Collaborators

RAMAIAH UNIVERSITY OF APPLIED SCIENCES

in association with RAMAIAH INSTITUTE OF TECHNOLOGY

PROCEEDINGS

International Symposium

"Building a Quantum Ready Workforce for Viksit Bharat @ 2047: Challenges and Opportunities"

Wednesday, 24 June 2026 · 09:30 AM – 04:30 PM

Council Hall, Ramaiah Medical College, GG Campus, Bengaluru

Sponsored by the Foundation for QC Innovation (FQCI)

Dignitaries, resource persons and participants of the International Symposium

About the Symposium

The year 2025 was observed worldwide as the International Year of Quantum Science and Technology, marking the centenary of the formulation of quantum mechanics. Building on this, and in alignment with the national vision of a developed and self-reliant Viksit Bharat @ 2047, Ramaiah University of Applied Sciences (RUAS) and Ramaiah Institute of Technology (RIT) jointly organised an International Symposium on "Building a Quantum Ready Workforce for Viksit Bharat @ 2047: Challenges and Opportunities."

Quantum science and technology has emerged as one of the most transformative domains of the twenty-first century, with implications for computing, communication, sensing, materials and security. With the Government of India's National Quantum Mission positioning the country among the nations investing in this frontier, the symposium was conceived as a platform to bring together academia, industry, research institutions and policymakers to deliberate on the preparation of a quantum-ready workforce. The event was sponsored by the Foundation for QC Innovation (FQCI).

Objectives

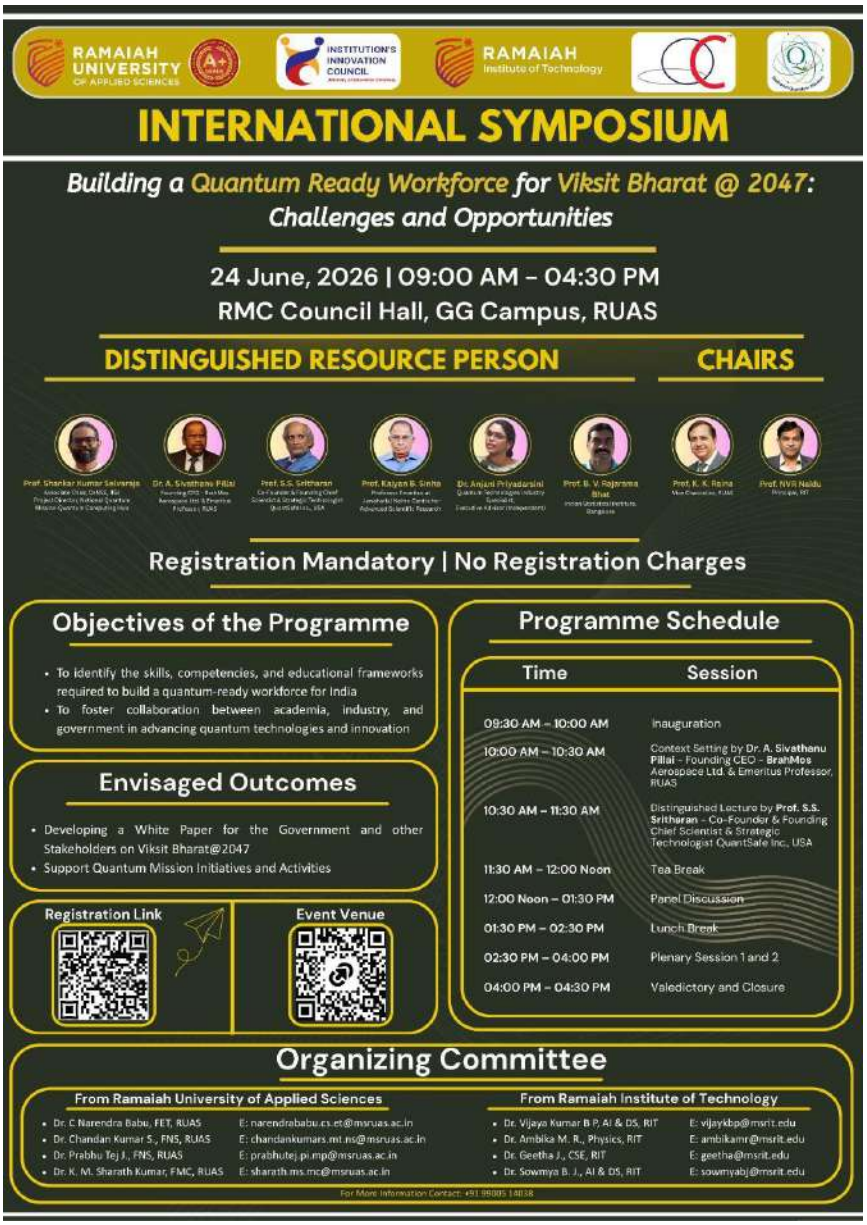
The symposium was organised with the following objectives:

- To deliberate on the importance of quantum science and technology for India's development goals under Viksit Bharat @ 2047.
- To examine the talent, infrastructure and curricular initiatives required to build a quantum-ready workforce.
- To foster collaboration among academia, industry, government and research institutions, including the National Quantum Mission hubs.
- To expose faculty, researchers and students to the foundations and the latest global developments in quantum computing, communication, sensing and quantum-safe systems.
- To identify actionable directions for institutional participation in the national quantum ecosystem.

Programme Schedule

Inauguration (09:30–10:00) — Welcome Address (Dr. C. Narendra Babu), Address by Chief Guest 1 (Dr. A. Sivathanu Pillai), Address by Chief Guest 2 (Prof. S. S. Sritharan), Presidential Address (Prof. K. K. Raina), Vote of Thanks (Dr. Vijaya Kumar B. P.).

Context Setting (10:00–10:30) — Dr. A. Sivathanu Pillai. Distinguished Lecture (10:30–11:30) — “The Quantum Revolution,” Prof. S. S. Sritharan. Panel Discussion (12:00–13:30) — moderated by Prof. K. K. Raina. Plenary Sessions (14:30–16:00) — Prof. Shankar Kumar Selvaraja and Dr. Anjani Priyadarsini. Valedictory (16:00–16:30).

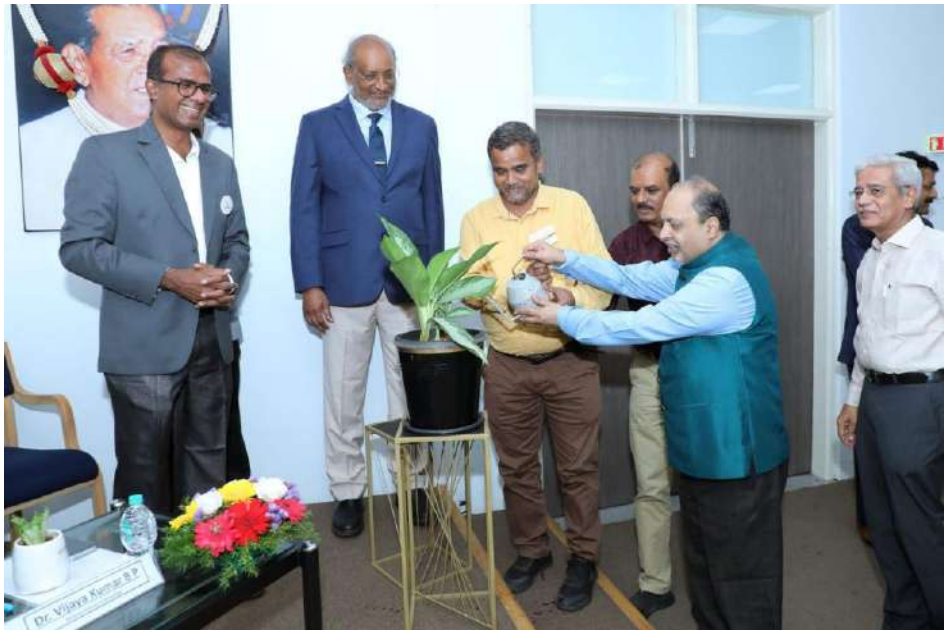


Symposium e-poster and programme schedule

Inaugural Session

The symposium commenced with a formal inaugural session. Following a welcome to the dignitaries on the dais, special invitees, heads of departments of RUAS and RIT, faculty, researchers and student delegates, the gathering observed the Ramaiah Anthem, invoking the blessings of the Almighty and of the Founder Chairman.

In keeping with the theme of sustainable development, the symposium was inaugurated through the watering of a sapling by the dignitaries on the dais, joined by participants — a gesture described as symbolising growth, innovation and a shared responsibility towards building a sustainable future.



Inauguration through the watering of a sapling

Dignitaries on the dais during the inaugural session

Welcome Address

Dr. C. Narendra Babu — Professor and Head, Department of Computer Science and Engineering, FET, RUAS

Delivering the welcome address, Dr. C. Narendra Babu individually welcomed the Vice Chancellor, the Chief Guests, the chairs and each of the distinguished resource persons, and extended warm greetings to the panelists, plenary speakers, delegates, faculty, researchers and students. He situated the symposium within the global observance of the International Year of Quantum Science and Technology and the national aspiration of Viksit Bharat @ 2047, and outlined the day's programme — from the context-setting session and the distinguished lecture to the panel discussion and plenary sessions.

Address by Chief Guest – 1 (Inaugural)

Dr. A. Sivathanu Pillai — Founding CEO, BrahMos Aerospace; Emeritus Professor and Member, Board of Governors, RUAS

In his inaugural address, Dr. A. Sivathanu Pillai placed quantum technology within the larger arc of India's progress over the past decade — spanning agriculture, industry, the adoption of artificial intelligence, and achievements in space — and noted the country's standing among the fastest-growing major economies. He observed that economic, military and space capability must be matched by leadership in frontier technology, and pointed to the national missions launched to that end, including those in artificial intelligence, hydrogen and quantum. He commended RUAS

for its initiative in this area and wished the symposium success, setting the stage for his detailed context-setting session that followed the inauguration.

Address by Chief Guest – 2 (Inaugural)

Prof. Sivaguru S. Sritharan — Co-Founder, Founding Chief Scientist & Strategic Technologist, QuantSafe Inc., USA; former Vice Chancellor and Emeritus Professor, RUAS

In brief inaugural remarks, Prof. S. S. Sritharan welcomed the gathering on behalf of the University and reflected on the global research landscape, identifying artificial intelligence and quantum as the two dominant scientific subjects of the present era, alongside fields such as hypersonics, autonomy and biotechnology. He set a collegial tone for the day and invited an open exchange of ideas, ahead of his distinguished lecture later in the morning.

Presidential Address

Prof. (Dr.) Kuldeep Kumar Raina — Hon'ble Vice Chancellor, RUAS

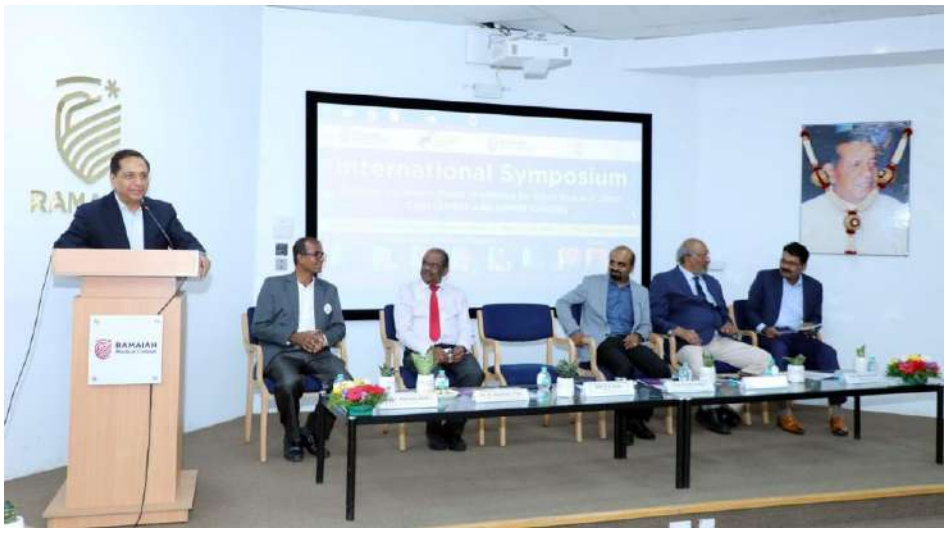
Delivering the presidential address, the Vice Chancellor, Prof. K. K. Raina, welcomed the coming together of RUAS and RIT and framed the symposium as the opening of new avenues for future partnerships and collaboration. He reported a participation of nearly seventy-six delegates drawn from academia and the corporate sector, a number constrained by the seating capacity of the venue.

Tracing the shift from the classical bit to the qubit, and recalling the foundational era of modern physics associated with Heisenberg, Einstein and their contemporaries, he argued that the nation is witnessing a paradigm shift comparable to the move from electron physics to electronics. He noted the public investment being directed towards quantum talent and infrastructure, including the conception of "quantum valleys," and emphasised that institutions such as RUAS must become equal partners in these national initiatives.

Among concrete institutional measures, he reported that RUAS has, on the recommendation of its task force and with the approval of its Academic Council, introduced quantum technologies as a subject offered across undergraduate engineering disciplines. Recalling the example of C. V. Raman — whose work on Raman spectroscopy emerged from a modest experimental setup at the Indian Association for the Cultivation of Science — he reminded the audience that great science depends on great ideas more than on great budgets, and advocated a consortium model in which institutions partner with the National Quantum Mission hubs rather than duplicating investment.

He further referred to strategic initiatives including a partnership with the University at Albany, State University of New York, the establishment of the Ramaiah Institute of Science and

Management, and a new B.Tech programme led by the electronics department structured around three tracks — nanoengineering and nanotechnology, semiconductors, and quantum technologies. Linking these to India's demographic dividend, he called for the country to retain and attract the best scientific minds and to partner globally as peers, so that the workforce maturing towards 2037–2047 is equipped to lead.

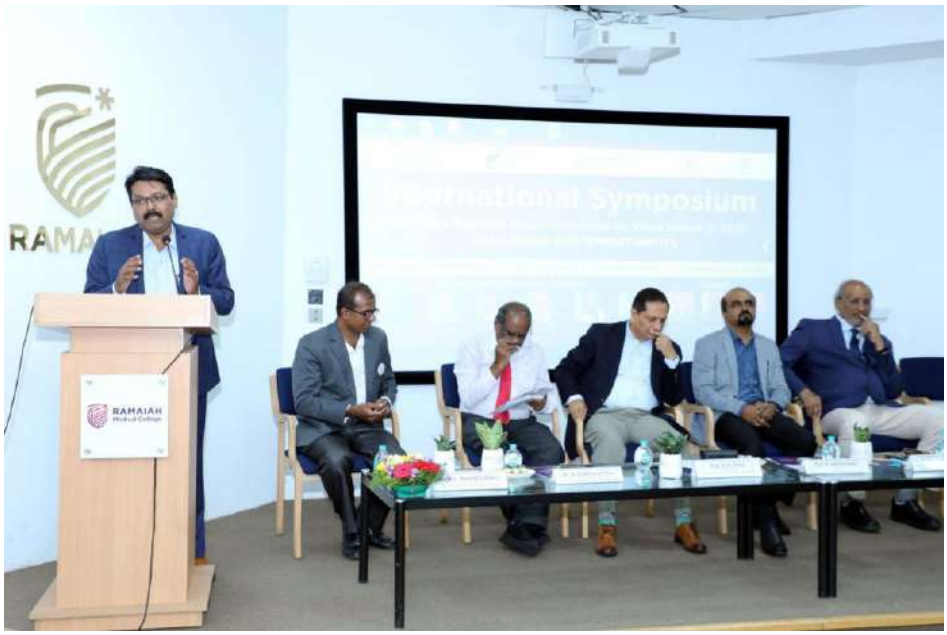


Prof. K. K. Raina, Vice Chancellor, RUAS, addressing the inaugural session

Vote of Thanks

Dr. Vijaya Kumar B. P. — Professor and Head, Department of AI & DS, RIT

Proposing the vote of thanks, Dr. Vijaya Kumar B. P. reflected briefly on the connected and probabilistic nature of the quantum world and its promise for future technology, before recording the gratitude of the organising committee. He thanked Dr. A. Sivathanu Pillai for his inspiring address on the role of advanced and strategic technologies in nation-building; Prof. S. S. Sritharan for his perspective on quantum technologies and secure systems; the Vice Chancellor for presiding over the function; and the chairs, distinguished resource persons, participants and the organising team.



Dr. Vijaya Kumar B. P. proposing the vote of thanks

Technical Sessions

Context Setting

Dr. A. Sivathanu Pillai — Founding CEO, BrahMos Aerospace; Padma Bhushan awardee

Following the inauguration, Dr. A. Sivathanu Pillai delivered a detailed context-setting session on the National Quantum Mission and its implications for institutional action. He described the mission as a national programme, which he placed at a 2023 launch, intended to build a robust quantum technology ecosystem and to establish India as a leader in quantum computing, communication, sensing and materials by 2030–31, supported by a budget of the order of ₹6,003.65 crore.

He set out the mission's four thematic areas and their deliverables: in quantum computing, the development of an intermediate-scale machine targeting one thousand qubits using superconducting and photonic platforms, noting that photonic computing capability has already been demonstrated at the Indian Institute of Science; in quantum communication, satellite- and fibre-based secure quantum networks beyond a 2,000-kilometre range, with cybersecurity as a central concern, led from IIT Madras; in quantum sensing and metrology, high-sensitivity magnetometers and atomic clocks for precision applications such as brain and terrain mapping, led from IIT Bombay; and in quantum materials, advances in materials and fabrication methodology, led from IIT Delhi.

Emphasising that technology must be matched by the people to manage and use it, he called on academic institutions to introduce dedicated electives in quantum computing and quantum sensing to build the necessary talent pool. He surveyed application domains poised for transformation — finance and banking, quantum-enabled healthcare diagnosis and treatment, and manufacturing, citing the use of computer vision and AI to reduce manufacturing time and cost by around twenty-five percent — and outlined a future shaped by topological and photonic computing, the quantum internet, and quantum cryptography and security, an area in which he urged India to take a lead.

He concluded with a concrete appeal to the host institution: rather than attempting a large machine, RUAS should constitute a dedicated quantum technology team and aim to build a photonics-based single-qubit desktop quantum computer, drawing on the expertise of the Indian Institute of Science, and so take a lead among universities in indigenous quantum capability. The Vice Chancellor presented a memento to Dr. Pillai at the close of the session.

Dr. A. Sivathanu Pillai delivering the context-setting session

Distinguished Lecture — "The Quantum Revolution"

Prof. Sivaguru S. Sritharan — Co-Founder & Founding Chief Scientist, QuantSafe Inc., USA (presented as "Quantum Revolution and the Legacy of John von Neumann")

The centrepiece of the day was the distinguished lecture by Prof. S. S. Sritharan, who offered a rigorous account of quantum science from the standpoint of an applied mathematician, organised around ten themes spanning the latest machines, the mathematical foundations, and the frontier of quantum filtering and control.

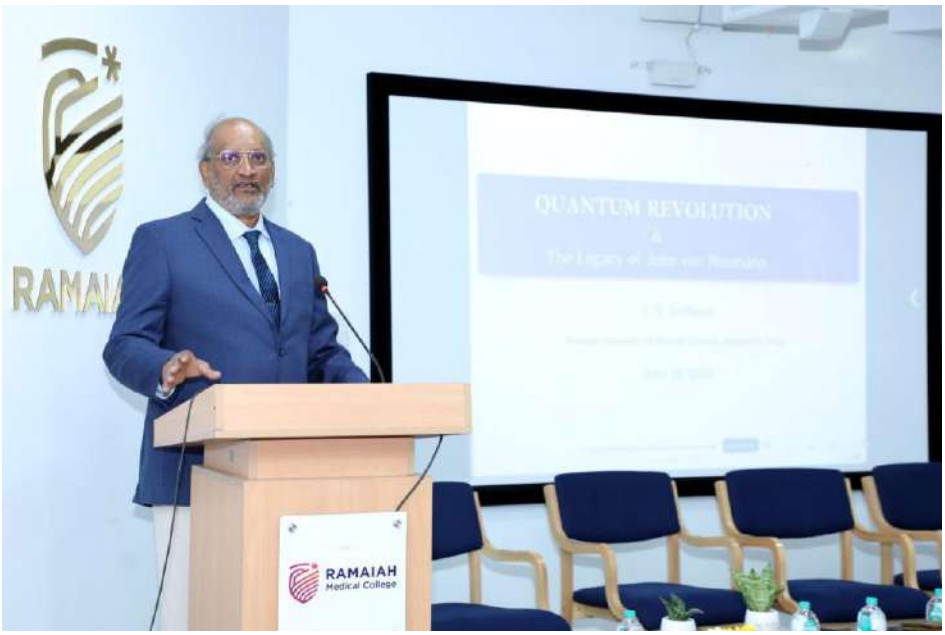
Latest machines. He opened with recent landmarks in quantum hardware: the Jiuzhang 4.0 photonic quantum computer reported by Chinese scientists in Nature (2026), using 3,050 photons to perform Gaussian boson sampling far beyond the reach of classical supercomputers; Google's 54-qubit superconducting Sycamore processor and its 2019 demonstration of quantum supremacy; and IBM's 127-qubit Eagle processor, the first to exceed one hundred qubits, maintained at near-absolute-zero temperatures by a cryostat.

Foundations. Tracing the conceptual lineage from Dirac's principle of superposition to von Neumann's precise formulation, he explained how quantum theory is built on the lattice of subspaces of a complex, separable Hilbert space, and how the symmetries of this structure — captured by projective unitary representations — give rise to the Schrödinger equation (from the time-translation group) and the Dirac equation (from the inhomogeneous Lorentz group). He introduced Dirac notation, states as unit vectors, observables as self-adjoint operators, and the composition of systems through tensor products.

Information, probability and entropy. He then developed the language of quantum information — qubits and multi-qubit registers, Bell states and entanglement, the Pauli, Hadamard, phase and controlled-NOT gates, and the universality theorem establishing that a small set of gates can approximate any unitary operation. Contrasting classical (Kolmogorov) and quantum (von Neumann) probability, he presented states as density matrices, measurement via the spectral theorem and the wave-collapse postulate, the Heisenberg uncertainty principle, and the von Neumann entropy, including the maximum-entropy (Gibbs) state that characterises quantum thermal equilibrium.

Error correction and open systems. Turning to practical capability, he set out the quantum-channel model of noise and the Knill–Laflamme conditions for a correcting code, illustrated by Shor's nine-qubit code and the optimal five-qubit code, and noted freely available software for quantum error correction. He then treated open quantum systems and decoherence through quantum dynamical semigroups and the GKLS (Lindblad) master equation of 1976, contrasting the reversible, entropy-preserving dynamics of closed systems with the irreversible, entropy-producing dynamics of open ones.

Quantum stochastic calculus, filtering and control. In his own area of research, Prof. Sritharan presented the quantum stochastic calculus of Hudson and Parthasarathy (1984) — Bosonic Fock space, exponential vectors, the quantum Itô table and the Hudson–Parthasarathy equation — and showed how classical Brownian motion and Poisson processes emerge from quantum noise. He concluded with the quantum filtering and control theory of Belavkin, including photon-counting and homodyne measurement models, the quantum analogues of the Zakai and Fujisaki–Kallianpur–Kunita filtering equations, and a separation principle leading to a Hamilton–Jacobi–Bellman formulation on von Neumann algebras. He placed these developments within a century-long arc of milestones, from Dirac and von Neumann to the present applications in quantum computing, open systems and sensing.



Prof. S. S. Sritharan delivering the Distinguished Lecture, "The Quantum Revolution"

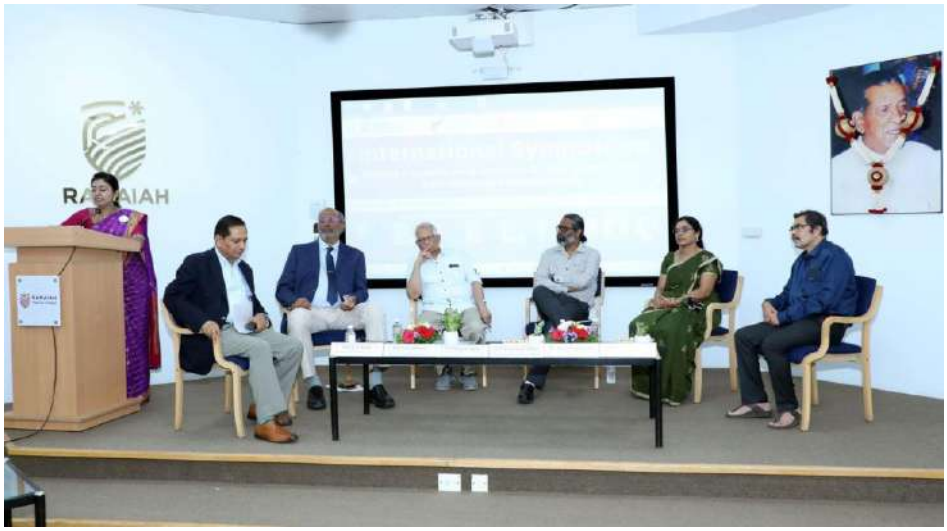
Panel Discussion

Theme: Building a Quantum Ready Workforce for Viksit Bharat @ 2047 — Challenges and Opportunities · Moderator: Prof. K. K. Raina

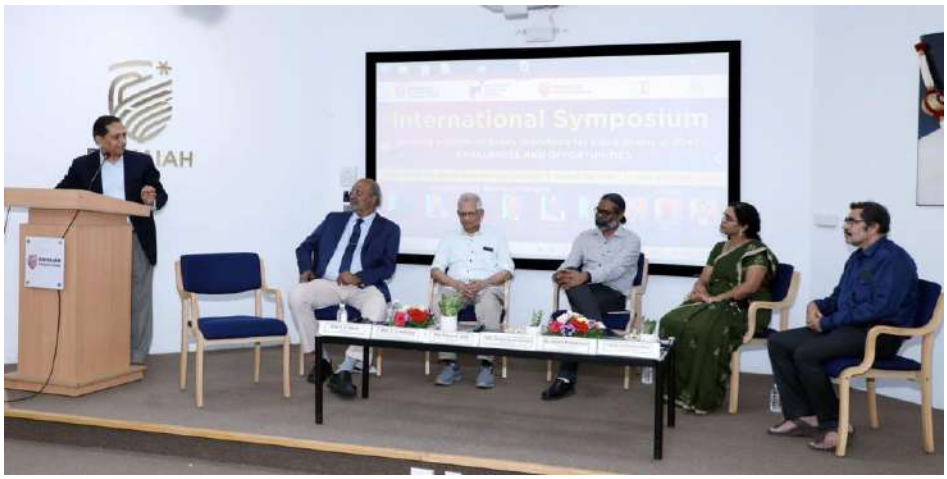
A panel discussion brought together representatives of academia, industry and research organisations to explore the skills, policies, collaborations and educational initiatives needed to prepare India's workforce for the quantum era. The panel comprised Prof. S. S. Sritharan; Prof. Shankar Kumar Selvaraja (Associate Chair, Centre for Nano Science and Engineering, IISc, and Project Director, National Quantum Mission – Quantum Computing Hub); Prof. Kalyan B. Sinha (Professor Emeritus, JNCASR); Dr. Anjani Priyadarsini (Quantum Technologies Industry Specialist and Executive Advisor); and Prof. B. V. Rajarama Bhat (Indian Statistical Institute), with the Vice Chancellor, Prof. K. K. Raina, as moderator. Key points raised during the discussion included:

- Prof. Kalyan B. Sinha framed the historical "quantum revolution" in stages — from Planck's 1900 quantum hypothesis and Einstein's 1905 theory of photoelectric emission, through the consistent theory built by Born, Heisenberg, Schrödinger and Dirac (1924–1950) and its crowning achievement in quantum electrodynamics, to the insight of Feynman and Deutsch that the linear mathematical structure of quantum mechanics can be exploited for computation, with quantum methods requiring resources scaling only polynomially in the logarithm of the problem size, a major advantage for very large problems.

- On building a workforce, Prof. Sinha observed that teaching new quantum electives requires teachers trained in the subject, whose mathematical basis lies in functional analysis and operator theory; he suggested leveraging existing expertise, creating postdoctoral positions for well-qualified researchers willing to teach a course while pursuing research, and providing internship opportunities for students to gain practical exposure.
- Prof. Selvaraja noted that, of the quantum technologies, sensing is already at a commercially mature level (for example SQUID magnetometers used in healthcare, safety and geology), with secure communication and post-quantum cryptography the next area of impact, while large-scale quantum computing remains the furthest off; he stressed identifying problems that are genuinely amenable to near-term quantum resources and setting realistic milestones.
- Prof. Sritharan addressed the question of "visualising" quantum systems, recalling that projective geometry and engineering drawing were developed to represent three-dimensional objects in two dimensions, and that mathematics enables one to reason about and, in a sense, visualise arbitrary dimensions — one of its great achievements.
- Dr. Anjani Priyadarsini, from an industry perspective, described emerging quantum software agents that translate a natural-language problem into a qubit-level mathematical formulation and select suitable hardware, and outlined how industry identifies quantum-amenable problems across sectors (such as capacity planning, routing and resource allocation in telecom) and contributes to closing the skill gap through curriculum inputs, staff reskilling and student internships.



The panel discussion in progress



Resource persons and moderator during the panel discussion

Plenary Session 1

Prof. Shankar Kumar Selvaraja — "National Mission for Self-Reliant Quantum Technology: Challenges and Opportunities"

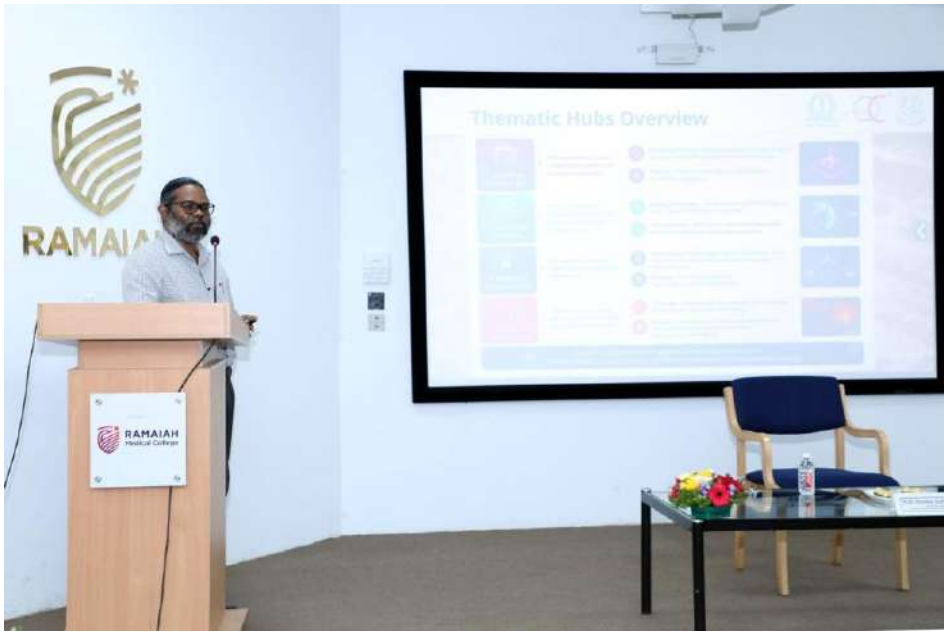
In the first plenary, Prof. Shankar Kumar Selvaraja provided an overview of the National Quantum Mission and a candid assessment of the opportunities and challenges for educational institutions. He described the mission, which he noted was officially launched in 2024, as structured around four technology verticals through thematic hubs — computing (IISc), sensing (IIT Bombay), communication (IIT Madras), and materials and devices (IIT Delhi) — with the explicit goal of building working quantum systems and making them available externally, including through the cloud, rather than pursuing research alone.

He explained that the mission operates on a consortium model: roughly seventeen large projects have been approved, each involving at least four institutes, with individual project budgets ranging from about ₹50 crore to ₹150 crore, spanning some 43 institutes across 17 states, and with a further vertical dedicated to quantum algorithms awaiting approval. For the Computing Hub specifically, he cited a budget of the order of ₹650 crore for six projects and an additional ₹570 crore for shared national central facilities for fabrication, characterisation, testing and packaging. He described programmes for start-ups, for industry–academia engagement, and for human resource development through internships and postdoctoral support, and emphasised the indigenisation of even individual components rather than only complete machines, so that strategic technology remains within the country.

Addressing educators directly, Prof. Selvaraja stressed that quantum technology is deeply interdisciplinary — drawing on physics, mathematics, electronics, computer science, photonics, control systems and mechanical engineering (including cryogenics and materials) — and that

there is therefore no single “foundational” quantum course; institutions should strengthen their existing engineering foundations and add to them rather than replace them. He identified the shortage of trained faculty as a central challenge, calling for serious train-the-trainer and faculty development efforts, and pointed to the AICTE quantum technology curriculum as a ready resource that institutions can adapt.

Crucially, he argued that institutions can begin without heavy investment: a good classical computing facility with open-source software, small optics, FPGA programming, simple RF electronics and classical experiments that mimic quantum effects are sufficient to start, while costly infrastructure carries significant recurring operating costs. He described quantum technology as a skill, akin to a craft that combines firm fundamentals with the ability to adapt, and urged that any new programme first answer the question of where its graduates will find careers — noting that graduates equipped with strong fundamentals can also contribute in semiconductors, cryogenics and allied fields. He concluded by advocating project- and application-based learning, industry–academia collaboration, interdisciplinary teamwork across departments, use of national resources such as NPTEL, and assessment that goes beyond conventional examinations. In the discussion that followed, he explained that scaling qubit numbers is comparatively easy whereas achieving high fidelity is the hard problem — one that depends more on process technology and control electronics than on quantum physics alone.



Prof. Shankar Kumar Selvaraja delivering Plenary Session 1

Plenary Session 2

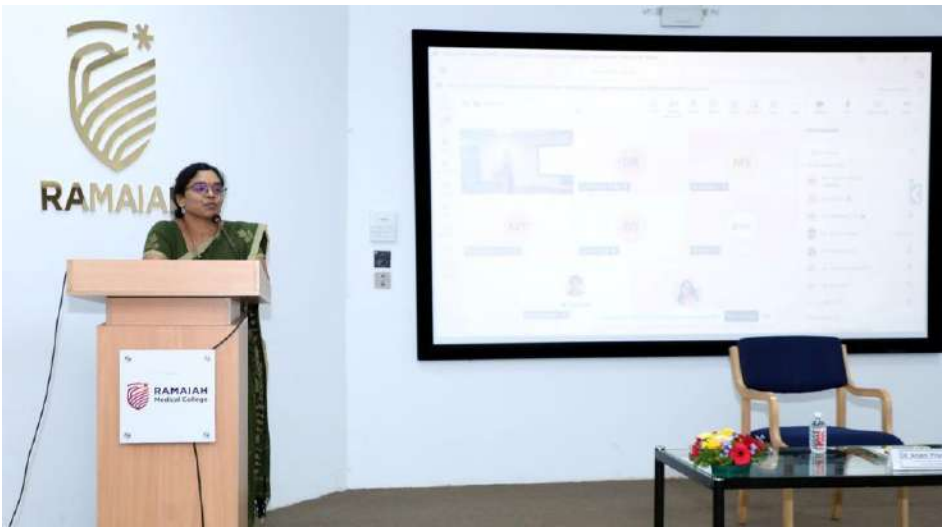
Dr. Anjani Priyadarsini — “Accelerating R&D with Quantum Computing”

In the second plenary, delivered in an interactive style, Dr. Anjani Priyadarsini addressed a common misconception at the outset: a quantum computer is not simply a faster classical computer — its clock cycles are in fact slower — and its distinction lies in how information is stored and processed. Where classical computers encode bits through voltage levels, quantum computers exploit quantum-mechanical states, such as energy levels in superconducting circuits, polarisation in photonic systems, or spin states.

She explained computational complexity as the "mathematical heavy lifting" within a programme — typically a small number of linear-algebra operations such as matrix inversion, eigenvalue computation or the solution of partial differential equations that consume most of the running time — and illustrated, through examples such as automotive brake design, how engineering problems reduce to such computations. The role of a quantum computer, she explained, is not to run an entire problem but, much like routing around congestion on a map, to take on the computational bottleneck within a hybrid workflow, working hand in hand with classical CPUs, GPUs and high-performance computing rather than replacing them.

She surveyed concrete use cases — material deformation and crash-test sequencing in the automobile industry, sensor placement in autonomous vehicles, molecule–protein binding in drug discovery, and portfolio optimisation in finance — and noted that a problem becomes a candidate for quantum methods when it exceeds practical classical timelines and falls into one of three categories: simulation, optimisation, or machine learning, provided the problem is sufficiently large and complex. She was candid that no quantum computer today outperforms classical systems in general; the value of quantum lies in a richer class of algorithms for problems where classical methods become impractical.

She distinguished "quantum-inspired" methods — classical techniques that capture some of the advantage (for example, a logarithmic speed-up through sampling and singular-value decomposition) and require no quantum hardware — from genuine quantum computation, and recommended that learners begin on simulators before moving to more expensive real hardware. She highlighted the trade-offs to weigh in choosing a platform (time complexity, accuracy, resources and cost), cautioned that converting classical data to and from quantum form is itself an overhead that does not enjoy the exponential speed-up of the processing step, and explained that quantum results are inherently probabilistic, obtained through repeated measurement and verified mathematically.



Dr. Anjani Priyadarsini delivering Plenary Session 2

Valedictory Session

Welcome: Dr. Vijaya Kumar B. P. · Valedictory Address: Prof. B. Sathish Babu · Vote of Thanks: Dr. K. M. Sharath Kumar

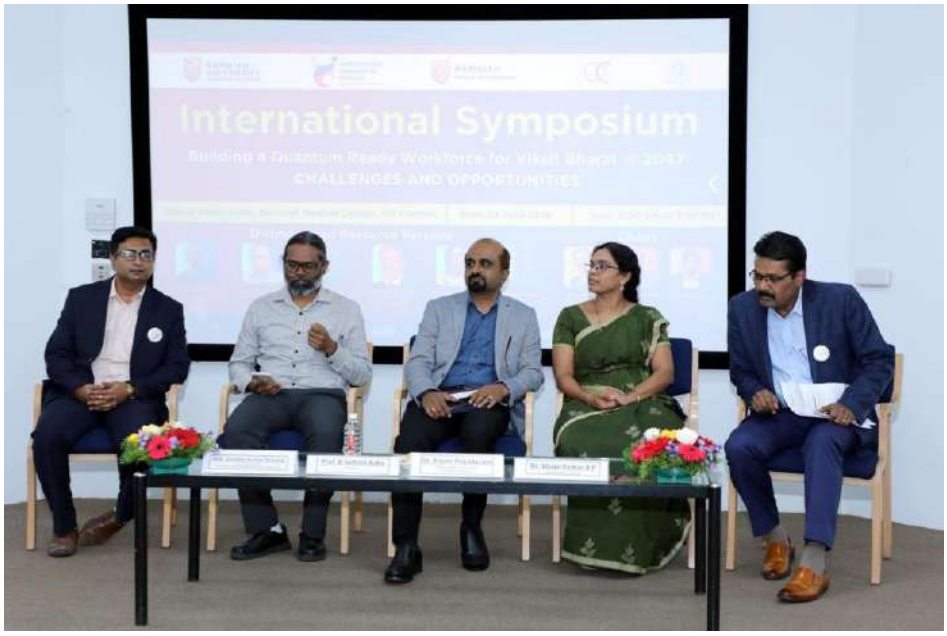
Welcoming the gathering to the valedictory session, Dr. Vijaya Kumar B. P. offered a unifying framing of the day's deliberations in terms of three kinds of computation that quantum technology stands to transform: classification (observing the world at the micro and nano scale, where quantum sensing applies), function approximation (carrying out functions more effectively and efficiently), and optimisation (the allocation and management of resources across every sector). He linked these to bringing clarity to ambiguity and to the achievement of the Sustainable Development Goals.

Delivering the valedictory address, the Principal of RIT, Prof. B. Sathish Babu, reflected candidly on his own journey into quantum from a classical computing background, touching on concepts such as Schrödinger's cat, superposition, entanglement, wave functions and the move from a deterministic to a probabilistic paradigm. He stressed that the quantum journey requires preparedness and conviction in the face of challenges in mathematics, physics and the limited availability of infrastructure, and pointed to regional developments — a 25-qubit quantum computer in the course of installation associated with IIIT under the Government of Karnataka, and infrastructure established by VTU with the Telecom Centre of Excellence under the national mission on an urban–spoke model. Observing that the National Quantum Mission proceeds in phases — from building knowledge to building a research ecosystem, then centres of excellence and funding — he urged institutions to form dedicated local teams and regular reading and study groups, recounting that members of his own earlier quantum group had gone on to quantum laboratories at Duke University and to Google. He encouraged participants to begin steadily and to persevere so that, by 2047, a confident quantum workforce can be built.

Proposing the vote of thanks, Dr. K. M. Sharath Kumar introduced the complementary notion of "Quantum Management" — the principle that everything is connected to everything, and that organisations must cultivate creativity and resilience in the face of unpredictability — illustrating it with management case studies and the idea that every employee should adopt an entrepreneurial, CEO-like mindset, which he linked to the national goal of reaching developed-nation status by 2047. He thanked the speakers, the leadership of the two institutions, the organising committee and the participants, and noted that what began as a single guest lecture had grown into an international symposium — a landmark joint event for RUAS and RIT — held

without any registration fee. The session closed with the distribution of certificates and the collection of feedback.

Welcome address at the valedictory session



The valedictory session

Key Outcomes and Takeaways

The principal takeaways from the symposium were as follows:

- Quantum science and technology was affirmed as a strategic national priority, with the National Quantum Mission and Viksit Bharat @ 2047 providing the policy framework for institutional action.
- The National Quantum Mission was described as operating through four thematic hubs — computing (IISc), communication (IIT Madras), sensing (IIT Bombay) and materials and devices (IIT Delhi) — on a consortium model of roughly seventeen large projects across 43 institutes in 17 states, with a mission budget of the order of ₹6,003.65 crore and a target of a thousand-qubit machine by 2030–31, supported by shared national facilities and a forthcoming quantum-algorithms vertical.
- The primacy of workforce and talent development was a recurring theme: dedicated electives, train-the-trainer and faculty development programmes, postdoctoral and internship routes, the AICTE quantum curriculum, project- and application-based learning, and the framing of quantum technology as a skill built on strong engineering fundamentals.
- Institutions were encouraged that they can begin with modest means — a classical compute facility with open-source software, small optics, FPGA and RF electronics, and classical experiments that mimic quantum effects — while being mindful of the recurring operating costs of advanced infrastructure, and were advised to first establish where their graduates will find careers.
- A realistic technical picture emerged: quantum computers are slower than classical machines but offer a richer class of algorithms; they are used within hybrid workflows for computational bottlenecks falling into simulation, optimisation or machine learning; quantum-inspired classical methods are a useful entry point; the input/output conversion of data is an overhead; achieving high fidelity (rather than scaling qubit numbers) is the hard problem; and among the technologies, sensing is already commercially mature, communication and post-quantum cryptography are next, and large-scale computing is furthest off.
- Concrete institutional measures at RUAS were highlighted: quantum technologies introduced as an undergraduate subject (Academic Council approved); a proposed B.Tech programme with nanotechnology, semiconductor and quantum tracks; a partnership with the University at Albany (SUNY) and the Ramaiah Institute of Science and Management; university fellowships; and a specific proposal that RUAS constitute a quantum technology team and build a photonics-based single-qubit desktop quantum computer with guidance from the Indian Institute of Science.

- Application domains identified as poised for transformation included healthcare and diagnostics, finance and portfolio optimisation, manufacturing, drug discovery, automotive design and testing, secure communication and cryptography, and sensing through magnetometers and atomic clocks.
- Regional ecosystem developments were noted, including a 25-qubit quantum computer under installation associated with IIIT under the Government of Karnataka and VTU's regional infrastructure with the Telecom Centre of Excellence, together with the phased path of the national mission from knowledge-building to research, centres of excellence and funding.
- A complementary management perspective — "Quantum Management," emphasising interconnectedness, resilience and an entrepreneurial mindset — was linked to the nation-building effort towards a developed India by 2047.
- The Vice Chancellor invited the symposium to converge on a small set of actionable recommendations, and speakers consistently advocated dedicated institutional teams, consortium and hub partnerships, and sustained industry–academia collaboration as the route forward.

Distinguished Resource Persons

Profiles of the resource persons, as introduced during the symposium:

Dr. A. Sivathanu Pillai

An Indian scientist and Padma Bhushan awardee, Founding CEO of BrahMos Aerospace, and Member of the Board of Governors of Ramaiah University of Applied Sciences. Widely regarded as a close associate of the former President, Dr. A. P. J. Abdul Kalam, he is President of Project Management Associates and former Chairperson of the Board of Governors of the National Institute of Technology, Kurukshetra. At the Defence Research and Development Organisation (DRDO), Ministry of Defence, he served as Chief Controller of Research and Development (1996–2014) and held the rank of Distinguished Scientist (1999–2014).

Prof. Sivaguru S. Sritharan

An internationally renowned mathematician and aerodynamicist whose work has earned over 2,550 citations, with research spanning nonlinear partial differential equations, stochastic Navier–Stokes equations, control theory and the optimal control of viscous flows. He earned first-class honours in mechanical engineering from the University of Peradeniya, an M.S. in aeronautics and astronautics from the University of Washington, and a Ph.D. in applied mathematics from the University of Arizona, and developed the dynamic programming method for the Navier–Stokes equations. In 2024 he developed nonlinear filtering frameworks for quantum dynamics for infinite-dimensional quantum stochastic systems modelled by Schrödinger equations with noise. He served as the first Provost and Vice Chancellor of the U.S. Air Force Institute of Technology, Dean of the Graduate School of Engineering and Applied Sciences at the U.S. Naval Postgraduate School, Professor and Chair of Mathematics at the University of Wyoming, and Vice Chancellor of RUAS (2019–2020). He is Co-Founder and Founding Chief Scientist of QuantSafe Inc., USA.

Prof. Shankar Kumar Selvaraja

A faculty member at the Centre for Nano Science and Engineering (CeNSE), Indian Institute of Science, Bangalore, where he is Associate Chair, and Project Director of the Quantum Computing Thematic Hub of the National Quantum Mission at IISc. He chaired the National Nano Fabrication Centre at IISc for nine years until 2025, driving it to ISO 9001, 14001 and 45001 qualifications. Previously with imec, Belgium, he developed wafer-scale fabrication technology for silicon photonic integrated circuits. He has published over 300 research articles and holds more than a dozen patents, and is a co-founder of AGNIT Semiconductors — India's first compound

semiconductor device manufacturing start-up — and of the photonics start-ups ELPHINS Technologies and VELLUME Photonics.

Prof. Kalyan B. Sinha

Professor Emeritus at JNCASR and a distinguished mathematician specialising in quantum probability and operator theory. Educated at Presidency College, Kolkata and the University of Delhi, he obtained his Ph.D. from the University of Rochester. He is a SERB Distinguished Fellow and Honorary Professor at JNCASR and a Distinguished Associate of IISc, Bengaluru. His previous positions include Bhatnagar Fellow (CSIR) and Distinguished Scientist and Director of the Indian Statistical Institute, with visiting professorships at the Universities of Texas at Austin, Tennessee, Geneva and RIMS Kyoto. His honours include the C. V. Raman Medal, the Ulam Chair Professorship at the University of Colorado, the Shanti Swarup Bhatnagar Prize, the Ganesh Prasad Memorial Award of the Indian Mathematical Society, and the P. C. Mahalanobis Medal of the Indian Science Congress. He is a Fellow of the Indian National Science Academy and the Indian Academy of Sciences.

Dr. Anjani Priyadarsini

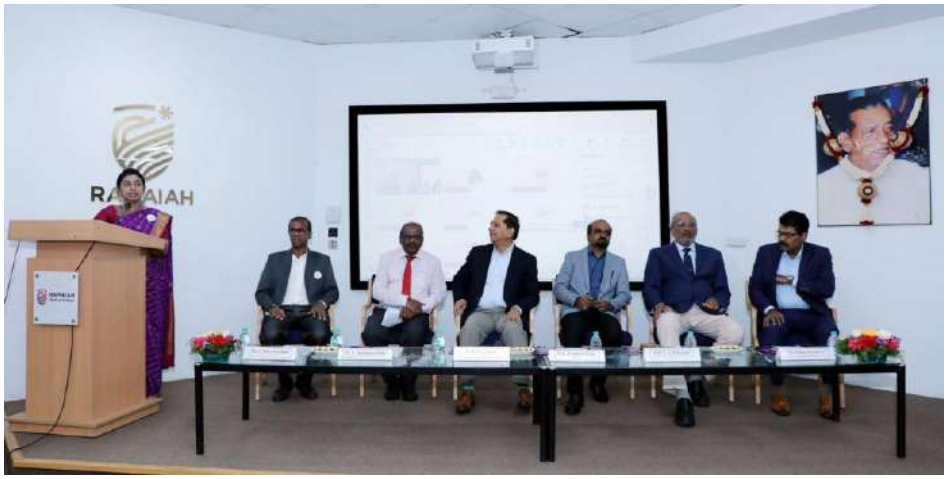
A quantum physicist with a Ph.D. from the Indian Institute of Science and former National Lead for Quantum Technologies at AWS India. Beginning her career as a software engineer at Infosys, she later served as Technical Lead at Sohum Innovation Lab, where she led the development of an indigenous newborn hearing-screening device for which the team earned a National Award, and subsequently as a Computation and Algorithmic Specialist in Quantum at Robert Bosch. Working in computational mathematics and quantum algorithms, her expertise spans domains including automotive, aerospace, robotics, computational fluid dynamics, finance, supply-chain management, materials science and drug discovery. She has been recognised as an IISc Alumni of the Year and is a member of the Expert Committee of the Amaravati Quantum Valley.

Prof. B. V. Rajarama Bhat

Professor at the Indian Statistical Institute, Bangalore, since 2000, specialising in operator theory and operator algebras with special reference to quantum probability. He obtained his Ph.D. from the Delhi Centre of the Indian Statistical Institute under Prof. K. R. Parthasarathy (1993) and carried out postdoctoral research at the University of Pisa and the Fields Institute, Canada. He is a Fellow of the Indian Academy of Sciences, the Indian National Science Academy and the National Academy of Sciences, and his honours include the INSA Medal for Young Scientists, the Swarnajayanti Fellowship (DST), the B. M. Birla Science Prize, the Shanti Swarup Bhatnagar Prize

in Mathematics and the J. C. Bose Fellowship. He has served as chief editor and editor of several journals and has guided numerous Ph.D. students.

Photo Gallery

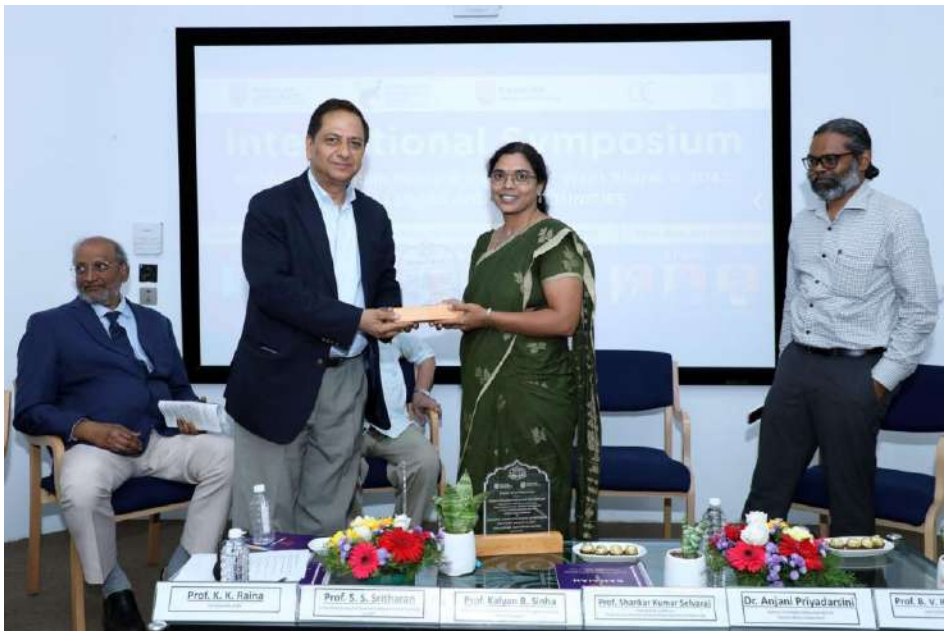


The dais during the symposium

Participants at the International Symposium

Felicitation of Prof. Kalyan B. Sinha

Felicitation of Prof. B. V. Rajarama Bhat



Felicitation of Dr. Anjani Priyadarsini

Felicitation of Prof. Shankar Kumar Selvaraja

Dignitaries, resource persons and participants of the International Symposium

Acknowledgements

The organising committee gratefully acknowledges the support of the Foundation for QC Innovation (FQCI). Sincere thanks are due to the Hon'ble Vice Chancellor of RUAS, the Principal and former Principal of RIT, the distinguished resource persons, the chairs, and all delegates for their participation, and to the faculty, staff and student volunteers of RUAS and RIT for their contribution to the conduct of the event.

Annexures

A. Participant List

International Symposium on Building a Quantum Ready Workforce for Viksit Bharat @ 2047: Challenges and Opportunities

Attendence (Afternoon session)

Sl no.	Name	Institution	Sign
1	Dr. J. Senthilkumaran	AIS College of Engineering	
2	Dr. Eswaramoorthy. M	SMVDU Katra	
3	Dr. Archan Mukhopadhyay	MSRUAS	
4	Ms. Sushma. H.P	MSRUAS	
5	Dr. Subarna Chatterjee	MSRUAS	
6	Ms. Shaista Tarannum	MSRUAS	
7	Ms. Sumita Chakraborty	MSRUAS	
8	Dr. Pushpavathi. T.P	MSRUAS	
9	Dr. Sumanth Bharadwaj	MSRUAS	
10	Dr. MANASH SARMA	RUAS	
11	Aman kumar Jaiswal	MSRUAS	
12	Dr V.V.SREEDHARACHARYULU	Infosys Ltd	
13	Ms. Sudipta Dutta	STCET	
14	Divyashree. A.M.	CIT (Cambridge Institute of Tech)	
15	DR PUSHPALATHA HL	CIT B'lore	
16	Dr. Anita R Shettar	R.R. Institute of Technology, Bangalore	
17	Dr. Deepak Kumar	MSRUAS	
18	Dr. Manohara G	MSRUAS	
19	Dr Vinay K.	ENC, RUAS	
20	Mrs. Lakshmi	Acs college of Engg	

International Symposium on Building a Quantum Ready Workforce for Viksit Bharat @ 2047: Challenges and Opportunities

Attendence (Afternoon session)

Sl no.	Name	Institution	Sign
21	Ms Lakshmi Priya P	Acs college of Engg	
22	Ms. Kalaivizha. S	Acs college of Engg	
23	Dr. Jaikishinay Prakash	IISER Tirupati	
24	Dr Gayathri M	RUAS	
25	Dr AMITHUL MUBHEET	RUAS	
26	Mr VISWANATH K		
27	Manjunath V. Reddy	IIT Tirupati	
28	Khushi Shrikant Kallapparam	Sapthagiri NPS University	
29	Bindushree. S. K	Sapthagiri NPS University	
30	Deepashree S	Sapthagiri NPS University	
31	Jayakumar	Sapthagiri NPS University	
32	Kusthri. S	Sapthagiri NPS University	
33	Meghana. R	Sapthagiri NPS University	
34	Harshitha. S. Hosakeri	Sapthagiri NPS University	
35	Lakshmi. C	Sapthagiri NPS University	
36	Dr. Sanjay. V	SJC Institute of Technology, Chickballapur	
37	Ravikumar R.S.	RUAS, ENS	
38	Dr. Shivanand	ENS, RUAS	
39	DEEPAK VARADAM	FET, RUAS	
40	Dr. SAHANA P. SHANKAR	FET, RUAS	

International Symposium on Building a Quantum Ready Workforce for Viksit Bharat @ 2047: Challenges and Opportunities

Attendence (Afternoon session)

Sl no.	Name	Institution	Sign
41	Dr Hari krishna Sm	RUAS	
42	Pallavi R Kumar	RUAS	
43	Dr Lokesh Phoenix	RUAS	
44	IRUTHAYARAJ. M	OUTRINSIC	
45	C.Charan Jetty	SISTK	
46	V Thorish Krishna	Aditya college of Engineering	V Thorish Krishna
47	DR. NUKARAJAPPA T G	AIKTC, SCHOOL OF ENGINEERING AND TECHNOLOGY	
48	Dr. Mobbina Taj	HKBK College of Engineering	
49	Chethana N	HKBK college of engineering	
50	Dr. Karuna Kumari	HKBK College of Engineering	
51			
52			
53			
54			
55			
56			
57			
58			
59			
60			

International Symposium on Building a Quantum Ready Workforce for Viksit Bharat @ 2047: Challenges and Opportunities

Attendence (Morning session)

Sl no.	Name	Institution	Sign
1	Dr. K. V. JAYARAGHAVAN	Infosys Ltd	
2	Prof. N.D. Gangadhar	RISM & RUAS	
3	RAGHURAM S	RIT	
4	Dr. RCA Naidu	RIT	
5	Dr. Chandra Prabha	RIT	
6	Dr. M. SIVAPRAGASAM	AAE, FET, MSRUAS	
7	Vishnu Prasad A	AAE, FET, MSRUAS	
8	Dr. A.T. Sriram	Aerospace Engg Dept, FET, MSRUAS	
9	Dr. V.R.M.S. Rao	AAE, MSRUAS	
10	Harshitha. G	AAE, MSRUAS	
11	M Pooja	AAE, MSRUAS	
12	Shylaja B N	CSE RIT	
13	V Thakish Krishna.	Aditya college of Engineering, MPL	
14	Mukul Kumar	Dupreelm Labs	Mukul
15	Ramkrishna D	APIT	
16	Dr. Jyotirmoy Karjee	Mahendra University, HYD	
17	BHASKAR K.V.S	IISc	
18	NITHIN M	Reach-out AI	
19	D. Rithika	RUAS	
20	Nancy Kh	RUAS	

International Symposium on Building a Quantum Ready Workforce for Viksit Bharat @ 2047: Challenges and Opportunities

Attendence (Morning session)

Sl no.	Name	Institution	Sign
21	Vertsol Vaishasiyan	RUAS	
22	Mukesh Kumar Ghosh	RUAS	
23	Chethan. M. P	RUAS	
24	Manoj. K	RUAS	
25	ChandanKumar S.	Ramaiah University of Applied Sciences	
26	Venu K	RUAS	
27	Dr. Muthuraj M H.	FNS. RUAS	
28	VARADAN DEEPAK	RUAS	
29	Dr. SAHANA P. SHANKAR	RUAS	
30	Dr. HARI KRISHNA S. M.	RUAS	
31	PALLAVI R KMAR	RUAS	
32	Dr. Karuna Kumari	HKBK college of Engineering, Bengaluru	
33	Chethana N	HKBK college of engineering	
34	DR. NOOHSINA TAJ	HKBK college of Engineering	
35	Dr. Shivananda	FNS, RUAS	
36	Ravikumar B.S.	Phy, FNS, RUAS	
37	Dr. Sanjay. V.	BJC Institute of Technology, Chikballapur	
38	TRUTHYARAJ.	OUTRINSIC	
39	Dr. Mallayadhya HM	RUAS	
40	Pritam Bhat	RUAS	

International Symposium on Building a Quantum Ready Workforce for Viksit Bharat @ 2047: Challenges and Opportunities

Attendence (Morning session)

Sl no.	Name	Institution	Sign
61	Prof. Lakshmi Priya P	ACS College of Engineering	
62	Prof. Lakshmi G	ACS College of Engineering	
63	Prof. Kayalvizhi	ACS College of Engineering	
64	Dr. Manohara G	MS Ramaiah University of Applied Sc	
65	Dr. Priyanka B.P	MS Ram..	
66	Ms. Sushma H.P	MS Ram..	
67	Ms. Shaista Tarannum	M.S RUAS	
68	Ms. Sudipta Dutta	STCET KOLKATA	
69	Dr.T. Senthil Kumaran	ALS College of Engineering.	
70	Dr. M. Eswaramoorthy	SMVDU Katra	
71	Dr. Atcham Mukherjee	MSRUAS	
72	Dr Sumanth Bharadwaj	MSRUAS	
73	Ms/Shaista Tarannum	MSRUAS	
74	Awar Kumar Tiwari	MSRUAS	
75	Dr. MANASH SARMA	RUAS	
76			
77			
78			
79			
80			

C. Invitation / Brochure

The Organizing Committee Cordially Invites
You to the

INTERNATIONAL SYMPOSIUM

Building a Quantum Ready Workforce for Viksit Bharat @ 2047: Challenges and Opportunities

Wednesday | 24 June 2026 | 09:30 AM to 04:30 PM

Venue: Council Hall, Ramaiah Medical College, GG Campus

Chairs

Prof. K K Raina
Hon'ble Vice Chancellor
RUAS

Prof. B Sathish Babu
Principal, RIT

Prof. NVR Naidu
Former Principal, RIT

Distinguished Resource Persons

Prof. S S Sritharan	Co-Founder & Founding Chief Scientist & Strategic Technologist QuantSafe Inc., USA
Dr. A Sivathanu Pillai	Founding CEO BrahMos Aerospace & Emeritus Professor, RUAS
Prof. Kalyan B Sinha	Professor Emeritus JNCASR
Prof. Shankar Kumar Selvaraja	Associate Chair, CeNSE, IISc Project Director, National Quantum Mission - Quantum Computing Hub
Dr. Anjani Priyadarsini	Quantum Technologies Industry Specialist & Executive Advisor (Independent)
Prof. B V Rajarama Bhat	Professor, Theoretical Statistics & Mathematics Division Indian Statistical Insitute

Ogranizing Committee

Ramaiah University of Applied Sciences

Dr. C Narendra Babu	FET
Dr. Chandan Kumar S	FNS
Dr. Prabhu Tej J	FNS
Dr. K M Sharath Kumar	FMC

Ramaiah Institute of Technology

Dr. Vijaya Kumar B P	AI & DS
Dr. Ambika M R	Physics
Dr. Geetha J	CSE
Dr. Sowmya B J	AI & DS

Programme Schedule

Time	Session
09:30 AM - 10:00 AM	**Inauguration**
09:30 AM	Welcome Address: **Dr. C Narendra Babu**
09:35 AM	Address by Chief Guest - 1: **Dr. A Sivathanu Pillai**
09:42 AM	Address by Chief Guest - 2: **Prof. S S Sritharan**
09:50 AM	Presidential Address: **Prof. K K Raina**
09:55 AM	Vote of Thanks: **Dr. Vijaya Kumar B P**
10:00 AM - 10:30 AM	Context Setting by **Dr. A Sivathanu Pillai**
10:30 AM - 11:30 AM	Distinguished Lecture by **Prof. S S Sritharan** *Title: The Quantum Revolution*
11:30 AM - 12:00 Noon	High Tea
12:00 Noon - 01:30 PM	Panel Discussion on **Topic:** *Building a Quantum Ready Workforce for Viksit Bharat @ 2047: Challenges and Opportunities* Moderator: **Prof. K K Raina** Panelists: ◆ **Prof. S S Sritharan** ◆ **Prof. Shankar Kumar Selvaraja** ◆ **Prof. Kalyan B Sinha** ◆ **Prof. B V Rajarama Bhat** ◆ **Dr. Anjani Priyadarsini**
01:30 PM - 02:30 PM	Networking Lunch
02:30 PM - 04:00 PM	Plenary Sessions Plenary Session 1: **Prof. Shankar Kumar Selvaraja** **Title:** *National Mission for Self-reliant Quantum Technology: Challenges and Opportunities* Plenary Session 2: **Dr. Anjani Priyadarsini** **Title:** *Accelerating R&D with Quantum Computing*
04:00 PM - 04:30 PM	Valedictory
04:00 PM	Welcome Address: **Dr. Vijaya Kumar B P**
04:05 PM	Valedictory Address: **Prof. B Sathish Babu**
04:25 PM	Vote of Thanks: **Dr. K M Sharath Kumar**