



ADVERTISEMENT NO. IGCAR/01/2022
SELECTION OF JUNIOR RESEARCH FELLOWS
NO. OF FELLOWSHIPS: 60



LAST DATE FOR RECEIPT OF APPLICATION: 12/11/2022

Indira Gandhi Centre for Atomic Research (IGCAR), is a premier research and development Centre under the Department of Atomic Energy. It is dedicated to the development of fast reactor technology and associated fuel cycle facilities based on intense multi-disciplinary research. IGCAR is empowering young, talented and motivated students to contribute towards advanced research in frontier areas of engineering/science/technology by offering **Junior Research Fellowships** in the areas of physical, chemical and engineering sciences. IGCAR, Kalpakkam is a constituent Institution of Homi Bhabha National Institute (HBNI), a deemed to be University of the Department of Atomic Energy.

Applications are invited from interested students of Indian Nationals for the award of **Junior Research Fellowships** at IGCAR, Kalpakkam.

Selected candidates shall register for Ph.D. under HBNI. Those who join with M.Sc./M.Tech. will be eligible to register for direct Ph.D. Those who join with B.E./B.Tech./B.Sc. Engg./B.Sc. [Tech.] and M.Sc.(Material Science/Material Science in Engg.) will be considered for integrated Ph.D. in Engineering Sciences with an option to have single degree (Integrated Ph.D. only) or two degree (M.Sc.(Engg.) and Ph.D.)

**Admission to Ph.D. programmes will be subject to prevalent rules and regulations of HBNI.*

1. AREAS OF RESEARCH PROJECTS:

Discipline	Research projects	No. of Fellowships
Physical Sciences	Condensed Matter Physics: Basic research on the behaviour of materials at low and high temperatures, high pressures and magnetic fields and exploration of novel properties of materials, emergent physics using heterostructures, physics of low dimensional materials. Defect solid state physics: Research on generation of various defects by heavy ion irradiation and their characterization by various techniques like positron annihilation spectroscopy. Computational physics: Computer simulations of material properties using techniques like DFT and MD. Surface and interface physics: Studies on surfaces, coating and nanomaterials. Radiation resistant polymers, graphene based functionalized materials. Exploration of materials for sensors and detectors. Magnetic nanomaterials and nanofluids, Thermal-optical-rheological properties of nanofluids. Soft condensed matter. Multi scale computing and experimental Reactor Physics. Radiation physics: Radiation Shielding, Environmental Radiation study, Studies on natural radioactivity, radon and analysis, interaction of radiation with matter, development of radiation dosimetry - materials and techniques, retrospective dosimetry. Atmospheric Physics: Multiscale Numerical modeling, Data assimilation and forecast, Atmospheric modeling related to dispersion modeling, mesoscale weather phenomena, boundary layer turbulence, cyclone/ storm surge and wave forecasting.	60
Chemical Sciences	Chemical thermodynamics, Solid state and high temperature chemistry, Electrochemistry, Spectroscopy and laser, Radiochemistry, Advanced separation techniques, Actinide Chemistry, Trace / ultra-trace analytical techniques. Synthesis and characterization of nano-ceramics and Chemical sensors. Super hydrophobic coating, Corrosion resistant coating and evaluation, Computational chemistry, High temperature mass spectrometry, Metal Organic Frameworks (MOF).	
Engineering Sciences	[Metallurgical and Materials Engineering] Development of new engineering materials, materials synthesis, processing and fabrication technologies, microstructural engineering, structure property correlations, mechanical behaviour, fracture mechanics and structural integrity, corrosion science and technology, advanced materials characterization including electron microscopy, behaviour of materials under irradiation, non-destructive evaluation (NDE), inspection technologies. [Nuclear engineering] [Mechanical Engineering] Thermal hydraulics and structural mechanics, computational fluid dynamics, computational nuclear engineering, design of critical components, development of remote handling equipment, modelling studies, safety analysis, robotics and development of intelligent machines, reliability engineering. [Electrical, Electronics] Development of devices and electro-magnetic sensors for NDE, signal and image processing, machine learning (ML) and artificial neural networks (ANN).	

	embedded and simulator systems, wireless networking. [Software Engineering] Advanced signal and image processing algorithms including ML and ANN for NDE. [Chemical Engineering] Chemical process engineering, high performance extractors, fluidic devices	
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The Centre also encourages high quality inter-disciplinary research in areas relevant to its programmes.

2. AGE LIMIT:

The maximum age limit is 28 years as on the closing date for submission of application. A relaxation in age, up to 3 years in case of Other Backward Class applicants, 5 years in case of Scheduled Caste and Scheduled Tribe applicants and 10 years in case of Persons with bench mark disabilities (40% and more) is allowed

NOTE: ONLY SSC/MATRICULATION/HSC CERTIFICATE OR BIRTH CERTIFICATE WILL BE ACCEPTED AS PROOF OF DATE OF BIRTH. NO SUBSEQUENT REQUEST FOR CHANGE SHALL BE ENTERTAINED.

3. QUALIFICATIONS:

For all the categories listed below:

- Candidates should have consistently good academic record and should have secured minimum of 55% aggregate at graduation and post-graduation levels from a recognized University. A relaxation of 5% of marks, from 55% to 50% or an equivalent relaxation of grade, will be allowed for those belonging to SC/ST/OBC (non-creamy layer)/persons with benchmark disabilities.
- Wherever the results are declared as CGPA/GPA, it may be converted to percentage and entered. (The formula prescribed by the institute for conversion to be indicated at the time of verification).
- Candidates who have completed the qualifying degrees are eligible to apply. Relevant certificates to this effect, in original or attested copies, should be produced at the time of interview, failing which their candidature will not be considered. In case of selection, originals of all the relevant certificates must be produced for the verification at the time of joining the centre, failing to which the admission will be cancelled.
- UGC/AICTE approved Degrees from UGC/AICTE recognized Universities only will be accepted.
- Candidates with five years integrated M.Sc. degree should have secured minimum of 55% aggregate in M.Sc./B.S-M.S (Dual degree)

Category – A:

Masters in Science/ Integrated M. Sc. is the eligible qualification for the following subjects

S. No	Main Subject	Additional Requirements
1	Physics (General, Applied, Condensed matter, Nuclear, Theoretical)	Mathematical Physics/Numerical Methods must be one of the subjects at M.Sc. level <u>and</u> Chemistry as ancillary at B.Sc. Level
2	Materials Science/ Materials Science and Engineering	Physics, Mathematics and Chemistry at B. Sc. Level <u>or</u> B.Sc. in Materials Science
3	Chemistry (General, Applied, Organic, Inorganic, Physical, Analytical)	Physics and Mathematics as ancillary subjects at B.Sc. Level
4	Radiation Physics	Physics/ Chemistry and Mathematics as ancillary subjects at B.Sc. level <u>and</u> Mathematical Physics must be one of the subjects at M.Sc. level
5	Atmospheric Science/Meteorology	Physics, Mathematics as ancillary subjects at B.Sc. Level

Category – B:

- a) M.Tech./M.E in Nuclear Engineering / Nuclear Science & Technology
- b) M.Tech. in Atmospheric Science/Climate Science and Technology

Category – C:

B.E./B.Tech./B.Sc. Engg./B.Sc. [Tech.] in any one of the following disciplines (criteria for exemption from written test are given in section 4).

- Chemical Engineering
- Computer Science and Engineering
- Electrical and Electronics Engineering
- Metallurgical Engineering
- Mechanical Engineering

Category – D:

Candidates with M.E./M.Tech.

- i. Admission to M.E./M.Tech. should be on the basis of a valid GATE score (A certificate from the institution to the effect that admission to M.E./M.Tech. programme was based on the GATE score should be submitted at the time of interview).
- ii. The GATE Score should be in the appropriate GATE Paper for any one of the disciplines mentioned under Category-C, Physics or Chemistry.
- iii. Should have B.E./B.Tech./B.Sc. Engg./ B.Sc. [Tech.] degree in any one of the disciplines listed under Category C or M.Sc. (Physics or Chemistry)
- iv. Candidates who joined M.E./M.Tech. without a valid GATE score, should appear for the written test.

Candidates with the following qualifications are **NOT** eligible to apply

- i. Bachelors degree in Aerospace, Automobile, Production, Industrial Production, Reliability, Ceramics, Architecture, Geology, Mining, Bio-Medical Engineering, Bio-Medical Electronics/ Instruments, Communication, Information Technology, Dyes & Dye Intermediates, Electrochemical, Energy Systems, Oils & Fats, Paints & Varnishes, Petrochemicals, Plastics, Paper, Sugar Technology, Textiles & Mechatronics.
- ii. B.Tech. degree in Chemical Engineering under the category of petroleum, polymer, sugar, oil, soap technology, etc.
- iii. Master of Computer Applications & M.Sc. in Computer Science.
- iv. Candidates with M.Sc./Integrated M. Sc. in Particle physics, Electronics, Astrophysics, Geophysics, Biophysics & Medical Physics.
- v. M.Sc. in Polymer, Medicinal, Pharmaceutical, Bio chemistry, Environmental and Industrial Chemistry.

4. SELECTION PROCEDURE:

Applications will be scrutinized and suitability of candidates will be decided on the basis of their degree, academic record / GATE/JEST scores. The cut off scores (GATE/JEST) to be eligible for direct interview will be decided by IGCAR. Short listed suitable candidates under different qualification categories will be further selected based on the cut off **WRITTEN TEST and INTERVIEW or DIRECT INTERVIEW**.

Written Examination will be held on 04/12/2022 at **Chennai only**. The results of written test will be declared on the same day. Interview of the candidates who qualify in the written test will be held at IGCAR **Kalpakkam** from 05/12/2022 onwards.

A summary scrutiny of the application/credentials would be carried out for short-listing of the candidates for the written test and a more detailed scrutiny of the credentials leading to the eligibility of the candidate would be done at the final stage of the selection process.

Category A: Those candidates who had secured the prescribed marks in the qualifying degree and in addition are satisfying any of the following conditions would be exempted from the written test based on cut off marks decided by IGCAR:

- i. With valid UGC-CSIR-NET Fellowship (SLET/ Lecturership is not eligible)

- ii. With valid JEST score
- iii. With a valid GATE score after Master's degree

Category B: Candidates who had scored the prescribed marks in the qualifying degree will have to appear for the written test and those short listed based on written test will be called for an interview.

Category C: Candidates with the prescribed marks in the qualifying degree and with a valid GATE score above the cut off (decided by IGCAR) are eligible to appear directly for the Interview (exempted from written test). Also, the candidates with valid JEST score and with eligible engineering disciplines listed as above are also eligible to appear directly for interview.

Category D: Candidates who have joined M.E./M.Tech. via valid GATE (eligible discipline and valid GATE score as mentioned above in Category-A (Physics, Chemistry) & Category-C) are exempted from written test. Other eligible candidates will have to appear for a written test in the discipline in which graduation degree was obtained.

Candidates shortlisted based on the written test or based on the above criteria will be called for an interview.

At the time of submission of application, candidates should clearly indicate the details of qualifying examinations (GATE/UGC-CSIR-NET/JEST) listed as above for consideration of application and submit the proofs at the time of document verification. Candidates will be shortlisted for written test and Direct Interview based on the inputs given and scores provided in the qualifying exam in the application form. Under no circumstances this will be changed later.

5. SELECTION INTERVIEWS:

The Selection Interview for all the shortlisted candidates (those who qualify in the written test as well as for those qualified for DIRECT interview) will be conducted in person at IGCAR Kalpakkam from 05/12/2022. The recommendation / decision of the Selection Committee will be final and binding.

6. GENERAL INSTRUCTIONS

- i. Before applying, the candidate should ensure that he/she fulfills all the eligibility conditions mentioned in the advertisement. Candidates should ensure that they fill in the correct information. Furnishing of incomplete, false or misleading information shall render the application liable to be rejected. The candidate would be admitted to various stages of the recruitment process based on the information furnished by the candidate in his/her application. Only a summary scrutiny of the application would be made before the final stage of the recruitment process and detailed scrutiny of the credentials leading to the eligibility of the candidate would be done only at the final stage of the recruitment process. As such, the candidature of the applicant shall remain provisional till detailed scrutiny is undertaken and the candidate is found eligible in all respects. IGCAR would be at liberty to reject any application at any stage of the recruitment process if the candidate is found ineligible for the post or if it comes to notice that the candidate has furnished false information. The decision of IGCAR shall be final in deciding the eligibility of the candidate. The mere fact that a call letter has been issued to the candidate and allowed to appear in the written exam/interview will not imply that his/her candidature has been finally cleared or that entries made by the candidate in his/her application have been accepted as true and correct.
- ii. Age, qualification, validity of GATE/JEST/CSIR-UGC-NET, community status, creamy layer status will be reckoned as on the closing date for submission of application.
- iii. Those who are in employment under any Central/State Govt./Public Sector Undertakings/Corporations/ Local Govt. etc. should submit a No Objection Certificate from the employer at the time of verification of the documents before interview.
- iv. SC/ST/OBC (clearly indicating Creamy Layer status) certificate should be as per the format prescribed for employment in Government of India.

- v. The original certificates / documents of the candidates will be verified at the final stage of the selection process. The shortlisted candidates must bring all original certificates of educational qualifications, date of birth, caste certificate in the prescribed format, disability certificate in respect of PWD candidates, No Objection Certificate if in regular employment under any Central/State Govt./Public Sector Undertakings/Corporations/ Local Govt. etc. and GATE/UGC-CSIR-NET/JEST fellowship, as applicable.
- vi. The list of candidates selected for the award of Junior Research Fellowship will be displayed on the IGCAR website (www.igcar.gov.in). The selected candidates will also be informed by their registered e-mail.
- vii. **The final induction of the selected candidates as JRFs will be subject to production of all necessary documents in original during the Document Verification and being found Medically Fit by the Medical Superintendent, DAE Hospital, Kalpakkam.**
- viii. **Accommodation will be provided on nominal charges for a period of 48 hours from Check-In at DAE Township, Kalpakkam only for those candidates shortlisted for Personal Interview.**
- ix. The number of fellowships indicated in this advertisement is approximate and may vary as per the requirement at the time of final selection. IGCAR reserves the right not to fill up the fellowships if it so desires. IGCAR reserves the right to screen and call only such candidates as are found prima – facie suitable for being considered by the Selection Committee. Thus, just fulfilling the prescribed conditions should not entitle one to be called for interview.
- x. Candidates who are NOT meeting the mentioned qualification NEED NOT apply.
- xi. The fellowship shall not confer any claim or right for regular employment at IGCAR or any Unit of Department of Atomic Energy.
- xii. The period of service rendered as research fellow will not be counted in any post of DAE / Other Government Department.
- xiii. Admission shall not be claimed by any candidate as a matter of right. The admission shall be entirely at the discretion of the Selection Committee, which may refuse to admit any candidate without assigning any reason thereof.
- xiv. No correspondence whatsoever form will be entertained from candidates regarding reason for not being called for interview/outcome of interview.
- xv. Candidates are advised to read the advertisement carefully. Frequent enquiries/representations made in any correspondence without reading the full content of the advertisement will not be entertained.

7. APPLICATION PROCEDURE

Applicants should fill online application form available at IGCAR website <http://www.igcar.gov.in/> and take a printout of filled in application after final submission of data. Applicant should **affix recent passport size photo** on the print out and sign at the place marked for signature. Self-attested copy of necessary documents should be enclosed along with the printout. The signed printout of the application form along with the documents should be sent by Post (Registered or Speed post of Indian Postal service) to the following address so as to reach IGCAR on or before 15/11/2022:

**The Assistant Personnel Officer [R]
Recruitment Section
Indira Gandhi Centre for Atomic Research
Kancheepuram District
Kalpakkam – 603 102.
Tamil Nadu**

Superscribe the envelope: “JRF, Advt. No. IGCAR/01/2022” & also clearly indicate the "Discipline" on the envelope

In addition to the above, the scanned copy of application along with all the relevant documents shall be sent to email id jrfrect@igcar.gov.in on the same day itself.

Applicants are advised to visit the website of IGCAR (www.igcar.gov.in) regularly for getting updates during the selection process.

No Correspondence / Admit Card will be sent by post to the candidates. The proforma of the Admit Card for appearing for the written examination will be published in the IGCAR website <http://www.igcar.gov.in/>. The candidates are requested to do the following:

- i. Download and print the Admit Card from the IGCAR website
- ii. Affix the recently taken passport size photograph on the space provided.
- iii. Put the signature on the space provided.
- iv. Also bring photo identity proof in original for verification, preferably those issued by government.

8. MEDICAL

The selected candidates are eligible to join the Contributory Health Service Scheme (CHSS) of this Centre as applicable.

9. ACCOMMODATION

The Selected candidates will be provided with subsidized bachelor Hostel Accommodation during the tenure.

10. FELLOWSHIP AND TENURE

Course	Fellowship*	Duration of fellowship
Direct Ph.D.	Rs. 31,000/- per month for the first two years. Rs. 35,000/- per month from third year onwards. Eligible for a Contingency grant including book allowance of Rs. 40,000/- per year.	Five years
Integrated Ph.D. (single degree)	First year: Rs. 21,000/- per month plus one-time book allowance of Rs. 25,000. Second and third years: Rs. 31,000/- per month. Fourth, fifth and sixth years Rs. 35,000/- per month. Eligible for a Contingency Grant of Rs. 40,000/- per annum from second year onwards.	Six years
Integrated Ph.D. (double degree)	First year Rs. 21,000/- per month plus one-time book allowance of Rs. 25,000. Second and third years: Rs. 31,000/- per month. Fourth, fifth, sixth and seventh years Rs. 35,000 per month. Eligible for contingency Grant of Rs. 40,000 per annum from second year onwards.	Seven years

*Continuation/enhancement of fellowship is subject to satisfactory performance/review examination at the end of each year as appropriate.

Candidates are advised to visit the website <http://www.igcar.gov.in/> periodically for further information and updates in this regard.

10. CANCELLATION OF THE CANDIDATURE

Candidate is cautioned not to furnish any incomplete, false or misleading information or submit any document which is defective, forged or fabricated or otherwise not admissible or claim fraudulently SC/ST/OBC/Person with Disability, etc. or resort to any sort of malpractice during the selection process. Notwithstanding verification of original documents during various stages of the selection process, if any such case is detected at any stage of the selection process or later on, this Centre reserves the right to withdraw/cancel candidature or selection apart from taking other appropriate legal action.

Candidates will not be allowed to appear for the Written Examination if they fail to bring the hall ticket and a valid photo identity card (such as Voter ID, Driving License, AADHAAR Card, Passport, College ID) in original.

CALENDAR WITH IMPORTANT DEADLINES (TENTATIVE)

Particulars	Date
Opening of online portal for submission of applications	26/10/2022
Last date for online submission of applications	12/11/2022
Publication of scrutinized list for written test & direct interview in website	18/11/2022
Written Test	04/12/2022
Interview of Candidates qualified in Written test	05/12/2022 to 09/12/2022
Interview of Candidates qualified for Direct interview	
Publication of final list of selected candidates in website	12/12/2022
Reporting Date of shortlisted candidates at IGCAR for document verification and medical examination	02/01/2023

Website: <http://www.igcar.gov.in/>

Online application form is available at www.igcrect.in

CANVASSING IN ANY FORM WILL CAUSE DISQUALIFICATION.

ANY LEGAL DISPUTES ARISING OUT OF THIS ADVERTISEMENT ARE SUBJECT TO CHENNAI JURISDICTION. IN CASE OF ANY DISPUTES, ENGLISH VERSION OF ADVERTISEMENT PLACED ON WEBSITE OF <http://www.igcar.gov.in/> WILL BE TAKEN AS REFERENCE.

RECORD OF THE NON-SELECTED CANDIDATES SHALL NOT BE PRESERVED BEYOND 6 MONTHS FROM THE DATE OF PUBLICATION OF SELECT LIST AND NO QUERIES WOULD BE ENTERTAINED AFTER THIS PERIOD.

FOR ANY FURTHER QUERIES, CANDIDATES MAY PLEASE MAIL TO jrfrect@igcar.gov.in
