Area of Online Internship for the Postgraduate Students

Name of Faculty Mentor	Area of Online Internship	Remarks
Department Of Astronomy, Astrophysics And Space Engineering (DAASE)		
Dr. Rajkumar Hajra	1. Cometary plasma and solar wind interaction 2. Earth's outer radiation belt relativistic electrons 3. Geomagnetic storms and substorms 4. Solar wind-Magnetosphere-Ionosphere coupling 5. Auroral activity 6. Space weather 7. Ionospheric modeling 8. Ionospheric F-region irregularities	
Dr. Saurabh Das	1. Machine Learning and artificial intelligence in space and atmosphere studies 2. Remote Sensing 3. Climate change and atmosphere 4. Space weather 5. Satellite based navigation and GNSS/GPS 6. IoT and android	
Dr. Abhirup Datta	1. Astronomy, Astrophysics, and Space Sciences 2. Cosmology 3. Radio Astronomy - Observations and Instrumentation 4. Statistics and Machine Learning Applications in Space 5. Square KIlometre Array - related simulations 6. Space Weather and Ionosphere 7. NavIC and GPS applications 8. X-ray Astronomy	

Dr. Unmesh Govind Khati	1. 3-D structure from space 2. Change detection 3. Radar polarimetry 4. Scalable geospatial data processing 5. Polarimetric SAR Interferometry 6. Radar applications in forestry, agriculture and cryosphere	
Dr. Manoneeta Chakraborty	1. Neutron star 2. Black holes 3. Pulsars 4. Magnetars 5. X-ray binaries 6. Accretion physics 7. Burst physics	
Dr. Narendra Nath Patra	1. Astronomical Techniques 2. Radio instrumentation 3. Machine Learning and big data processing 4. Digital signal processing	
Department of Biosciences and Biomedical Engineering (BSBE)		
Dr. Hem Chandra Jha	1. Role of Kinases in Cancer 2. Epstein Barr Virus Mediated Neurodegeneration 3. Understanding of the progression of Cerebral malaria	
Dr. Parimal Kar	1. Computer Aided Drug Design 2. Conformational dynamics of proteins	
Dr. Mirza S. Baig	1. Drug Discovery and Development	

Dr. Shanmugam Dhinakaran	1. Computational Fluid Dynamics in Biosciences and Biomedical Engineering 2. Biofluid Mechanics and Bioheat Transfer 3. Cancer and its treatment (all types of cancer) 4. Biomedical Device Development 5. Experimental/CFD studies on Human Bodies 6. Biomicrofluidics 7. Blood flow in diseased arteries 8. Vascular Pathologies/Pulmonary Pathologies	
Dr. Kiran Bala	1. Phycotechnology 2. Bioremediation/wastewater treatment 3. Algal Biofuels 4. Biopolymers: Process and Optimization 5. Algal Biorefinery	
Professor Avinash Sonawane	1. Drug development for tuberculosis and blood cancer 2. Host pathogen interaction and host cellular immunity 3. Drug delivery	
Department of Chemistry		
Dr. Sampak Samanta	1. Organocatalytic Asymmetric Transformations, 2. Domino Approaches to Heterocyclic Synthesis 3. Spectroscopic Techniques (IR, NMR, MS etc) for the Characterization of Organic Molecules.	
Dr. Chelvam Venkatesh	1. Total synthesis of biologically important natural products and drugs 2. Design and synthesis of heterocycles and carbocycles of biological importance 3. Developing new methodologies for construction of C-C and C-X (X=N, O, S, P)bonds 4. Design, synthesis and diagnostic applications of new targeting ligands forcancers and inflammatory diseases	

	5. Drug delivery systems, near-infra red fluorescence, nuclear Imaging and bio-conjugate chemistry 6. Synthesis of Inhibitors for drug targets	
Dr. Apurba K. Das	1. Synthesis and Molecular Self-assembly of Peptides 2. Synthesis and Molecular Self-assembly of G-quarduplex 3. Synthesis and Molecular Self-assembly of Peptide Bolaamphiphiles 4. Engineering of Antibacterial Hydrogels 5. Development of Organic-inorganic Nanohybrids as Catalysts 6. Organic-inorganic Nanohybrids as Electrocatalysts 7. Development of Nanohybrids for Energy Storage	
Dr. Sanjay Singh	1. Catalysis 2. Hydrogen Production and Storage 3. CO2 capture and Utilization 4. Biomass transformation and Biofuel	
Dr. Amrendra K. Singh	1. Sustainable Development & Chemical Sciences 2. Inert Atmospheric Methods in Chemical Synthesis 3. Catalysis by Organometallic Pincer Complexes	
Professor Suman Mukhopadhyay	1. Nanostructured metallogels 2. Organometallic compound in therapeutics 3. Metalloenzymes and catalysis 4. Molecular recognition	
Department of Civil Engineering		
Professor Sandeep Chaudhary	1. Sustainable Construction Practices 2. Novel Bricks and Blocks	

	3. Microstructure and Durability of Concrete 4. Steel Concrete Composite Structures	
Dr. Guru Prakash	1. Structural health monitoring 2. Impact loading 3. Degradation Modeling 4. Damage Detection 5. Kalman Filter 6. Particle Filter 7. Bayesian Method	Minimum duration 3months
Dr. Ashootosh S. Mandpe	1. Sustainable solid waste management strategies 2. Bio-valorization of solid wastes 3. Waste to Energy (W2E) 4. Development of novel strategies for remediation of contaminants of emerging concern 5. Circular Economy approaches in solid waste management systems 6. Additive-aided-Thermophilic composting 7. Treatment of Sewage/Distillery/Fecal sludge 8. Green Buildings	
Dr. Lalit Borana	1. Unsaturated Soil Mechanics 2. Fiber optic sensors in Geotechnical Engineering & Geotechnical health monitoring 3. Soil-Structure Interface 4. Soft Soil and Creep 5. Ground Improvement Techniques	
Dr. Mayur Shirish Jain	1. Rapid Composting Techniques 2. Kinetic modeling of Bio-waste degradation 3. Circular economy in environmental engineering 4. Soil Revitalization via waste utilization 5. C&D Waste quantification and environmental risks	

	6. Techno-economic and sustainability assessment 7. Water Quality Assessment 8. Green Building Assessment	
Dr. Priyank J. Sharma	1. Characterizing the Evolution of Extreme Hydroclimatic Conditions 2. Improving Hydrologic Predictions for Flood Mitigation 3. Impact of Climate Change on Freshwater Ecosystem Services 4. Analysis of Compound Extremes 5. Reservoir Operation under a Changing Environment 6. Development of New Indices/Approaches for Hydrologic Model Evaluation	
Dr. Kaustav Bakshi	1. Dynamic analysis of RCC buildings and overhead tanks using IS codes 2. Structural dynamics of single degree and multi-degree of freedom systems 3. Elastic stability analysis of columns using finite difference technique 4. Finite difference analysis of beams and plates 5. Weighted residual approach and finite element analysis of civil engineering problems	
Dr. Saikat Sarkar	1. Crack propagation and failure of structures 2. Metamaterials for civil engineering applications 3. Structural health monitoring and damage detection 4. Structural optimization	
Professor Manish Kumar Goyal	1. **Climate change** Impact of climate change on water resources Statistical Downscaling Climate variability and change detection 2. **Hydrology and Glaciology** Hydro-Climatology Hydrological Modeling and Flood Routing Snow-melt Hydrology Glacial Lake Changes Hydro-geoInformatics	

	Remote Sensing Applications 3. **Irrigation** Crop modeling Irrigation Water Management 4. **Data Mining applications in water management and climate change** Multivariate Statistical Analysis Machine Learning Models -Neural Network, Fuzzy logic, clustering	
Department of Computer Science and Engineering		
Dr. Neminath Hubballi	1. Software Defined Networking 2. Network Security 3. Digital Forensics	
Dr. Anirban Sengupta	1. Computer Architecture 2. Hardware Security, Processor security 3. CAD algorithms for VLSI 4. Optimizations, watermarking, biometrics	
Dr. Nagendra Kumar	1. Deep Learning 2. Social Network Analysis 3. Natural Language Processing	
Dr. Chandresh Kumar Maurya	1. Multimodal sarcasm detection	
Dr. Aruna Tiwari	1. Scalable Machine Learning 2. Deep Learning 3. Resource constrained Artificial Intelligence	
Dr. Ayan Mondal	1. Internet of Things (IoT) Networks	

	2. Software-Defined Networks 3. Sensor-Cloud 4. Smart Grid	
Dr. Bodhisatwa Mazumdar	1. Implementation of cryptographic primitives and performance evaluation 2. Analysis of cryptographic algorithms for classical cryptanalysis attacks 3. Side-channel analysis of cryptographic primitives	
Dr. Aniruddha Singh Kushwaha	1. Computer Networks 2. Software Defined Networking	
Department of Electrical Engineering		
Professor Ram Bilas Pachori	1. Signal and Image Processing 2. Biomedical Signal Processing 3. Non-stationary Signal Processing 4. Speech Signal Processing 5. Brain-Computer Interfacing 6. Machine Learning 7. AI and IoT in Healthcare	
Dr. Amod C. Umarikar	1. Applications of Power Electronics in Renewable Energy 2. Power Electronics applications in Electric Vehicle.	
Professor Vimal Bhatia	1. AI/Machine/Deep Learning 2. Wireless Communications 3. Telecom standards 5G, 6G 4. Image/Video Processing	
Dr. Swaminathan Ramabadran	1. Efficient design of space-air-ground integrated networks (SAGIN) 2. Unmanned-aerial-vehicle (UAV)-assisted free space optics (FSO)	

	communication 3. Development of novel algorithms using machine learning/deep learning techniques for blind parameter estimation of FEC codes and interleavers, 4. Beyond 5G and 6G wireless systems 5. Energy harvesting schemes for integrated optical-RF networks 6. Intelligent-reflecting-surfaces (IRS)-aided wireless communications	
Dr. Mukesh Kumar	1. Integrated Optoelectronics 2. Silicon Photonics; Integrated CMOS Photonics 3. Microwave & RF Photonics, Optical Antenna 4. Devices for Optical Communication & Interconnects 5. Nano-scale devices for Advanced Memory and Computing 6. Nanoelectronics, VLSI Technology & Device Fabrication	
Professor Santosh Kumar Vishvakarma	1. Energy-Efficient and Reliable SRAM Memory Design 2. Enhancing Performance and Configurable Architecture for DNN Accelerators 3. SRAM based In-Memory Computing Architecture for Edge AI 4. Reliable, Secure Design for IoT Application 5. Design for Reliability	
School of Humanities and Social Sciences		
Dr. Kalandi Charan Pradhan	1. Data analysis for the development economics and sustainable development 2. Assessing vulnerability to climate change 3. Migration Studies 4. Covid 19 pandemic and its dynamic effects	
Dr. Mohanasundari Thangavel	1. Resource Economics: Water, Forestry and Energy 2. Environmental Economics 3. Climate change impact on Agriculture 4. Energy-Food nexus	

	5. Agricultural Policies and Organization 6. Technology Adoption 7. Consumption Pattern and Consumerism	
Dr. Nirmala Menon	1. Humanities Data 2. Text mining Tools for Textual Data 3. Translation Studies 4. Literature and Climate Change	
Dr. Ananya Ghoshal	1. Ekphrasis 2. Narratives of the Anthropocene 3. Modernism 4. Literature and Disability 5. Parallel Cinema/The Indian New Wave 6. Children's Literature	
Dr. Aratrika Das	1. Nineteenth Century British Literature 2. Gothic 3. Medical Humanities 4. Graphic Novel; Visual Culture 5. Writing Pedagogy	
Professor Ruchi Sharma	1. International Economics 2. Industrial Organization 3. Economics of Innovation	
Dr. Akshaya Kumar	1. Indian film and media studies 2. Comparative media studies 3. Cultural Studies 4. Platform Economy	
Dr. Kedarmal Verma	1. Cognitive Psychology	

	2. Sleep and Cognition 3. Experimental Psychology	
Department of Mathematics		
Dr. Santanu Manna	1. Mathematical Modelling 2. Local/Nonlocal elastic wave propagation 3. Earthquake Prediction Analysis	
Dr. Bapan Ghosh	1. Chaotic Dynamics and Computations 2. Delay Differential Equations and Applications 3. Fractional Differential Equations 4. Mathematical Biology 5. Numerical Methods and Computations	
Dr. Mohd. Arshad	1. Statistical Inference 2. Statistical Decision Theory	
Department of Mechanical Engineering		
Professor Anand Parey	1. Noise control of electric vehicles 2. Vibration control of electric vehicles 3. Noise control of drones 4. Vibration analysis of tennis racket 5. Fault detection of Gearbox using vibration analysis	
Dr. Shanmugam Dhinakaran	1. Computational Fluid Dynamics (CFD) 2. Heat Transfer 3. Bluff body Aerodynamics 4. CFD in Aerospace/Chemical/Mechanical/Biomedical Engineering	

	5. Physics of Fluids 6. Thermal Energy Storage 7. Phase Change Materials 8. Biofluid Mechanics/BioHeat Transfer 9. Microfluidics 10. Heat Transfer in Porous Media 11. Solar Collectors/Solar PV/Thermal systems	
Dr. Santosh Kumar Sahu	1. Thermal management of electronic components by phase change materials 2. Thermal management of electric battery modules 3. Phase change materials for energy storage 4. Jet impingement cooling for industrial applications 5. Synthetic jet based cooling for electronic components	
Dr. Satyanarayan Patel	1. Piezoelectric materials 2. Ferroelectric materials 3. Pyroelectric materials 4. Energy harvesting and storage materials 5. Solid-state refigeration 6. Smart materials	
Department of Metallurgy Engineering and Materials Science		
Dr. Eswara Prasad Korimilli	1. Mechanical behavior of materials 2. Structure - property exploration of additively manufactured metallic materials 3. High strain rate deformation and fracture 4. Extraction of mechanical properties using indentation	
Dr. Mrigendra Dubey	1. Design of fluorescent smart materials 2. Characterization of fluorescent materials 3. Corrosion Engineering	

	4. Single crystal growth and analysis	
Dr. Hemant Borkar	1. Lightweight materials for automotive applications 2. Advanced materials and processing	
Dr. Rupesh Devan	1. Nanostructures and Thin film technology 2. Techniques in materials characterization 3. Materials for energy storage 4. Photoactive materials for clean energy	
Dr. Ajay Kumar Kushwaha	1. Nanomaterials Synthesis and Characterization 2. 2-D Materials and Devices 3. Thin films and Memristors 4. Next-generation solar cell 5. Applied Electrochemistry 6. Electrochemical Sensors 7. Photo/electrochemical water-splitting 8. Corrosion Analysis and Anti-corrosion Coatings	
Department of Physics		
Dr. Raghunath Sahoo	1.The Global Properties of Quark Gluon Plasma (QGP) created in the Big Bang Experiment. [ALICE Experiment at LHC, CERN, Switzerland] 2. Exploration of QCD Phase Diagram and search for the Critical Point 3. Matter formed at High Baryon Densities[Compressed Baryonic Matter Experiment (CBM), GSI, Darmstadt, Germany] 4. Phenomenology of Quark-Gluon Plasma 5. GRAPES-3 (Gamma Ray Astronomy PeV Energies) 6. Applications of Machine Learning and Artificial Intelligence in High-Energy Physics 7. Applications of Statistical Mechanics in High-Energy Physics	

Professor Subhendu Rakshit	1. Neutrino and dark matter 2. The origin of the Universe 3. Astroparticle Physics 4. Physics beyond the standard model	
Professor Rajesh Kumar	1. Device Physics 2. Electrochromic Materials and Device 3. Raman Spectroscopy 4. Nanomaterials	
Dr. Pankaj R. Sagdeo	1. Application and characterization of spintronics material. 2. Modeling Structural and Optical properties using density functional theory 3. Design and development of a computer program for interfacing & temperature dependent dielectric measurements	
Dr. Somaditya Sen	1. Semiconductors 2. Magnetic and Ferroelectric oxides 3. Structural and Electrical property measurements 4. Nano materials	
Professor Preeti Anand Bhobe	1. X-ray Absorption Spectroscopy (XANES/EXAFS) 2. Temperature-dependent electrical resistivity 3. Crystal structure studies 4. Thermoelectric materials 5. Magnetic Materials	
Professor Sarika Jalan	1. Hypergraphs 2. Coupled Dynamics on networks 3. Spectral graph theory 4. Computational Neuroscience 5. Power-grid networks	

Professor Krushna R. Mavani	1. Basics of Pulsed Laser Deposition technique 2. Functional Oxide Thin Films 3. Terahertz Time-Domain Spectroscopy 4. Colossal Magnetoresistive Manganites	
Dr. Manavendra N Mahato	1. General relativity 2. Quantum Mechanics and applications 3. Quantum field theory	
Centre for Rural Development and Technology (CRDT)		
Professor Sandeep Chaudhary	1. Sustainable Construction Technology for Rural Development 2. Novel Building Products for Rural Area	

Important Note:

1. Fees once paid is non-refundable.
2. The Postgraduate Students are requested to contact concerned faculty mentor for any query/clarification.
3. Consent from the faculty mentor of IIT Indore is a must.