

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

Advertisement No: 4/2022(R-V)

THE LAST DATE FOR RECEIPT OF APPLICATION :- 28/10/2022

Applications are invited for 78 positions of Research Associate (RA) Fellowship to work on the following R&D projects of Bhabha Atomic Research Centre, Mumbai:

Research Project No. 1

Name of the Research Project	:	Development of Schwarzschild Couder Cherenkov Telescope and maintenance of existing facilities at ApSD
Requirement of RA	:	2
Qualification	:	PhD
Field of work	:	EXPERIMENTAL-VERY HIGH ENERGY GAMMA RAY ASTRONOMY
Nature of work	:	Project related Simulation & Experimental activities
Duration of project	:	Maximum three years

Research Project No. 2.1

Name of the Research Project	:	Development of Neutron and Synchrotron Beamlines, Research on Energy Materials, and Investigations of Quantum Spin Phenomena
Requirement of RA	:	2
Qualification	:	Ph.D. (Mechanical Engineering) or M.E./M.Tech. (Mechanical Engineering) with two years' experience as on the date of application. Experience in mechanical design, manufacturing, inspection and testing is preferred, but not mandatory
Field of work	:	Mechanical design, Preparation of design reports and drawings, and Technical specifications, Review of manufacturing documents received from the supplier, Inspection, QA & testing at suppliers' shop, Installation and commissioning
Nature of work	:	The primary responsibility of the Research Associate (RA) will be to participate in the on-going activities related to design & development of the respective instruments as mentioned below, for enhancing their experimental capabilities and to carry out cutting-edge applied and basic research in the field of material science. Occasionally, the RA may have to visit manufacturer's place for design consultation, inspection and testing. The RA will be primarily stationed at BARC, Mumbai to work on 1. Design, manufacturing, inspection, installation, testing and commissioning of Advanced Materials Diffractometer (AMD) and Cold Neutron Source test setup facility. 2. Design, manufacturing, inspection, installation, testing and commissioning of Triple Axis Spectrometer (TAS) facility.
Duration of project	:	Upto 31.07.2025

Research Project No. 2.2

Name of the Research Project	:	Development of Neutron and Synchrotron Beamlines, Research on Energy Materials, and Investigations of Quantum Spin Phenomena
Requirement of RA	:	1
Qualification	:	Ph.D. (PHYSICS) is preferred, but not mandatory; PhD (Chemistry/Materials Science) would also be eligible. Research experience using synchrotron beamline/X-ray/neutron scattering facilities is preferred but not mandatory.
Field of work	:	R&D in PHYSICS/ Experimental Condensed Matter Research / Synchrotron Beamline development

Nature of work	:	The Research Associate (RA) will be primarily stationed at RRCAT, Indore to work at the Small and Wide-Angle X-ray Scattering (SWAXS) beamline (BL-18). The primary responsibility of the RA will be to participate in the ongoing augmentation project of the state-of-the-art beamline facility for enhancing its experimental capabilities and to carry out cutting-edge applied and basic research in the field of nanoscience and nanotechnology. The RA will also contribute towards the regular operation and maintenance of the beamline including user support towards experiments and data analysis. Occasionally, the RA may have to visit BARC, Mumbai for experiments and analysis.
Duration of project	:	Upto 31.07.2025

Research Project No. 2.3

Name of the Research Project	:	Development of Neutron and Synchrotron Beamlines, Research on Energy Materials, and Investigations of Quantum Spin Phenomena
Requirement of RA	:	1
Qualification	:	Ph.D. (PHYSICS), preferably with experience in gas kinetics, and handling radiation sensors, with associated electronics, and vacuum systems
Field of work	:	Design and development of radiation detectors
Nature of work	:	The neutron beamlines at BARC, Mumbai are supported with indigenously developed durable neutron detectors, such as neutron beam monitor, proportional counters and one-dimensional and two-dimensional position sensitive detectors (PSD), which are tailor-made for the beam size and intensity. These instruments are periodically upgraded with gain in detection efficiency, solid angle coverage and spatial resolution. Detector designs are supported with high precision fabrication and analytical calculations on electrostatics and gas kinetics. The RA would be working on mechanical hardware design, precision assembly of detectors, vacuum and gas filling systems, testing of neutron detectors, handling electronics equipment for measurement of radiation, development of radiation detectors including procurement of materials. The RA should be ready to work in radiation fields.
Duration of project	:	Upto 31.07.2025

Research Project No. 2.4

Name of the Research Project	:	Development of Neutron and Synchrotron Beamlines, Research on Energy Materials, and Investigations of Quantum Spin Phenomena
Requirement of RA	:	2
Qualification	:	Ph.D. (PHYSICS). A prerequisite for eligible candidates would be research experience in the area of magnetism and solid-state physics
Field of work	:	Research and Development work related to quantum magnets
Nature of work	:	Under the sub-project "quantum magnets", we aim to obtain microscopic information about the structure and dynamics of unexplored quantum phases of electrons in novel compounds based on polycrystalline and single crystal samples. In this project, the RA would be studying low dimensional frustrated spin systems, magnetic organic compounds, metal-organic hybrid magnets, and magnetic oxide multilayers. A high magnetic field and low temperature laboratory along with a magnetic multilayer growth facility will also be set up under this project.
Duration of project	:	Upto 31.07.2025

Research Project No. 2.5

Name of the Research Project	:	Development of Neutron and Synchrotron Beamlines, Research on Energy Materials, and Investigations of Quantum Spin Phenomena
Requirement of RA	:	1
Qualification	:	Ph.D. (PHYSICS). An in-depth knowledge of, and research experience in solid-state physics and single-crystal growth is necessary.
Field of work	:	Single crystal growth of novel magnetic materials in search of a variety of unconventional physical states such as quantum spin liquids, Weyl semimetals, and investigation of their physical properties
Nature of work	:	The RA will be required to grow the single crystals of technologically important oxide materials and topological insulators using optical floating zone technique. The RA will also investigate the physical properties of these crystals using in-house neutron scattering and other allied techniques with a goal to understand how magnetic properties are related to their chemical composition and atomic structure.
Duration of project	:	Upto 31.07.2025

Research Project No. 2.6

Name of the Research Project	:	Development of Neutron and Synchrotron Beamlines, Research on Energy Materials, and Investigations of Quantum Spin Phenomena
Requirement of RA	:	1
Qualification	:	Ph.D. (PHYSICS). A strong experimental background in solid-state chemistry/physics, familiarity with thin film growth, and electrical transport measurements are highly desirable.
Field of work	:	Synthesis of bulk material and fabrication of thin films of novel magnetic materials promising for spin Seebeck effect based thermoelectric generators and investigation of their transport and physical properties.
Nature of work	:	The RA will be required to synthesize bulk material and grow the thin films of magnetic materials promising for spin Seebeck effect. The RA will investigate the physical properties of these materials using in-house neutron scattering and other allied techniques. The work also includes detailed analysis of the microstructure and transport properties.
Duration of project	:	Upto 31.07.2025

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	:	2 (The RAs can be deputed out of Mumbai for experimental work related to the project)
Qualification	:	PhD (Physics) Applicants are expected to have outstanding experience in the field of experimental condensed matter research, should have the aptitude for excellence in basic research. Expertise in Raman spectroscopy or Infrared/Brillouin spectroscopy is highly desirable. Experience of working with high-pressure devices and expertise in XRD analysis, computational methods is preferable.
Field of work	:	Experimental research under non-ambient conditions in High Pressure and Synchrotron Radiation Physics
Nature of work	:	The responsibilities of the Ras include carrying out thematic research using Raman spectroscopy as primary technique. Should synthesise and characterize the samples as required, should be open to learning new techniques and interacting with other divisional colleagues. Also expected to participate in activities relating to augmentation of experimental capabilities.
Duration of project	:	Upto 31.03.2024

Research Project No. 4

Name of the Research Project	: Augmentation & upgradation of Indus beamlines(PX/ECXRD/IR), high-pressure and spectroscopic experimental facilities
Requirement of RA	: 2 (The RAs can be deputed out of Mumbai for experimental work related to the project)
Qualification	: - PhD(Physics, Chemistry, Materials Science) - Applicants are expected to have outstanding experience of research and development, relevant computer skills, organizational skills, verbal and written communication skills, and should be able to work effectively both as a team player and independently. - An experience of working with high-pressure devices/ single crystal x-ray diffraction / powder x-ray diffraction / EXAFS / Spectroscopic studies/Transport measurements/ab-initio calculations is preferable.
Field of work	: - Experimental/theoretical condensed matter research under extreme thermodynamic conditions
Nature of work	: - The responsibilities of the RA include participation in the augmentation and use of the high pressure EXAFS experimental facility at the BL8 beamline at Indus-2 synchrotron source at RRCAT, Indore. - Developing and integrating novel high-pressure techniques -participating in lab based experiments and related ab-initio calculations - Conducting independent researches. This experimental station will be used for x-ray absorption spectroscopy of material investigations under extreme conditions.
Duration of project	: Upto 31.03.2025

Research Project No. 5

Name of the Research Project	: R&D in Chemical Sciences for Nuclear, Societal and Environmental Applications like Nuclear Safety such as Core Catcher Materials & Iodine Chemistry, Special Biosensors, Security Related Materials and Detector Materials etc.
Requirement of RA	: 1 (The RA will be stationed at NCCCM, Hyderabad)
Qualification	: Ph.D. (Chemical Sciences)
Field of work	: Analytical Chemistry
Nature of work	: Separation Science and Environmental Chemistry
Duration of project	: Upto 30.11.2023

Research Project No. 6

Name of the Research Project	: R&D in Chemical Sciences for Nuclear, Societal and Environmental Applications like Nuclear Safety such as core catcher materials & iodine chemistry, special biosensors, security related materials and detector materials etc.
Requirement of RA	: 1
Qualification	: Ph.D.
Field of work	: Development of core-shell nanohybrids for innovative potable water decontamination technologies and indigenous development of reference material of national importance.
Nature of work	: In order to provide safe drinking water to the member of public, noble materials (nano microsphere/hybrid materials) will be synthesized and used to decontaminate metals like, Arsenic, Fluoride, Aluminum, Pb, Cd, Hg and Cr etc. In addition to this a testing facility of potable water where all 54 parameters can be analysed will be established. Production of certified reference materials having national importance like trace impurities in Ti&Li would be carried out in accordance with ISO 34 guidelines.
Duration of project	: Upto 30.11.2023

Research Project No. 7

Name of the Research Project	:	R&D in Chemical Sciences for Nuclear, Societal and Environmental Applications like Nuclear Safety such as Core Catcher Materials & Iodine Chemistry, Special Biosensors, Security Related Materials and Detector Materials etc.
Requirement of RA	:	3
Qualification	:	PhD in Chemical Sciences
Field of work	:	Research in Chemical Sciences
Nature of work	:	Spectroscopic measurements; atmospheric/gas phase chemistry, chemistry of excited states and radicals, fluorescence biosensors and detectors, development of methodologies for selective extraction
Duration of project	:	Upto 30.11.2023

Research Project No. 8

Name of the Research Project	:	R&D on various options of Hydrogen Energy Production
Requirement of RA	:	1
Qualification	:	PhD (Chemistry)
Field of work	:	Heterogeneous catalysis
Nature of work	:	Development of Electrocatalyst, Membrane Electrode Assembly for CuCl/HCl electrolysis step, Kinetics and Spray Reactor for CuCl ₂ Hydrolysis step of Cu-Cl thermochemical cycle.
Duration of project	:	Upto 30.04.2024

Research Project No. 9

Name of the Research Project	:	Research on Cellular and Molecular Radiation Biology for Human Health
Requirement of RA	:	1
Qualification	:	Ph.D. in Organic chemistry/chemistry/chemical sciences. Expertise in Organic synthesis is mandatory
Field of work	:	Synthesis of nuclear medicine ligands for diagnosis and therapy
Nature of work	:	Research and Development of nuclear medicine ligands
Duration of project	:	Upto 31.07.2024

Research Project No. 10

Name of the Research Project	:	Research on Cellular and Molecular Radiation Biology for Human Health
Requirement of RA	:	1
Qualification	:	Ph.D. (Life Sciences/ Molecular Biology/ Cell Biology) (Specialization in stem cell research will be preferred)
Field of work	:	Stem Cell Biology and its therapeutic applications
Nature of work	:	Stem Cell research including adult stem cells using mice model, High Throughput functional genomics, Fundamental research on regulation of alternative splicing and chromatin remodeling, in vitro and in-vivo study using cell imaging, Flow cytometry and FACS analysis.
Duration of project	:	Upto 31.07.2024

Research Project No. 11

Name of the Research Project	:	Research on Cellular and Molecular Radiation Biology for Human Health
Requirement of RA	:	1
Qualification	:	Ph.D. (Life Sciences/ Molecular Biology/ Cell Biology) (Specialization in microbiome data analysis research will be preferred)
Field of work	:	Gut microbiome roles in colon cancer/ gut inflammatory disease and radiotherapy.

Nature of work	: Mice model handling, Microbiome collection and isolation of genomic DNA for 16s rRNA sequencing, assay for immunological marker assay, DNA repair functions studies, handling of mice model for site specific radiotherapy, FACS, microbiome data analysis etc.
Duration of project	: Upto 31.07.2024

Research Project No. 12

Name of the Research Project	: Research on cellular and molecular radiation biology for human health
Requirement of RA	: 1
Qualification	: Ph. D in Life sciences, Biochemistry, Biotechnology or related field. Applicants are expected to have experience in cell biology, confocal microscopy, epigenetics, making knock-out and stable cell lines and mammalian biology.
Field of work	: Radiation Biology and Immunology
Nature of work	: Animal tissue culture, gene and protein expression analysis, rodent studies (wild type and Nrf-2 KO mice) and chromatography (LC-MS/MS and HPLC).
Duration of project	: Upto 31.07.2024

Research Project No. 13

Name of the Research Project	: Research on cellular and molecular radiation biology for human health
Requirement of RA	: 1
Qualification	: Ph. D in Life sciences, Biochemistry, Biotechnology or related field. Applicants are expected to have experience in stem cell biology, molecular biology, flow cytometry, animal handling and mammalian biology.
Field of work	: Radiation Biology and Immunology
Nature of work	: To establish mouse models of bacterial infection (non-pathogenic), humanized SCID mice tumor models for studying therapeutic efficacy of putative drug molecules. Animal tissue culture, gene and protein expression analysis and metabolomics.
Duration of project	: Upto 31.07.2024

Research Project No. 14

Name of the Research Project	: Research on cellular and molecular radiation biology for human health
Requirement of RA	: 1
Qualification	: PhD degree in Human Molecular Genetics/ LifeSciences/Biochemistry/Biotechnology/any other biological Sciences
Field of work	: Human molecular Genetics/Genomics (Bioinformatics knowledge preferable, especially genome sequencing analysis)
Nature of work	: Nature of the work includes field work at high level natural radiation areas of Kerala coast, Cell culture, expertise in Fluorescence microscopy, Flow cytometry, high through put genome sequencing (exome, transcriptome and methylome)
Duration of project	: Upto 31.07.2024

Research Project No. 15

Name of the Research Project	: Research on cellular and molecular radiation biology for human health
Requirement of RA	: 1
Qualification	: Ph.D.in Life Sciences/ Biotechnology/ Biomedical Sciences or allied subjects. <u>Desirable:</u> Experience in RNA-seq, proteomics, bioinformatics and proficiency in a programming language (such as R, python, perl)
Field of work	: Cell Biology, Proteomics and Genomics

Nature of work	:	The selected candidate will be involved in performing animal cell culture, proteomics and transcriptomics work. Will be responsible for creating pipelines for integration of data from transcriptomics, proteomics and analysis using computational approaches.
Duration of project	:	Upto 31.07.2024

Research Project No. 16

Name of the Research Project	:	Research on cellular and molecular radiation biology for human health
Requirement of RA	:	1
Qualification	:	Ph. D in Life sciences, Biochemistry, Biotechnology or related field. Experience in structure function studies of proteins, virtual screening of novel inhibitors and cell line based expression systems.
Field of work	:	Structure Biology of protein complexes and Structure based drug design
Nature of work	:	High throughput screening and rational drug design to identify novel anti-microbial compounds. Structural studies of target proteins to develop novel therapeutics.
Duration of project	:	Upto 31.07.2024

Research Project No. 17

Name of the Research Project	:	Development of products, processes and technologies for sustainable agriculture including setting up of model Seed Village
Requirement of RA	:	12
Qualification	:	Ph. D in Agriculture, Biotechnology, Biochemistry, Microbiology, Molecular Biology, Genetics, Botany, Zoology, Soil Science, Plant Science, Genetics & Plant Breeding, Plant Pathology, Entomology, Life Sciences and Bioinformatics. <u>Desirable :-</u> 1. Practical experience in molecular biology, bioinformatics, biochemistry, genetics and plant breeding, agricultural microbiology, entomology, pathology, soil science and biotechnological research 2. Knowledge and experience in data collection and analysis, usage of computer, and bioinformatics 3. Research publications relevant to the qualifications mentioned above
Field of work	:	Agriculture & Biotechnology
Nature of work	:	R&D
Duration of project	:	Upto 30.06.2024

Research Project No. 18

Name of the Research Project	:	Research in biological systems and their biotechnological applications in health and environment.
Requirement of RA	:	1
Qualification	:	Ph.D. in molecular biology/plant molecular biology/life science with expertise in plant molecular biology, genetic engineering, and tissue culture
Field of work	:	Project will involve generation of multi gene constructs & transformation for plant metabolic engineering applications: 1) production of desired metabolites, 2) 1-step generation of transgenic plants containing multiple genes. Expertise in plant molecular biology, genetic engineering, transformation & tissue culture is required
Nature of work	:	Research work in plant molecular Biology
Duration of project	:	Upto 30.04.2024

Research Project No. 19

Name of the Research Project	:	Research in biological systems and their biotechnological applications in health and environment.
Requirement of RA	:	1
Qualification	:	Ph.D. in Molecular Biology, Cancer Biology, Life Sciences, Biochemistry, Biotechnology, Zoology. Expertise in DNA repair and autophagy is desirable.
Field of work	:	Molecular mechanisms of DNA repair and autophagy in cancer resistance in vitro and in vivo tumor models.
Nature of work	:	Research and Development of nuclear medicine ligands
Duration of project	:	Upto 30.04.2024

Research Project No. 20

Name of the Research Project	:	Research in biological systems and their biotechnological applications in health and environment.
Requirement of RA	:	1
Qualification	:	PhD in Chemistry, Chemical Sciences or related fields with extensive experience in organic synthesis as evident from research publications
Field of work	:	The candidate will be carrying out multi-step synthesis of designed organic molecules, including several peptidomimetics. Synthesized molecules will be characterized by NMR and crystallography. These molecules will be tested for their potential inhibitory activity against selected protein targets in biochemical assays which has already been developed in our laboratory
Nature of work	:	Research & Development
Duration of project	:	Upto 30.04.2024

Research Project No. 21

Name of the Research Project	:	Research & Development on anti-cancer drugs, radiation biology & bio-management of waste-water.
Requirement of RA	:	1
Qualification	:	Ph.D in Life sciences, Biochemistry, Biotechnology or related field. Applicants are expected to have experience in flow cytometry, animal handling and mammalian biology.
Field of work	:	Preclinical drug testing
Nature of work	:	Animal tissue culture, gene and protein expression analysis, testing of drugs in pre-clinical animal models.
Duration of project	:	Upto 30.06.2024

Research Project No. 22

Name of the Research Project	:	Research in biological systems and their biotechnological applications in health and environment
Requirement of RA	:	1
Qualification	:	Ph.D
Field of work	:	Development of CRISPR-Cas tools for biomedical application and evaluation of anti-cancer and anti-bacterial therapeutics in gene-knock-out mice.
Nature of work	:	Research work in Molecular Biology
Duration of project	:	Upto 30.04.2024

Research Project No. 23

Name of the Research Project	:	R&D on Various Options of Hydrogen Energy Production
Requirement of RA	:	1
Qualification	:	Ph.D
Field of work	:	Polymer, Electrolyser, Electrochemistry, Material Science
Nature of work	:	Characterization of membrane electrode assembly, its scale up, electrolyzer development and testing.
Duration of project	:	Upto 30.04.2024

Research Project No. 24

Name of the Research Project	:	Technology Demonstration of Advanced Chemical Processes and Equipments for Nuclear Materials
Requirement of RA	:	3
Qualification	:	PhD in Chemistry/Physics/Materials Science
Field of work	:	Computational and Experimental Chemistry/Physics/ Material Science
Nature of work	:	1. Machine learning guided molecular modeling based design and screening of novel grafted ligands and catalyst for metal ion and isotope separation 2. Design and screening of multi-component glass by studying structural, dynamical and thermodynamic properties of the selected glass matrix using machine learning and molecular dynamics simulations 3. Synthesis and characterization of some selected extractants for improving yield by elucidating reaction mechanism
Duration of project	:	Upto 31.12.2024

Research Project No. 25

Name of the Research Project	:	R&D on Various Options of Hydrogen Energy Production
Requirement of RA	:	2
Qualification	:	Ph.D
Field of work	:	Computational Chemistry/Physics/ Material Science/Chem. Engg.
Nature of work	:	1. Design and screening of solid barrier materials by studying adsorption, dissociation and diffusion of hydrogen using ab-initio molecular dynamics simulations. 2. Studies on development of corrosion resistant coating material for high temperature molten chloride based reactor.
Duration of project	:	Upto 30.04.2024

Research Project No. 26

Name of the Research Project	:	Augmentation of National Radiation Standards and Internal Dosimetry Facilities
Requirement of RA	:	1
Qualification	:	MTech (Electronics)/ ME(Electronics)/ PhD(Electronics)
Field of work	:	R&D in ionizing radiation dosimetry
Nature of work	:	Establishment of a source irradiation facility: The work involves establishment of automatic irradiation facility and related dosimetry systems.
Duration of project	:	Upto 31.08.2024

Research Project No. 27

Name of the Research Project	:	Augmentation of National Radiation Standards and Internal Dosimetry Facilities
Requirement of RA	:	2
Qualification	:	PhD (Physics)
Field of work	:	R&D in ionizing radiation dosimetry
Nature of work	:	1. Establishment of a facility for calibration and testing of radiation monitors: The work involves development and testing of various radiation monitors for calibration purposes. 2. Establishment of a primary standard for absorbed dose to water: The work involves development, testing and establishment of ionometric and/or calorimetry standard
Duration of project	:	Upto 31.08.2024

Research Project No. 28

Name of the Research Project	:	Development of process schemes and upgradation of facilities for recovery of U, By-products and critical metals from Uranium and rare metal ore deposits.
Requirement of RA	:	1 (The RA will be stationed at Hyderabad)
Qualification	:	PhD/M.Tech (Geology/Applied Geology)
Field of work	:	Ore microscopy and process mineralogy for characterisation of ores, beneficiated mineral concentrates and metallurgical products.
Nature of work	:	R&D (Geology and Process Mineralogy)
Duration of project	:	Upto 31.10.2024

Research Project No. 29

Name of the Research Project	:	R&D on Various options of Hydrogen Energy Production.
Requirement of RA	:	1
Qualification	:	Ph.D.in Chemical/ Mechanical/Materials Engineering or M.E./M.Tech. with minimum two years' experience in Chemical/ Mechanical/Materials Engineering
Field of work	:	High Temperature Steam electrolyser for hydrogen Production
Nature of work	:	Analysis of experimental data of high temperature electrolysis (HTSE), CFD modelling, Optimal design of HTSE single cell and stack
Duration of project	:	Upto 30.04.2024

Research Project No. 30.1

Name of the Research Project	:	Development of Novel Glass and Ceramic Materials
Requirement of RA	:	1
Qualification	:	PhD (Chemistry/Materials Science/Physics)
Field of work	:	<p><u>Characterization and Computational work</u></p> <p>The project is about development of suitable materials for hydrogen storage applications followed by demonstration of a lab scale prototype hydrogen storage device. It involves testing and validating the effectiveness of the materials through lab-scale experimentation. Research associate will be actively involved in the synthesis, characterization and testing of Mg-based hydrogen storage materials. The candidate is expected to be familiar with</p> <p>(1) Thermogravimetric techniques such as TG-DTA-MS / HP-DSC / Sievert apparatus</p> <p>(2) Characterizations techniques such as XRD / FTIR / RAMAN / NMR / SEM / TEM</p>
Nature of work	:	Scientific and Technical
Duration of project	:	Upto 30.09.2024

Research Project No. 30.2

Name of the Research Project	:	Development of Novel Glass and Ceramic Materials
Requirement of RA	:	1
Qualification	:	PhD (Chemistry/Materials Science/Physics)
Field of work	:	<p><u>Material Processing</u></p> <p>The project is about development of suitable materials for hydrogen storage applications followed by demonstration of a lab scale prototype hydrogen storage device. Execution of the project involves the establishment of hydrogen storage mechanism of suitable hydrogen storage materials based on Mg through modelling and simulations along with testing and validating the effectiveness of the materials through lab-scale experimentation.</p> <p>The candidate will be actively involved in the density functional theory (DFT) and molecular dynamics (MD) based simulations involving surfaces, interfaces and catalysis.</p>

		The candidate should be familiar with (1) DFT based solid state simulation techniques involving VASP/QE/WIEN2K, etc. (2) Transition state theory, catalysis, defects in solids
Nature of work	:	Scientific and Technical
Duration of project	:	Upto 30.09.2024

Research Project No. 31

Name of the Research Project	:	Research & development on surface modification using beams & plasma technologies for nuclear & societal applications.
Requirement of RA	:	1
Qualification	:	Ph.D. Physics/ Bio-physics Those with experience in the field of lasers, laser material processing, biological aspects of cell-surface interactions etc will be preferred
Field of work	:	Laser assisted Surface Modification of surfaces, metals and dielectrics, for improving their biofunctionality as bio-implants. Surface microstructuring, thin film coating, particle assisted periodic surface pitting and characterisation of these surfaces wrt their biocompatibility, corrosion, simulation of the process etc shall form a major part of the work.
Nature of work	:	Experimental involving pulsed lasers, surface characterization, mechanical, and biological tests as well as simulation of laser material interaction
Duration of project	:	Upto 28.02.2025

Research Project No. 32

Name of the Research Project	:	Research & development on surface modification using beams and plasma technologies for nuclear and societal applications
Requirement of RA	:	1
Qualification	:	PhD Physics/ Material Science Those with experience in plasma based thin films synthesis, characterization, with a certain background of simulation of the deposition process and/or the charged particle-material interaction will be preferred.
Field of work	:	Plasma based deposition of functional thin films for targeted application like neutron detection, diffusion barriers etc. Thin film synthesis and involved characterization forms a major part of the work. In addition, simulation studies of the process will also be required.
Nature of work	:	Synthesis and characterization of functional thin films, simulation studies of the deposition process and interaction of charge particles with the thin films.
Duration of project	:	Upto 28.02.2025

Research Project No. 33

Name of the Research Project	:	Research & development on surface modification using beams and plasma technologies for nuclear and societal applications
Requirement of RA	:	1
Qualification	:	PhD in Physics. Candidates with experience in simulation of atmospheric pressure cold plasma device design and Multiphysics modelling of cold plasma processes will be preferred.
Field of work	:	Simulation & associated experiment in the field of cold plasma and plasma processing
Nature of work	:	Simulation of the atmospheric pressure cold plasma for parametric optimization of diagnostic parameters, plasma chemistry and its experimental verification.
Duration of project	:	Upto 28.02.2025

Research Project No. 34

Name of the Research Project	:	Feasibility studies and demonstration of laser application in medical isotopes
Requirement of RA	:	1
Qualification	:	Min 2 years research experience after PhD in high resolution laser spectroscopy (CW and Pulsed) and computational photoionization dynamics of gas phase atoms. Experience in density matrix formalism will be an added advantage.
Field of work	:	High resolution laser spectroscopy, RIMS
Nature of work	:	Pulsed and CW laser spectroscopy based experiments and theoretical simulations on related laser-gas phase atom interactions
Duration of project	:	Upto 28.02.2025

Research Project No. 35.1

Name of the Research Project	:	Isotopes and radiation technologies for industrial and societal applications
Requirement of RA	:	1
Qualification	:	Ph.D.
Field of work	:	Analytical chemistry
Nature of work	:	Metal ion estimation from sewage sludge , ICP-OES, NMR, cyclic voltammetry and HPLC analysis
Duration of project	:	Upto 31.05.2024

Research Project No. 35.2

Name of the Research Project	:	Isotopes and radiation technologies for industrial and societal applications
Requirement of RA	:	1
Qualification	:	Ph.D.
Field of work	:	Polymer chemistry/technology
Nature of work	:	Polymer synthesis, polymer compounding and characterization
Duration of project	:	Upto 31.05.2024

Research Project No. 35.3

Name of the Research Project	:	Isotopes and radiation technologies for industrial and societal applications
Requirement of RA	:	1
Qualification	:	Ph.D.
Field of work	:	Isotope Applications
Nature of work	:	Application of isotopes in sustainability of ground water
Duration of project	:	Upto 31.05.2024

Research Project No. 36.1

Name of the Research Project	:	Augmentation of facilities for enhanced processing of radioisotopes and development of new radiopharmaceuticals & allied products.
Requirement of RA	:	1
Qualification	:	Ph. D in Biosciences (Molecular biology, genetic engineering, Biotechnology)
Field of work	:	Development and biological evaluation of novel molecular targeting agents
Nature of work	:	Novel drugs and tracer development involving generation of Phage libraries for affibodies and molecular scaffolds with targeting ability to targets overexpressed in cancers. The candidate will also be supporting ongoing research programs as well as conducting independent research in the field.
Duration of project	:	Upto 31.08.2024

Research Project No. 36.2

Name of the Research Project	:	Augmentation of facilities for enhanced processing of radioisotopes and development of new radiopharmaceuticals & allied products.
Requirement of RA	:	1
Qualification	:	Ph.D. (Chemistry)
Field of work	:	Synthesis and evaluation of cancer-specific peptides/molecules
Nature of work	:	R&D to synthesize and develop cancer-targeting molecules/peptides. Solid phase synthesis of peptides, HPLC purification and thorough characterization. Labelling of synthesized molecules with different radionuclides, optimization of radiochemistry, HPLC analysis. Studies related to evaluation of radiolabelled molecules in cancer cell lines and in vivo evaluation in tumor bearing animals.
Duration of project	:	Upto 31.08.2024

Research Project No. 37.1

Name of the Research Project	:	Irradiation Induced transformation in nuclear materials
Requirement of RA	:	1
Qualification	:	PhD (Materials Science/ Physics /Chemistry/Geoscience)
Field of work	:	<p><u>Experimental Studies</u></p> <p>The project is about understanding radiation damage in different orthosilicate phases (zircon, garnet, olivine) and its analogues (serpentines, phosphates) taking samples from nature and characterize them by various electron microscopic /spectroscopic/ x-ray techniques. Research associate will be actively involved in the sampling, irradiation experiments, characterization and testing of natural materials and its analogues.</p> <p>The candidate is expected to have HANDS ON EXPERIENCE with characterizations techniques such as EPMA/ XRD/ XPS/ SAXS –SANS/ Synchrotron based techniques/ FTIR / RAMAN / NMR / SEM / TEM.</p>
Nature of work	:	Scientific and Technical
Duration of project	:	Upto 31.07.2025

Research Project No. 37.2

Name of the Research Project	:	Irradiation Induced transformation in nuclear materials
Requirement of RA	:	1
Qualification	:	PhD (Chemistry/Materials Science/Physics/Geoscience)
Field of work	:	<p><u>Simulation Studies</u></p> <p>The project is about understanding radiation damage in different orthosilicate phases (zircon, garnet, olivine) and its analogues (serpentines, phosphates) and its effects on thermodynamic and mechanical stability.</p> <p>Research associate is expected to have HANDS ON EXPERIENCE in the density functional theory (DFT) and molecular dynamics (MD) based simulations involving bulk surfaces, interfaces and catalysis;</p> <p>The candidate should be familiar with</p> <p>(1) DFT based solid state simulation techniques using VASP/QE/WIEN2K, etc.</p> <p>(2) Transition state theory, catalysis, defects in solids</p>
Nature of work	:	Scientific and Technical
Duration of project	:	Upto 31.07.2025

Research Project No. 38.1

Name of the Research Project	:	Development of New Generation Alloys
Requirement of RA	:	1
Qualification	:	PhD (Materials Science/Physics/Chemistry/Mechanical Engineering/Metallurgist)
Field of work	:	<p><u>Experimental and Characterization work</u></p> <p>The project is about developing methodologies for joining various grades of stainless steels with Zr-based alloys using the diffusion bonding technique. This involves conducting diffusion bonding experiments with different combination of base materials at various bonding parameters such as bonding temperature and bonding time. The efficacy of the use of various interlayers between the base materials in improving the joint properties would be one of the essential parts in the investigations. The bonding conditions would be optimized with respect to the joint strength and the interfacial microstructure. The project also involves detailed characterization of the diffusion bonded joints using advanced analytical techniques to gain insight into the reactions occurring at the interface during the process of bonding. Attempts would also be made to investigate the effect of irradiation on degradation of the properties of the joints.</p> <p>The candidate is expected to be familiar with microstructural characterization and mechanical property evaluation techniques, such as:</p> <ol style="list-style-type: none"> (1) EPMA (2) SEM, EBSD, FIB (3) TEM (4) XRD (5) Hardness measurement and mechanical testing using universal testing machine
Nature of work	:	Scientific and Technical
Duration of project	:	Upto 30.04.2024

Research Project No. 38.2

Name of the Research Project	:	Development of New Generation Alloys
Requirement of RA	:	1
Qualification	:	PhD (Materials Science/Physics/Chemistry)
Field of work	:	<p><u>Experimental and Characterization work</u></p> <p>The project is about improving the joint strength between bearing/spacer pad and fuel tube of nuclear reactors with minimal microstructural alteration of base materials using resistive brazing technique wherein Zr-based metallic glasses and low melting eutectic alloys will act as filler material. Various methodologies of integrating the filler material to bearing pad like magnetron sputtering, laser/resistance stitching will be explored. Methodology will be developed to braze this integrated bearing pad to fuel tube through resistive brazing. Evaluation of the strength of the joints will be carried out using mechanical testing. Irradiation stability of the joints will also be investigated.</p> <p>The candidate is expected to be familiar with microstructural characterization and mechanical property evaluation techniques, such as:</p> <ol style="list-style-type: none"> (1) XRD (2) SEM, EBSD, FIB (3) TEM (4) Hardness measurement and tensile testing
Nature of work	:	Scientific and Technical
Duration of project	:	Upto 30.04.2024

Research Project No. 39.1

Name of the Research Project	: Advanced Research in Spectroscopy with Synchrotron Radiation, Lasers & R&D on Thin Film Multilayer Devices
Requirement of RA	: 3 (The RAs will be stationed at RRCAT, Indore)
Qualification	: PhD (Physics, chemistry, material science) Preference : Applicants are expected to have outstanding experience of research and development, relevant skills, organisational skills, verbal and written communication skills, and should be able to work efficiently both as team player and independently. An experience of working in synchrotron-based beamlines for characterisation of materials using VUV spectroscopy, PES, XAFS, XRD techniques will be preferred.
Field of work	: Synchrotron radiation-based instrumentation and condensed matter research.
Nature of work	: The responsibilities of the RA include, participation in the augmentation work at dispersive EXAFS(BL-8) beamline, scanning EXAFS beamline (BL-9), & AMOS beamline(BL-5) as well as utilization of beamlines for material investigation by SR based XAFS, PES and XRD techniques and other lab based experimental facilities.
Duration of project	: Upto 31.07.2025

Research Project No. 39.2

Name of the Research Project	: Advanced Research in Spectroscopy with Synchrotron Radiation, Lasers & R&D on Thin Film Multilayer Devices
Requirement of RA	: 1
Qualification	: PhD (Physics) Preference : Experience in the field of Laser Spectroscopy is preferred.
Field of work	: Laser spectroscopy of actinide containing molecules
Nature of work	: Laser spectroscopy of metal-bearing molecules and metal clusters in gas phase. The RA will be responsible for development work, planning & performing experiment, and experimental data analysis, preliminary theoretical work and coordinating with collaborators.
Duration of project	: Upto 31.07.2025

Research Project No. 39.3

Name of the Research Project	: Advanced Research in Spectroscopy with Synchrotron Radiation, Lasers & R&D on Thin Film Multilayer Devices
Requirement of RA	: 1
Qualification	: PhD (Physics) Preference: Experience in the field of Laser Spectroscopy is preferred.
Field of work	: Laser spectroscopy of metal clusters
Nature of work	: Laser spectroscopy of metal-bearing molecules and metal clusters in gas phase. The RA will be responsible for development work, planning & performing experiment, and experimental data analysis, preliminary theoretical work and coordinating with collaborators.
Duration of project	: Upto 31.07.2025

Research Project No. 39.4

Name of the Research Project	:	Advanced Research in Spectroscopy with Synchrotron Radiation, Lasers & R&D on Thin Film Multilayer Devices
Requirement of RA	:	2
Qualification	:	PhD (Physics, chemistry, material science) Preference: Candidates with working experience on physical vapour deposition viz., Electron beam deposition, sputtering, pulse laser deposition, are preferable. Experience in thin film technology and research.
Field of work	:	R & D on optical thin films and multilayers
Nature of work	:	RA shall work on PVD (EB evaporation, sputtering, etc.) to deposit thin film and multilayers. Characterization and investigation of various physical and chemical properties using techniques, XRD, AFM, SEM, UV-VIS spectroscopy, EXAFS, XRR etc., will be the part of responsibilities. RA shall also participate in optical design and instrumentation pertaining to the development of optical thin films & multilayer program.
Duration of project	:	Upto 31.07.2025

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 SHOULD APPLY SEPARATELY FOR EACH RESEARCH PROJECT WITH A SEPARATE SET OF DOCUMENTS.

NOTE :

1. Educational Qualification: As indicated against each Research Project.
2. Amount of Fellowship:

(i)	RA-1	:	₹47,000/- p.m. plus Contingency Grant of ₹40,000/- per annum plus HRA as applicable.
(ii)	RA-2	:	₹49,000/- p.m. plus Contingency Grant of ₹40,000/- per annum plus HRA as applicable.
(iii)	RA-3	:	₹54,000/- p.m. plus Contingency Grant of ₹40,000/- per annum plus HRA as applicable.

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) Selection will be on interview basis only. Applications received will be subject to screening. Only screened-in candidates will be interviewed. All information related to the 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) Hostel accommodation will not be provided to the Research Associates.
- 3) 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.
- 4) Corrigendum/Addendum, if any, pertaining to this advertisement will be uploaded only on BARC website.
- 5) In case of any query, candidates may email at niyukti5@barc.gov.in.

APPLICATIONS RECEIVED THROUGH EMAIL WILL NOT BE ACCEPTED/CONSIDERED.

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.

10. एसएससी (अथवा समकक्ष स्कूल की परीक्षाओं) से शैक्षणिक कैरियर/Academic career from SSC (or equivalent from School Examination) onwards.(एसएससी से अंक पत्रों एवं पारित प्रमाणपत्रों की प्रतियां संलग्न करें) (attach copies of mark sheets and passing certificates from SSC onwards):

परीक्षा/डिग्री Examination/Degree	संस्था/ विश्वविद्यालय Institute/University	उत्तीर्ण करने का वर्ष/ Year of passing	प्रभाग/ग्रेड Division/ Grade	प्राप्त अंकों का % % of Marks Obtained	No. of Attempt
एसएससी/S.S.C.					
एचएससी/H.S.C.					
बीई/स्नातक (डिग्री) B.E. /Graduation (Degree)					
एमई/स्नातकोत्तर (डिग्री) M.E. /Post Graduation (Degree)					
पीएचडी Ph.D					

11. पीएचडी के विषय का विवरण Details of Ph.D. Topic :

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12. अनुभव Experience :

संबंधित विशेषताओं में अनुभव Experience in concerned speciality	वर्षों की संख्या/No. of Years

13. शैक्षणिक उपलब्धियों का प्रकाशन एवं सम्मेलन में प्रतिभागिता

Academic Achievement Publication & Conference attended

शैक्षणिक उपलब्धि/प्रकाशन तथा सम्मेलन में उपस्थिति Academic achievement publication and conference attended

14. आपकी व्यवसायिक दक्षता के संदर्भ में दो व्यक्तियों का नाम और पता

Name and Address of two persons to whom a reference can be made regarding your professional competence:

नाम Name :	नाम Name :
पता Address :	पता Address :

15. कोई अन्य सूचना, जो अभ्यर्थी देना चाहता है/चाहती है

Any other information the candidate may wish to furnish

--

घोषणा Declaration : मैं एतद् द्वारा घोषणा करता/करती हूँ कि आवेदन पत्र में दिए गए सभी विवरण मेरी जानकारी और विश्वास के अनुसार सही हैं। I hereby declare that all statements made in the application are true to the best of my knowledge and belief.

नोट Note :-

- यदि आवश्यकता हो तो, अतिरिक्त शीट संलग्न किए जाएं ।
If required, additional sheets may be attached.
- प्रत्येक अनुसंधान परियोजना के लिए दस्तावेजों के एक अलग सेट के साथ अलग आवेदन किए जाएं ।
Separate application may be made for each Research Project along-with a separate set of documents

दिनांक/Date: ____/____/____

हस्ताक्षर/Signature: _____

संलग्नक/Encl:

1. _____
2. _____
3. _____

प्रत्येक आवेदन के साथ संलग्न किए जाने वाले दस्तावेजों की प्रतियों की जांच सूची:-

CHECKLIST OF COPIES OF DOCUMENTS TO BE ATTACHED WITH EACH APPLICATION :-

1.	एसएससी पासिंग सर्टिफिकेट SSC PASSING CERTIFICATE
2.	पैन या आधार कार्ड PAN / AADHAR CARD
3.	सेमेस्टर-वार / वर्ष-वार मार्कशीट और प्रमाण पत्र - एसएससी एवं उसके आगे के SEMESTER-WISE/YEAR-WISE MARKSHEETS & CERTIFICATES FROM SSC ONWARDS
4.	जाति प्रमाण पत्र यदि लागू हो CASTE CERTIFICATE, IF APPLICABLE
5.	कार्य अनुभव संबंधित WORK EXPERIENCE RELATED
6.	शैक्षणिक उपलब्धियों का प्रकाशन एवं सम्मेलन में प्रतिभागिता संबंधित ACADEMIC ACHIEVEMENT PUBLICATIONS AND CONFERENCES ATTENDED RELATED
7.	कोई अन्य प्रासंगिक दस्तावेज ANY OTHER RELEVANT DOCUMENTS