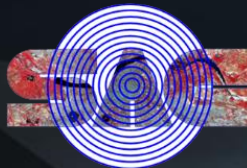


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National Technology Day - 2022
Seminar on *Space Quantum Frontiers* (May 19, 2022)

Organised Jointly
by

Space Applications Centre (SAC), ISRO, Ahmedabad
and
**Directorate of Technology Development & Innovation (DTDI), ISRO-HQ,
Bengaluru**

Hosted in hybrid mode
by

Space Applications Centre (SAC), ISRO, Ahmedabad
on

May 19, 2022 (Thursday)
09:30 hrs - 21:00 hrs (IST)

Venue: Yashpal Auditorium, Space Applications Centre, ISRO, Satellite Road, Ahmedabad



This one day seminar offers a rare opportunity for academicians, research scholars and industry participants to visit SAC, ISRO and interact on state-of-the-art quantum frontiers.

There is no registration fee.

Registration link: <https://bit.ly/3LL3lJo>

Highlights

- Inauguration by **Shri S Somanath, Chairman, ISRO/Secretary, DOS**
- **Guest of Honour- Prof. Tarun Souradeep, Director, Raman Research Institute, Bengaluru**
- **Special theme talk on “Quantum Frontiers in ISRO” – Shri N M Desai, Director, SAC/ISRO**
- Talks on Various Technological developments for ISRO's Quantum frontiers
- Opportunity for participants to showcase their quantum research
- SAC/ISRO Lab visits
- **Live demonstration of ISRO's Free Space Quantum Key Distribution Experiments (@20:00hrs. Onwards)**

Expert Talks

- Invited Talk on “Metro Area Quantum Access Networks (MAQAN): Solving the last mile problem” by Prof. Anil Prabhakar, IIT-Madras
- Invited Talk on “Quantum Technology : Directions & Prospects” by Prof. Apoorva D Patel, IISc-Bengaluru
- Invited Talk on “Accelerating commercialization of Quantum Secure Communications Technology” by Shri Sunil Gupta, Co-founder & CEO, QNu Lab

About Quantum Technology

Quantum Frontiers is one of the nine missions of national importance, being driven by the Prime Minister's Science, Technology and Innovation Advisory Council (PM-STIAC) for enabling future preparedness in emerging domains of science and technology. The focus areas would be under the four identified verticals, viz., ❖ Quantum computing & simulations, ❖ Quantum materials & devices, ❖ Quantum communications and ❖ Quantum sensor & metrology. Recent developments at the global level impress upon the need to develop and exploit quantum technologies for various applications such as quantum-safe communication, autonomous vehicle navigation, weather prediction, secure financial communications, sensing, and many others. SAC/ISRO has a prime role in developing satellite-based quantum technologies, as demonstrated recently in the real-time Quantum Key Distribution (QKD) over a 300m atmospheric channel, quantum-secure text & image transmission, and quantum-assisted two-way video calling. With these technology developments, ISRO is getting ready for demonstrating satellite-based quantum communication for future-proof data security. The theme for this year's National Technology Day-2022 is "Integrated Approach in Science & Technology for Sustainable Future." This seminar on “Space Quantum Frontiers” is befitting the identified theme. We shall be discussing the latest trends, challenges, and sharing experiences on quantum frontier technologies. This program will also open up a unique opportunity for participants from diverse backgrounds by providing a multi-disciplinary platform for conceptual deliberations towards developing quantum technologies.

About SAC

Space Applications Centre (SAC) is one of the major centres of the Indian Space Research Organization (ISRO). It plays a crucial role in realizing the vision and mission of ISRO. Located in Ahmedabad, SAC focuses on designing instruments and payloads for various ISRO space and other missions and developing & operationalizing applications of space technology for societal benefits. These applications include communication, broadcasting, navigation, disaster monitoring, meteorology, oceanography, environment monitoring, agriculture and natural resources management.

About DTDI

Directorate of Technology Development & Innovation (DTDI), ISRO Headquarters, Bengaluru is set up to sow the seeds of futuristic and disruptive technologies. Timely incubation and induction of such technologies complementing the existing program can lead to revolutionary achievements. DTDI has conceived several Disruptive Technologies for the Indian Space Programme, and these proposals on Quantum and other technologies & applications have been referred to various ISRO centres. DTDI, through its "DTDI connect" program, connects the technology developer and the users.

About Ahmedabad

Colloquially referred to as the Manchester of the East, Ahmedabad holds great commercial and cultural importance. Ahmedabad is also India's First World Heritage City recognised by UNESCO, in 2017. The city is also a hub of technology, education, and industries. Founded in 1411 AD, it has grown into India's one of the most important modern cities for archaeologists, architects, anthropologists, historians, traders, sociologists, and tourists. The weather condition of Ahmedabad in the month of May is hot (42°C) to extreme hot (45°C).

How to reach Ahmedabad

By Air: Sardar Vallabhbhai Patel International Airport of Ahmedabad connects the city to all major domestic and international destinations. Participants can easily book a pre-paid taxi or a cab from the airport to reach SAC-ISRO, Satellite road, Ahmedabad-380015.

By Road: Ahmedabad is well connected to major Indian cities like Mumbai, Pune, Surat, Nagpur and Udaipur with interstate bus services.

By Rail: Ahmedabad railway station, also known as Kalupur Station, and Sabarmati junction connects the city to all major cities of India by rail.

Important instructions:

- There is no registration fee.
- Last date of registration is Monday 16th May, 2022.
- Early registration is appreciated, you may edit or fill travel details before the closing date.
- Limited seats are available for in-person participation, so register at the earliest to secure your seat.
- Participants attending in-person are expected to reach the venue on their own.
- For any query e-mail to sacakam@gmail.com or call +91-79-26914117

Program Schedule

- **Inaugural Session (09:30-10:00Hrs)**
 - ❖ Welcome Address – Shri T. Victor Joseph, Director, DTDI, ISRO-HQ
 - ❖ Programme Overview– Shri N M Desai, Director, SAC
 - ❖ Address by Guest of Honour, Prof. Tarun Souradeep, Director, RRI
 - ❖ Inaugural Address by Chief Guest, Shri S Somanath, Chairman ISRO, Secretary, DOS
 - ❖ Vote of Thanks – Shri R K Bahl, Group Director, QUTG, SAC

Tea Break

- **Session-1: Quantum Research @ Institutes (Session Chair, Prof. Tarun Souradeep, RRI)**
 - 10:15-11:00Hrs: “Metro Area Quantum Access Networks (MAQAN): Solving the last mile problem”
by Prof. Anil Prabhakar, IIT-Madras
 - 11:00-11:45Hrs: “Quantum Technology : Directions & Prospects”
by Prof. Apoorva D Patel, IISc-Bengaluru
 - 11:45-12:30Hrs: “Quantum Frontiers in ISRO”
by Shri N M Desai, Director, SAC-ISRO & Chairman, Joint Quantum Commn. Working Group

Lunch Break

- **Session-2: March Towards Space based Quantum Technology (Session Chair, Shri Raghu Metei, DTDI, ISRO)**
 - 13:30-15:30Hrs: Talks by ISRO-DOS Teams

Tea Break

- **Session-3: Quantum Research @ Academia and Industry (Session Chair, Prof. Baladitya Suri, IISc Bengaluru)**
 - 15:45 - 16:30Hrs: Talks by participants involved in Quantum Research Activities
 - 16:30 - 17:15Hrs: “Accelerating commercialization of Quantum Secure Communications Technology”
by Shri Sunil Gupta, Co-founder & CEO, QNu Lab
- **Session-4: Interaction Session (Session Chair, Dr. R P Singh, PRL)**
 - 17:15-17:45Hrs: Interactions with ISRO Scientists/Engineers
- **Session-5: Concluding Session (Moderator, Shri D K Singh, SAC)**
 - 17:45-18:15Hrs: Panel discussion on Way Forward

High Tea

18:30-20:00Hrs: Optical Ground Station-OGS / Lab Visits, SAC
20:00-21:00Hrs: Live Demo: ISRO Free-Space Quantum Key Distribution experiments

Dinner : 21:00Hrs Onwards at SAC Main Campus