

**Government of India  
Bhabha Atomic Research Centre  
Trombay, Mumbai-400 085**

**Advertisement No: 2/2021 (R-V)**

Applications are invited for 31 positions of **Research Associate (RA)** Fellowship to work on the following R&D projects in Bhabha Atomic Research Centre, Mumbai:

**Research Project No. 1**

Name of the Research Project	:	Development of Materials, Devices, Analytical Instruments & NDT Techniques for Physics Research
Requirement of RA	:	3
Qualification	:	PhD (Physics)
Field of work	:	R&D in Physics
Nature of work	:	<p><b>1. Single Crystal growth &amp; characterization for various applications:</b> The work involves single crystal growth of advanced scintillator materials and measurement of their optical, luminescence and scintillator properties.</p> <p><b>2. Growth and characterization of NEG (Non-evaporable Getter) coatings used for creation of Ultra High Vacuum (UHV):</b> The work involves deposition of alloy thin films of NEG materials by sputtering and their characterization using different experimental techniques.</p> <p><b>3. Metal-organic interface study by Hard X-ray Photoelectron Spectroscopy:</b> The work involves preparation of various metal-organic multi-layered thin films and studies thereof.</p>
Duration of project	:	Upto 31.01.2023

**Research Project No. 2**

Name of the Research Project	:	Development of Synchrotron and Neutron Beamlines, optical Multilayer Devices, Liquid hydrogen Test Loop and Physics Research
Requirement of RA	:	4
Qualification	:	<p>PhD (Physics, Chemistry, Materials Science, Earth Science, or a related field)</p> <p>Applicants are expected to have outstanding experience of research and development, relevant computer skills, organizational skills, verbal and written communication skills, and be able to work effectively both as a team player and independently.</p> <p>An experience of working with high-pressure devices is preferable.</p>
Field of work	:	<p>Experimental condensed matter research under extreme thermodynamic conditions.</p> <p>Synchrotron beamline development</p>
Nature of work	:	<p>The responsibilities of the RA include participation in the development, installation and commissioning of upcoming beamlines at Indus-2 synchrotron source at RRCAT, Indore being developed by SDCPS, HP&amp;SRPD, PG, BARC,</p> <ul style="list-style-type: none"> <li>- Supporting user programs,</li> <li>- Developing and integrating novel high-pressure techniques</li> <li>- Conducting independent researches.</li> </ul> <p>These beamlines will exploit high-energy x-ray diffraction, x-ray absorption spectroscopy and x-ray fluorescence techniques for material investigations under extreme conditions.</p>
Duration of project	:	Upto 31.03.2024

**Research Project No. 3**

Name of the Research Project	:	Development of Synchrotron and Neutron Beamlines, optical Multilayer Devices, Liquid hydrogen Test Loop and Physics Research
Requirement of RA	:	1
Qualification	:	<p>PhD(Physics) in the area of Photonics/ Optical thin films with strong aptitude in photonics design software</p> <ul style="list-style-type: none"> <li>• Applicants are expected to have outstanding experience of research and development, organizational skills, verbal and written communication skills, and must be able to work in collaboration and independently.</li> </ul> <p>An experience in practical optical thin film coating design &amp; deposition techniques is desirable.</p>

Field of work	:	Optical thin film devices, Photonic nano structure
Nature of work	:	Research & Development in the areas of theoretical modeling, simulation and developments of optical thin films and photonic structures-based devices. The work profile includes investigations into optical, microstructural and mechanical properties of novel multi-layered photonic structures and devices. The candidate will be supporting ongoing research programs as well as conducting independent research in the field.
Duration of project	:	Upto 31.03.2024

**Research Project No. 4**

Name of the Research Project	:	Development of Synchrotron and Neutron Beamlines, optical Multilayer Devices, Liquid hydrogen Test Loop and Physics Research
Requirement of RA	:	1
Qualification	:	PhD (Cryogenic Engineering) in the area of cryogenic fluid flow and heat transfer <ul style="list-style-type: none"> <li>Applicants are expected to have outstanding experience of research and development, organizational skills, verbal and written communication skills, and must be able to work in collaboration and independently.</li> </ul> An experience in hydrogen liquefaction is desirable.
Field of work	:	Development of cold neutron source
Nature of work	:	Solid modeling, thermal analysis, stress analysis, fabrication and testing of liquid hydrogen based cold neutron source. The work profile includes handling of liquid hydrogen. The candidate will be supporting ongoing research programs as well as conducting independent research in the field.
Duration of project	:	Upto 31.03.2024

**Research Project No. 5**

Name of the Research Project	:	Newer applications of radiation technology for food security and value addition.
Requirement of RA	:	3
Qualification	:	Ph.D. in food and food related field/Biochemistry/ Zoology/ Biotechnology/Microbiology/Dairy microbiology. <b>Desirable expertise:-</b> (a) Development of functional foods (b) Working experience with cell line as well as animal model systems (c) Probiotics (d) Prebiotics and food microbiology (e) Food fermentation
Field of work	:	Food Technology
Nature of work	:	Research and development
Duration of project	:	Upto 30.11.2022

**Research Project No. 6**

Name of the Research Project	:	Structural and Thermal Hydraulic Safety Studies for Indian NPPs
Requirement of RA	:	4
Qualification	:	PhD (Mechanical Engineering) or ME/M.Tech with three years R&D experience as on the final date of application. Specialization in design, material engineering, thermal engineering would be desirable. The candidate applying for RA should have a minimum of one research publication in a standard refereed journal as listed in Journal Citation Reports (JCR).
Field of work	:	Structural and thermal hydraulic safety
Nature of work	:	RA would be involved in the work such as commissioning of the experimental facilities or test set up for carrying out tests to facilitate research and development in the area of structural safety of nuclear components, thermally hydraulic safety of the nuclear power reactors.
Duration of project	:	Upto 31.12.2022

**Research Project No. 7.1**

Name of the Research Project	:	Processing of Materials and Control of Material Degradation for Nuclear Industry, Zr based, Ni based and Ti based alloys
Requirement of RA	:	1
Qualification	:	PhD in Science/Engineering (Materials Science/Chemical Science/Metallurgy)
Field of work	:	Extractive Metallurgy
Nature of work	:	Processing and Characterization of RE metals and alloys
Duration of project	:	Upto 31.10.2022

**Research Project No. 7.2**

Name of the Research Project	:	Processing of Materials and Control of Material Degradation for Nuclear Industry, Zr based, Ni based and Ti based alloys
Requirement of RA	:	1
Qualification	:	PhD in Science/Engineering (Chemical Science/Chemical Eng.)
Field of work	:	Solution Chemistry, Hydrometallurgy
Nature of work	:	Separation of critical elements (rare earth, base metal) from lean and secondary sources by hydrometallurgy
Duration of project	:	Upto 31.10.2022

**Research Project No. 8**

Name of the Research Project	:	Processing of Materials and Control of Material Degradation for Nuclear Industry, Zr based, Ni based and Ti based alloys
Requirement of RA	:	1
Qualification	:	PhD (Chemical Science/Material Science)
Field of work	:	Chemical Science / Materials Science
Nature of work	:	Work includes the evaluation of in-house developed polymeric resins for sorption of metal ions, spectroscopic characterization of metal species sorbed on to resins, process development for bench scale demonstration
Duration of project	:	Upto 31.10.2022

**Research Project No. 9.1**

Name of the Research Project	:	Processing of Materials and Control of Material Degradation for Nuclear Industry, Zr based, Ni based and Ti based alloys
Requirement of RA	:	1
Qualification	:	PhD-Metallurgy/Materials Science/Mechanical
Field of work	:	Metallurgy
Nature of work	:	Work involves the following :- i) Establishing the oxidation behavior of nuclear materials (Ti based alloys) in actual partial boiling conditions. ii) Establishing the effect of surface modification of machined austenitic stainless steel and its effect on SCC mitigation will be established. Work will be done using an indigenously designed and fabricated setup.
Duration of project	:	Upto 31.10.2022

**Research Project No. 9.2**

Name of the Research Project	:	Processing of Materials and Control of Material Degradation for Nuclear Industry, Zr based, Ni based and Ti based alloys
Requirement of RA	:	1
Qualification	:	PhD-Metallurgy/Mechanical/Chemistry
Field of work	:	Metallurgy
Nature of work	:	Work involves :- Corrosion / electrochemical studies of various candidate materials (Ti alloys, stainless steels, Zr alloys) in boiling nitric acid in three phases and in various aqueous solutions of interest. Also establishing microstructure-corrosion property correlation.
Duration of project	:	Upto 31.10.2022

**Research Project No. 10.1**

Name of the Research Project	:	Processing of Materials and Control of Material Degradation for Nuclear Industry, Zr based, Ni based and Ti based alloys
Requirement of RA	:	1
Qualification	:	PhD (Metallurgical Engg. with specialization in powder processing and characterization / extractive metallurgy)
Field of work	:	Preparation and fabrication of metals, alloys, ceramics, and their characterization
Nature of work	:	Scientific and Technical
Duration of project	:	Upto 31.10.2022

**Research Project No. 10.2**

Name of the Research Project	:	Processing of Materials and Control of Material Degradation for Nuclear Industry, Zr based, Ni based and Ti based alloys
Requirement of RA	:	1
Qualification	:	PhD (Chemical Science with specialization in high-temperature electrochemistry )
Field of work	:	Preparation and fabrication of metals, alloys, ceramics, and their characterization
Nature of work	:	Scientific and Technical
Duration of project	:	Upto 31.10.2022

**Research Project No. 11**

Name of the Research Project	:	Processing of Materials and Control of Material Degradation for Nuclear Industry, Zr based, Ni based and Ti based alloys
Requirement of RA	:	1
Qualification	:	PhD (Materials Science/Chemical Science)
Field of work	:	The work is in the field of electrochemical deposition of U & other refractory metal coating/thin films from molten salt and their detail structural characterization in terms of phases, crystal structure, chemical state, (GIXRD, XPS, FESEM), cross-sectional investigation and property evaluation such as hardness, corrosion resistance, wear & COF etc. This work may be extended to synthesize superhydrophobic coatings for anti-microbial applications.
Nature of work	:	Experimental
Duration of project	:	Upto 31.10.2022

**Research Project No. 12.1**

Name of the Research Project	:	High performance carbons and carbides
Requirement of RA	:	1
Qualification	:	PhD (Chemical Science/ Physical Science/ Materials Science/Metallurgy/)
Field of work	:	Energy conversion, storage and sensing
Nature of work	:	Fabrication of thin films and nano material based electronic devices for application in the energy conversion, storage and gas sensing
Duration of project	:	Upto 31.10.2023

**Research Project No. 12.2**

Name of the Research Project	:	High performance carbons and carbides
Requirement of RA	:	1
Qualification	:	PhD in Science/Engineering (Chemical Science/Chemical Eng./Materials Science/Metallurgy)
Field of work	:	Chemical vapour deposition and material processing
Nature of work	:	Development of vertically aligned spinnable array of carbon nanotubes
Duration of project	:	Upto 31.10.2023

**Research Project No. 13**

Name of the Research Project	:	Development of a novel multi-resolution fracture model for prediction of graphite failure strength
Requirement of RA	:	2
Qualification	:	PhD (Engg.). Some prior research experience/publication in the areas of Crystal Plasticity or Dislocation Dynamics will be useful for this work.
Field of work	:	Computational Materials Modelling
Nature of work	:	Research. Specific damage mechanisms in graphite under quasi-static and cyclic loads will be simulated using a suitable modelling scheme. The developed failure models will be validated with the experimental data.
Duration of project	:	Upto 31.03.2023

**Research Project No. 14**

Name of the Research Project	:	Development & Deployment of Technologies of Beams & Plasmas for Nuclear and Non-Nuclear applications
Requirement of RA	:	2
Qualification	:	PhD (Thermal Plasma)
Field of work	:	Thermal Plasma experiment and plasma CFD Simulation
Nature of work	:	R&D
Duration of project	:	Upto 31.01.2023

**Research Project No. 15 (DST sanctioned)**

Name of the Research Project	:	Development of efficient and robust working electrodes / photocatalysts for solar energy conversion to hydrogen via photoelectrochemical/photocatalytic splitting of water : Next level up-scaling of laboratory experience.
Requirement of RA	:	1
Qualification	:	PhD (Chemistry)
Field of work	:	Heterogeneous catalysis, Solar-hydrogen generation
Nature of work	:	It includes extensive R & D to develop new and efficient photocatalyst materials/systems for solar energy conversion to hydrogen via photocatalytic water splitting. It includes synthesis, thorough characterization and performance evaluation of nanostructured visible light active photocatalysts. Photoelectrochemical water splitting and upscaling the existing laboratory systems would also be carried out.
Duration of project	:	Upto 31.08.2023

The Fellows recruited will have opportunity to carry out research under plan projects/other research projects of BARC under the guidance of senior scientists.

Interested candidates may apply in the prescribed format with complete bio-data, one set of photocopies of mark-sheets, degree certificates (from SSC to M.E./M.Tech/Ph.D.), other academic credentials and work experience and the duly filled-in application may be sent to Deputy Establishment Officer, Recruitment-V, Central Complex, BARC, Trombay, Mumbai-400085 **superscribing the Research Project No. on the envelope.**

**Candidates may apply separately for each Research Project.**

**THE LAST DATE FOR RECEIPT OF APPLICATION :- 10/05/2021**

**NOTE :**

- Educational Qualification:** As indicated against each Research Project.
- Amount of Fellowship:**

(i)	RA-1	: ₹ 47,000/- p.m. plus Contingency Grant of ₹ 40,000/- per annum plus HRA as applicable [wherever hostel accommodation is not available].
(ii)	RA-2	: ₹ 49,000/- p.m. plus Contingency Grant of ₹ 40,000/- per annum plus HRA as applicable [wherever hostel accommodation is not available].

(iii) RA-3	: ₹ 54,000/- p.m. plus Contingency Grant of ₹ 40,000/- per annum plus HRA as applicable [wherever hostel accommodation is not available].
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**NOTES :-**

- A) The Research Associates will be fixed at one of the 3 fellowship as indicated above depending on qualifications and experience. The level at which a fellow will be placed will be decided by the interview committee based on the following;
- i) Quality of Ph.D. thesis;
  - ii) Post-Ph.D. research experience as evidenced from the quality of the publications and/or products/processes designed and developed and
  - iii) Performance in the Selection interview.
- B) The Department does not grant any such fellowship to the Scholars who have submitted Ph.D. thesis and are awaiting evaluation of thesis.
- C) A person with Provisional/Regular Ph.D. will be treated at par with Research Associates and will be eligible for fellowship as per extant rates.

**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 status 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 interview if they fail to bring a copy of the Application and a valid photo identity card (such a Voter ID, Driving License, AADHAR Card, Passport, College ID) and all the documents in original at the time of interview.**

**Important Notes :**

- 1) **All information related to the Screening/Interview/Selection will be made available on the website i.e. <http://www.barc.gov.in>.** Candidates are advised to visit the website periodically for information and updates in this regard. Information displayed on the website will be deemed as intimation to the candidates.
- 2) Any legal disputes arising out of this notification are subject to Mumbai jurisdiction only and in case of any dispute, English version of detailed Advertisement placed on BARC website shall be referred.
- 3) Corrigendum/Addendum, if any, pertaining to this advertisement will be published only on BARC website.

**CANVASSING IN ANY FORM WILL BE A DISQUALIFICATION**

**RECORD OF THE NON-SELECTED CANDIDATES SHALL NOT BE PRESERVED BEYOND SIX MONTHS FROM THE DATE OF PUBLICATION OF SELECT LIST.**