Plenary Speakers

1. **Prof. Hidetoshi Katori, The University of Tokyo Team Director, RIKEN Center for Advanced Photonics**

Title: From Precision Time Measurement to Spacetime Engineering

Abstract: Time and frequency are the most precisely measurable quantities in science. The continuous quest for higher precision in time and frequency measurements has advanced international standards and satellite navigation, providing the technological basis of today's global society. Building on this foundation, optical clocks now achieve an unprecedented precision of 18 digits—equivalent to losing or gaining less than one second over the age of the universe. Such clocks redefine the frontier of measurement science and open new possibilities for exploring our world.

At this level of precision, a clock can sense the general relativistic effect of gravity, revealing how time flows differently at heights differing by just one centimeter on Earth. The frequency shift arising from gravity thus allows clocks to resolve variations in the Earth's gravitational field—a capability known as chronometric leveling. This sensitivity enables mapping subtle changes in the Earth's surface and mass distribution through precision frequency measurements, such as crustal deformation and tidal effects.

Our recent work focuses on making these ultra-precise optical clocks compact, robust, and transportable, enabling measurements beyond the laboratory. In collaboration with Japanese industry, we have developed field-deployable systems capable of long-term autonomous operation. These efforts have reached the commercial production stage, with orders now open for compact optical lattice clock systems. We are also exploring techniques for continuous operation, which will further enhance precision and practical usability.

In the near future, networks of such advanced clocks could form a new measurement infrastructure—linking laboratories, satellites, and observatories—to monitor both spatial and temporal variations of the Earth's surface, and to probe the limits of fundamental physics. Looking ahead, we aim to establish a new framework of spacetime engineering—an approach that treats relativistic spacetime itself as a new framework to be explored and utilized, leading to new sensing principles and real-world applications.

This work received support from JST-Mirai Program Grant Number JPMJMI18A1, Japan.

2. Prof. Masaru Tomita, Distinguished Professor, Keio University

Title: Synthetic Protein Materials: Industrializing Circular Biomanufacturing for Apparel and Beyond

Abstract: The convergence of biotechnology and computer science is transforming how we create the materials for everyday life. Few examples illustrate this shift more clearly than the work emerging from a biotechnology research hub in Tsuruoka, in northern Japan, where biology, data science, and engineering are coming together to form an entirely new manufacturing platform. From this foundation emerged Spiber Inc., a company that applies computational design and microbial fermentation to produce structural protein materials at industrial scale. What began as an academic experiment in the early 2000s has grown into one of the most advanced examples of data-driven biomanufacturing in the world.

At the center of Spiber's platform is the seamless integration of design and production. A comprehensive database linking natural spider silk sequences with their mechanical properties forms the basis for computer-guided protein design. Automated DNA synthesis and high-throughput screening complete the cycle, creating a continuous loop of design, build, test, and learn that accelerates progress from molecular concept to manufacturable product. Traditional production of protein materials has relied on resource- and land-intensive animal farming, whereas Spiber's fermentation-based approach achieves high productivity within compact facilities, with only a fraction of the resource requirements, land use, and emissions.

These advances have opened possibilities across diverse sectors. Protein polymers are being spun into fine fibers for apparel, used as functional ingredients in cosmetics, and explored for applications ranging from furniture and automotive interiors to food textures. The materials are inherently biodegradable and renewable, combining performance with a significantly lower environmental impact. Building on this foundation, initiatives such as the BioCircular Materials Alliance are advancing the use of agricultural residues and waste textiles as fermentation feedstocks, pointing the way toward circular biomanufacturing systems that can operate in harmony with nature.

This presentation will trace the scientific and engineering journey behind these achievements, beginning with the innovation ecosystem in Tsuruoka and leading to Spiber's industrial-scale operations. It will also reflect on what this evolution suggests for the future of manufacturing. By aligning computation and biology, we are starting to build not only new materials but a new industrial paradigm that evolves alongside the living systems of our planet.

3. Prof. Ganesh Ramakrishnan, Bank of Baroda Chair Professor at the Dept of CSE, IIT Bombay

Title: Artificial General Intelligence and Sovereign Capability

Abstract: Artificial General Intelligence (AGI) is no longer science fiction. Current projections indicate AGI systems matching human-level reasoning across all domains will emerge by 2027, just over two years from today. AGI refers to AI systems that can understand, learn, and solve any intellectual task that a human can—from writing code to diagnosing diseases to conducting diplomacy—without being narrowly trained for one specific job. Technically, AGI represents the achievement of artificial general problem-solving capability with reasoning, transfer learning, and contextual adaptation across unfamiliar domains, surpassing today's narrow, task-specific AI models. This transformation will reshape civilization more profoundly than electricity or the internet. For society, AGI could automate most knowledge work, restructure global economies, and determine which nations and communities retain technological agency or become permanently dependent. Conversely, it also poses existential risks: systems designed with misaligned values or deployed by authoritarian regimes could entrench inequality, surveillance, and loss of human autonomy at unprecedented scale. The world faces choices in the form of monopolistic models and surveillance states. The talk will also discuss a third, sovereign path grounded in democracy, inclusion, and sustainability. The question is whether this can move beyond aspirational rhetoric toward a strategic realism built on concrete advantages that most nations can replicate. Within this model, several reinforcing pillars emerge: (a) the creation of transparent and provenance-preserving AI systems instead of retrofitting explainability into black-box models; (b) the pursuit of data- and compute-efficient AGI to achieve algorithmic efficiency gains that democratize technology and scale out the AI innovation ecosystem; (c) the cultivation of human-in-the-loop ecosystem development fostering Global South partnerships; and (d) the integration of linguistic, cultural, and cognitive diversity as a source of resilience and insight. These elements together define a path toward responsible, democratic AGI. The choice we make today will determine whether billions of Indians—and five billion citizens across the Global South—retain agency in the AGI era.

Artificial Intelligence

Keynote Speaker:

Dr. Sridhar Vembu, Co-Founder and Chief Scientist, Zoho Corporation, Chennai

Title: Building India-Centric Resource Efficient AI for Social Good

Abstract: India stands at a pivotal moment in shaping its digital future: as Atmanirbharta (self-reliance) becomes not only a slogan but a strategic imperative, technology platforms must internalize values of trust, transparency, equity, and sovereignty. In this talk, I will outline potential directions for integration into India's Atmanirbharta software and AI stack, particularly in public sector and social-impact deployments, and how we envision the seamless confluence of homegrown generative AI and foundation models with application platforms that deliver real benefits to citizens. This includes adoption in Indian government and public sector use cases, productivity and enterprise platforms, small language models, AI assistants, embeddings platforms, model-serving stacks, infrastructure layers in domains such as education, health, governance, and local language solutions. Such integration with sovereign AI efforts will help respect India's principles of data localization, interpretability, model auditability, and ethical safeguards. This will also enable trusted pipelines from national foundational models into domain-specific, socially beneficial applications. All this can be viewed under the umbrella of "sovereign AI scaffolding," application ecosystem slots in as the vertical execution layer over soverign LLM initiatives, enabling regulated, auditable AI services at scale in education, healthcare, climate resilience, agriculture, rural development, citizen services, and more.

I will also offer a roadmap of research challenges and deployment strategies that include dynamic model adaptation for low-resource languages and dialects, federated fine-tuning for local governance units, transparency and validation frameworks in AI for social good, and collaborative public-private governance for AI in the Atmanirbharta context. The hope is that this talk will inspire cross-institutional momentum: bridging foundational AI research and applied systems engineering in service of India's development, while upholding the sovereignty, trust and inclusivity that the nation's mission demands.

Session Speakers:

1. **Dr. Sriram Raghavan, VP, IBM Research for AI,**

USA Title: Scaling AI for India through Open Innovation

Abstract: Open innovation in AI has progressed at a remarkable pace, driven by the availability of state-of-the-art open weight models and associated opensource libraries and toolkits for customizing, evaluating, and serving these models. These models and

tools hold immense potential to support the development and scaling of impactful AI solutions for India that address real-world challenges in a variety of sectors, from agriculture and finance to healthcare, citizen services, and education. In this talk, we will provide an overview of efficient state-of-the-art open weight models from IBM that cover a diverse set of data modalities, from natural language and code to time series and geospatial data. We will provide illustrative examples of how these technologies are at the heart of an open collaborative approach to building scalable, efficient, and responsible AI solutions.

2. Dr. Geetha Manjunath

Title: Affordable Accessible Breast Cancer Detection using AI

Abstract: Artificial Intelligence is reshaping healthcare by enabling smarter and more inclusive diagnostics. Niramai has pioneered a novel AI-driven cancer detection technology which provides a non-contact, radiation-free, and privacy-preserving cancer screening experience for all. This innovation called Thermalytix is an example of how AI can bridge the gap in cancer care and drive equitable, technology-enabled solutions, particularly for low-resource settings. In this talk, Dr Geetha will share the intricacies of this patented Indian AI innovation that is able to accurately detect early cancer by analyzing subtle heat patterns on the skin. She will describe how combining clinical science with responsible AI can result in creating such breakthrough innovations.

3. Shri Amit Sheth

Title: Introducing a new architecture of small, collaborating agents designed for domain-focused, cost-efficient, responsible and reliable enterprise-grade intelligence.

Abstract: Artificial Intelligence has evolved through four generations each redefining what “intelligence” means. The first, Symbolic AI, encoded rules to mimic reasoning. The second, Statistical Learning, discovered patterns from data. The third, Generative AI, achieved scale - training on massive internet data to produce models that can create, but not always understand.

The fourth generation is about comprehension - AI systems that don’t just generate, but reason, explain, and align, especially in enterprise environments. This talk introduces the C3AN framework - Custom, Compact, Composite, and Neuro Symbolic AI - a technical blueprint for this new era. C3AN shifts intelligence from one large

model to many small, collaborating agents that reason, self-correct, and integrate human expertise, reliably and transparently.

Imagine a national power grid where predictive, diagnostic, and causal agents coordinate to detect faults, optimize energy distribution, and justify every action to human operators in real time.

As AI enters enterprise and sovereign domains, responsibility by design becomes essential.This talk traces AI’s journey from rules to comprehension, showing how C3AN achieves reliability, consistency, and alignment with human, enterprise, and societal goals - ushering in a more intelligent, and trusted AI future.

Advanced Materials & Manufacturing

1. **Prof. G. U. Kulkarni , Former President, JNCASR, Bengaluru**

Title : Unlocking Advanced Material Functionality for Product Realization

Abstract: Materials, whether natural or synthetic, derive their technological importance from the unique properties that define their functionality. Advances in material science now allow fine-tuning of these properties through precise control of composition, size, shape, and dimensionality. At the nanoscale, pronounced quantum effects give rise to new phenomena, as seen with graphene's remarkable electron mobility compared to graphite. Innovative functionalities are increasingly achieved through the design of composites and heterostructures, driving significant interest and rapid growth in the field over the past two decades.

However, transforming novel material properties into viable products presents persistent challenges, including issues of scaling up production, integrating new materials into existing systems, and addressing their environmental and health impacts. This presentation will review national initiatives in advanced materials, with a focus on the translation of laboratory discoveries into real-world technologies. Selected case studies will illustrate both achievements and ongoing challenges in bringing advanced materials to market.

2. **Shri. Pawan Kumar Chandana, Co-founder and CEO, Skyroot Aerospace, Hyderabad**

Title: Elevating Aerospace: The Frontier of Advanced Composites and 3D Printing

Abstract: To venture beyond Earth and expand humanity's reach across the cosmos, we must innovate not just on spacecraft design, but the very materials and manufacturing processes that bring them to life. Advanced composites — carbon fiber reinforced polymers (CFRP) for tankage, honeycomb architectures for fairings, and ceramic matrix composites for thermal protection — deliver unprecedented strength, stiffness, and resilience while dramatically reducing weight. Emerging capabilities like self-healing and thermal management address the harsh realities of space debris and extreme environments. Meanwhile, metal additive manufacturing transforms production by enabling complex geometries once impossible to fabricate
— be it with nickel, titanium, aluminum, or copper alloys — while dramatically reducing material waste and lead times. Together, these technologies are forging cost-effective, reliable launch systems that make space accessible for all

3. **Ms. Rajashri Bhojraj Teli, MD, Innovative Projects Private Ltd, Pimpri**

Title: From blueprint to breakthrough: when precision becomes a national duty

Abstract: HYT Inovative Projects Pvt Ltd which was established in 2001 houses India's Largest Flow Forming Facility The company is headed by Mr Bhojraj Teli, the Chairman and Rajashri Teli, Vice president. The Parent company HYT Engineering Company Pvt. Ltd , is a Developer & Manufacturer of precision machine tools and import-substitute solutions & systems for railways. HYT innovative was established with the aim to pacify India's need of precision thin walled tubes. It is now India's leader in defence and aerospace component manufacturing through cold flow forming method. Alongside supplying motor tubes for the Pinaka missile, the company has ventured into related technologies like EPDM linning, Silica Pheonolic lining and fibre glass reinforced moulding.

The key attributes of flow flow forming include: Cold Plastic Deformation,CNC-Controlled Kinematics, Material Efficiency,Superior Mechanical Properties:, Geometric Versatility:

FEW REMARKABLE ACHIEVMENTS

· BARC

IN 2003 HYT INOVATIVE PROJECTS PVT LTD WAS THE FIRST INDIAN COMPNAY TO SUCCESSFULLY DEVELOP THIN WALLED PRECISION TUBES

· PINAKA

IN 2004 HYT INOVATIVE WAS THE FIRST COMPANY TO SUCESSFULLY DEVELOP PINAKA ROCKET MOTOR TUBE IN INDIA

· LRSAM

IN 2006 HYT INOVATIVE PROJECTS PVT LTD IS THE FIRST INDIAN COMPANY TO SUCESSFULLY DEVELOP TUBES FOR LONG RANGE SURFACE TO AIR MISSILES

· ROCKET LAUNCHER BARREL

IN THE YEAR 2008 HYT INOVATIVE PROJECTS PVT LTD IS THE FIRST COMPANY TO SUCESSFULLY DEVELOP NAVAL ROCKET LAUCNHER TUBES

· BOOSTER SHELLS FOR BRAHMOS

HYT INOVATIVE PROJECTS PVT LTD IS THE FIRST COMPANY TO SUCESSFULLY DEVELOP THIS IN INIDIA THE YEAR 2009

· Rafel - Envelops for Spice 2000 Guided Bombs.

HYT INOVATIVE PROJECTS PVT LTD IS THE FIRST INDIAN COMPANY TO SUCESSFULLY DEVELOP THIS PRODUCT AND EXPORT IT IN THE YEAR 2015

- RGB -60

With this project the company demonstrated the capability for precision manufacturing and assembly of naval rockets

The company's future Roadmap includes exploring newer application ,Making International footprint, Accessing to global market for export , Expansion and addition of units for application beyond defense, Getting into systems and assemblies involving flow forming, thermal insulation, welding, compression molding, and precision machining and Exploring development of full platform.

4. **Prof. T Pradeep , Deepak Parekh Institute Chair Professor and JC Bose National Fellow, IIT Madras**

Title: Matter Dreams at Scale: Creating the Future of Materials

Abstract: We can now create matter with atomic precision and extend it seamlessly to macroscopic scales. Through the convergence of chemistry across length scales and under diverse stimuli—exemplified by microdroplet science, cavitation-driven transformations, and cryogenic methods—we are beginning to access active interfaces where materials evolve, reorganize, and stabilize in unexpected ways. This talk will present the visible tip of that convergence, where such processes enable the scalable creation of materials with novel properties, opening pathways toward programmable matter, adaptive systems, and energy-efficient transformations that may redefine the foundations of advanced materials science for a sustainable future.

Biomanufacturing

1. **Dr. Kallam Satish Reddy, Chairman, Dr. Reddy's Laboratories, Hyderabad**

Title: Biomanufacturing and India as a Bioeconomy Abstract:

(a) An overview on Biomanufacturing, detailing the use in various industries, including Pharmaceuticals. A brief on the importance of Biomanufacturing, and the need for its adoption across industries and countries.

(b) Defining a Bioeconomy.

(c) India as a Bioeconomy, enablers and way forward

2. **Dr. Ashvini Shete, Prominent Scientist Praj Industries,Pune**

Title: Polylactic Acid (PLA)

Abstract: India's transition to a low-carbon, circular economy is catalyzed by the urgent need to tackle plastic waste and embrace sustainable materials. Bioplastics such as Polylactic Acid (PLA), derived from renewable feedstocks like sugarcane and corn starch, offer a viable alternative to conventional plastics, exemplifying principles of green chemistry. PLA is fully biodegradable, compostable, and safe for food contact, and can be processed on existing plastic machinery, with significantly lower carbon emissions during production. Its adoption aligns with national programs like Swachh Bharat and Mission LiFE. For successful commercialization, a robust ecosystem integrating feedstock supply, indigenous technology, and market development is essential. Key enablers include end-to-end technology integration, modular plant engineering, and sustained innovation. India's agricultural abundance, adaptive polymer industry, favorable policies, and rising demand for sustainable

materials position it as a global PLA hub. Praj Industries, leveraging decades of biotechnology expertise, has developed scalable PLA technology suitable for Indian conditions, initiating a demonstration plant near Pune as a nucleus for the domestic PLA value chain. Commercial-scale PLA production will help India reduce imports, create green jobs, and advance its Net Zero goals, making PLA central to India's green industrial revolution

3. **Prof. Rekha S Singhal, Institute of Chemical Technology, Mumbai**

Title: Transforming Food Production and Processing through Biomanufacturing towards 'NetNegative'

Abstract: The emission of greenhouse gases (GHGs) throughout the food chain and the contribution of food waste to 1/3rd of global GHG emissions has created an alarming situation. The policy makers realize the urgency to achieve 'Net-Zero'

emissions and further march towards Net-Negative. Some of the approaches require biomanufacturing with focus on altered food production as well as processing technologies, upcycling food waters, become responsible industry house as well as responsible global citizens. Other approaches towards 'Zero-Negative' are being investigated through numerous ways of transforming food systems. This presentation will highlight some of these aspects and propose the way forward to counteract this urgent need of the existence of society itself.

4. **Dr. Vijay Singh, Executive Director, Integrated Bioprocessing Research Laboratory, University of Illinois, Urbana**

Title: Food from Air – Innovative Bioprocessing Technology

Abstract: Precision fermentation, driven by advances in precision biology, is an emerging bioprocessing technology enabling the sustainable and affordable production of food ingredients. Building on traditional microbial fermentation, it combines metabolic engineering, synthetic biology, and advanced bioprocessing to develop high performing microorganisms capable of producing specific proteins, lipids, and other nutrients with superior yield and functionality. Through precise genome editing and process optimization, these systems achieve high productivity using renewable feedstocks while minimizing waste and environmental impact. Recent breakthroughs have rapidly advanced precision fermentation from laboratory research to commercial-scale production of animal free food proteins, dairy and egg alternatives, and functional lipids that replicate or enhance conventional ingredients. Entire foods with balanced macro- and micronutrient profiles can now be created through this approach, offering nutritious and sustainable options for a growing population. As such, precision fermentation holds tremendous potential to transform global food systems by decarbonizing production, reducing resource dependence, and building resilient supply chains

Blue Economy

1. **Dr. Shailesh Nayak, Director, NIAS, IISc, Bengaluru Title**: Towards Ocean Science-led Blue Economy

Abstract: The 'Blue Economy' has been defined as an ocean-dependent economic development to improve quality of life of people while ensuring inclusive social development as well as environmental and ecological security (Nayak, 2020).

Oceans supply food, energy and mineral resources and are storehouses of biodiversity, influence weather and climate and provide an ecosystem for sustaining human life and other biota. The major scientific issues to be addressed for development blue economy are sustainable fisheries, conservation and preservation of coastal and marine ecosystems: Coral reefs, mangroves and sea grasses, ocean acidification, harmful algae, coastal pollution, coastal and deep-sea minerals, ocean energy, tourism, hazards and response mechanism, small islands development, shipping, industries, infrastructure. Observations of ocean from satellite and aerial platforms are critical to understand ocean processes, model and forecast weather, sea state and hazards and ensure safety of human lives and facilitate human activities. The building capacity for sustained observations is a key to understanding physics, biogeochemistry, biology and ecosystems. The idea is to develop approaches and mechanisms to promote sustainable and equitable economic development of ocean resources while ensuring a healthy ocean environment and address impacts of climate change. This is in tune with the SDG 14 and India-led global movement on Mission LiFE (Lifestyle for Environment) to protect and preserve environment. It is now certain that after 2030, when impacts of climate change are more visible, the dependence on ocean is going to increase to sustain economy and ensure livelihood. It is the need of the day to promote a "Digital Ocean" by integrating scientific data along with environmental, social and economic data to ensure ocean health and ushering blue economy. This is an opportunity to renew our commitment to the oceans, and thus of the planet Earth, for the benefit of mankind.

2. **Dr. Ratheesh Kumar Raveendran, Senior Scientist, ICAR-Central Marine Fisheries Research Institute**

Title: The role of the fisheries sector in advancing India's blue economy

Abstract: The Blue Economy framework for sustainable ocean development is crucial for achieving India's targeted growth. This talk highlights the achievements and importance of the fisheries sector as a core component of this vision, serving as a primary driver for economic growth, food security, nutritional security, and the support for coastal communities. However, the potential of marine fisheries faces threats from challenges such as overfishing, habitat degradation, climate change impacts, and inadequate post-harvest infrastructure. Therefore, sustainable resource management, including deep-sea harvesting, expanding environmentally friendly mariculture (such as seaweed farming & Integrated Multi-Trophic Aquaculture), species diversification, and modernising the value chain, is essential for improving the growth rate of the sector. By adopting sustainable practices supported by strong governance and technology, India can unlock the full potential of the fisheries sector and ensure its long-term, equitable contribution to advancing India's Blue Economy.

3. **Dr. Ganesh Kamath , Director, Organica Biotech Pvt. Ltd, Mumbai**

Title: Innovation-Driven Biotechnological Solutions for a Sustainable and Resilient Blue Economy.

Abstract: At Organica Biotech, we advance India’s Blue Economy through science-driven biotechnological innovations aimed at restoring aquatic ecosystems and ensuring sustainable water use.

In collaboration with CSIR–National Institute of Oceanography (NIO), Goa, we are exploring deep-sea marine microbes and their metabolites for bioremediation of soil and water contaminated with crude oil hydrocarbons. Our flagship innovations— WaterRevive and GutNourish—enhance aquaculture productivity and sustainability by improving water quality, microbial health, and nutrient cycling in ponds. Meanwhile, IMBAT provides in situ treatment of wastewater drains, preventing untreated effluents from entering rivers and seas, thereby reducing marine pollution. These scientifically validated and field-tested technologies contribute to ecological restoration, pollution mitigation, and sustainable livelihood enhancement.

By integrating research, innovation, and implementation, Organica Biotech plays a vital role in strengthening India’s journey toward a cleaner, resilient, and sustainable Blue Economy.

4. Ms. Minushri Madhumita , Co-Founder & Director, ThinkRaw Innovative Solutions Pvt Ltd, Kalahandi

Title: ThinkRaw Innovative Solutions: Catalysing DhivaraMitra for a Sustainable Blue Economy Revolution

Abstract: ThinkRaw Innovative Solutions Pvt Ltd. , a women-led cleantech-based enterprise, is driving a sustainable transformation in India's aquaculture sector through its flagship innovation, DhivaraMitra — a solar-powered, smart aquaculture solution that reduces operational costs and enhances productivity through uniform feed distribution and maintains the dissolved oxygen level and pH level of the water body at the desired level. Designed to address key challenges like high diesel expenses, labour intensity, and low survival rates, DhivaraMitra integrates technology with livelihood empowerment. It enables farmers, FPOs, and exporters to achieve higher yields while reducing carbon footprints, supporting the nation's Blue Economy goals. With over 6,400 lives positively impacted, ThinkRaw has been recognised by leading institutions, including the Ministry of Fisheries, IITs, and MSME programs, receiving multiple grants and awards for innovation. By merging sustainability, technology, and inclusivity, ThinkRaw positions DhivaraMitra as a catalyst for equitable blue growth in India

Digital Communications

1. **Prof. Kiran Kumar Kuchi , Department of Electrical Engineering, IIT Hyderabad Title:** How to Realise the 6G Vision for Bharat" (Charting India's roadmap towards
next-generation wireless connectivity and innovation.)

Abstract: Digital communications—and the broader stack of information and communication technologies (ICT)—sit at the core of India's development story. Over the past decade, India has built world-class Digital Public Infrastructure (DPI) and accelerated 4G/5G adoption at population scale, while catalyzing indigenous design and manufacturing in telecom networks and mobile devices. This momentum provides the launchpad for the next leap: a 6G-and-AI . era that embeds intelligence across devices, networks, and edge/cloud to deliver secure, resilient, and universally accessible connectivity and services. The talk outlines a concrete implementation roadmap: (i) spectrum policy enabling timely access across low/mid/high and NTN bands; (ii) phased technology development and large- scale pre-6G pilots and field trials for networks and devices—including AI-driven applications and integrated sensing-and- communication—with insights fed back into 6G standards, products, and rollout plans to de-risk nationwide deployment; (iii) coordinated R&D funding and pre- commercial testbeds; and (iv) inter-ministerial programme governance linking Communications, MeitY, S&T, Education, Health, Rural/NE, Agriculture, Industry, and Defence. A parallel "Make-in-India" manufacturing track will progressively localize analog/digital ICs, software, and systems—leveraging domestic and upcoming fabs—while India leads in standards (3GPP/ITU) and builds a strong IP base spanning MSMEs, large firms, operators, integrators, fabless semiconductor companies, application developers, and academia. 6G will prioritize rural coverage and reliability via NTN backhaul, energy-efficient, low-cost RAN, and affordable last-mile FWA, with open APIs for local innovators. Use cases span education, health, agriculture, and essential utilities (water/electricity/transportation) that leverage 6G and AI. Together, these unlock productivity, skilling, employment, and a resilient digital economy—bridging the digital divide and advancing sustained GDP growth toward Viksit Bharat 2047.

2. Shri Ramu Srinivasaiah, Co-Founder & Director, Lekha Wires, Bengaluru:

Title: Private Networks Reimagined: ORAN's Expanding Role in 6G Network Design

Abstract: Every time we roll out next generation network there are loads of innovations, opens up new business opportunities through use cases. It is also an opportunity to reimagine the telecom network shaping aspirations of the country. Leveraging ORAN architecture, combined with policy backing, can fast-track 6G deployment in line with the Viksit Bharat Vision.

3. Shri Kumar Sivarajan, Co-Founder and President, VVDN Technologies, Gurugram:

Title: Making India a Global Telecom Sector Leader by 2030
Abstract: In this talk, we will begin by discussing the evolving market trends and technology advances in the global telecommunications sector. We will then analyse their potential impact on the Indian industry in the coming years, in the light of recent macro developments and our inherent strengths. We will then attempt to come up with a policy prescription that exploits mutual synergies between the government, industry and academia to help India gain its rightful place as a global telecom sector leader in the 6G era.

4. Dr. Rajkumar Upadhyay (CEO, C-DOT, New

Delhi) Title: Taking Indigenous Technologies to the

Next Level

5. Prof. Radhakrishna Ganti (Department of Electrical Engineering, IIT Madras, Chennai)

Title: Extending the 5G Ecosystem in India and Preparing for 6G
Abstract: We discuss the challenges and opportunities that are required for enabling a 6G eco- system in India. In particular, we focus on technologies, standards and product manufacturing and look at the challenges in playing a prominent role in 6G.

6. Prof. Panganamala Vijay Kumar (Department of ECE, IISc,

Bengaluru) Title: Advancing Indigenous PNT through the NavIC L1 Signal

and Beyond

Abstract: The NavIC satellite system developed by ISRO has been broadcasting navigation signals in the L5 and S bands. To enable integration with mass-market mobile devices, ISRO initiated transmission in the L1 band. This required a new ranging code compatible with international systems. The speaker led the development of an indigenous ranging code family, IZ4, that competes well against existing designs by GPS and BeiDou. This design as well as the future trajectory of navigation satellite systems will be briefly discussed here

7. Shri. Parag naik Lead Scientist, EVP Tejas Networks, X-CEO Saankhya Labs

Title: Building Indigenous disruptive technology stacks: From D2M to 6g
Abstract: This talk summarizes and pontificates on the indigenous tech stacks like D2M and the need to build a disruptive, first principles 6g stack based on

the intersection of signal processing, server grade technologies and AI/ML with thought leadership in mind. Technologies that solve local problems with a global intent

Electronics & Semiconductor Manufacturing

1. **Dr. Bobby Mitra IEEE Fellow, CIO and President AI & Digital Transformation, Tata Electronics**

Title: AI-FIRST Software Defined Semiconductor and Electronics Manufacturing
Abstract: Tata Electronics is driving semiconductor and electronics manufacturing in India. This keynote on "AI-FIRST Software-Defined Manufacturing" is based on our belief that it is more than a strategy—it's a new way of thinking that positions AI at the heart of all manufacturing operations. This opportunity can deliver tangible business benefits of higher yield, reduced cycle-time, increased productivity, reduced rework! Synthetic AI, fine-tuned multi-modal models, high-speed sensing- control-actuation loop etc. bring the digital and physical worlds seamlessly together. This integrated AI foundation spans across semiconductor and electronics manufacturing and covers critical use- cases spanning applications from safety and construction modelling to cleanroom planning/layout simulation, improving material traceability and maximizing equipment utilization. The AI-FIRST approach has been extended from manufacturing to the broader enterprise as well. We are seeing encouraging results on the ground already from our deployment.

2. **Shri G. S. Madhusudan Founder & CEO, Incore and Semiconductors, Chennai**

Title: Creating a fabless semiconductor eco system in India

Abstract: An overview of the priorities India should have in the creation of a fabless semiconductor eco-system, the areas that need support and policy initiatives that are needed. The talk will focus on practical steps that can be taken to achieve the necessary goals and will propose a roadmap.

3. **Prof. Srinivasan Raghavan Professor, CeNSE, IISc, Bengaluru**

Title: Vision 2047: India’s GaN Ecosystem Based on India’s Own Indigenous GaN Materials-Devices and Systems Technology

Abstract: The world of electronics as we know it today is enabled by silicon, the preeminent semiconductor material. However, from everyday civilian applications like white light emitting diode bulbs, compact chargers for cell phones and electric vehicles, wireless connectivity for cell phones to strategic applications like radars, drones, electronic warfare and satellite communication, yet another semiconductor called Gallium Nitride (GaN) takes centre stage. For the last 20 years, a group of faculty members cutting across disciplines, from materials to devices to systems, have created India’s own indigenous materials and device technology based on GaN at the Indian Institute of Science, Bengaluru. Then, with

the help of the Ministry of Electronics and Information Technology they embarked on establishing a translational centre, The Gallium Nitride Ecosystem Enabling Centre and Incubator (GEECCI), for taking this capability up the TRL level. Today India's own indigenous GaN device technology is being put into low volume prototype production at this translation centre. The incubator GEECI has embarked on creating a "keiretsu" of companies that will create, sustain and support India's GaN capability. GEECI's vision is to create an ecosystem of startups, established industry organizations, supply chain companies, equipment manufacturers, and academic institutions to cater to the developing markets of GaN wafers and electronic devices in the power electronics, RF communication, and nitride MEMS sectors. The talk will take the audience through my journey of the last 20 odd years and my vision for the future.

4. **Dr. Suraj Rengarajan Managing Director & Head Semiconductor Products Group SPG), Applied Materials India**

Title : Rise of Advanced Packaging

Abstract: This presentation explores the pivotal role of advanced packaging in the semiconductor industry's response to the exponential growth of AI and high-performance computing. As traditional 2D scaling (Moore's Law) slows, the industry is rapidly transitioning to 3D architectures across logic, memory, and packaging to meet escalating power and performance demands. The shift from system-on-chip to system-in-package is driven by the need to integrate more transistors and memory than reticle limits allow, fueling the rise of GPU superchips and heterogeneous integration.

Key enablers include die stacking, interconnect scaling, and the move from wafer-level to panel-level packaging. Hybrid bonding emerges as a breakthrough technology, offering dramatic improvements in I/O density and energy efficiency by directly connecting chips without micro-bumps. Panel processing and the adoption of glass substrates are presented as critical innovations for enabling larger, faster AI packages, with benefits in mechanical stiffness, thermal stability, and signal integrity.

In summary, advanced packaging is positioned as the key to extending PPACt

(Power, Performance, Area, Cost, and time-to-market) benefits, enabling the next generation of AI and high-performance systems through 3D integration, innovative materials, and collaborative development models.

Emerging agriculture technologies

1. **Dr. Trilochan Mohapatra, Former Secretary, DARE and DG, ICAR, New Delhi**

Title: India's Agricultural Future: New Paradigms for a Sustainable Food System

2. **Dr. Usha Barwale Zehr (Executive Director & Chairperson, Grow Indigo Pvt. Ltd., Jalna, Maharashtra)**

Title: Innovation for sustainability in Agriculture

Abstract:

- Agriculture as a solution
- Key intervention that lead to immediate solutions
- Biological solutions to address sustainability challenges

.

3. **Dr. Nachiket Kotwaliwale (Director, ICAR, Ludhiana)**

Title: Automation and cognitive computing in the post-harvest sector: Reducing losses, ensuring food quality and safety.

Abstract: The post-harvest sector faces significant challenges in minimizing losses, maintaining nutritional value, and ensuring food safety across diverse supply chains. Emerging technologies in automation and cognitive computing are transforming this landscape by enabling intelligent monitoring, quick decision-making, and reliable traceability. Sensor-based platforms such as electronic noses and electronic tongues are being deployed to rapidly assess freshness, spoilage, and contamination, while a wide spectrum of additional sensors—including temperature, humidity, gas (CO_2/O_2/ethylene), vibration, and optical sensors—are increasingly used for real-time condition monitoring and early detection of quality deterioration. Advanced machine vision systems—including high-resolution digital imaging, hyperspectral imaging, synchrotron-based techniques, radiation and magnetic resonance—provide deeper insights into internal and external attributes of agricultural produce non-destructively. The integration of miniature robots and collaborative robotics (cobotics) is enhancing precision handling and sorting, while immersive tools such as virtual reality, augmented reality, and digital twin frameworks provide simulation-driven optimization of storage facilities and supply- chain networks. Moreover, Internet of Things (IoT) frameworks enable real-time monitoring of storage environments, animal houses, and logistics operations, ensuring proactive interventions to mitigate risks. The convergence of these

systems with blockchain platforms further strengthens end-to-end traceability, ensuring transparency in the movement of produce from farm to consumer. Together, these technologies create an integrated ecosystem in which cognitive computing utilizes data from sensors, imaging, and IoT networks to drive predictive analytics, autonomous decision-making, and intelligent interventions. This convergence marks a paradigm shift toward resilient, efficient, and safe post- harvest management, providing practical solutions to minimize losses, ensure food safety, and strengthen global food security.

4. **Shri Sachin Hegdekudgi (Founder & CEO, Roots Goods, Bengaluru)**

   Title: "From Fields to Futures: India's Global Digital OS for Food, Farmers, and Health
   (An Operating System for reimagining crop quality and food security)"
   Abstract: "Every year, nearly a third of crops are lost or undervalued because we cannot guarantee quality or trust in our food systems. For farmers, this is lost income. For consumers, it is lost nutrition. For nations, it is lost security." "What we need is not just tools, but a digital operating system with a foundation that can make crop quality trusted, transparent, and universal. We will explain Roots Goods model and its impact. Based on our work we would suggest how, "India is the perfect test bed — diverse, complex, farmer-first. If a Digital OS for crop quality can work here, it can scale anywhere." This is not just for maize, or just for India. "What we are building is a trust layer for global agriculture." With Call to action: Invite policymakers: "Let us make quality digital public good." Invite researchers: "Join us in refining this OS for resilience, sustainability, and health." Invite startups & partners: "Together we can create the Android of agriculture — open, scalable, trusted." "From fields to futures — if we can build trust into every grain, we can secure farmers' livelihoods, feed the world better, and create a healthier planet

5. **Dr. Kesavan T.R. (Group President, Tractors and Farm Equipment Ltd., Chennai)**

   Title: Rethinking Farm Mechanization in India
   Abstract: (3–5 sentences only) outlining the key points you intend to present before audiences.

1. Instead of individual ownership, farm mechanization in India should focus on service-based models where farmers access equipment through rentals, aligning with the reality of fragmented land holdings and reducing financial burden
2. This approach necessitates the development of specialized, precision technology equipment tailored for small farms and the establishment of digital platforms to connect farmers with service providers.
3. Policy should be realigned to support sustainable rental models over subsidized purchases, while integrating next-generation technologies like precision tools,

drones, and sustainable machinery.

4. Must avoid subsidising machinery as these became affluent farmer's tools, underutilised and also leads to malpractice

6. Prof. K.C. Bansal, Adjunct Professor, Guru Jambheshwar University of Science & Technology, Haryana

Title:"Genome Editing for Sustainable and Climate-Resilient Indian Agriculture: Fast-Tracking Viksit Bharat 2047"

Abstract: (3–5 sentences only) outlining the key points you intend to present before audiences.

· The challenges facing agriculture today in India like climate change, dwindling natural resources, and meeting the increasing demand of food sustainably, necessitate utilization of modern biotechnological tools like CRISPR- based Genome Editing for crop improvement.

· CRISPR has become one of the most talked-about breakthroughs in science of the 21st century, and has taken the scientific world by storm.

· It has emerged as a powerful tool that is redefining the way we develop climate-resilient, high yielding, disease resistant and nutrient rich crops by enabling targeted modifications of specific key genes.

· India, with its vast population dependent on agriculture, is using this powerful technology and has made a humble beginning by developing two genome-edited rice varieties (Launched recently by Hon'ble Minister of Agriculture on May 4, 2025).

· However, we need to move ahead in a fast-track mode for achieving Viksit Bharat 2047

7. Mr. Abhilash Sethi (Investment Director, Omnivore, Bengaluru)

Title: Emerging technologies in agri. I can talk about biotechnology, digital technologies, satellite, robotics, sensors. Can also talk about post-harvest technologies

Abstract: (3–5 sentences only) outlining the key points you intend to present before audiences.

· There are many promising startups working on cutting edge technologies in agriculture.

· These emerging deep tech companies need cheaper debt support with moratorium from the govt apart from our equity support.

· Country needs a strong accreditation agency to validate the products of such deep tech companies.

8. **Prof. Santanu Chaudhury (Schlumberger Chair Professor, Department of Electrical Engineering, IIT Delhi)**

Title: AI for Prescriptive Agriculture

Abstract: A brief abstract (3–5 sentences only) outlining the key points you intend to present before audiences.

AI for prescriptive agriculture involves use of machine learning and generative AI for analysis of sensor/IOT based field data and generation of actionable recommendations for optimizing farming practices. It aims to enhance crop yields, reduce resource usage, and improve sustainability by predicting outcomes and suggesting the interventions for mitigating risks related to weather variability, pests, diseases, and market fluctuations, enhancing supply chain resilience.

Energy Enviroment & Climate

1. **Ms. Rhea Mazumdar Singhal, Founder of Ecoware Solutions, New Delhi Title:** Innovation that Builds a Resilient Bharat

Abstract: India's ambition for *Viksit Bharat 2047* demands innovation that delivers both economic growth and climate resilience. As Founder of Ecoware, I've seen how sustainability and competitiveness can drive each other when innovation moves from prototype to scale. This talk will focus on science- led entrepreneurship can accelerate decarbonisation through bio-based materials, low-carbon manufacturing, and circular systems that convert waste into value. It will also outline how policy, technology, and finance must align to enable joint research, technology transfer, and large-scale adoption, particularly across MSME and manufacturing clusters. By investing in scalable, science-backed solutions, India can build a competitive, low-carbon economy that strengthens supply chains, attracts global capital, and future-proofs industrial growth, positioning the nation as a leader in sustainable innovationAnuj Sharma, CEO- Waaree Clean Energy Solutions Private Limited

2. **Anuj Sharma, CEO- Waaree Clean Energy Solutions Private Limited**

Title: Green Hydrogen – The Key Link Between Clean Energy, Environment and Climate

Abstract: The world is today facing a conundrum of creating a fine balance between energy demand, environmental degradation and climate change. Conventional fossil fuels, while powering growth, have also created an alarming rise in global greenhouse gas emission levels. In this scenario, Green Hydrogen has emerged as a transformative solution that can resolve this challenge.

Produced through renewable energy sources such as wind and solar, Green Hydrogen offers a carbon-free alternative that can decarbonize key sectors such as industries, power generation and transportation. Its integration into energy systems enhances storage, grid stability and promotes long term sustainability. As Bharat pursues its net zero ambitions via 'National Green Hydrogen Mission', the strategic adoption of Green Hydrogen can significantly mitigate climate impacts while ensuring our nation's energy security and resilience.

3. Dr. Dave Smith, National Technology Adviser (NTA)UK

Title: F r o m Innovation to Impact: UK-India Collaboration

Abstract: “Dr Dave Smith, the UK’s National Technology Adviser will be drawing on his extensive experience, including his role as Technology Director at Rolls-Royce (Aerospace & Power), setting their global Net Zero Strategy—Dr Smith will illustrate how advanced R&D, innovation ecosystems, and national technology strategies can deliver scalable climate solutions.His talk will reflect the ambitions of the India–UK Vision 2035, a long-term framework for joint leadership in science, technology, and sustainability. This includes initiatives such as the UK–India Net Zero Innovation Partnership, through which both countries are working together on key areas like decarbonising transport and energy systems, low-carbon manufacturing, hydrogen technologies, and carbon capture.”

Health & Medical Technologies

1. **Dr.** Shiv Kumar Sarin, Director, The Institute of Liver and Biliary Sciences, New Delhi

   Title: "Fatty Liver Disease Demands Engineering Healthcare"

   Abstract: Fatty Liver is seen in nearly one in three adults world wide, affecting more than 1.5 billion subjects. It is defined as >10% fat content in the liver, normal being <5%. Surplus fat in liver leads to inflammation of liver, diagnosed by high (>40 IU/ml) ALT (a liver enzyme) level. Overtime 20-30% subjects develop fibrosis of liver and a proportion, cirrhosis and even liver cancer. Fatty liver is also core to metabolic ill- health as the liver cells (hepatocytes) with surplus fat are unable to utilize the nutrients and need additional insulin (insulin resistance) to achieve same amount of energy, the ATPs. This leads to over the years, development of diabetes.

   Fatty liver is promoter of release of extra fat (cholesterol and triglycerides) in the blood which gets deposited on the arteries, making them hard and producing high BP, cardio-vascular diseases, stroke, and Non-communicable diseases (NCDs).

   We need to identify early biomarkers (genetic, biochemical, metabolic, etc.) and integrate them into non-invasive point of care (POC) tools for large population screening and precision medicine for high risk subjects. Future of precision medicine will depend on multi-ethnic genomic datasets, prospective multi-omic cohorts and randomized evaluation of polygenic risk score/microbiome-guided interventions. By uniting genetics, microbiome science, objective staging, and AI, precision medicine can shift Fatty Liver care from reactive disease management to proactive, individualized prevention and therapy.

2. **Prof. Gagandeep Kang**

   Title: "Developing point of care diagnostics for public health use"

3. **Prof. Tanuja Nesari, Director, ITRA, Jamnagar**

   Title: Integration of Ayush with Technology: Way for HEALTHY AND WEALTHY nation by 2047

   Abstract: The vision of Viksit Bharat 2047 calls for harmonizing India's rich traditional wisdom with cutting-edge technological innovation to create a sustainable, inclusive, and globally competitive nation. Ayurveda and other Ayush systems are the recognized indigenous systems of India and a separate Ministry of Ayush is established by Govt of to foster the quality education, cutting age research, innovations and translating the strengths of the system into

mainstream health care systems of India and across the globe. Ayush through its holistic wellness component offers soft strength to entire humanity and planet, hence complementing Ayush traditional knowledge systems with latest digital tools, AI,

biotechnology, and data analytics etc. can revolutionize healthcare deliveries and well as production and service industries. This integration fosters evidence-based practices, promotes innovation rooted in ancient science, and enhances global recognition of India's intellectual legacy. Initiatives like AYUSH GRID, Ayushman Bharat scheme, National Ayush Mission and digital therapeutics of Ministry of Ayush exemplify the seamless convergence of heritage and modern science. The scientific renaissance of Ayurveda includes advancements in understanding concepts like Prakruti etc. through Ayur-genomics, ancient diagnostics like Nadi (pulse examination) through digital applications and sensing technologies and drug deliveries as well as therapeutics through nano-formulations, digital therapeutics and standardized herbal research ensuring safety, quality, and efficacy of medical plants and products. Thus, the synergy of tradition with technology paves the path toward a self-reliant, evidence- driven, prosperous Bharat by 2047, embodying the true spirit of Saksham and Atmanirbhar Bharat making HEALTHY NATION IS WELTHY NATIONS reality in its true sense.

1. **Dr. Muraleedharan, Scientist G (SG) & Associate Head, Biomedical Technology Wing, SCTIMST, Trivandrum**

Title: "Role of Health Technologies as a pillar of Atma Nirbhar Bharat"

Abstract: We have the Atmanirbhar Bharat initiative aimed at making the country self-sufficient through focus on local manufacturing, reduced import dependency, and strengthening domestic industries. The role of public funded R&D institutions will be crucial in the success of this initiative. SCTIMST is a public funded institution under the aegis of Department of Science and Technology, Government of India. The Institute has an R&D arm, the Biomedical Technology Wing, which focuses on biomaterials and medical devices. The institute, for the past four and half decades of existence, has been successful in the development and commercialisation of many medical devices. Close to ninety technologies have been transferred to the industry. Out of which, more than twenty have been commercialised with good market penetration. During this period, SCTIMST was able to develop a sustainable and effective model for supporting indigenous industry and this model could be emulated across other domains also. In this holistic model, the institution shall take up the roles of a strategic investor, a facilitator and a catalyst. As a strategic investor, the institution shall establish the infrastructure for R&D and invest in business-driven R&D programs. As a facilitator, the institution shall establish testing and evaluation facilities with national/ international accreditation for meeting the regulatory requirements of the domain, set up modular manufacturing facilities to support industries for pilot production and work towards strengthening the regulatory system within the country. As a catalyst, it shall gear up to become nodal centre for knowledge in the domain and conduct programs for skill upgradation of people from R&D and industry.

Quantum Science & Technology

1. **Prof. Anil Prabhakar, Department of EEE, IIT Madras,**

Chennai: Title - Digital security through Quantum Secure

Communications

Abstract: The development of quantum computing poses an imminent threat to our digital infrastructure. The National Quantum Mission is developing both quantum key distribution (QKD) networks and post quantum cryptography (PQC) to safeguard our digital infrastructure. This talk will describe progress in PQC, research and development in both terrestrial and satellite based QKD, and the ongoing efforts in academia and industry towards building a quantum safe internet.

2. **Prof. Rajamani Vijayaraghavan, TIFR, Mumbai**

Title - Quantum computers based on superconducting electrical circuits

Abstract: Department of Condensed Matter Physics & Materials Science, Tata Institute of Fundamental Research, Mumbai-400005

The counterintuitive laws of quantum physics can be exploited for extremely powerful computations using a quantum computer. I will describe the hardware approach to build quantum computers using superconducting electrical circuits operating at cryogenic temperatures close to absolute zero. I will then give an overview of the status of this field worldwide and highlight the opportunities and challenges. I will conclude by describing the achievements in this field in India and highlight the goals planned under the National Quantum Mission.

3. **Dr. Gayathri Honnenahalli Niranjana Murthy, CEO, Quan2D Technologies Pvt limited, Bengaluru**

Title - Building Quantum Hardware for India's Future: An Entrepreneurial Journey in Deep-Tech Innovation

Abstract: Quantum technologies are redefining the boundaries of computation, communication, and sensing. India's National Quantum Mission has positioned the nation to emerge as a global hub for quantum research and innovation. This talk presents perspectives from a progressing entrepreneurial journey in developing superconducting nanowire single-photon detector (SNSPD) systems—core components for quantum communication and photonic sensing. It highlights how deep-tech startups, supported by national programs, are bridging the gap between research and commercialization. It also reflects on the challenges of advancing deep-tech R&D within India's evolving innovation ecosystem, emphasising indigenous development, inclusivity, and innovation.

The session explores how India can transform its scientific potential into sustainable quantum infrastructure and global competitiveness.

“Pioneering India’s quantum journey with purpose, inclusion, and the spirit of scientific entrepreneurship.”

4. **Prof. Aditi Sen De, Harish-Chandra Research Institute, Prayagraj**
   Title - Quantum Networks
   Abstract: Distributing information with minimal errors between several parties (nodes) situated in distant locations remains a challenging problem both in the classical and quantum domains. I will talk about the protocols based on quantum measurements and quantum gates, which enable the spread of quantum entanglement, the main ingredient for quantum communication, over multiple nodes of the network. I will further show how to implement these protocols in a photonic setup. Moreover, at the heart of building a large-scale quantum internet lies the challenge of establishing long-distance entanglement using quantum repeaters, which mitigate direct transmission losses but introduce additional noise in the nodes via interactions with the environment and imperfect operations. This effect has typically been studied under a simplifying Pauli channel assumption. I will also discuss how to distribute end-to-end entanglement in a homogeneous, repeater-based linear quantum network operating under a non-Pauli noise.
5. **Prof. Urbasi Sinha, RRI Bengaluru**
   Title: Building India's Quantum Edge

   Abstract: India is building a quantum edge. This panel channels ambition into action: how communications, computing, sensing, and materials can translate National Quantum Mission investments into near-term wins and durable capability. Speakers benchmark India against leading programs, surface bottlenecks (talent, fabs, supply chains, standards), and propose execution plays: secure-link field trials, demonstrator processors, deployable sensors, and materials pipelines. A policy-and-defense segment aligns DST, DRDO, MeITY, ISRO, and industry for scale. We conclude with a crisp action list—pilots to back, metrics to track, collaborations to launch, and timelines to hit—so prototypes become production-grade systems and India’s quantum stack moves from promise to performance

Space Technologies

1. **Dr. V.Narayanan, Chairman, ISRO, Bengaluru**

Title: India's Space Vision 2047: Challenges and Way forward

Abstract: On 21 November 1963, Nike Apache, the first rocket took-off from Thumba, a fishing hamlet near Thiruvananthapuram, Kerala announcing the birth of India's space programme. Over the years, leveraging its key resources, Indian Space Research Organisation (ISRO) has made several strides in space technologies, putting India a major player in the global space arena. ISRO's commitment to socio- economic development through space technology is evident in its research, application development and missions. The accomplishments have also led to world records in the niche space areas. Currently, ISRO is pursuing the nation's prestigious Gaganyaan programme i.e. for sending 1-3 Indians to the Space for a limited day. The Hon'ble Prime Minister of India had announced the India's Space Vision 2047 i.e., establishing Bhartiya Antariksh Station by 2035 and Indian Moon Landing by 2040. Towards the India's Space Vision 2047, major projects viz., Chandrayaan-4 i.e., Lunar Sample Return mission, Chandrayaan-5 i.e., ISRO-JAXA Lunar Polar Exploration mission, Next generation Launch Vehicle and Third Launch Pad were recently approved by the Union Cabinet. ISRO in association with the industries is actively pursuing these projects. In addition to this, ISRO is also venturing into advanced interplanetary missions viz., Venus Orbiter Mission and Mars Landing Mission. With this, India will become World Leader by 2040 in advanced space exploration and space infrastructure. Subsequent to the Space Sector Reforms 2020 and release of Indian Space Policy-2023, private space industries/ start-ups in the country have grown exponentially and started making significant contributions to the overall space ecosystem of India.

2. **Prof. Sanjay Mittal, Aerospace Engineering, IIT Kanpur**

Title: Sustainable Space Exploration: Air Intakes of Reusable Launch Vehicles

Abstract: Hybrid propulsion systems offer sustainable options for space missions. One such design is to employ a scramjet engine at a certain stage in the flight. Air intakes form a vital component of an airbreathing engine of a aerospace vehicle. We investigate the performance of a mixed-compression intake using stabilized finite element methods implemented on parallel computing platforms. In the sub-critical regime, the normal shock is pushed in the convergent part of the intake leading to the "buzz" instability and "unstart". It adversely affects the mass flow entering the engine and may lead to combustion instability, engine surge and flame out. Little buzz arises due to shear layer instabilities in the intake. Big buzz occurs due to pressure pulses from the subsonic portion of the intake. Flow control techniques such as boundary layer bleed to increase the operational boundaries of these engines are explored.

3. Ms. Jayanthi Bhagatha, Founder & CEO, JBI Aerospace

Title: Empowering India's Space Ecosystem: The Role of Women-Led MSMEs and Emerging Entrepreneurs in Building the Supply Chain for Space Missions

Abstract: India's space ambitions, from planetary exploration to sustained human spaceflight - call for a resilient and technology-driven industrial ecosystem. Women- led MSMEs and young entrepreneurs are emerging as key enablers in this transformation by strengthening indigenous supply chains, advancing precision manufacturing, and developing advanced composite and material solutions critical for space applications.

This talk highlights how enterprises like JBI Aerospace are collaborating with public sector organizations such as HAL and ISRO to qualify new materials, standardize processes, and achieve global certification readiness. It underscores the vital role of women entrepreneurs in driving innovation, fostering industrial partnerships, and contributing to India's vision of a self-reliant, sustainable, and inclusive space ecosystem.

4. Dr.Jhon Paul, Founder & CEO, Mysitech, Bengaluru

Title: Engineering the Extreme High Temperature Composites for Viksit Bharat 2047 Abstract: India's next decade of strategic programs—reusable spaceflight, launch- vehicle propulsion, hypersonics, advanced aviation, automobiles, and semiconductors— demands materials that perform at 1,200–3,000 °C and beyond. High-temperature composites (HTC) offer decisive advantages over metals in specific strength, thermal-shock tolerance, and high-temperature strength retention, among others. This address presents priority Indian use cases—TPS, hot structures, nozzles/throats, aircraft and automotive brake discs, and semiconductor hot zones— and outlines a pragmatic qualification ladder aligned with global benchmarks. At the center is the disruptive Film-Boiling CVI (FB-CVI) process, which shortens manufacturing cycles, improves material quality, reduces energy consumption, and raises first-pass yield—turning schedule into strategy. Indigenous capability demonstrations have positioned India on the global stage for the development and manufacture of HTC. Market sizing (TAM/SAM) and an import-to-export roadmap show how to build sovereign capability and create export-grade SKUs. The talk concludes with a National HTC Mission: process sovereignty, qualification infrastructure, digital-twin workflows, strategic procurement, and export enablement this transformation by strengthening indigenous supply chains, advancing precision manufacturing, and developing advanced composite and material solutions critical for space applications.

This talk highlights how enterprises like JBI Aerospace are collaborating with public sector organizations such as HAL and ISRO to qualify new materials, standardize processes, and achieve global certification readiness. It underscores the vital role of women entrepreneurs in driving innovation, fostering industrial partnerships, and contributing to India’s vision of a self-reliant, sustainable, and inclusive space ecosystem.