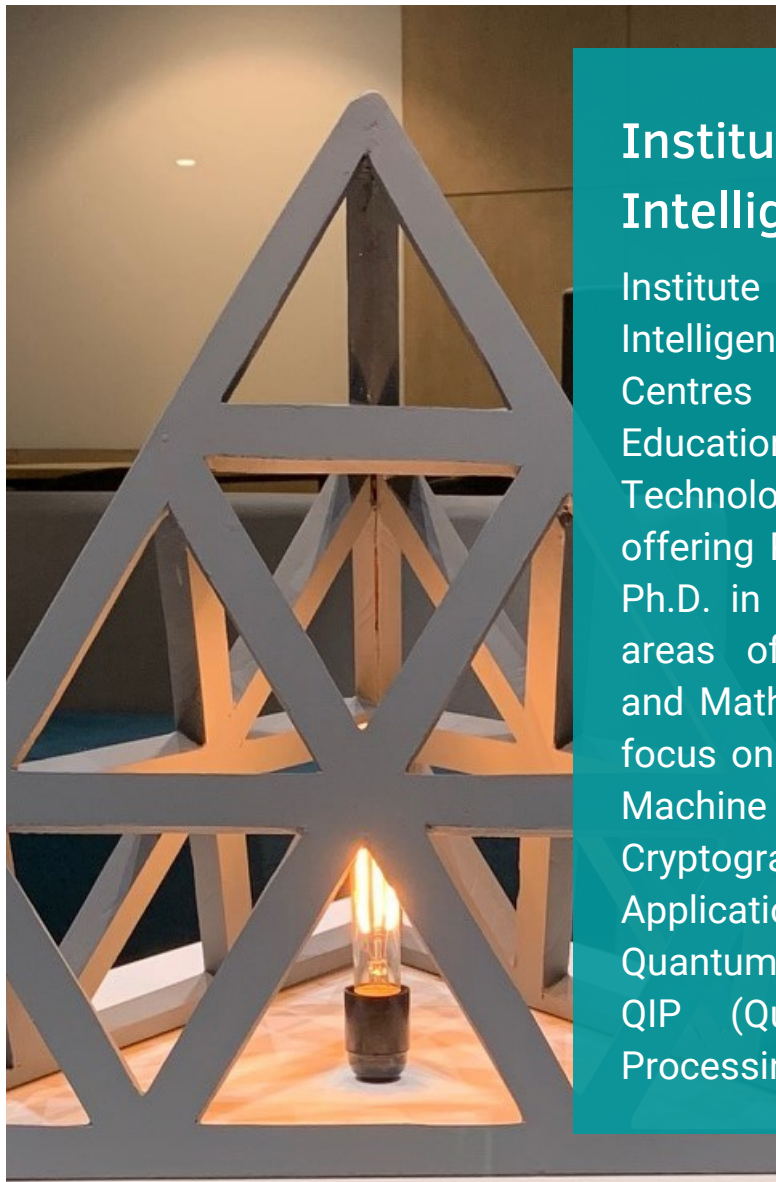




# TCG

Centres for Research and Education  
in Science and Technology

# Ph.D. PROGRAM



## Institute for Advancing Intelligence (IAI)

Institute for Advancing Intelligence (IAI), under TCG Centres for Research and Education in Science and Technology (TCG CREST), is offering Ph.D. in Science and Ph.D. in Engineering in broad areas of Computer Science and Mathematics with special focus on Artificial Intelligence, Machine Learning, NLP, Cryptography and Security, Applications of Mathematics, Quantum Cryptography and QIP (Quantum Information Processing).

### Ph.D. @ IAI

The goal of the IAI Ph.D. program is to nurture students with raw talent and intellect and produce well-educated next-gen research leaders who will impact the future world. The degree will be offered under Academy of Scientific and Innovative Research (AcSIR) and we will follow the AcSIR guidelines. At present, we offer Ph.D. in Science and Ph.D. in Engineering degrees in the broad areas of Artificial Intelligence & Machine Learning, Cryptology & Security and Applications of Mathematics.



**tcg crest**

Inventing Harmonious Future

visit <https://tcgcrest.org/iai-programs-2023/> for more details

# Research Focus

## AI / ML

Statistical Learning Theory, Deep Neural Networks, Representation Learning, Deep Generative Models, Computer Vision, NLP, Large Language Models, Climate Informatics, and AI in Law.

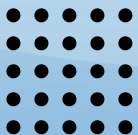
## Cryptology & Security

Quantum Cryptology, Post Quantum Cryptology, Lightweight Cryptography, Block-chain, Provable Security, Cloud Computation and Security, Cryptanalysis and Side Channel Cryptology.

## Translational Research in Mathematics

Pure Mathematics and Application Areas, Functional Analysis, Operator Algebra, Topology, Algebra, Graph Theory, Combinatorics, Algebraic Geometry and application areas.

visit <https://www.tcgcrest.org/iai-research/> for more details



WHY?

### 01 Fellowship and Travel Support

At TCG CREST, we offer a competitive institute fellowship (including HRA) for a maximum period of five years. Support towards national and international travel may be provided (subject to approval).

### 02 Facilities at TCG CREST

There are five digital classrooms with smart boards, audio and video systems. There is a state of the art computer lab with in-premise servers, GPU clusters and cloud based facilities.

### 03 Research Oriented Coursework

At IAI, students undergo detailed research focused courseworks in their first year of Ph.D. program. Our coursework is comparable to those offered at both national and international institutes of repute.

# Admission

## Eligibility

### Ph.D. in Science ( Mathematics )

All students who have successfully completed or are in their final year pursuing M.Sc / M.Stat / M.Math or equivalent degree in Mathematics, Statistics, Data Science or other areas of Quantitative Sciences may apply.

### Ph.D. in Science ( Cryptology & Security )

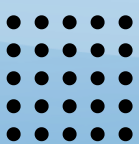
All students who have successfully completed or are in their final year pursuing M.Sc / M.Stat / M.Math or equivalent degree in Mathematics, Statistics, Physics or other areas of Quantitative Sciences may apply.

### Ph.D. in Engineering ( AI / ML )

All students who have successfully completed or are in their final year pursuing M.E / M.Tech / M.Engg or equivalent Master's degree in Engineering or Technology in Computer Science, Information Technology, Electronics and Communications, Electrical Engineering or other areas of Quantitative Sciences may apply.

### Ph.D. in Engineering ( Cryptology & Security )

All students who have successfully completed or are in their final year pursuing M.E / M.Tech / M.Engg or equivalent Master's degree in Engineering or Technology in Computer Science, Information Technology, Electronics and Communications, Electrical Engineering or other areas of Quantitative Sciences may apply.



## Application Deadline

31st May, 2023.

## Date of Examination

To be announced on our website.

# Selection Process

Reservations policy as per the Gov. of India norms will be followed.

## Qualifying Test: Stage One

All candidates must qualify a selection test – either a national level test conducted by a national body or a national level test conducted by TCG CREST.

A. Students who have qualified a national level fellowship (eg. NET JRF), would be eligible to directly apply for the AcSIR PhD program at TCG CREST. If selected, they should avail the national level fellowship

B. Students who have qualified a national level test but the Fellowship is not tenable at AcSIR, would be eligible to directly apply for the AcSIR PhD program at TCG CREST. If selected, they would be eligible to apply for the TCG CREST Institutional Fellowship.

C. Students who do not have a fellowship will be eligible to apply for the PhD program. However, such student will have to qualify a written test organised by TCG CREST. If selected, they will be provided with TCG CREST Institutional Fellowship subject to the candidates fulfilling the selection criterion.

D. All candidates may apply for the TCG CREST Institutional Fellowship by taking the TCG CREST qualifying test.

## Selection Interview: Stage Two

A. Based on the performance in the national level test or the TCG CREST qualifying test and past academic records, candidates will be shortlisted for interview.

B. For final selection of the candidate, an interview will be conducted by the relevant selection committee of the institute and the decision will be solely on the basis of performance in the final interview.

C. TCG CREST will retain its right to offer fellowship to candidates qualifying TCG CREST test.

## Institute Fellowship

TCG CREST will provide an institutional fellowship, similar to the national level fellowships offered by the different national level funding agencies National and international Travel Support may be provided to ALL candidates selected to the Ph.D. Program as per the norms of TCG CREST.

# Team



**tcg crest**  
Inventing Harmonious Future

## Bimal Kumar Roy, Honorary Director, IAI

Professor Bimal Kumar Roy is the Honorary Acting Director of IAI and also the Honorary Chairman of the Scientific Advisory Board of IAI. Prof. Roy is a Padmasree Awardee of 2015 and was previously the Chairman of National Statistical Commission, India, and is a professor at Indian Statistical Institute, Kolkata.

## Key Scientific Members



### Rajeeva Karandikar

Professor Rajeeva Karandikar is a Fellow of the Indian Academy of Sciences and Indian National Science Academy. He is currently the Chairman of National Statistical Commission.



### Swagatam Das

Professor Swagatam Das is the Deputy Director of IAI. He served as a professor and immediate past Head of ECSU, ISI Kolkata. He received his Ph.D. from Jadavpur University.



### Rana Barua

Professor Rana Barua is an Emeritus Professor at IAI. He was previously HOD of Stat-Math unit at ISI. He completed his Ph.D. at ISI and was Joint-Cordinator of Regional Maths Olympiad, Eastern India.



### Goutam Mukherjee

Professor Goutam Mukherjee is an honorary visiting professor at IAI, TCG CREST and he is leading the TRIM group at IAI. He is a Professor at Stat-Math Unit at ISI, Kolkata and completed his Ph.D. at ISI, Kolkata.

# About TCG CREST

The Chatterjee Group (TCG) launched the TCG Centres for Research and Education in Science and Technology (TCG CREST), a not-for-profit organisation, with an aspiration to become a leading member of the global science and technology driven innovation eco-system by collaborating with the global centres of excellence. TCG CREST is focused on creation of strong networks with reputed knowledge centres of the world – universities, research institutions, technology innovators and academic communities. It passionately inculcates a culture of continual knowledge exchange through joint projects, research, student exchange, faculty exchange, collaborative workshops, seminars and colloquiums for knowledge creation, knowledge application and knowledge dissemination for the overall benefit of human society.



# About AcSIR

The AcSIR was established as an Institution of National Importance by an Act of Parliament in 2010 and has been set-up based on a 'Hub and Spoke' model where the hub (AcSIR-HQ at Ghaziabad) is responsible for centralized administrative functions. The spokes are located in the 38 CSIR institutes/units (AcSIR Academic Centres) and 15 non-CSIR Institutes (AcSIR Associate Academic Centres) spread along the length and breadth of India, which act as the academic campuses of AcSIR.

AcSIR is the largest Academic Institution for doctoral research in India having awarded 577 Ph.D. degrees in 2022 and with more than 6100 students currently registered for PhD. Presently, AcSIR is ranked 3rd by "Scimago Institutions Ranking" (2023), 12th by "Nature Index" (2021-22) and 18th by "NIRF" (2022) in the Research Category, among the academic institutions in India.