported major national and international socioeconomic, environmental and infrastructure projects across Nigeria. These datasets, available at short revisit intervals, have saved the country millions of dollars otherwise spent on buying data from foreign partners. They have also helped Nigeria build one of Africa's largest capacities in satellite data acquisition, handling and processing. This lecture focuses on the socioeconomic benefits Nigeria has derived from the NigeriaSat fleet and its data.

04 HL

Design and Optimization of Small Satellite Constellations for Different Applications

15:30 - 16:00 HALL GALAXY

Antonio Prado · National Institute for Space Research, Brazil

Small satellite constellations offer flexible, cost-effective solutions for Earth observation, communication and monitoring. This presentation explores the design, orbital dynamics and optimization of constellations for various mission objectives. Particular attention is given to regional coverage of the Brazilian Amazon, the entire Brazilian territory and Colombia, involving challenges in orbit selection, satellite distribution, revisit times and coverage optimization. Constellations supporting air traffic monitoring and control, which require continuous coverage and reliable communication, are also investigated. The relationship between the number of satellites, orbital parameters, coverage performance and mission cost is discussed, showing how constellation design can meet diverse operational needs.

05 HL

Position Statement of the International Academy of Astronautics on the "Declaration of Principles Concerning the Conduct of the Search for Extraterrestrial Intelligence (SETI): 2026 Update"

16:00 - 16:30 HALL GALAXY

Leslie Tennen · Sterns and Tennen, USA

In 2022 the IAA SETI Committee established a Task Group to update the Post-Detection Protocols, making them relevant to the realities of twenty-first century science, media, and public engagement. The new Declaration of Principles Concerning the Conduct of the Search for Extraterrestrial Intelligence (SETI) – 2026 Update was approved by the IAA SETI Committee and unanimously approved by the Board of Trustees and made a Position Paper of the Academy. This presentation reviews the new Declaration and addresses concurrent work towards best practices guidelines / supplementary guidance and future work including rebooting the Post-Detection Sub-Committee within the IAA SETI Committee.

06 HL

Space at a Crossroads: Operating Sustainably in Space through Decisions, Cooperation, and Shared Responsibilities

16:30 - 17:00 HALL GALAXY

Bocar Ba · World Space Sustainability Association, President, UAE

Orbit is no longer an empty void but a finite, shared environment on which navigation, communications, finance and disaster response depend. In 2025 alone, more than 4,400 satellites were deployed, bringing the operational population above 14,000. This rapid industrialisation of low Earth orbit is colliding with governance frameworks designed for a slower era. Space sustainability extends beyond debris to re-entry impacts, interference with astronomy, spectrum and orbital resources, resilience of critical services and equitable access. The lecture makes the case for a multi-stakeholder platform, the World Space Sustainability Association, as a standing table for shared positions and collective action.

WED November 25 WEDNESDAY

07 HL

Neuro-Symbolic AI for Space Exploration and Applications

11:30 - 12:00 HALL GALAXY

Ketan Kotecha · Symbiosis Institute of Technology, India

Neuro-Symbolic AI combines deep learning with symbolic reasoning to enable intelligent, explainable, and autonomous space systems. This talk explores its applications in space exploration, satellite operations, planetary exploration, spacecraft autonomy, space situational awareness, and anomaly detection. By integrating data-driven intelligence with scientific knowledge and physical constraints, Neuro-Symbolic AI can enhance mission reliability, autonomous decision-making, and the safety of future space missions.

08 HL

Self-Learning Fuzzy Control for Satellite Attitude Regulation

12:00 - 12:30 HALL GALAXY

Renuganth Varatharajoo · Universiti Putra Malaysia, Malaysia

Precise attitude control is essential for satellite missions under unknown disturbances such as gravitational perturbations, solar radiation pressure and aerodynamic drag. This study applies fuzzy control enhanced by reinforcement learning to stabilize satellites using fluid wheels. The architecture combines an event-triggered fuzzy controller, which updates control only when an error threshold is exceeded and adapts its gains incrementally, a self-tuning fuzzy controller that refines its rules online, fuzzy sliding mode control that reduces chattering, and a neural actor-critic agent that optimizes sliding-surface parameters. Numerical simulations show pointing accuracy of about 0.0001 degrees in the presence of unknown disturbances.

09 HL

Space-Based Technology Integration on Indian Development Programmes

12:30 - 13:00 HALL GALAXY

Tarun P. Singh · Symbiosis Institute of Geoinformatics, India

Space-based technologies, particularly satellite remote sensing, GIS and geospatial analytics, have become critical enablers of India's development planning, resource management and governance. The lecture examines how space-based information is integrated into major Government of India programmes such as PM Gati Shakti, SVAMITVA, NAKSHA, FASAL, PMAY-G and watershed development, supporting infrastructure, rural transformation, agriculture, urban planning, water resources and disaster management. Satellite imagery, drone mapping and GIS platforms enable spatial planning, asset geotagging, crop forecasting and land-record modernisation. Geospatial intelligence also improves public expenditure efficiency, transparency and climate resilience, supporting evidence-based policymaking for inclusive and sustainable development.

10 HL

Enhancing Agricultural Resilience in Southern Africa through Satellite-Based CropWatch Monitoring

14:00 – 14:30 HALL GALAXY

Emmanuel Mashonjowa · University of Zimbabwe, Zimbabwe

Agricultural systems across Southern Africa are increasingly vulnerable to droughts, erratic rainfall and flooding, especially for rain-fed smallholder farmers. The lecture examines deployment, operational efficacy and socio-economic impact of CropWatch, developed by the Aerospace Information Research Institute of the Chinese Academy of Sciences and localized through regional partnerships. CropWatch combines multi-source Earth observation data and cloud computing with ground truth from the GPS-Video-GIS surveying system. Drawing on experience in Zimbabwe, Zambia and Mozambique, the lecture shows how open-access platforms, training and SMS advisories strengthen climate adaptation and food sovereignty, and how to overcome barriers of connectivity, data-processing capacity and funding.

11 HL

From Vision to Orbit: DIT's Journey in Advancing Tanzania's National Space Programme

14:30 – 15:00 HALL GALAXY

Petro Ernest Pesha · Dar es Salaam Institute of Technology, Tanzania

This Highlight Lecture traces Tanzania's journey from a national vision for space technology to practical preparations for a satellite mission. It examines how the Dar es Salaam Institute of Technology (DIT) is turning that vision into action through joint degree programmes with RUDN University, applied research and hands-on training. Through the UNOOSA–JAXA KiboCUBE programme, DIT is developing TanzaniteSat-1, a CubeSat designed to track boundary beacons in game reserves and collect environmental data. The lecture also explains how ground station development builds local capacity for mission operations and how satellite data could support biodiversity conservation, agriculture, climate response and land-use planning.

12 HL

An Analysis of the Economic and Strategic Impact of Africa's Skewed Historic Narrative in Space Innovations and Applications

15:00 – 15:30 HALL GALAXY

Doreen Agaba · Ministry of Science, Republic of Uganda

This lecture presents a collection and analysis of space technologies and applications on the African continent from 1900 to 2000, covering infrastructure, treaties, innovations, launches, patents and indigenous space knowledge. Africa's historical contribution to space science and technology remains unrecognized. Correcting this narrative is critical as the world enters a new space age: a corrected African identity in space is a key tool for building a meaningful African space economy. The study analyses the legal, strategic and economic impact of the skewed narrative, which can lead to flawed space implementation plans and low uptake of space services, and offers recommendations.

13 HL

Lightweight Polymer Composites for Next-Generation Space Systems

15:30 – 16:00 HALL GALAXY

Meena Laad · Symbiosis Institute of Technology, India

Spacecraft materials must withstand extreme thermal cycling (−150 °C to +120 °C), atomic oxygen, radiation, vacuum and micrometeoroids, while every kilogram raises launch cost. This work presents a lightweight hybrid nanocomposite film of PVDF reinforced with graphite nanoparticles and multiwalled carbon nanotubes, produced by ultrasonication and solution casting. FTIR, XRD, FESEM and EDS confirmed filler–matrix interaction, a uniform CNT network and oxidation-free processing. Comparable PVDF/carbon composites show degradation onset rising from 425 °C to 451–461 °C and nearly doubled storage modulus over the orbital temperature range, making the hybrid promising for satellite panels, thermal management and smart aerospace structures.

14 HL

Integration of Artificial Intelligence and Space Technology in India: Emerging Developments, Applications and Future Prospects

16:00 – 16:30 HALL GALAXY

Narendra S. Chaudhari · Assam Science and Technology University, India

Integrating Artificial Intelligence with space technology is becoming a key driver of innovation in India's space sector. Examples include AI-enabled electronic intelligence microsatellites (Technology Development Board with Astrome Technologies), the Pixxel–Sarvam AI orbital data centre for in-orbit hyperspectral processing, Chandrayaan-3's hazard detection and Pragyan rover autonomous navigation, and Gaganyaan's humanoid robot Vyommitra. Supported by IN-SPACe, startups and academia are advancing edge AI, onboard data processing and geospatial analytics. AI applied to satellite data also benefits agriculture, weather and climate monitoring, disaster management and urban planning. With continued investment and collaboration, India can strengthen its global position in space technology.

15 HL

Tree Ensembles Outperform Deep Learning for Label-Scarce Winter Wheat Mapping: Evidence from Planet-NICFI Time Series in Zimbabwe

16:30 – 17:00 HALL GALAXY

Davis Shekede · Zimbabwe National Geospatial and Space Agency, Zimbabwe

Mapping winter wheat in Zimbabwe is constrained by scarce labelled training data, and map accuracy is judged on held-out polygons. We compared two deep learning classifiers (BiLSTM and CNN-LSTM) with two tree ensembles (Random Forest and CatBoost) in Mashonaland West, using Planet-NICFI time series and label budgets from 5 polygons per class group to all 1,028. The tree ensembles matched or exceeded the networks at every budget. On 1,400 stratified random reference points, their maps reached user's accuracy of 0.90 and 0.82 against 0.53–0.57 for the networks. Polygon-based validation can hide large commission errors that only area-weighted reference samples reveal.

16 HL

Staged Mission Planning for Gradual Deployment of Multipurpose Digital Sky Megaconstellation

17:00 – 17:30 HALL GALAXY

Dmitry Monakhov · L5 Ltd., Russia

Global transportation infrastructure accounts for about 40% of the value of global infrastructure, while space activity accounts for only about 3%. As the global economy may grow fourfold within 25–40 years, at least a quarter of it could rely on space assets, driving rapid constellation deployment. This calls for new forms of participation, not only for megacorporations but also for medium-sized players and emerging space nations, with a sustainable revenue model from the first 10–30 satellites: remote sensing, IoT, navigation, situational awareness and connectivity. The lecture outlines staged growth towards a 10,000+ satellite constellation for the economy of the 2040s.

THU November 26 THURSDAY

17 HL

Pulsating and Oscillating Flows on Spiked Blunt Bodies with Various Forebody Bulges and Spikes at Supersonic Speed

10:00 – 10:30 HALL GALAXY

Sudip Das · Birla Institute of Technology, India

Aerodynamic spikes ahead of blunt bodies reduce pressure drag at supersonic and hypersonic speeds by weakening the shock system and creating a shielding recirculation zone, but they make the flow unstable. Two instability types occur: violent, low-frequency pulsation of the shock system, and smaller-amplitude oscillation with a steady recirculation zone. This study examines a flat-faced cylindrical forebody with sharp spikes of L/D 0.5, 1.0 and 1.75 at Mach 2.0. Strong pulsation appears at L/D 0.5 and 1.0, depending on spike geometry; at L/D 1.75 it turns into oscillation, explained by Kenworthy's shear-layer hypothesis. Forebody bulges influence the fluctuations.

18 HL

Space Technology for Societal Benefits

10:30 – 11:00 HALL GALAXY

Prakash Chauhan · Indian National Space Promotion and Authorization Centre, India

India's space programme has emphasized using space technology for national development and societal benefit. Over six decades ISRO has built indigenous capabilities in Earth observation, satellite communication and navigation. Remote sensing and geospatial technologies support agriculture, water management, environmental conservation, urban planning and disaster risk reduction, using satellites such as Resourcesat, RISAT-1A, NISAR and NavIC. Initiatives like the Bhuvan geoportal and the National Database for Emergency Management widen access to geospatial information. The talk highlights India's achievements and operational applications, discusses emerging opportunities from AI, cloud computing and high-resolution observation, and outlines directions towards an inclusive, resilient and sustainable India.

19 HL

From NewSpace to Deep-Space Consortia: A New Economic Model of Cooperation in Far-Space Exploration

11:00 – 11:30 HALL GALAXY

Maria Ulyanova · Institute of Oriental Studies of the Russian Academy of Sciences, Russia

Near space has shifted to a commercial NewSpace paradigm, while far space remains dominated by state agencies. This paper proposes a hybrid cooperation model that replaces legacy national programmes with transboundary consortia: the state acts as anchor tenant, private capital provides agility, and international partners share infrastructure, risk and data, in compliance with Article II of the Outer Space Treaty. Three pillars are identified: anchor demand mechanisms, interoperable open-access infrastructure and innovative risk-pooling finance. Concepts of "functional sovereignty" and "registered operator zones" allow private participation without national appropriation. Far-space leadership belongs to those building the most inclusive cooperation architecture.

20 HL

International Virtual Observatory

11:30 – 12:00 HALL GALAXY

Oleg Malkov · Institute of Astronomy of the Russian Academy of Sciences, Russia

The talk deals with the implementation of an international astronomy project, the Virtual Observatory (VO), whose principal idea is to make all the world's astronomical data transparently available from one's desktop. VO standards are now mature and underpin data discovery, usage and interoperability at most major observatories; new facilities are being built with these standards fully integrated. The VO enables excellence through interoperability of services and data exchange. The talk gives an overview of the importance of the VO to the modern observatory, highlighting its successes and discussing upcoming challenges.

21 HL

The Foundation of International Space Law and the Challenge of Space Sustainability

12:00 – 12:30 HALL GALAXY

Narkhanim Orujova · Space Agency of the Republic of Azerbaijan, Azerbaijan

This highlight lecture traces the path from the foundational rules of international space law to the practical challenge of keeping orbits usable. The first part outlines the institutional and treaty architecture: the UN Committee on the Peaceful Uses of Outer Space, the UN Office for Outer Space Affairs, the 1967 Outer Space Treaty and the four treaties that followed it. The second part examines how space debris mitigation and space traffic management are governed today through non-binding instruments, including the IADC and COPUOS guidelines, and where gaps between treaty obligations and operational practice remain.

22 HL

Investment in Space: Accelerating Global Space Technology

12:30 – 13:00 HALL GALAXY

Ray Zimmerman · Global Investment Administration, USA

Space is no longer only a domain of government programmes. Private capital now plays a major role in turning new space technologies into working systems and services. The talk discusses how investment shapes the global space economy, from launch services and satellite constellations to in-orbit servicing and lunar infrastructure. Key funding models are reviewed, including venture capital, public–private partnerships and international cooperation. Criteria are outlined that investors use to assess technical maturity and market potential. Ways are proposed to connect research teams, industry and investors and to bring promising technologies faster from the laboratory to orbit.

23 HL

Beyond the Rocket Equation: the Spin-Density Model as a Physical Basis for Future Space Capabilities

14:00 – 14:30 HALL GALAXY

Yury Razoumny · RUDN University, Russia

A principle of motion without mass ejection is presented. For a dumbbell with a flywheel in a central field, it is shown that the orbit can be changed by internal exchange of angular momentum. The principle is extended to the quantum level, where spin acts as a flywheel and thrust is directed perpendicular to the spin. The vacuum is treated as a three-phase medium of spinning carriers, and the Spin-Density Model of space-time is proposed. Newton's law of gravitation and inertia are recovered, and laboratory and astronomical tests are outlined. Implications for propellantless space transport are discussed.

24 HL

Legacy of “Intercosmos” Association and Modern International Cooperation in Space Science

14:30 – 15:00 HALL GALAXY

Anatoli Petrukovich · Space Research Institute of the Russian Academy of Sciences, Russia

The development of exploration programs opens new horizons for international cooperation in space. 2026 marks the 60th anniversary of “Intercosmos”, the special Council of the USSR Academy of Sciences, a unique milestone in cooperation and the peaceful use of outer space. More than 100 robotic spacecraft carried scientific payloads designed by many countries, and cosmonauts from more than ten countries flew in international crews to the Salyut and Mir orbital stations. Scientists built instruments for missions to the Moon, Mars, Venus and Halley's Comet. The lecture reviews modern international cooperation of Russian institutions in space science.

25 HL

Detailed Study of the GR-Caused Distortions of Quasi-Elliptic Trajectories in the Vicinity of the Sun

15:00 – 15:30 HALL GALAXY

Aleksandr Yefremov · RUDN University, Russia

Besides the well-known effects of General Relativity (GR), the trajectory of a space probe near the Sun is subject to further, purely relativistic distortions. The lecture critically analyses the standard calculation of a known GR effect, the secular precession of the quasi-elliptical orbit of a massive body, and highlights new observational aspects. Fundamental theoretical issues are discussed. A computational (tabular) tool is proposed for rapid numerical construction of such trajectories, using an extended time step in the weak-field approximation, and for high-precision analysis of the influence of each relativistic factor on the motion of a space object.

26 HL

Opportunities and Challenges for Space Solar Systems

15:30 – 16:00 HALL GALAXY

John Mankins · Artemis Innovation Management Solutions, USA

Space solar power can collect sunlight in orbit, day and night, and send the energy to the Earth or to users in space. The talk reviews new opportunities created by falling launch costs, modular spacecraft design and progress in wireless power transmission. Applications are discussed, from clean baseload power on the Earth to energy supply for lunar bases and in-space industry. Key challenges are outlined: system mass and cost, in-orbit assembly, transmission efficiency, safety and regulation. A path forward is proposed through staged demonstrations and international cooperation.

5-6 HALLS · PARALLEL SESSIONS

Technical Sessions

Halls Mercury, Mars, Saturn, Pluton and Neptune

Space Flight Mechanics (SFM)

2 SESSIONS

CHAIR Shufan Wu
Shanghai Jiao Tong University, China

CHAIR Vladimir Razoumny
RUDN University, Russia

The session addresses the dynamics, control and mission design of spacecraft: attitude control with intelligent, fuzzy and reinforcement-learning methods, control moment gyroscope steering, tethered systems and solar sails, deorbiting of space debris, station-keeping in very low Earth orbits, formation flying and collision avoidance, as well as low-thrust and impulsive transfers, trajectory optimization, cislunar missions and lunar navigation constellations.

TS 1	WED, NOVEMBER 25	10:00 – 12:45	HALL MERCURY
TS 11	THU, NOVEMBER 26	10:00 – 12:45	HALL MERCURY

Spacecraft Materials & Structures (SMS)

2 SESSIONS

CHAIR Meena Laad
Symbiosis Institute of Technology, India

CHAIR Kazem Reza Kashy Zadeh
RUDN University, Russia

The session is devoted to materials and structures for space applications: titanium alloys produced by additive and SHS technologies, nanoreinforced alloys, shot peening and micro-arc oxidation, fatigue life and residual stresses, functionally graded, polymer, smart and aerogel materials for extreme conditions, as well as the design, optimization and flight validation of spacecraft and launch vehicle structures and lunar surface infrastructure.

TS 2	WED, NOVEMBER 25	10:00 – 13:00	HALL MARS
TS 12	THU, NOVEMBER 26	10:00 – 13:15	HALL MARS

Space Architecture & Habitats (SAH)

2 SESSIONS

CHAIR Petro Ernest Pesha
Dar es Salaam Institute of Technology, Tanzania

CHAIR Ivan Khalil
RUDN University, Russia

The session addresses the architecture of orbital stations and of habitats on the Moon and Mars: artificial gravity stations, inflatable softgoods, membrane and deployable truss structures, reuse of spent upper stages, modular growth and habitability of orbital settlements, interior ergonomics and lighting, as well as lunar base siting, lava tubes as natural shelters, regolith-printed and sulfur-concrete structures, and thermal, radiation and acoustic protection.

TS 3	WED, NOVEMBER 25	10:00 – 13:00	HALL SATURN
TS 13	THU, NOVEMBER 26	10:00 – 13:00	HALL SATURN

Space Policy, Law & Economics (SPLE)

2 SESSIONS

CHAIR Irina Chernykh
RUDN University, Russia

CHAIR Narkhanim Orujova
Space Agency of the Republic of Azerbaijan, Azerbaijan

The session is devoted to the discussion of the complex and increasingly critical intersection of legal frameworks, policy development and economic considerations that govern space activities. It is also focused on governance, regulation and sustainable economic growth in the space sector, protective arrangements around long-term lunar activities, national space legislation and licensing, emerging space economies, human capital for NewSpace, space debris mitigation and the commercialization of space exploration activities.

TS 4	WED, NOVEMBER 25	10:00 – 12:45	HALL PLUTON
TS 16	THU, NOVEMBER 26	10:00 – 12:45	HALL VENUS

Spaceports, Ground Infrastructure & Operations

2 SESSIONS

CHAIR **Francis Chizea**
National Space Research and Development Agency, Federal Republic of Nigeria

CHAIR **Vera Galishnikova**
RUDN University, Russia

The session is dedicated to the design, construction and operation of spaceports and ground infrastructure: high-strength, fiber-reinforced and ultra-high performance concretes, rubber-based concretes for gas-escape channels, corrosion and residual capacity of reinforced concrete members, strengthening of structures under extreme loads, composite reinforcement, selection of launch sites for light-class launch vehicles, and surveying and information modelling for lunar bases.

TS 5	WED, NOVEMBER 25	10:00 – 12:15	HALL NEPTUNE
TS 10	WED, NOVEMBER 25	14:00 – 16:00	HALL NEPTUNE

Solar System Exploration (SSE)

CHAIR **Antonio Prado**
National Institute for Space Research, Brazil

CHAIR **Olga Saltykova**
RUDN University, Russia

The session covers mission analysis and trajectory design for the exploration of the Solar System and its small bodies, including multi-asteroid tours, missions to trans-Neptunian objects, Venus, Mars and Ganymede, gravitational modelling and spacecraft dynamics around irregular bodies, regional exploration and resources of the Moon, as well as the detection of near-Earth objects and planetary defense strategies.

TS 6	WED, NOVEMBER 25	14:00 – 16:45	HALL MERCURY

Space Power & Propulsion (SPP)

CHAIR **Felix Mora-Camino**
French Civil Aviation University, France

CHAIR **Siamak Ghorbani**
RUDN University, Russia

The session addresses sub-orbital, Earth-to-orbit and in-space propulsion, including solid propellant research, burn rate and ignition studies, internal ballistics and chamber pressurization, as well as nuclear and other power sources for planetary bases. The session also features university rocketry programmes: development, ground testing and flight validation of sounding rockets, their motors and aerostructures.

TS 7	WED, NOVEMBER 25	14:00 – 17:00	HALL MARS

Earth Observations (EO)

2 SESSIONS

CHAIR **Tarun P. Singh**
Symbiosis Institute of Geoinformatics, India

CHAIR **Elizaveta Shemyakina**
RUDN University, Russia

The session covers Earth observations from space for natural resources, the environment and economic needs: multispectral and radar remote sensing of mineral deposits, lineament analysis for hydrocarbon prospectivity, satellite monitoring of methane emissions, InSAR monitoring of land subsidence and oil and gas fields, monitoring of pipelines, dust storms and floods, and machine learning for satellite data.

TS 8	WED, NOVEMBER 25	14:00 – 16:15	HALL SATURN
TS 15	THU, NOVEMBER 26	10:00 – 12:30	HALL NEPTUNE

Small Satellites, Space Sensors & Actuators (SSA)

2 SESSIONS

CHAIR **Renuganth Varatharajoo**
Universiti Putra Malaysia, Malaysia

CHAIR **Ekaterina Gosteva**
RUDN University, Russia

The technical session is focused on small satellite missions and on-board systems that enable spacecraft and launch vehicles to perceive their environment and execute commands: CubeSat computers, power and communication buses, FlatSat testing platforms, satellite networks and routing algorithms, intelligent on-board systems, laser sensors, photodetectors, avionics and altimeters, guidance and control of sounding rockets, and assistive actuation for EVA tools.

TS 9	WED, NOVEMBER 25	14:00 – 16:45	HALL PLUTON
TS 14	THU, NOVEMBER 26	10:00 – 12:30	HALL PLUTON

QUICK REFERENCE

Speakers, Moderators & Chairs

Every role links to its page in the program

A

Aarti Holla-Maini
Opening Ceremony 2 · Moderator · RT1 5

Adolf Mkenda Faustine
Roundtable · RT2 6

Aleksandr Yefremov
Lecture · HL25 12

Alexandr Sigov
Roundtable · RT3 7

Anatoli Petrukovich
Lecture · HL24 12 · Roundtable · RT1 5

Antonio Prado
Lecture · HL4 8 · Moderator · PS6 4 · Roundtable · RT1 5 · Roundtable · RT2 6 · Chair · TS6 14

Augustine Amadikwa Uwakwe
Roundtable · RT2 6

B

Bocar Ba
Lecture · HL6 9

C

Catherine Wangari Kuria
Roundtable · RT2 6

D

Davis Shekede
Lecture · HL15 10

Dmitry Monakhov
Lecture · HL16 11

Doreen Agaba
Lecture · HL12 10 · Roundtable · RT2 6

E

Ekaterina Gosteva
Chair · TS9 14 · Chair · TS14 14

Ekaterina Kovaleva
Chair · TS16 13

Elizaveta Shemyakina
Chair · TS8 14 · Chair · TS15 14

Emmanuel Mashonjowa
Lecture · HL10 10 · Roundtable · RT2 6

Eugeniy Terukov
Roundtable · RT3 7

F

Felix Mora-Camino
Chair · TS7 14

Francis Chizea
Lecture · HL3 8 · Roundtable · RT1 5 · Chair · TS5 14 · Chair · TS10 14

G

Giancarlo Genta
Lecture · HL1 8

I

Igor Shakhray
Roundtable · RT3 7

Irina Chernykh
Chair · TS4 13

Ivan Khalil
Chair · TS3 13 · Chair · TS13 13

J

Jean-Michel Contant
Opening Ceremony 2

John Mankins
Lecture · HL26 12 · Roundtable · RT3 7

K

Kazem Reza Kashy Zadeh
Chair · TS2 13 · Chair · TS12 13

Ketan Kotecha
Lecture · HL7 9 · Roundtable · RT3 7

L

Leslie Tennen
Lecture · HL5 9

Lorant Czaran
Roundtable · RT2 6

M

Maria Ulyanova
Lecture · HL19 11

Meena Laad
Moderator · PS2 2 · Lecture · HL13 10 · Chair · TS2 13 · Chair · TS12 13

N

Narendra S. Chaudhari
Lecture · HL14 10

Narkhanim Orujova
Lecture · HL21 11 · Roundtable · RT1 5 · Chair · TS4 13 · Chair · TS16 13

Nikolay Evtikhiev
Roundtable · RT3 7

O

Oleg Malkov
Lecture · HL20 11 · Roundtable · RT2 6

Olga Saltykova
Chair · TS6 14

P

Painos Gweme
Roundtable · RT1 5

Petro Ernest Pesha
Lecture · HL11 10 · Chair · TS3 13 · Chair · TS13 13

Prakash Chauhan
Lecture · HL18 11

Preksedis M. Ndomba
Roundtable · RT3 7

R

Ravinder Rena
Moderator · PS3 2 · Moderator · RT2 6

Ray Zimmerman
Lecture · HL22 12

Renuganth Varatharajoo
Moderator · PS4 3 · Lecture · HL8 9 · Roundtable · RT3 7 · Chair · TS9 14 · Chair · TS14 14

S

Sergei Belousko
Roundtable · RT1 5

Sergey Chernyshev
Opening Ceremony 2 · Roundtable · RT1 5

Sergey Ryabkov
Opening Ceremony 2

Sergey Saveliev
Opening Ceremony 2

Shufan Wu
Lecture · HL2 8 · Moderator · PS5 3 · Roundtable · RT3 7 · Chair · TS1 13 · Chair · TS11 13

Siamak Ghorbani
Chair · TS7 14

Sudip Das
Lecture · HL17 11

Svetlana Agasieva
Roundtable · RT2 6

T

Tarun P. Singh
Lecture · HL9 9 · Moderator · PS7 4 · Roundtable · RT2 6 · Chair · TS8 14 · Chair · TS15 14

V

Vasily Gudnov
Roundtable · RT1 5

Vera Galishnikova
Chair · TS5 14 · Chair · TS10 14

Vladimir Razoumny
Chair · TS1 13 · Chair · TS11 13

Vyacheslav Sinyugin
Moderator · RT3 7

Y

Yulia Ebzeeva
Opening Ceremony 2

Yury Razoumny
Moderator · PS1 2 · Opening Ceremony 2 · Lecture · HL23 12 · Roundtable · RT1 5 · Roundtable · RT3 7

FORUM AT A GLANCE

Three days in orbit

TUE November 24

08:00 – 10:00	Registration	RUDN University, main building
10:00 – 11:30	Opening Ceremony	Plenary Session 1 · Hall Galaxy
11:30 – 12:30	Highlight Lectures	Plenary Session 2
12:30 – 13:30	Lunch	Moon Village Hall
13:30 – 15:00	**Roundtable Meeting 1**	Global governance of outer-space activities: COPUOS agenda
15:00 – 17:00	Highlight Lectures	Plenary Session 3

WED November 25

10:00 – 11:30	**Roundtable Meeting 2**	International space research and education cooperation
10:00 – 13:00	Technical Sessions	Parallel · 5 halls
11:30 – 13:00	Highlight Lectures	Plenary Session 4
13:00 – 14:00	Lunch	Moon Village Hall
14:00 – 17:30	Highlight Lectures	Plenary Session 5
14:00 – 17:00	Technical Sessions	Parallel · 5 halls

THU November 26

10:00 – 13:00	Highlight Lectures	Plenary Session 6
10:00 – 13:15	Technical Sessions	Parallel · 6 halls
13:00 – 14:00	Lunch	Moon Village Hall
14:00 – 16:00	Highlight Lectures	Plenary Session 7
16:00 – 17:30	**Roundtable Meeting 3**	Orbital grid: space solar energy

MOSCOW TIME (GMT+3)



VENUE

RUDN University

6 Miklukho-Maklaya Str., Moscow, 117198, Russia

FORUM WEBSITE

spacescitech.com

JOIN ONLINE

Zoom registration

LOCAL ORGANIZING COMMITTEE

orgcom@spacescitech.com

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