

tcg crest

Inventing Harmonious Future

TCG CREST 2024



**Unleashing
the Potential
of the Future**

The Chatterjee Group (TCG) has set up **TCG Centres for Research and Education in Science and Technology (TCG CREST)**. We strive to become an institution of global eminence in pursuit of excellence in research and education in new and emerging areas of science. TCG CREST is recognised as a Scientific and Industrial Research Organisation by the Department of Scientific and Industrial Research of the Government of India.



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Chairman's Message



TCG CREST: A Vision for Transformative Research and Innovation



Dr. Purnendu Chatterjee
Founder & Chairman, TCG CREST

TCG CREST was founded on the vision of creating a world-leading institute dedicated to translational and cross-disciplinary research, aiming to address the most pressing societal challenges. At the heart of its mission are three core principles: Knowledge Creation, Knowledge Application, and Knowledge Dissemination and Exchange. We believe every individual has inherent talent, and the key to unlocking their full potential lies in providing the right environment, tools, and opportunities. This is precisely what TCG CREST is committed to offering.

Scientific progress cannot occur in isolation. To drive meaningful innovation, fostering the free exchange of ideas across different research fields is essential. At TCG CREST, we actively promote integrating fundamental and applied research with education. This seamless collaboration cultivates a sustainable intellectual ecosystem where creativity and problem-solving flourish. We are dedicated to building a global network of distinguished knowledge centres, including top universities, research institutions, technology-driven companies, and academic communities. Through collaborative research, student and faculty exchange programmes, workshops, and conferences, we aim to establish a culture of continuous knowledge exchange—a vital driver of innovation and progress.

TCG CREST's vision is closely aligned with India's evolving academic landscape, especially the objectives of NEP-2020. As India transitions towards a multidisciplinary, research-oriented higher education system, TCG CREST is committed to shaping graduates with critical thinking, problem-solving, and interdisciplinary skills. By integrating cutting-edge research with education, we are nurturing an environment where innovation thrives, and the next generation of leaders in science, technology, and global problem-solving can emerge.

While TCG CREST is a non-profit initiative by The Chatterjee Group with a global outlook from the outset, India remains at the core of our operations. As we continue to grow, we are forging partnerships with prestigious institutions worldwide, strengthening our global presence while deepening our roots in India. Looking forward, TCG CREST will focus on expanding these collaborations nationally and internationally, ensuring that our researchers have access to state-of-the-art facilities and an intellectually stimulating environment for growth and knowledge exchange.

TCG CREST is poised to be a beacon of transformative research and education, driving innovation and fostering solutions for a better tomorrow.



Message from the Director



TCG CREST aspires to be a pioneering force in translational research, driving India towards self-reliance in critical technologies while nurturing a skilled workforce for the knowledge economy.



Swapan Bhattacharya
Director, TCG CREST

The institute envisions transcending traditional models by combining the best of Indian educational principles with valuable aspects of Western academia, creating a unique platform for knowledge creation, translation, and dissemination aligned with India's national needs.

Building on the legacy of The Chatterjee Group (TCG), a global conglomerate of industrial and technology businesses, CREST is committed to advancing both national and global progress. With a prominent presence in Kolkata, its world-class research centres lead groundbreaking advancements in renewable energy, including sodium-ion and solid-state batteries, green hydrogen, and clean fuels; quantum computing and quantum communications; artificial intelligence and machine learning; and biomedical applications in neuroscience. The institute is driving innovations in food technology, particularly plant-based proteins, and advancing cancer vaccine development through strategic collaborations and cutting-edge technologies.

As a hub of academic and research excellence, TCG CREST fosters a vibrant, innovative ecosystem. Its diverse team of faculty, researchers, and students consistently publishes high-impact research in leading journals while promoting international collaboration, joint projects, and academic exchanges that connect India's scientific talent with global leaders.

In essence, CREST aims to be a dynamic research and education hub, not just for India but for the global community. Though its objectives may seem ambitious, the decades of experience behind TCG ensure that CREST is poised to make a transformative impact on large-scale societal needs, positioning it as a beacon of scientific and technological advancement on the global stage.





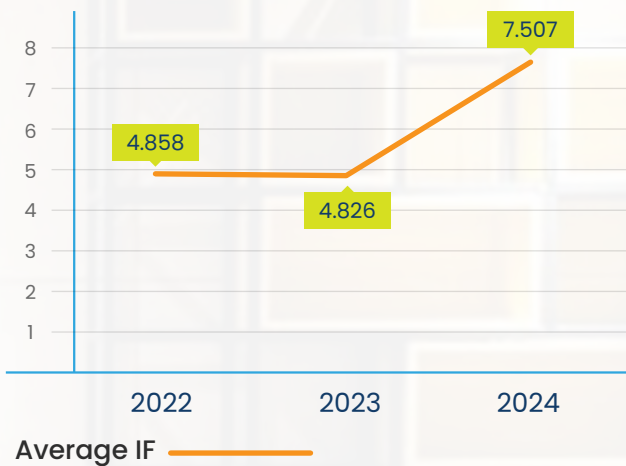
TCG CREST at Present

Total Journal Publications (2020–2024): **268**

74% articles are in Q1 journals | 22.6% articles are in Q2 journals

Publications in 2024: **110**

Average Impact Factor of publications in last 3 years



Top journals in which TCG-CREST published in 2024:

Journal Name	IF
<i>Nature</i>	(IF = 50.5)
<i>Advanced Energy Materials</i>	(IF = 24.4)
<i>Advanced Functional Materials</i>	(IF = 18.5)
<i>Small</i>	(IF = 13)
<i>Applied Physics Review</i>	(IF = 11.9)



H-index:
24

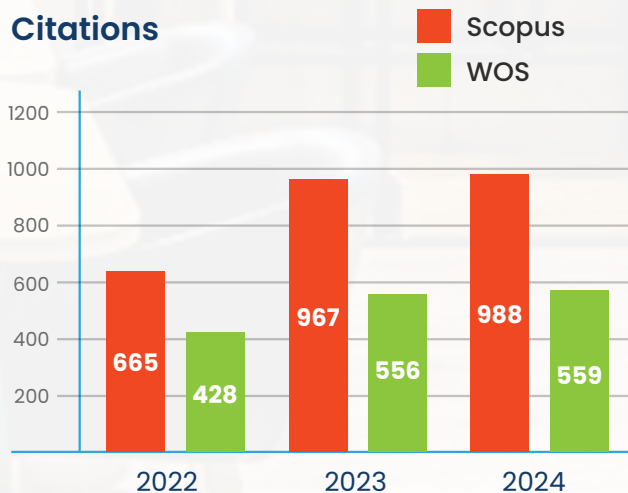


Total citations:
2630+



93%
citations are in
Q1 journals

Citations



Publications in 2024
with collaborators:

98



National

34



International

64



73+ Ph.D. students



150+ Full-time staff, including faculty, visiting faculty, PDFs, and technicians



TCG CREST ranked #1

in 2022 by Nature Index India in the Corporate Category for Physical Sciences.

Institute for Advancing Intelligence (IAI)



**Professor
Goutam Mukherjee**

Director, IAI,
TCG CREST

Today, technology has become imperative for the progress of science and society. Therefore, at IAI, we are committed to providing the best possible environment and state-of-the-art facilities for learning and research in the areas of quantitative, computational, technological, and analytical streams. Currently, we conduct research in Cryptology and Security, Translational Research in Mathematics, and Artificial Intelligence and Machine Learning, and hope to include Finance and Quantitative Economics in the near future. In this increasingly AI-centric world, we are also committed to promoting research and initiatives focused on ethics in AI and responsible AI. And finally, IAI hopes to collaborate with the government and other organisations and align ourselves with the IndiaAI mission.



Research Areas of IAI

Cryptography and Security (Crypto)

Theoretical and applied aspects of Cryptology and Security research, including Lightweight Cryptology, Internet of Things Security, Secure Cloud Computing, Blockchain and Crypto Currency, Quantum Cryptology, Post-Quantum Cryptology, and White-Box Cryptology.

Know more at: <https://www.tcgcrest.org/researches/iai-research-1/>



Translational Research in Mathematics (TRIM)

Research in fundamental and applied mathematics, including Non-Associative Algebras, Algebraic Deformation Theory, Low Dimensional Topology, Graph Theory, and Algebraic Combinatorics, analysis and their applications to other areas of science.

Know more at: <https://www.tcgcrest.org/researches/translational-research-in-mathematics-trim/>



Artificial Intelligence and Machine Learning (AI-ML)

Fundamental, human-centric, and sustainable research in the fields of Large Language Models and Prompt Design, AI-enabled Speech Engineering, Statistical Theory of Deep Learning, Deep Generative Models, Large-scale Data Clustering, Trustworthy & Responsible AI, Climate Informatics and AI for Sustainability, and Medical Image Processing.

Know more at: <https://www.tcgcrest.org/researches/ai-ml/>



Access the complete list of publications of researchers of IAI at:

<https://www.tcgcrest.org/iai-publications/>



**Current strength
of IAI:**

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Faculty
Members

3

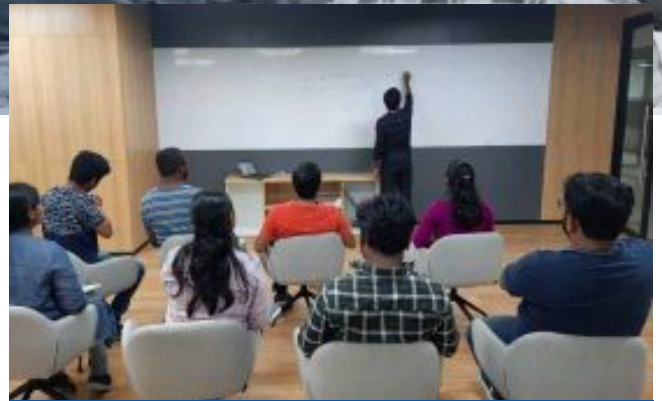
Post-Doctoral
Fellows

45

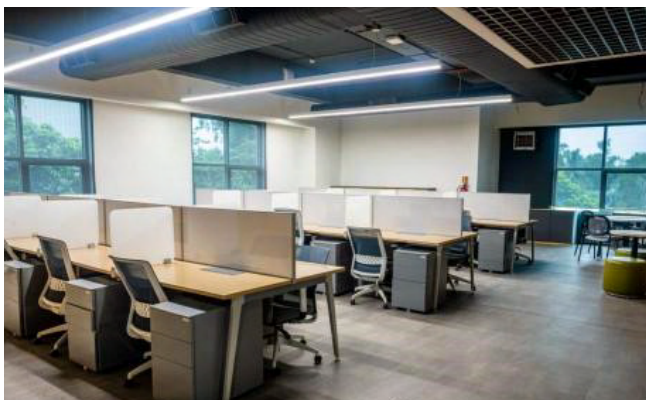
Research
Scholars



Classroom with state-of-the-art audio visual facilities to enable in-premise and online teaching



Discussion rooms for in-premise research discussions



Well-planned student workspace



CREST School 2022

Important research projects at IAI:

Crypto Group:

- Lightweight Cryptography
- Digital Rights Management and Mobile Payment Security
- Developing decentralised e-voting solutions
- Developing Searchable Symmetric Encryption (SSE) scheme that requires lower storage
- Lattice-based Cryptography
- Web and Cloud Security
- Post-Quantum Cryptography and Quantum Information Theory

TRIM Research Group:

- Analysis of protein-protein interaction network for drug detection
- Theory and application of modern optimisation techniques
- Topological and geometric approaches to deep learning
- The Continuous Variable Quantum Error Correction
- Multi-Way Number Partitioning (MNP)
- Lattice-based Cryptography (A post-quantum candidate)
- Mathematics for Large Computation

AI/ML Research Group:

- Speech Analytics
- Combining omics and imaging for personalised treatment
- Coalition structure generation
- Unlocking neuroimaging insights with NICARA integrated with a deep learning pipeline



Prof. Angshul Majumdar, Professor, IAI, is conducting a first-in-India study where he uses a machine learning model to predict the optimal drug for patients with lung cancer, based on their genetic profile.



Dr. Arpita Maitra, Associate Professor, IAI, conducted a workshop on "Post-Quantum Cryptography" as part of the 20th International Conference on Information Systems Security, conducted by CDAC with the support of Ministry of Electronics and Information Technology (MeitY), hosted at LNMIIT Jaipur, India.



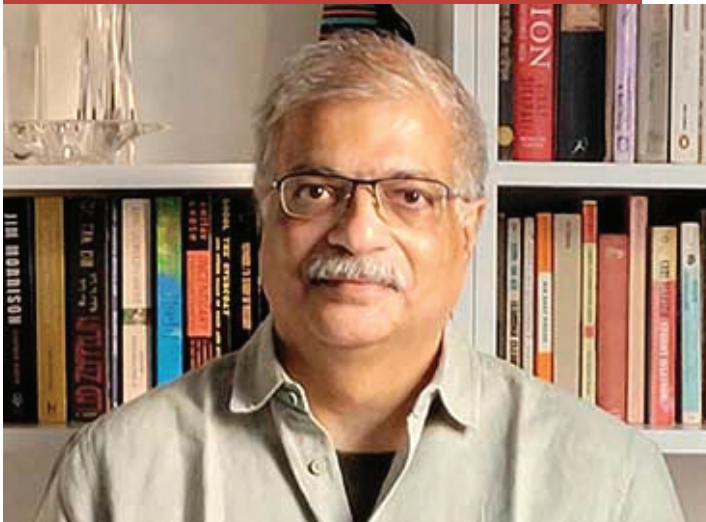
Key Achievements

- Organised ASIACRYPT 2024, one of the flagship conferences on Cryptology.
- Organised and hosted ASK 2024—the 11th Asian Workshop on Symmetric Key Cryptography.
- Organised the Bengal Topology Circle Meeting in 2023.

CREST-School 2022:

The Summer School was held from 11th to 22nd July 2022 in Applied Combinatorics, with a special focus on Foundations, Cryptology, and Combinatorial Topology. A total of 55 post-doctoral fellows, research scholars, and post-graduate students from reputed Indian Institutes (ISI, IITs, CMI, CU, Presidency, NITs) attended the workshop.

Centre for High Impact Neuroscience and Translational Applications (CHINTA)



Professor Sumantra Chattarji
Director, CHINTA,
TCG CREST

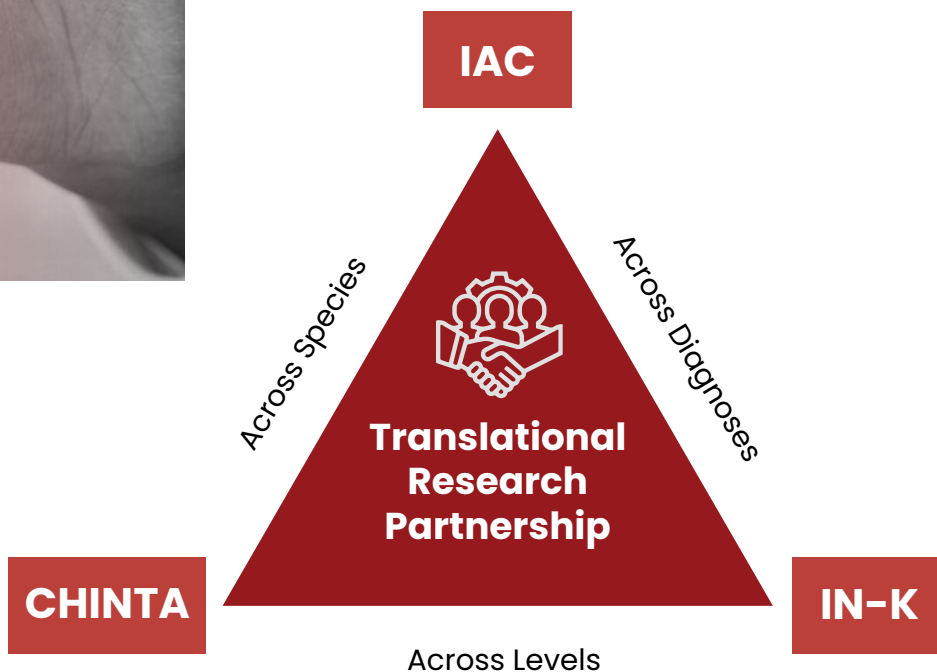
Understanding the functioning of neurons and neural circuits has become a need of the hour to be able to address the growing global health concerns related to ageing, neurodevelopmental conditions, and degenerative diseases. These questions can only be tackled through creative solutions, which is why neuroscience research has become increasingly interdisciplinary in nature. I believe that CHINTA is the right place to take on these challenges because it focuses on conducting translational neuroscience research and leveraging state-of-the-art techniques across disciplines. At CHINTA, we are using multiple approaches and setting up collaborative projects to investigate questions in neurodevelopment, neurodegeneration, complex neural circuits, and behaviour.



Interlinked Projects

CHINTA has partnered with India Autism Center (IAC) and Institute of Neuroscience Kolkata (IN-K) on **three interlinked projects** focused on disease modelling across scales:

- Characterising neural stem cell and animal disease models of Spinocerebellar Ataxia Type 12 (SCA12)
- Investigating SCA12 cognitive deficits in patients
- Using neuroimaging approaches to understand disease pathogenesis in Alzheimer's disease, Parkinson's disease, and SCA12



In a collaborative project, **Dr. Anant Jain** and others discovered the novel mechanism of '**Behavioural Time Scale Plasticity (BTSP)**', whereby our brain can encode information over seconds rather than milliseconds, allowing for simple learning behaviours that occur over seconds to minutes. The study found that BTSP activates CAMKII across the neuron rather than at specific synapses, where it is traditionally thought to act. This research is important as it redefines our understanding of brain plasticity and memory formation.

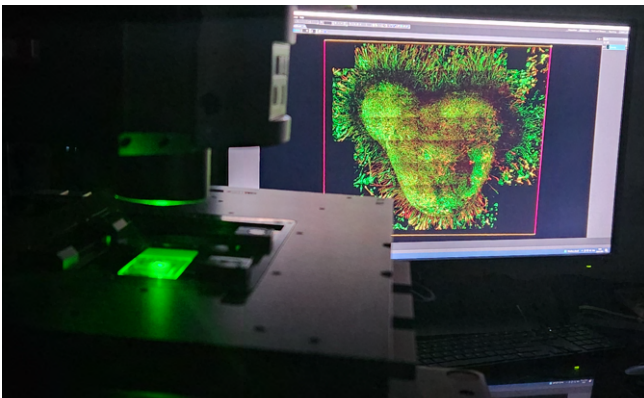
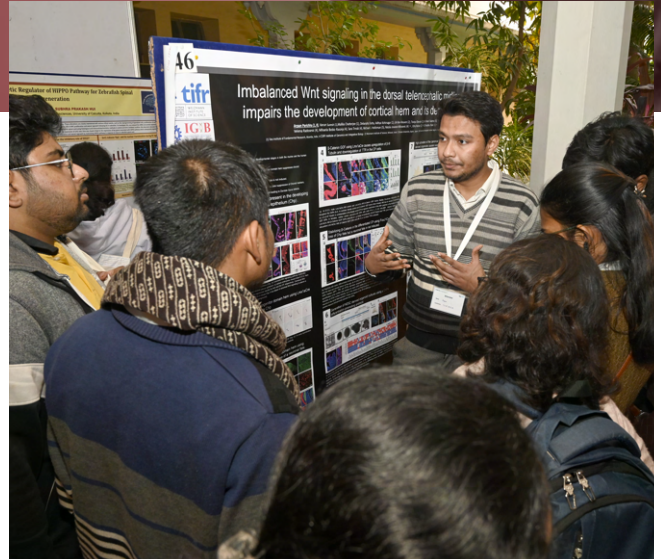


Our results, which were recently published in *Nature*, have opened many more questions for further investigation, including what defines the specificity of information coding at single synapses or the time-delay in CAMKII activation.

Dr. Anant Jain, Assistant Professor, CHINTA



(L-R) Prof. Eric Klann, Joshua Gorden, Erin Shuman, Dr. Purnendu Chatterjee, Prof. Sumantra Chattarji, Prof. Francis Lee



Stem cell-derived brain-specific cell types (organoids) are now being studied using high throughput imaging



Key Activities



- Eminent research collaborators include **Prof. Francis Lee** (Weill-Cornell Medical School, USA), **Prof. Eric Klann** (Center for Neural Science, New York University, USA), **Dr. Ron Stoop** (University of Lausanne, Switzerland), **Dr. Andrew Holmes** (NIH, USA), and **Prof. Richard Morris** (University of Edinburgh, UK).
- CHINTA organised its **inaugural symposium on ‘From molecules to mind’** between 18th and 20th January 2024. The symposium saw participants from around the world and there were discussions on a wide spectrum of exciting findings from molecular and synaptic neuroscience to systems and behavioural neuroscience.
- Prof. Timothy Bliss and Prof. Richard Morris, winners of the prestigious Brain Prize, talked about their ground breaking work at the seminar on **‘Synaptic Symphony: How memories are made’** organised at CHINTA on 8th March 2024.
- Prof. Sumantra Chattarji gave two key interviews—a **Nature India** interview on CHINTA’s establishment and goals and a **The Telegraph** interview on how Kolkata is rapidly turning into India’s new science capital.
- Dr. Anant Jain spoke about setting up a neuroplasticity lab in India on the **Neurotransmissions Podcast by Max Planck Florida Institute for Neuroscience**.
- **Extramural grants** were obtained from the following institutes for three key research projects: Max Planck Partner Group, Indian Council of Medical Research (ICMR), and Kavli Foundation and Chan Zuckerberg Initiative.
- A **patent application** was made for “A Method of Generating Human iPSCs-Derived Forebrain-Specific Astrocytes, and Uses Thereof” (Patent Application No. 202431008923) by Reddy B., Pal R., and Chattarji S.

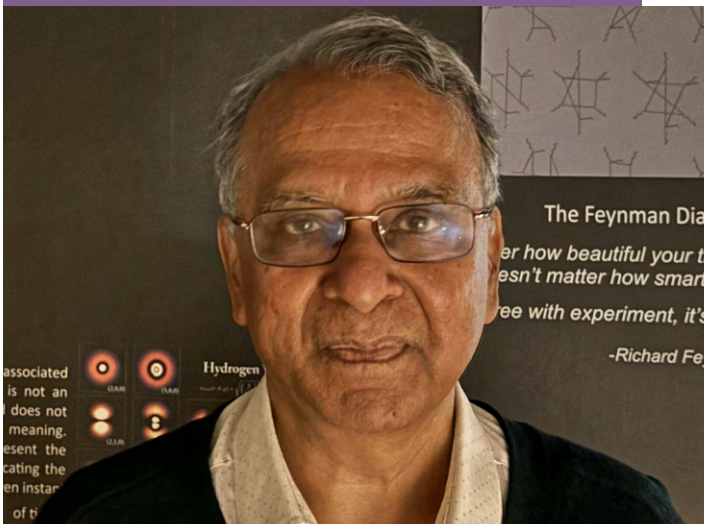
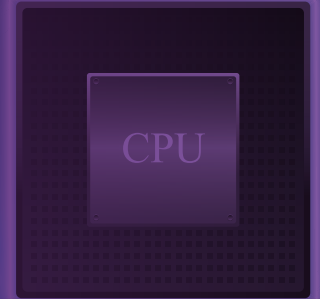


Stem cell-derived models in neurobiology have opened doors to understanding cognition in patients with Spinocerebellar Ataxia Type 12, and with neuropsychological testing, we hope to uncover how potential impairments in memory, learning, and other cognitive domains affect functional independence and quality of life among affected families—a project CHINTA is pursuing in collaboration with the Department of Neurology at the Institute of Neurosciences, Kolkata (IN-K).

Nishka Mishra, Research Associate, CHINTA



Centre for Quantum Engineering, Research and Education (CQuERE)



Professor Bhanu Pratap Das
Director, CQuERE,
TCG CREST



Quantum science and technology has revolutionised various domains in our life, so much so that the United Nations has declared 2025 as the International Year of Quantum Science and Technology! CQuERE was established with a vision of conducting cutting-edge research in the field of quantum science, both theoretical and experimental. And within five years of setting up, we have already made significant contributions in quantum computing, quantum information science, and quantum machine learning. One of the best things about CQuERE is that it promotes collaborations across disciplines as well as between academia and industry, and strives to provide a stimulating and conducive environment for research as well as for training future leaders in quantum science.



Focus Areas

Quantum Sensing and Metrology using Cold Atoms:

Development of a portable Absolute Quantum Gravimeter (AQG) that can be used to measure the acceleration due to gravity (g) at a level of 10^{-9} .

Photonic Integrated Circuits and Nitrogen Vacancy Centres for sensing:

Research on applied aspects of photonics on an integrated platform, including chem/bio-sensing chips.

Quantum Computation with superconducting qubits:

Use of superconducting approach to implement qubits.

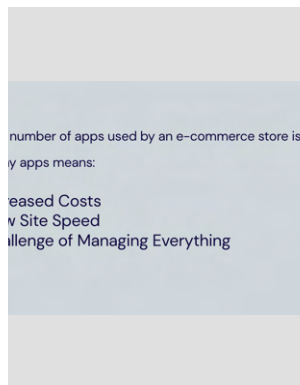
Quantum Computation: Theory

Quantum Information: Theory



Access the complete list of publications from CQuERE at:

<https://www.tcgcrest.org/cquere-publications/>



We currently have a single superconducting qubit in a dilution refrigerator, studying its interaction with a cavity using microwave pulses for control and readout. Our goal is to develop a multi-qubit processor for quantum algorithms and establish an in-house fabrication facility for manufacturing these processors. In the future, we aim to build a fault-tolerant quantum computer.

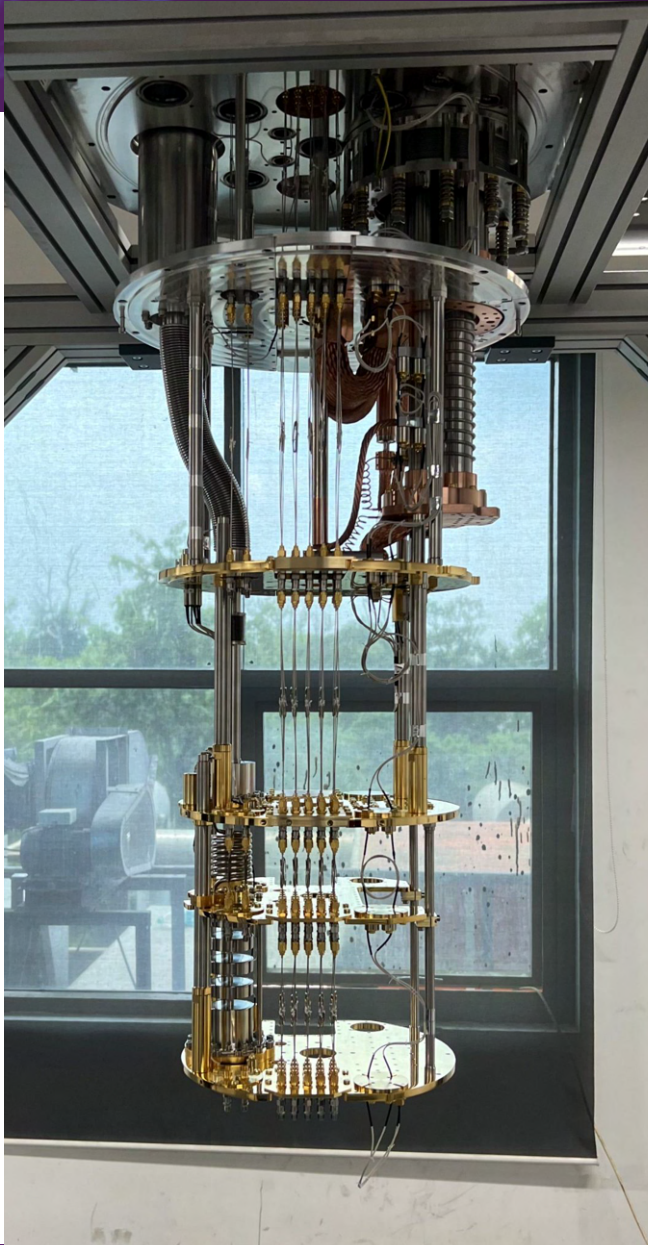
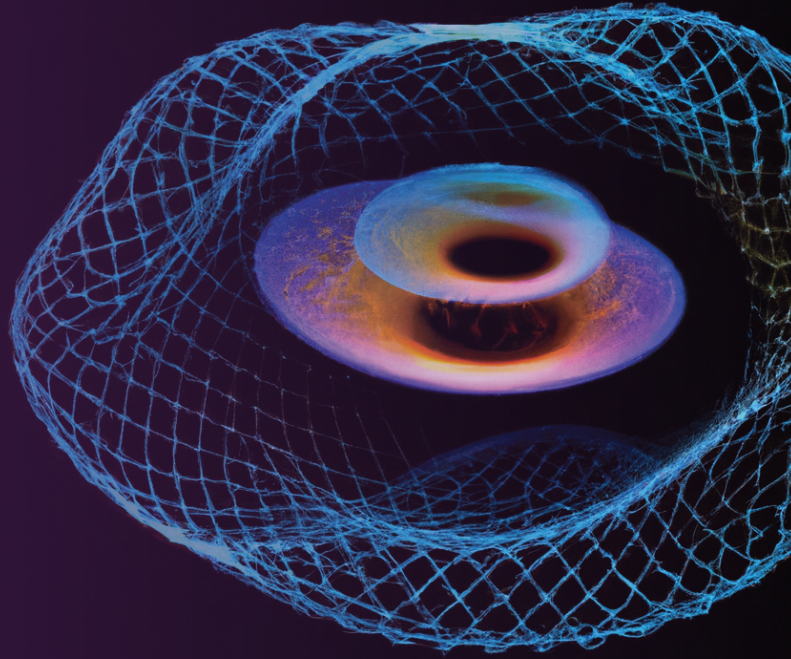
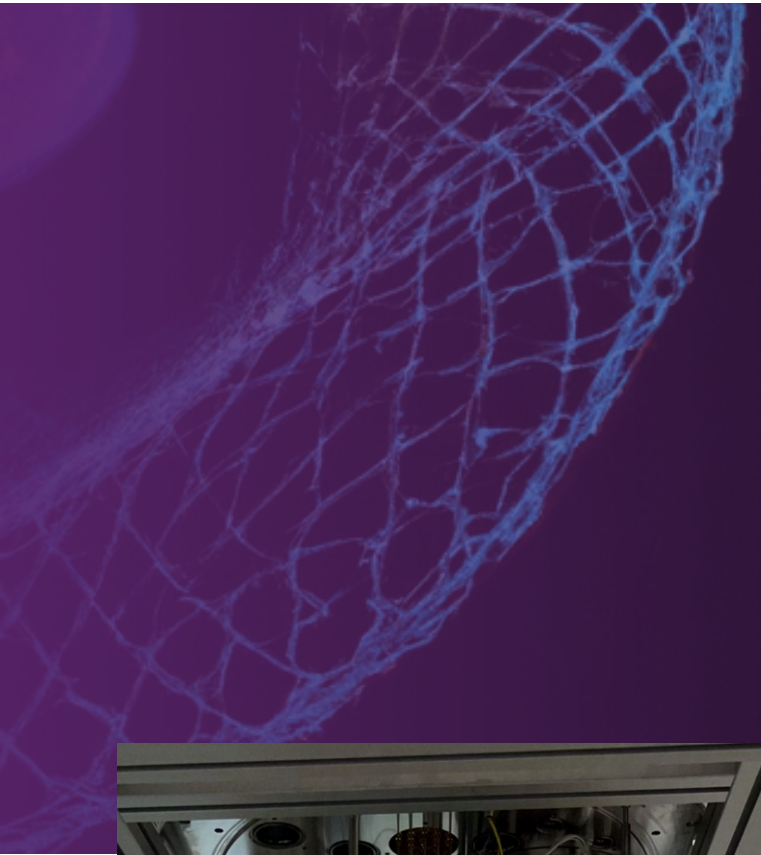
Dr. Snehal Mandal, Post-Doctoral Fellow, CQuERE



Before joining TCG CREST, I was in KIIT University pursuing an integrated M.Sc.-Ph.D. degree. I quit that university because I wanted to join a quantum technology university. Then I found this institute, which is the only such institute in Eastern India. I wanted to join here because of the highly esteemed faculty and their mentorship.

Akankshya Dash, Ph.D. Student, CQuERE





Quantum Lab



Intelligent Classroom



Discussion Lobby



Coffee Room

Key Activities:

- Set up in 2020, within five years, CQuERE has built a strong team of scientists working on many aspects of quantum science and technologies, including Quantum Computing (theory and experiment), Quantum Information Science, and Quantum Machine Learning.
- Publications in leading journals, including *Physical Review Letters*, *Physical Review A*, and *Physical Review Research*.
- Established a vast network of national and international collaborations in Japan, USA, and Europe.
- Organised international conferences on timely themes such as Cold Atom Quantum Computing and Superconducting Qubit Quantum Computing.
- Established state-of-art Ultra High Vacuum processing facility; Electronics fabrication and rework facility; and RF and Microwave test and measurement facility.



Key Achievements

- Awarded grants on quantum science and technologies from the National Quantum Mission.
- First calculations of properties of atoms and molecules other than energy on quantum computers.
- The most accurate quantum computations of atomic properties on a quantum annealer to date.
- Stronger quantum speed limits have been obtained for different physical systems with important implications for charging time of quantum battery.
- Experimental studies on a new material, cobalt disilicide for qubits (basic building blocks) for superconducting quantum computers.
- Won prestigious grants from MeitY, Government of India's Quantum Computing Applications Lab, and the Anusandhan National Research Foundation's Core Research Grant.
- An APS TV film highlighted CQuERE in a pre-recorded video case study within the official broadcast at the American Physical Society (APS) 2023 March Meeting in Las Vegas (March 5–10, 2023) and 2024 March Meeting in Minneapolis (March 4–8, 2024).



The video can be viewed at:

<https://www.youtube.com/watch?v=3zbe07XltAA>

Research Institute for Sustainable Energy (RISE)

Prof. Satishchandra Ogale was honoured with the 2026 The World Academy of Sciences (TWAS) Award for Physics. In the last 39 years, he is the 17th Indian Physicist to be honoured by the Italy-based TWAS covering 138 countries. This award celebrates his impactful work on developing functional materials for energy harvesting, storage, and conservation.



Professor Satishchandra B. Ogale
Director, RISE,
TCG CREST



Sustainable energy is the only solution to climate change and mitigating its consequences such as pollution, declining biodiversity, and health. RISE aims to contribute toward building a sustainable energy future by developing novel materials and device technologies for sustainable energy storage. Particularly, we are working on two types of battery systems: the sodium-ion battery, which includes the anode-free metal battery, and the all solid-state battery. We are also keen on developing highly efficient systems for hydrogen energy and fuel cell applications as well as conversion of carbon dioxide into clean fuels. Through it all, developing intellectual properties and finding tangible solutions to societal issues will remain our priority. We are also committed to aligning our technological achievements with our National Missions.



Focus Areas

Na-ion, Na-Metal and Anode-Free Battery Development (Liquid and Solid Electrolyte-based)

High capacity anode and cathode materials; interfacial dynamics for superior battery performance (experimental and modelling studies); stable electrolytes (liquid and solid) and additives (liquid), low and high temperature operation; modified current collectors and other components for robust and high performance anode-free Na metal batteries; new concepts of iono-magnetics and iono-spintronics.

Solid-State Lithium/Sodium Metal Battery

Cost-effective solid-electrolytes with high conductivity; dry coating fabrication of thin film; high-voltage fast-charging NMC cathodes; low stack pressure/pressure-free Si-NMC SSBs; microstructure tuning of SE and anode protection; anode-free Li/Na SSBs: Coupled electrochem-mechanics; SSBs with high thermal stability.

Green Hydrogen and Clean Fuels

Designing earth-abundant durable catalysts for hydrogen production along with plastic upcycling; Energy conversion efficiency from 65% to 72% in water electrolyser; photochemical molecular transformations; reagents/catalysts for clean and green fuel; microbial routes for hydrogen production and clean fuel generation; materials and system designs for efficient solar desalination.



Access the complete list of publications from RISE at:

<https://www.tcgcrest.org/rise-publications/>



We thoroughly examined the dynamics of metastable phases at the interface of Li metal and halide solid electrolytes and their impact on interface passivation. This was achieved using operando XPS analysis and virtual Li metal plating. We meticulously analysed over 300 XPS spectra for this paper. A comprehensive analysis of this data would be invaluable for young researchers engaged in XPS studies for battery research.

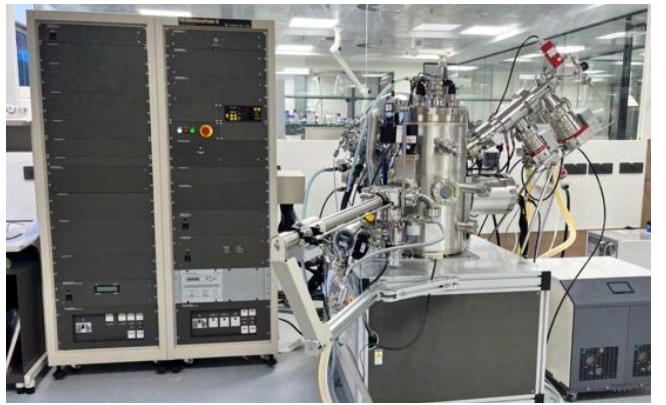
Dr. Abhik Banerjee on their recently published research



We had a wonderful workshop at TCG CREST Research Institute for Sustainable Energy! It was a joy to meet so many brilliant young talented minds who are focusing on #energystorage and next-gen batteries!!!

Prof. Shirley Meng, The University of Chicago, USA, on LinkedIn



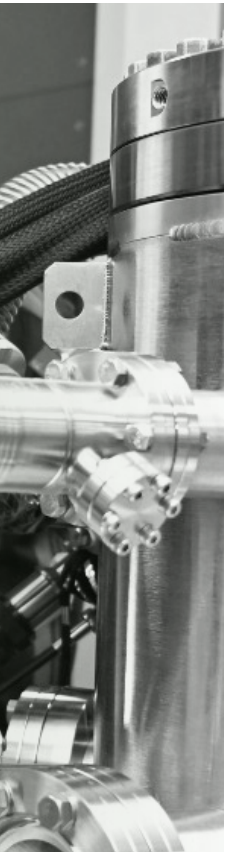


Cell fabrication facility



Solid-state pouch cell assembly line—a first in India

Characterisation facilities, including XRD, XPS, Raman, XPM, AFM, Cryo-Dual-beam (ion/electron) microscope, UV-Vis spectrophotometer, FTIR, DSC, AAS, GC, etc.



Key **Activities** and **Achievements**

- RISE scientists developed a sodium-ion battery with a gravimetric and volumetric energy density 30% higher than LFP-based lithium-ion batteries and nearly equivalent to LCO/NMC chemistry.
- In a collaborative project, researchers developed a novel aqueous zinc-ion battery (AZIB) system that displays remarkable cell stability and charge storage efficiency.
- Dr. Abhik Banerjee spoke about battery technology on the Energy Podcast by the IIT Mumbai Tech Team.



The podcast can be viewed at:

<https://www.youtube.com/watch?v=pOZdOeXJs1g>

- Dr. Ananya Banik won the prestigious Young Scientist Award at the Global Conference for Decarbonization of Energy and Materials (GCDEM).
- TCG CREST, along with IISER Pune and Wiley, co-organised the "Advanced Energy Materials and Interfaces 2024 (AEMI 24)" conference on 9th December 2024.
- RISE has initiated a collaboration with Prof. Shirley Meng and Prof. Chibueze Abanchuku for the joint development of Na-ion batteries.
- RISE has installed the country's first anode-free pouch cell fabrication system for both Na and Li metal battery cathodes.
- RISE has the nation's first Cryo dual-ion microscope installed to accelerate the Li and Na metal battery research for both solid and liquid phases.
- A pouch cell fabrication line has been installed inside Argon-filled glove box
- RISE convened a dynamic one-day workshop on Sodium and Solid State Batteries on 17th February 2024.
- RISE scientists have published over 85 research papers in renowned international journals during the last 5 years

Cancer-related Advanced Research and Education **(CARE)**

Through strategic collaborations, cutting-edge technology, and scientific leadership, CARE is redefining the future of cancer vaccine development to deliver transformative, accessible, and scalable immunotherapies worldwide. Initiation of CARE research starts with targeting Human Endogenous Retroviruses (ERVs), a unique source of tumour antigens from the “dark genome”. These shared tumour antigens offer a transformative approach to global cancer vaccines, enabling off-the-shelf pan-cancer immunotherapies. Dr. Ashish Goyal (Assistant Professor, CARE) will employ clinical-grade epigenetic inhibitors to awaken (re-express) epigenetically silenced ERV mRNAs and exploit their immunogenic potential for developing off-the-shelf scalable cancer vaccines. The recently funded CARE’s BFI Biome Project is investigating EGFR-TKI resistance in lung cancer, integrating multi-omics data from Caucasian and Indian patients to design AI-driven prediction of responders vs. non-responders. Furthermore, epigenomic signatures of methylated DNA in tumour biopsies, peripheral blood mononuclear cells, and other body fluids are being pursued for early detection of solid tumours, such as, lung, liver, gall bladder, and pancreatic cancer.

Focus Areas



Neoantigen Discovery and Vaccine Development



Radiation-Enhanced Immunotherapies



AI-Integrated Discovery Platforms



Key Activities and Achievements

- Received the BFI-Biome grant for lung cancer project in April 2024, with an effective official start date of 1st October. Project title: Development of AI-ML model to predict responder vs non-responder molecular signatures against EGFR-TKI – India vs Caucasian patients with lung cancer.
- I-CANVAX, a one-day symposium on cancer vaccines, was organised by CARE in December 2024.
- Two academic programmes have been planned: Cancer Biology & Therapy and Radiobiology & Molecular Therapeutics.



- Poster presentation by CARE researchers at ICGA conference in September 2024 on lung cancer work.
- Podium presentation in IACR 2025 (<https://iacr2025.in/>)—Title: Potential role of B cells in promoting tumour growth through regulating cholesterol metabolism in tumour microenvironment.
- Scientific Advisors at CARE
 - » **Prof. Chandan Guha**, Albert Einstein College of Medicine (USA)
 - » **Prof. Vivek Mittal**, Director of the Neuberger Berman Lung Cancer Laboratory, Weill Cornell Medical Center (USA)



Dr. Ashish Goyal joined as the first faculty of CARE in January 2025.

Food Technology and Science Institute (FTSI)



“



Dr. Parthasarathi Bhattacharya

Director, FTSI,
TCG CREST

FTSI was set up in 2024 with the aim to become a front-runner in the realm of food science—an institute that can drive innovation in the field of holistic nutrition. Our top-notch facility is equipped for conducting experimental studies across food science, biochemistry, microbiology, and sensory analysis. We hope to build a conducive environment for not only innovative research but also for commercialisation of our ideas so as to be able to develop novel sustainable food products and have an actual positive impact on the “foodscape”.

”

Focus Areas



Alternate Meat

Develop healthy food products using plant proteins.



Mycology

Exploring mycoproteins and fungal metabolites for a sustainable food source.



AI for Food Science

Develop and implement AI-driven solutions that enhance the aroma, flavour, sustainability, and nutritional quality of foods.



Precision Fermentation

Develop sustainable and efficient methods for producing high-quality proteins, enzymes, and other bioactive compounds.



Pro- and Post-biotics

Develop superior probiotics that can be added to various food formulations to help improve gut health. Develop postbiotic compounds that can be supplemented with food to help improve health.



I joined FTSI to leverage my expertise in addressing critical challenges in food science. Currently, my focus is on exploring proteins and fermentation products to develop innovative solutions that enhance the taste, health benefits, and sustainability of food products. By combining my background in Biotechnology with extensive industry experience, I am dedicated to driving meaningful advancements in sustainable and cutting-edge food solutions.

Dr. Anuradha S. Nambiar

Principal Scientist, FTSI



Key Achievements

- FTSI received GLP certification by UKcert for the facility.
- LIMS implemented to manage, analyse, and store all research data.
- In partnership with CSIR-CFTRI, Mysore, a novel enzyme technology has been developed to produce nutritionally improved dietary fiber (Pannofiber™) from starch.
- A unique research programme on using AI for developing Novel Flavour for Food Application has been initiated under the guidance of Dr. Partha Pratim Chakraborty, IIT Kharagpur.
- A novel process is being developed to purify highest-grade plant- and myco-protein for human consumption from raw materials that are abundantly available locally.
- Dr. B. Sesikeran, M.D. FAMS, Former Director of National Institute of Nutrition, and Chairman, Review Committee for Genetic Manipulation (RCGM), Govt. of India, has joined FTSI as Honorary Advisor.

Collaborators | Academic

 <p>Chennai Mathematical Institute</p>	 <p>Ramakrishna Mission Vivekananda Educational and Research Institute</p>	 <p>National Institute of Technology, Durgapur</p>
 <p>Institute of Neurosciences</p>	 <p>National Centre for Biological Sciences</p>	 <p>Indian Institute of Technology Kharagpur</p>
 <p>Dandrite (Danish Research Institute of Translational Neuroscience, Aarhus University)</p>	 <p>Indian Institute of Technology, Tirupati</p>	 <p>Indian Institute of Science Education and Research, Kolkata</p>
 <p>Indian Institute of Science Education and Research, Pune</p>	 <p>India Autism Centre</p>	 <p>University of California Berkeley, USA</p>
 <p>The University of Edinburgh, UK</p>	 <p>Uppsala University, Sweden</p>	 <p>Max Planck Group</p>
 <p>The University of Montenegro</p>	 <p>Mathematical Institute of Serbian Academy of Sciences and Arts</p>	 <p>National University of Singapore</p>
 <p>Dhirubhai Ambani Institute of Information and Communication Technology</p>	 <p>The Regent of the University of California, on behalf of Davis Campus</p>	 <p>West Bengal National University of Juridical Sciences</p>
 <p>University of Lausanne</p>	 <p>Sir Ganga Ram Hospital</p>	 <p>University of Chicago</p>
 <p>CSIR - National Physical Laboratory</p>	 <p>AcSIR Academy of Scientific and Innovative Research</p>	 <p>Plaksha University</p>

Several prestigious institutions have recognised TCG CREST for Ph.D. programmes, including Chennai Mathematical Institute (CMI), IIT Tirupati, IISER Kolkata, NIT Durgapur, Ramakrishna Mission Vivekananda Educational and Research Institute (RKMVERI), and the Academy of Scientific & Innovative Research (AcSIR). AcSIR has also designated TCG CREST as an Associate Academic Centre for its Ph.D. programmes.

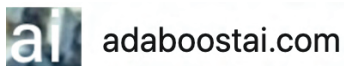
Collaborators | Industry





Vaditi Working
Group

Maven Edumatrix &
Tech Amelioration
(META)







Atotech Development
Center Pvt. Ltd

Rincell
Corporation












Leveraging these strategic partnerships, TCG CREST is primed to establish further collaborations with academia and industry. This will enrich its programmes and offer faculty and students valuable opportunities to gain hands-on experience, deepen their expertise, and collaborate with leaders in their fields.

Mentor's Note



As we look back at 2024 and forward to 2025, one can see that CREST has made several significant advancements, particularly in developing greater collaborative research activities across its Centres and taking first steps towards its goal of becoming a world-class research university.



**Professor
Malabika Sarkar**
Mentor, TCG CREST

2024 marks the realisation embedded in CREST—education—with the final submission of the application for obtaining deemed-to-be-university (DTBU) “distinct category” status.

CREST is unique compared to other academic-research institutes in India in that it follows a reverse trajectory model, wherein research centres are set up first, followed by Ph.D., Master's, and finally undergraduate programmes. This is unlike the traditional model of beginning with undergraduate programmes and then progressing towards research centres. This reverse model will ensure an immersive research experience at all levels. Furthermore, the focus will be to curate programmes, especially Master's programmes, to include the experience of Liberal Arts and Sciences as one component, and translational research approach as another to frame the core and optional courses.

On the research front, 2024 has seen enhanced research productivity and commitment from each of its Centres. A new centre for Cancer-related Advanced Research and Education (CARE) was also launched in 2024.

As we step into 2025, we are committed to building on these achievements and envisioning new exciting possibilities.





Collaborate for a harmonious future

We create **innovative solutions** for societal benefits

tcg crest

Inventing Harmonious Future

Prepared by the Research & Development Office, TCG CREST



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