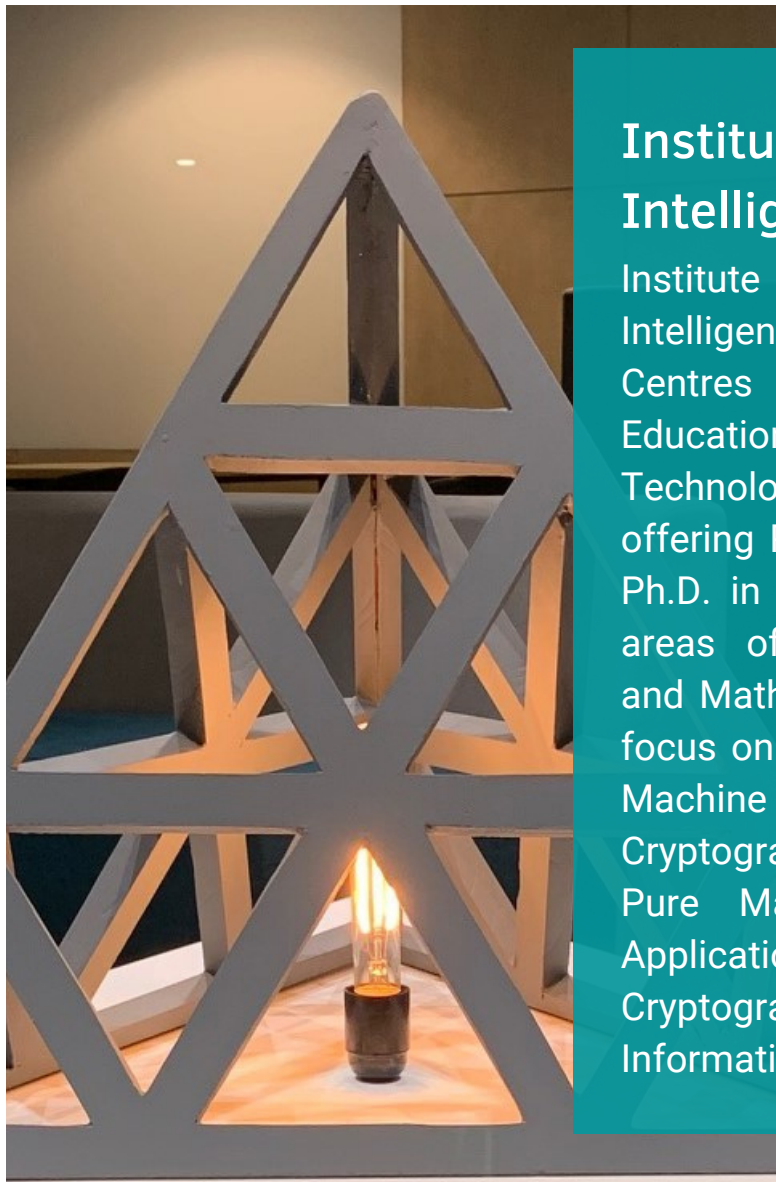




# TCG

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, Pure Mathematics and its Application Areas, Quantum Cryptography and 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 and Machine Learning, Cryptology and Security and Mathematics and its Application Areas.



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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.

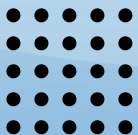
## Cryptography & Security

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) to ALL candidates selected to our Ph.D. programs.

### 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.

# AcSIR Eligibility

## General Eligibility Requirements of AcSIR

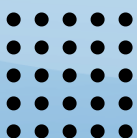
### Ph.D. in Science

Candidates with a Master's degree in Science or equivalent are eligible to apply. The candidate should be having a valid National level fellowship (JRF/ SRF of various funding agencies, e.g. CSIR, UGC, DBT, DST etc.) or any other equivalent fellowship like INSPIRE, RGNF etc. Project Assistants, Senior Research Fellows, Group-IV Scientists and Group-III Technical Staff of CSIR are also eligible to apply (as per relevant AcSIR rules). Candidates with a Master's degree in Science or equivalent are eligible to apply with endorsement from Industry, Academic or Research Institutes for required academic leave and financial support during the program.

### Ph.D. in Engineering

- (i) A Master's degree in Engineering or Technology following a four-year engineering/technology or 4/5 year science degree; or an integrated minimum-5-year M Tech degree; or equivalent. AND (ii) At least one of the following
- (a) Awarded a national-level fellowship (such as NET JRF) tenable at CSIR institutes
  - (b) Meeting all the conditions required for eligibility for the CSIR-SRF
  - (c) Meeting all the conditions for award of the INSPIRE fellowship (typically awarded to students ranked first in the University)
  - (d) Meeting all the conditions stipulated by AcSIR for Project Assistants to register for a Ph.D.
  - (e) Meeting all the conditions stipulated by AcSIR for industry-sponsored students. Project Assistants, Senior Research Fellows, Group-IV Scientists and Group-III Technical Staff of CSIR are also eligible to apply (as per relevant AcSIR rules)

Candidates without national level fellowships and/ or without national level qualifications can apply to Ph.D. programs at TCG CREST.



# Admission

## Subject Eligibility to IAI Programs

### 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 )

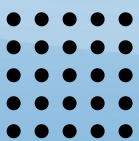
All students who have successfully completed or are in their final year pursuing M.Sc / M.Stat / M.Math or equivalent degree in Mathematics, Statistics, Physics or other areas of Quantitative Sciences may apply.

### 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 ( following a four-year engineering/technology or 4/5 year science degree ) 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 ( following a four-year engineering/technology or 4/5 year science degree ) 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

## Admission Process at TCG CREST

The admission to Ph.D. programs at TCG CREST under AcSIR consists of two stages:

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

## Channels of Admissions

Candidates must apply for the AcSIR Ph.D. Program at TCG CREST using one of the following three channels.

**Channel 1:** Candidates who have qualified for a national-level test and have a valid national level fellowship from a national funding agency (e.g. NET JRF, NBHM) will be shortlisted for the interview. If selected, they should avail of the national-level fellowship.

**Channel 2:** Candidates who have qualified for a national level test within the last three years but the fellowship is not tenable at AcSIR ( or do not have a fellowship from a national body ) are eligible to apply directly for the interview. These candidates will be shortlisted for the interview based on their prior academic performances and their performance in the national qualifying test.

**Channel 3:** Candidates who have not qualified for any national-level test, must qualify the TCG CREST written qualifying test and will be shortlisted for interview based on their performance in the TCG CREST test.

If selected, candidates applying in Channel 2 or Channel 3 are eligible for TCG CREST institute fellowship. TCG CREST will retain its right to offer fellowship to candidates qualifying TCG CREST test.

## Final Selection

The final selection of the candidates will be solely on the basis of performance in the final interview conducted as per the guidelines of AcSIR.

## Reservation Policy

The reservation policy of the Gov. of India will be followed at TCG CREST.

All candidates are allowed to appear for the TCG CREST written test. No admission to PhD program shall be made of a candidate without either National level fellowship or Institutional fellowship of TCG CREST.

# Team



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## 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 19 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 STEM 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.

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