No.	Research Type	Title	Team	PI Name	Co-PI Name	Other PI& CoPI	Funding Agency	School	Sanction Order	Date of sanction	Sanction Order Value	Duration Month	Status	Brief description	Key highlights	Societal impact of the project
1	["Research Project"]	FIST Program	Dr Piyush KuchhalDr. Sushabhan Choudhury,Dr. Abhinav Sharma,,Dr. Surajit Mondal	Piyush Kuchhal(UPES);Sushabhan Choudhury(UPES);Abhinav Sharma(UPES);Surajit Mondal(UPES)			Department of Science & Technology-DST	SOAE	SR/FST/ET-I/2021/821 (c)	02-09-2022	11400000	60	Ongoing	Infrastructure project	Building infrastructure for battery management and communication system.	Project still not started, under procurement process.
2	["Research Project"]	Assessment of disease burden in the arsenic and pesticide exposed population in the Gangetic plains of Bihar	Dr. Arun Kumar-PI Dr Dhruv Kumar-CoPI		Dhruv Kumar(UPES)	1-Dr. Arun Kumar@PI@Mahavir Cancer Sansthan and Research Centre, Patna, Bihar	Indian Council of Medical Research	SOHST	R.11013/16/2023-GIA/HR	01-03-2023	9083760	36	Ongoing	A. Assessment of Heavy Metals: 1. Female Subjects: Evaluate levels of arsenic, lead, and mercury in blood, hair, nails, and breast milk. 2. Infants and Children (below 5 years): Measure levels of arsenic, lead, and mercury in hair and nail samples. B. Hormonal Assessment in Female Subjects: 1. Estrogen	First-Ever Study in the Region: This is the first comprehensive study conducted in this part of the country where arsenic contamination has caused severe health hazards, particularly affecting the Gangetic plain area. Focus on Women's Reproductive Health: For the first time, the study will evaluate the reproductive health of women in the affected regions, providing critical insights into how arsenic exposure	This project marks the first-ever comprehensive study addressing the severe health hazards caused by arsenic contamination in this part of the country. The Gangetic plain area is particularly affected, making this research crucial for the region. For the first time, this study will evaluate women's reproductive health and the mental health risks to children in this area. The investigation into heavy metals such as arsenic, lead, and
3	["Research Project"]	Development of an Integrated Intelligent Disaster Management System for Mountain Communities in India	Anil kumar(PI)	Anil Kumar(UPES)			Department of Science & Technology-DST	SOCS	TPN-79670	22-03-2024	6851040	36	Waiting(Awaiting For Sanctioned Letter)	It is a consortium project with nomination of a project of national importance by DST, Govt. of India. This is approved under the scheme of TDP(technology Development Program). In this project, apart from UPES, there are four other premier institutes of India and part of this project, they are IIT Patna, IIT Roorkee, NIT Surathkal, Amrita Vishwa Vidyapeetham. The goal of this project is to develop an indigenous intelligent responsive system based on a comprehensive knowledge database built on disasters, traditional	hazard data take, Intelligent Wireless Sensor Probe (IWSP), AI and ML based models for hazard mapping and susceptibility indexing, community knowledge, unified evaluation framework, Physical model tests to validate parameters and rainfall & earthquake vibrations	The major goal of the data-driven techniques for disaster management is to facilitate the administration in decision making through automated means by gaining quick knowledge from the past disasters as well as obtaining a more precise view of the current situation post disaster. This would help in better decision making and would mitigate the risks involved in distribution of relief funds, in terms of wastage, scams and fraud
4	["Research Project"]	Ultra-Sensitive SERB Probing for food and health safety using hybrid plasmonic metasurfaces and dual-beam pump-probe Raman	Dr. Prasanta Mandal(PI)	Prasanta Mandal(UPES)			Science and Engineering Research Board-SERB	SOAE	CRG/2023/001170	29-08-2024	5307192	36	Ongoing	SERS enhancement relies on strong plasmonic near-fields localized around metallic nanostructures caused by surface plasmon resonance. Exact mechanism of high SERS and near-field dependence (reported to be E^4) are still needs to be unveiled. While most of the studies are based on the designation of plasmonic substrates and single beam SERS measurements, no reports are available on the excitation of plasmonic near-fields separately and	Ultrasensitive SERS, Food & health safety, Dual-beam pump-probe Raman, soft lithography, Interference lithography, cost effectiveness	The research outcome from the proposed project will be documented through research publications, conference publications and patents. The hybrid plasmonic metasurfaces along with dual-beam pump-probe Raman will be assets for potential Raman probing and ultrasensitive SERS detection. This technological development will have fundamental importance on molecular sensing platform for various applications; including spectroscopy, chemical sensing
5	["Research Project"]	Structure formation of nanofillers inside the polymer matrix using ultra small angle x-ray scattering techniques	Dr. SARATHLAL K V Prof. AJAY GUPTA	Dr.Sarathlal KV(UPES)	Dr. Ajay Gupta(UPES)		Defence Research and Development Organisation - DRDO	SOAE	TR/0569/CARS/135	05-08-2022	4874740	36	Ongoing	Commercially available elastomers are commonly used as the primary materials for flexible and stretchable applications. Despite their excellent properties, they typically have low electrical conductivity. Carbon nanofillers such as carbon nanoparticles, carbon nanotubes, and graphene, have been extensively researched to incorporate into the matrices to address the foresaid issue. In this project, we aim to investigate different polymer nanocomposites	•The cost effective, efficient route to prepare flexible and conductive PNC will be explored. •An in-house designed polymer stretching device, capable of introducing high precision strain, and compatible for beamline incubation will be fabricated. •Versatile, non-destructive, synchrotron based SAXS & USAXS techniques will be employed to do real-time structural and transport	•The successful establishment of one-to-one relationship between structure & transport properties, opens up a wide window of opportunities in the field of flexible electronics. •The optimization of preparation parameters to produce low percolation threshold, facilitates extensive commercialization of low cost- conductive PNCs. •The inferences facilitate production of strain sensors, biopotential
6	["Research Project"]	A Novel Eco-Friendly Nano-Agriculture Strategy for Small-Marginal Farmers of Higher Himalayas: A Nano-Pyrite Based Seed/Root/Shoot Treatment Approach for Improving Potato Yield and Dairy Green Fodder Production	Himanshi Jangir	Dr. Himanshi Jangir(UPES)			Sree Padmavathi Venkateswara Foundation	SOHST	Sree PVF/G/AS/24/2	09-09-2024	4796000	24	Ongoing	Farming in mountainous terrains is labor-intensive since advanced mechanization is challenging. Small- scale farmers engage in subsistence farming as they lack the resources to profit from meager landholdings. Women travel long distances to collect fodder for cattle. Here, we intend to create a self- reliant and profitable food production ecosystem in remote areas for small-scale farmers with minimal investment while maximizing the niche dairy economy and	We propose a nano pyrite-based seed/root/shoot priming technology to boost plant growth as a fertilizer replacement strategy. It is a disruptive agronomic strategy to counter the energy-intensive Haber-Bosch process of ammonia fertilizer synthesis. This sustainable strategy maximizes profits while considering various agricultural stakeholders, such as land, water, energy, plants, animals, and humans. Here, we aim to create a cost-effective, eco-friendly, and high-yield agro-technology for the cultivation of potato	In 2018, cost estimation per hectare of land for a pilot study for rice showed that the cost of seed priming with nano pyrite is INR26, whereas that for NPK fertilizer application is INR890. Priming with nano pyrite is a one-time seed/root/shoot treatment strategy, thus reducing the efforts of farmers in comparison to multiple applications of fertilizers at different stages of plant growth. The crop
7	["Research Project"]	Promoting a conducive academic environment by addressing campus interpersonal violence at an Indian higher education institution(GCVP)	1-Melissa Reneaux(PI) 2-Yamini Negi(CO-PI)	Melissa Reneaux(UPES)	Yamini Negi(UPES)		University of California, Los Angeles(UCLA)	SOLS&M	N/A	11-10-2023	4162375	25.709589	Ongoing	However, interpersonal violence (IpV) is entirely contrary to creating such an environment. It not only poses a direct threat to the physical and emotional well-being of individuals involved but also undermines the principles of safety, respect, and inclusivity that are fundamental to fostering a productive and supportive educational atmosphere. Addressing and preventing IpV is crucial to ensure that students can	It will be among the pioneering (b) This initiative sets a precedent for other institutions by outlining effective strategies to counter IpV, fostering a safer academic environment. (c) The effort will be sustainable and scalable through the creation of an online module, together with an	project to commence, and has not received any grants or
8	["Research Project"]	Biomass nanocomposite with reduced volatile matter as the substitution of conventional coal for co-firing operation in thermal power plants	"1-Dr. Nirlipta Priyadarshini Nayak(UPES) 2-Prof.Zishan Husain Khan(Jamia Milia Islamic, Central University 3-Dr. Harshal Kumar(Gla University) "	Nirlipta Priyadarshini Nayak(UPES)		1-Prof.Zishan Husain Khan@PI@Jamia Milia Islamic 2-Dr. Harshal Kumar@PI@Gla University	Department of Science & Technology-DST	SOAE	DST/C3E/CERI/RES/BARC/2023/06(G)/1	28-03-2024	4050200	36	Ongoing	Biomass-derived chars can substitute conventional fossil fuel i.e. Coal in Thermal Power plants for electricity generation. High Carbon content, specific area and porous structure make biochar the best alternative/ add on to offset the load of power plants in terms of consumption of feedstock and emission of greenhouse gases as well. Biochar production is a carbon-negative process, as it reduces CO2 in the atmosphere. In the process of making biochar, the	volatile biomass pellets to minimize the auto-oxidative tendency of coal and thereby minimize the safety hazards. •Substitution of 5-7 % of coal with biomass in coal-based power plants can save 38 million tons of carbon dioxide emissions. •This will reduce power cost by almost 40% and exhaust effluents by 60 % compared to conventional fuels	Waste utilization- Disposal of stubble is a matter of concern. Stubble burning causes severe environmental damage. Consumption of biomass/ stubble in pellet making can curb its damaging effects. Biomass pellets can be made from agricultural waste and forestry byproducts, which reduces waste and promotes resource efficiency. Energy efficiency & security
9	["Research Project"]	Experimental research investigation to use algae as a combined source for biodiesel production and wastewater treatment	Dr Siddharth Jain(PI)	Siddharth Jain(UPES)			Science and Engineering Research Board-SERB	SOAE	SRG/2023/001949	22-11-2023	3175450	24	Ongoing	Due to the availability of wastewater as a readily accessible water and nutrient source, microalgae have become the most favored alternative source for biodiesel production. The current daily volume of wastewater (sewage) produced by urban sector in India is 72,368 megaliters (ML/D), while the expected sewage treatment capacity is only 37% [15]. Algae cultivation in wastewater is a potential solution to this issue. Advancements and an efficient combined process is	that utilizes microalgae for both biological wastewater treatment and biodiesel production. • The study will also suggest the synthesis of a heterogeneous nano-catalyst for the in-situ transesterification process of the algae produced, thereby achieving sustainable biodiesel production."	The project will help in waste management under swatch bharat abhiyan scheme and will also help in fulfilling the biofuel demand of India
10	["Research Project"]	Development of gold nanoparticles based colorimetric nanosensor array for multiplex detection of xenobiotics in resource limited settings.	Dr Piyush Kumar(PI)	Piyush Kumar(UPES)			Science and Engineering Research Board-SERB	SOHST	SRG/2023/002188	28-12-2023	2961926	24	Ongoing	In this project, we have to develop array of differentially charged gold nanoparticles and look into interactions with different kind of xenobiotic molecules.	First of its kind of project in which we have to develop a method by which we will be to screen multiple xenobiotics in a panel.	We will be able to develop a low cost and fast screening method which can be utilize in resource limited settings.
11	["Research Project"]	Tribo-Tech:Development Polymer-Based Tribo-/Piezo-Electric Devices for Sustainable Sensing and Energy Harvesting Application	Tridib Sinha(PI)	Tridib Kumar Sinha(UPES)			Science and Engineering Research Board-SERB	SOAE	SRG/2023/002754	26-10-2023	2938485	24	Ongoing	The project aims to develop polymer-based flexible and sustainable sensing and energy harvesting devices. Flexible devices require a polymeric protective layer to ensure their flexibility and safety. Mostly all polymers are triboelectric in nature which could produce collective response for a polymer-coated piezoelectric device. However, triboelectricity is highly moisture/humidity sensitive, leading to irreproducibility in device response. This irreproducibility restricts the application of both the piezoelectric nanogenerator (PNG) and triboelectric nanogenerator (TNG) for their forward	The primary objective of this project is to develop flexible, reproducible, and bio-compatible, polymer-based piezo- and tribo-electric sensors and energy harvesters. Specific objectives of the project are as follows: • Developing a reproducible and scalable process of device fabrication. • Use of waste biomaterial in material's development towards enhance increase the biocompatibility and performance (i.e., trash-to-treasure).	• By utilizing biopolymers extracted from various wastes as fillers for developing flexible polymer nanocomposites, the project contributes to reducing waste and promoting a circular economy. This ""Trash-to-treasure"" approach not only reduces environmental pollution but also provides a low-cost and sustainable solution for flexible device fabrication. • The development of low-cost, flexible, and bio-compatible polymer nanocomposites opens up opportunities for widespread adoption of sensing and energy harvesting devices, especially in resource-
12	["Research Project"]	Development of Impact Resistive and Thermally Resilient Hybrid Laminated Composite Panel for Personal and Vehicle Armours	1-Dr. Ashish Mishra(PI) 2-Dr. Subhankar Das (Co-PI)	Ashish Mishra(UPES)	Subhankar Das(UPES)		Science and Engineering Research Board-SERB	SOAE	CRG/2023/007045	03-05-2024	2884200	36	Ongoing	With the development and maturity of ultra-high-molecular-weight polyethylene (UHMWPE) fibres, the body armour sector, which has been dominated by aramid fiber-based solutions over the previous three decades, is drawing greater attention to UHMWPE fibres. Compared to aramid fibre, UHMWPE fibre has a strength-to-weight ratio of around 40% higher. However, UHMWPE fibre also has drawbacks when employed in a ballistic protection system, including low creep resistance, low melting temperature (144-152 °C), and poor fibre adherence to the polymer matrix due to its smooth surface	•Utilizing a novel EPD method with graphene oxide to enhance the wettability of UHMWPE fiber and improve the thermo-mechanical properties of polyurethane resin. •Development of lightweight composite panels with improved energy absorption capabilities, suitable for protecting against various ballistic threats. •Potential applications in military, law enforcement, and civilian security sectors, offering standalone protection or as backing layers for higher-level protection systems, contributing to enhanced safety	The outcome includes the development of lightweight composite panels with improved energy absorption capabilities, suitable for protecting against various ballistic threats. These panels can be utilized in standalone protection or as backing layers for higher-level protection systems, benefiting military, law enforcement, and civilian security applications. Additionally, the research contributes to technological advancement in materials science and engineering, potentially leading to further innovations in composite materials and their applications beyond ballistic protection. This innovation
13	["Research Project"]	Self-entangled CNT/ZnO tetrapod based fillers to solve the delamination and weak polymer-fibre interface issue in carbon fibre reinforced polymer (CFRP)	Dr. Manjeet Singh Goyat	Manjeet Goyat(UPES)			Science and Engineering Research Board-SERB	SOAE	SUR/2022/005356	05-12-2023	2783260	36	Ongoing	Carbon fibre reinforced polymer (CFRP) composites of various sectors like aerospace, automotive, naval, railways, wind turbine blades, military equipments, civil structures, medical equipment's, sporting goods, radar and telecommunications. From 1960, the CFRPs becomes most favorable material for various industries due to their unique characteristics such as light weight, high strength, high stiffness, resistance to fatigue, corrosion and damping vibrations, high-	• To fabricate self-entangled CNT/t-ZnO network reinforced CFRP composite laminates using vacuum assisted resin transfer molding (VARTM). • To characterize the polymer matrix-fibre interface and delamination of CFRP epoxy nanocomposites laminates. • To characterize the physical and mechanical properties of the 3D CNT/t-ZnO network reinforced CFRP epoxy composites."	The outcome of the project can train a new era for fabrication of next-generation CFRP epoxy nanocomposites much needed for the aerospace, automobile and energy industries. This project is focused on developing a new understanding of controlling the fibre-polymer matrix interface and delamination problem of CFRP epoxy nanocomposites. The main aim of the proposed research is to avoid the use of toxic chemicals, harsh reaction conditions and expensive reagents that will lead the fast fabrication of economical, high
14	["Research Project"]	Geochemical, petrogenetic and metallogenetic study of Malanjkhand and Dongargarh Supergroup volcanics and plutons along Dongargarh Kotri mobile belt with insights from LA-ICPMS data of relict magmatic minerals	1-Prof Sunil Kumar Khare(PI) 2-Prof. Venkatesh Satya Akella(CO-PI)	Sunil Kumar Khare(UPES)	Somenath Ganguly(UPES)	1-Prof. Venkatesh Satya Akella@Co-PI@Indian Institute Of Technology (Indian School Of Mines,Dhanbad)	Science and Engineering Research Board-SERB	SOAE	CRG/2022/004833	17-03-2023	2696680	36	Ongoing	The project aims to understand the earth's crustal evolution at Archean Proterozoic transition. It aims to understand the metallogenic and petrogenetic aspects of Central Indian craton during early evolution of earth.	Three research articles published in international Elsevier journals "Ore and Energy Resource Geology" and "Journal of Earth system science". Field work done and rock samples collected, petrography done, CL study done, rock sample analysis done. Advanced interpretation in progress.	This research study intends to explore critical minerals needed by Govt. of India for its Energy transition requirements.
15	["Research Project"]	Morphotectonic assessment of structurally induced geohazard potential areas within the MBT Zone: NW of Dehradun, Uttarakhand	Girish Chandra Kothyari(PI) & Atul Kumar Patidar(CO-PI)	Girish Chandra Kothyari(UPES)	Atul Kumar Patidar(UPES)		Science and Engineering Research Board-SERB	SOAE	CRG/2023/000555	08-05-2024	2611720	36	Ongoing	The current research project deals with the mapping of tectonically induced landforms and geohazard potential analysis along the MBT zone, central Himalayan region of Uttarakhand. The state-of-the-art InSAR/GLA/ML/SPIM modeling, and field-based technique will be implemented to map the zone of active deformation. The idea is to generate a potential hazard map and delineate structurally controlled active landform morphology in the study area, which will ultimately help to create the chronology of paleoseismic events along MBT zone. This study will be extremely beneficial for future	1.Fault linkage analysis of Srinagar Tal Fault (STF), Malaj Fault (MF) and their connectivity with the MBT with respect to landform evolution and hazard potential. 2.Identify and map geological and geomorphic evidence of active deformation and prepare 3D stereographical projection to understand probable causes of stress build-up and vulnerable zones having landslide potential. 3.Analysis of active ground deformation pattern/ground subsidence, using InSAR/PSINSAR & SPIM modeling techniques.	The proposed project's findings will provide insight into the Quaternary evolutionary history and hazard potential of MBT zones, particularly with respect to the neotectonic and seismic events that led to the formation of the current terrain. The main aim is to provide a precise geohazard potential and active fault map of the densely populated regions located between Dehradun and the eastern part of Himachal. Further, the outcome of the study will be utilized for urban development, town planning, civil engineering works respectively
16	["Research Project"]	Engineering of 2d-Transition Metal oxides for Integrated Carbon Capture and Utilization	Dr. Abhishek Kumar Mishra(PI) &Dr. Sravendra Rana(Co-PI)	Abhishekkumar Mishra(UPES)	Sravendra Rana(UPES)		Science and Engineering Research Board-SERB	SOAE	SUR/2022/004935	03-10-2023	2431240	36	Ongoing	We propose to design 2d transition metal oxides (TMOs) [Fig. 1] as potential high-performance dual functional materials (DFMs), where the aim is to engineer these materials by heteroatom doping, defect engineering, interfacial structure engineering, etc. through a combined computational and experimental approach.	We plan to develop novel dual functional materials (DFM) for an efficient ICCU process, as so far DFMs available still have serious shortcomings including inferior CO2 selectivity, poor electrical conductivity, bad chemical stability, high cost, etc.,	The carbon dioxide concentration on earth has passed 400 ppm last year and is expected to reach levels up to 1000 ppm by the end of this century, this is mainly due to our dependence on fossil fuels for energy. There are great efforts in this direction to reduce CO2 in the atmosphere and fix the climate-change problem in an economically attractive and easy by converting CO2 into value-added products.
17	["Research Project"]	Data-Driven Approaches for Enhanced Detection of Fetal Arrhythmia	Dr. Muthukumar K A(PI)	Muthukumar Ka (UPES)			Science and Engineering Research Board-SERB	SOCS	EEQ/2023/000315	22-01-2024	2215004	36	Ongoing	his project focuses on enhancing the detection of fetal arrhythmias and assessing the quality of fetal electrocardiogram (FECG) signals through advanced techniques. By leveraging deep learning methodologies, the initiative aims to classify FECG signals into normal or arrhythmic conditions without heavily relying on precise heartbeat detection. This is achieved by segmenting the FECG signals and analyzing them through a deep learning model that categorizes the	1-Deep Learning for Arrhythmia Detection: Utilization of a deep learning framework for the classification of FECG signals into normal and arrhythmic categories, reducing the dependency on accurate heartbeat detection and increasing the reliability of fetal arrhythmia identification 2-Signal Quality Assessment Using EMD: Introduction of the Earth Mover's Distance (EMD) as a metric for comparing the distribution of observed FECG signals with a reference, enabling an objective	The implications of this project for society are significant, particularly in the context of prenatal care and fetal health monitoring. Early and accurate detection of fetal arrhythmias can have a profound impact on the outcomes of pregnancies by enabling timely interventions and tailored care plans. By improving the reliability and accuracy of fetal arrhythmia detection and signal quality assessment, the project has the potential to:
18	["Research Project"]	Autonomous underwater Navigation and Mapping		Jitendra Kumar Pandey(UPES)	Surajit Mondal(UPES),Vikas Thapa(UPES)		IIT Tirupati Navavishkar i-Hub Foundation (IITTNiF)	SOAE	IITTNiF/TPD/2024-25/P21	21-03-2025	2122500	18	Ongoing	AUV-N&M represents a breakthrough approach to ocean exploration. These unmanned vehicles can move autonomously for lengthy periods of time, allowing them to explore extreme depths and dangerous regions that traditional means cannot reach. They are equipped with modern sensors and can collect high-resolution data on numerous aspects of the ocean.	Real-Time 3D Seafloor Mapping: Uses advanced sensors and AI for precise, autonomous mapping of underwater terrains. Unmanned and Risk-Free Exploration: Operates without human divers, enabling safe access to extreme or hazardous underwater environments. Multi-Application Versatility: Supports marine research, disaster	Environmental Protection: Enables effective monitoring of marine ecosystems, helping to preserve biodiversity and combat pollution. Disaster Preparedness: Enhances early warning systems for tsunamis and underwater earthquakes, improving community safety. Support for Coastal Livelihoods: Assists in sustainable fisheries management, protecting the incomes of coastal communities.

19	["Research Project"]	ESTABLISHING A TECHNICAL SUPPORT UNIT FOR THE RICE FORTIFICATION PROGRAMME IMPLEMENTED BY THE GOVERNMENT OF UTTARAKHAND	1-Dr Ravinder Kaushik(PI)2-Dr. Ramesh Kumar Saini(Co-PI)3-Dr. Abhishek Chandra(Co-PI)4-Dr. Amritansh Bhanot(Co-PI)	Ravinder Kaushik(UPES)	Ramesh Kumar Saini(UPES);Abhishek Chandra(UPES);Dr.Amritansh Bhanot(UPES)		United Nation- World Food Programme	SOHST	N/A	29-03-2023	1900000	57.139726	Ongoing	Under this project UPES has been identified as Technical support partner for creating advocacy and sensitization for fortified rice. This is a 2-years project, to carry out research and outreach activities under this project UN-world food programme had provided 7.5 lakhs to UPES.	1) To carry out sensitization and advocacy of fortified rice in Uttarakhand state. 2) To carry out training for the rice millers, state officials, govt. school staff and consumers to create awareness pertaining to fortified rice. 3) To carry out research work and assess the impact of fortified rice on human health. "	This project is aimed for society, prime aim is to sensitize the consumers regarding fortified rice and it's benefit for human health. Major chunk of Indian population is suffering from undernutrition, one of the forms of Malnutrition and in order to eradicate the prevalence of undernutrition from the community Government has initiated distributing fortified rice in Public Distribution System (PDS). Under this project me and my team visit villages, govt schools, Anganwadi and rice millers of Uttarakhand and sensitize them on
20	["Research Project"]	Establishment of Community COVID Resilience Resource Centre (CCRRC) in Doiwala Block, Vikasnagar Block and Sahaspur Block, Dehradun District of Uttarakhand State	"PI - Dr Neelu Jyothi Ahuja CO- PI - Dr Jyoti Upadhyay"	Neelu Jyothi Ahuja(UPES)	Jyoti Upadhyay(UPES)		Department of Science & Technology-DST	SOCS	DST/SEED/CCRRC/2021/003/G	29-03-2022	1830440	42.1479452	Ongoing	The primary objective of the project is to establish a Community COVID Resilience Resource Center at UPES to assess and address the impact of the COVID-19 pandemic on health, nutrition, education, information sharing, and livelihood diversification in eight villages located in the Doiwala, Sahaspur, and Vikas Nagar blocks of Dehradun District, Uttarakhand. Targeting 5000 beneficiaries, the project seeks to improve immediate health and education outcomes while building community resilience to cope with future crises. This	Focus on addressing health, nutrition, education, information sharing, and livelihood diversification for 5000 beneficiaries. Aimed at mitigating the long-term impact of the COVID-19 pandemic while building community resilience against future crises Survey covered health status, nutrition, education disruptions, economic challenges, and pandemic-related information sharing. Enabled efficient outreach and data collection from remote, rural communities Organized health camps with participation from 3000	the CCRRC drives lasting change by empowering communities to recover, rebuild, and thrive after crises. We focus on inclusive and equitable recovery, prioritizing marginalized groups like women and the economically disadvantaged. Addressing challenges worsened by the pandemic, we bridge resource gaps, foster resilience, and promote inclusive growth. Through collective action, we strengthen social cohesion and set a benchmark for sustainable, community-led progress
21	["Research Project"]	Development of Soft Armoured Lightweight Nanocomposite Material with enhanced Ballisitic Protection.	Dr Piyush Gaur(PI)	Piyush Gaur(UPES)			Science and Engineering Research Board-SERB	SOAE	SERB/F/12567/2023-2	06-02-2024	1830000	36	Ongoing	This project is about developing a soft armour graphene reinforced Armour with enhanced ballistic protection.	Light weight, graphene reinforced material with enhanced ballistic protection.	Useful for the Defense and Aerospace sector.
22	["Research Project"]	Human induced pluripotent stem cell-based functional characterizations of novel identified disease causal gene(s)/variant(s) in families with juvenile Parkinson's disease	Dr. Laxmi Kirola(PI)	Laxmi Kirola(UPES)			Science and Engineering Research Board-SERB	SOHST	TAR/2023/000148	17-05-2024	1830000	36	Ongoing	Parkinson's disease (PD) is the second most devastating neurodegenerative disease after Alzheimer's disease. It affects both motor and non-motor symptoms in humans. The incidences of PD are increasing and an average of ~13.4 per 100,000 individuals are affected worldwide. PD cases with early onset at or before 21 years are known as juvenile PD (JPD). The main cause of JPD includes a combination of genetic and environmental factors, mostly JPD is	The major outcome of these findings will be immediately useful for early diagnostics/probable predictive medicine, biomarker(s) discovery, and provide leads for personalized therapeutic targets for the next step. The scientific research on discovery genomics and functional characterization of Parkinson's disease (PD) is of paramount importance for several reasons:	The international excellence of scientific research on discovery genomics and functional characterization of Parkinson's disease is marked by collaboration, inclusivity, technological advancements, global impact, and the translation of research findings into meaningful applications for patient care. Further, this includes i) Global collaboration ii) Understanding and unraveling disease complexity
23	["Research Project"]	Water Quality assessment of Nainital Springs and remediation using green nanoparticles	Dr. Madhuben Sharma (PI) and Dr. Sapna Jain (Co-PI)	Madhuben Sharma(UPES)	Sapna Jain(UPES)		G. B. Pant National Institute of Himalayan Environment, Kosi Katarmal, Almora - 263643,Uttarakhand, India	SOAE	GBPI/IERP/23-24/13/83	23-02-2024	1782930	36	Ongoing	Uttarakhand is divided into two geographical areas, namely Garhwal and Kumaon area. The state receives 90% supply of potable water from springs and rivers (indiawaterportal.org/). In the Kumaon region, 60% of rural people depend on natural springs for water supply. The traditional sources of spring water are locally known as Chal, Khals, Naulas, and Gharats (Sharma 2016). Springs are a result of local hydrogeology and rainfall patterns. Prolonged human intervention is affecting the quantity, quality, and accessibility of spring water.	1) An updated report about the quality of spring water in the area will be prepared. 2)This study aims to develop a site-specific action plan by identifying potential sources of pollution in the study area. 3)A water quality map of the springs near Lake Nainital will be developed. It will serve as reference data for researchers and scientists working in the water sector. 4)Study aims to link water quality and diseases to provide proactive	The major goal of the study is to discover a link between common diseases and water quality concerns in this area so that preventive advice can be given to the people. Development of green nanoparticle-based water filtration system. This filtration system will help in supplying better water quality to the local communities living in the vicinity of the spring.
24	["Research Project"]	Vaccum Photodiode detectors for broadband vaccum ultraviolet detection in ADITIYA-U tokamak	Dr. Prashant Rawat(PI) & Kailash Pandey(Co-PI)	Prashant Shambhudayal Rawat(UPES)	Kailash Pandey(UPES)		DAE- BRNS	SOAE	57/14/03/2022-BRNS/34015	15-06-2022	1622600	36.3616438	Ongoing	The project is funded through the Board of Research in Nuclear Sciences (BRNS), DAE-GOI, and is being worked in collaboration with the Institute for Plasma Research (IPR), Gandhinagar. The project is about building and installing a detector in the soft X-ray and VUV region of the EM spectrum on the Tokamak, ADITYA-U. This would give a much-needed fill-up to diagnostic needs in the respective region. The detector has been designed, fabricated and installed on the tokamak ADITYA-U. Preliminary data has been obtained and	1. Design, fabrication and installation of a detector on the tokamak, ADITYA -U. 2. Diagnostics in the VUV and soft X-ray region. 3. All of above done. 4. Preliminary data obtained and being compared with available data.	The project is not directly in the regime of applied science and technology, but in that of fundamental science, in the area of experimental Atomic, Molecular and Optical Physics (AMOP) and Plasma Physics. Though the project works on the fundamentals of science, it concerns building one of the several other diagnostics for plasma produced in Tokamaks, which eventually is going to help to achieve fusion energy through plasma. And that would have an impact comparable to that of the discovery of fire and the invention
25	["Research Project"]	Formation of nanostructured W-Cu thin films for nuclear and energy applications	Prof Asokan Kandasami Prof Abhishek kumar Mishra	Asokan Kandasami(UPES)	Abhishekkumar Mishra(UPES)		Department of Science & Technology-DST	SOAE	DST/INT/BLR/P-41/2023	14-08-2023	1517680	24	Ongoing	Tungsten (W) and tungsten alloys in bulk form have a wide range of applications due to their high density, strength, and hardness, excellent thermal conductivity and high-temperature capabilities, and minimal sputtering yield. Particularly, tungsten-copper (W-Cu) multilayered films are considered potential candidates for applications in microelectronic, plasma and nuclear fields due	To fabricate nanostructured W and W-Cu bilayer/multilayer thin films by thermal annealing and ion irradiation. (b). To characterise the structural properties such as crystalline structure, interfacial layers and nanostructure formation upon various thermal annealing and ion irradiation conditions. (Indian team) (c). To evaluate radiation hardness and mechanical properties of	Nanocomposites and thin films of W and W-Cu synthesized within the framework of this project can be effectively used in industry, especially in the nuclear and space fields, due to their high stability under extreme conditions, as well as in the energy industry to create new materials promising for hydrogen storage. This project will lead to bilateral research activities between India and Belarus
26	["Research Project"]	Design and development of a portable KVIC type biogas plant for colder region	Dr. Shailey Singhal (PI) and Dr. Amit Kumar Sharma (Co-PI)	Shailey Singhal(UPES)	Amit Kumar Sharma(UPES)	N/A	Khadi and Village Industries Commission(KVIC)	SOAE	S&T/KVIC/HQ/1/2024/35353/2023-24/505	20-03-2024	1495000	18	Ongoing	The project is about the technological upgradation of KVIC type biogas digester.	The present idea proposes two innovative solar techniques: 1. heat trapping within the digester using greenhouse during daylight hours 2. utilizing solar heater with a heat exchanger to elevate digester temperatures	1. Biogas and nutrient rich organic manure generated by the anaerobic digestion of kitchen waste, cattle dung, agriculture waste (Fruit-vegetable waste) 2. Novel technology for converting waste to wealth specifically for colder regions 3. Minimization of LPG requirement for rural areas by its replacement with biogas
27	["Research Project"]	Engineering and fundamental aspects of Interfacial Dzyaloshinski-Moriya Interaction in Heavy Metal/ Ferromagnet multilayers	Dr. Sarathlal KV	Dr.Sarathlal KV(UPES)			UGC - DAE	SOAE	CRS/2021-22/01/353	30-03-2022	1361880	36	Ongoing	The heavy metal (HM)/ferromagnetic (FM) multilayers exhibit interfacial Dzyaloshinskii-Moriya interactions (iDMI) attributing to high spin-orbit coupling (SOC) and structure inversion asymmetry (SIA). iDMI favours perpendicular magnetic anisotropy (PMA), stabilizing chiral domain walls and skyrmions energetically. These kind of magnetic spin textures are highly important in spintronic based devices. In HM/FM multilayers the interfaces are the region of	•Engineering of various magnetic interactions in low dimensional systems. •Depth resolved, element specific electronic and magnetic studies in magnetic multilayer systems. •Various state-of-Art, non-destructive, synchrotron-based techniques like HAXPES, XRMR, PNR etc... will be employed for the sample characterization.	•Correlating the interfacial structures with magnetic interactions which paves a way to efficient control of interfaces to modify the magnetic properties of multilayers. •Development of heavy metal/ferromagnetic multilayers with tailored properties for spintronic based magnetic memory and logic devices.
28	["Fellowship"]	Award of INSPIRE Fellowship to the Research Students [IF220197]	1-Piyush Verma-(PI-Inspire Fellow) 2-Dr. Ravinder Kaushik(Supervisor) 3-Dr.Ranjna Sirohi(External Supervisor)	Piyush Verma(UPES-Inspire Fellow);Ranjna Sirohi(UPES);Ravinder Kaushik(UPES)			Department of Science & Technology-DST	SOHST	DST/INSPIRE Fellowship/[IF220197]	08-08-2023	903340	60	Ongoing	Environment, the generation of agricultural waste is growing at rapid due to an increase in the population. The agricultural sector generates hundreds of millions of tonnes of waste annually, which has seriously harmed the environment's ecology. Thus, there is a pressing need to efficiently and systematically reduce and reuse agro-waste. This waste can be utilized for the production of "non-digestible oligosaccharides" which offer countless benefits to	Indian households generate 62 kg of food waste per capita per year, totalling 70 MT annually (UNEP, 2023) This waste can be utilized for the production of "non-digestible oligosaccharides" which offer countless benefits to consumers and society •Continuation of low-valence and long-metastable Ni possibly	Environmental Sustainability: Utilizing agro-waste for XOS extraction reduces waste, promotes sustainability, and contributes to eco-friendly practices Health Benefits: XOS are prebiotic fibres that support the growth of beneficial gut bacteria, like bifidobacteria and lactobacilli, promoting digestive health, and immunity, and potentially reducing
29	["Fellowship"]	Award of INSPIRE Fellowship to the Research Students [IF220044]	1-Ananya Bishnoi(PI-Inspire Fellow) 2-Gunjan Vasant Bonde(Supervisor)	Ananya Bishnoi(UPES-Inspire Fellow);Gunjan Vasant Bonde(UPES)			Department of Science & Technology-DST	SOHST	DST/INSPIRE Fellowship/2022/IF220044	10-08-2023	900150	60	Ongoing	As advanced, cancer is still claiming utmost worldwide. There is no known therapeutic therapy which cure cancer, not even after effective conventional medicines. This necessitates exploration of innovative therapeutic approaches. Recently, researchers targeted Poly (ADP) ribose polymerase (PARP) enzyme as nove therapeutic approach. Therefore, US-FDA approved olaparib for the treatment of germline BRCA mutated HER-2 negative Breast cancer.	have enhance anti-proliferative effects as compared to monotherapy. •There if no known such combinations yet, which opens the door for effective combination therapy with new perspective for effective treatment. •The effective combination can be loaded into several nanocarrier	The delivered drug delivery system with combination moieties can ensure better cancer therapy with reduced side-effects, dose and frequency. The perspective can lead to a cost-effective and easily affordable treatment so that the patients will be benefitted especially low-income group. Furthermore, the patient compliance can be observed in the form of life-style, less number of visits to the clinic.
30	["Research Project"]	Chemical recycling of cotton-based waste fabrics to cellulose	1-Dr. Shailey Singhal(PI) 2-Dr. Ajay Mittal(CO-PI)	Shailey Singhal(UPES)	Ajay Mittal(UPES)		Uttrakhand State Council for Science and Technology-UCOST	SOAE	UCS&T/R&D-04/23-24/24533	22-09-2023	600000	24	Ongoing	This projects aims to convert the waste and discarded fabrics into cellulose, which is an industrially significant material, owing to its various applications.	1. Helpful in addressing the problem of waste management. 2. Means for converting waste to wealth. 3. Offers a process for extracting cellulose from waste. 4. Support to environmental protection.	This will help in improving the environmental quality, thereby making a positive impact on the health of the people. Futher, this may also create an opportunity for employment generation in future.
31	["Research Project"]	Development of flexible MXene/Oxides based layered electrodes for energy storage devices		Shalendra Kumar(UPES)	Aditya Sharma()		Uttrakhand State Council for Science and Technology-UCOST	SOAE	UCOST-RND/39/2024-UCOST-DPT/26805	10-12-2024	600000	24	Ongoing			The development and realization of new generation of flexible nanostructured materials are the thirst area of research, worldwide. The proposed work will open pathways to develop flexible batteries/supercapacitor devices for high-energy applications. This proposal aims to move the research from laboratory to industry i.e., academia to industry transformation of research. In this context, the proposed materials and methods will solve the issue of flexibility
32	["Research Project"]	Development of flavored yogurt with indigenous Himalayan yellow berries and lactic acid bacterial strains isolated from ethnic fermented food of Uttarakhand	Piyush Kumar (PI)	Piyush Kumar(UPES)			Uttarakhand Council For Biotechnology (UCB)	SOHST	UCB/R&D Project/2024/556	27-03-2024	580000	24	Ongoing	The majority of Indian Himalayan ethnic fermented foods have yet to be scientifically investigated for potential probiotic properties and their controlled commercial production. The knowledge that is currently available focuses primarily on the microbial diversity in the marketed finished products of the Eastern Himalaya, and there is little data on the microbial diversity, their probiotic properties and production of fermented foods from the Western Himalaya,	This proposal aims to develop a potential probiotic yogurt with a consortium of lactic acid bacteria (LAB) isolated from ethnic fermented food of Uttarakhand for specific health benefits, supplemented with the medicinal goodness of highly nutritious wild fruit of Uttarakhand commonly known as Himalayan yellow berry (Rubus ellipticus Sm., local name – Hisalu or ainselu). Incorporating the extract from Himalayan yellow berries into the yogurt	Strains isolated from indigenous sources are usually considered more effective in exerting long lasting beneficial effects. Indigenous isolates are well adapted to grow in the ambient environment of their native niches. Hence, in this proposal, we will gather information about indigenous preparations of the Uttarakhand region and their efficacy in the Indian market, which can perform well in the Indian population. This information is crucial for understanding the
33	["Fellowship"]	INSPIRE Fellowship under INSPIRE Program-IF220387	NISHTHA SAH-JRF & Dr Nidhi Chauhan(Supervisor)	Nishtha Sah(UPES);Nidhi Chauhan(UPES)			Department of Science & Technology-DST	SOHST	DST/INSPIRE Fellowship/2022/IF220387	13-01-2024	543920	60	Ongoing	Water microbes play a crucial role in the bioremediation of wastewater. In the Western Himalayan regions, wastewater has become an emerging concern due to its impact on the surroundings and human health. Several organisms, including bacteria and fungi, have been found to possess the ability to utilize the organic component present in wastewater and to generate electricity as a byproduct that could be used for operating various small devices.	1.MFC work is limited to synthetic/ artificial water. 2.Evaluation of the potentiality of microbes to be performed. 3.Proper functioning of the MFC needs factors optimization. 4.A laboratory model of MFC will be designed and developed. 5.Performance-based evaluation needs to be determined.	Our proposed work is highly innovative and will be an attempt in India to generate bioelectricity by utilizing microbial biofilms. Upon the success of our lab model design, the developed approach will be further extended to form a scale-up bioelectricity plant using wastewater as the extract. This wastewater will be collected from different areas and will be converted to less toxic water. In addition to this conversion, bioelectricity will be generated, which could be a
34	["Fellowship"]	INSPIRE Fellowship under INSPIRE Program-IF230084	Rahul Kumar Singh, JRF@PI & Dr. Nirlipta Priyadarshini Nayak@Supervisor	Nirlipta Priyadarshini Nayak(UPES);Rahul Kumar Singh(UPES-Inspire Fellow)			Department of Science & Technology-DST	SOAE	DST/INSPIRE Fellowship/2023/IF230084	06-04-2024	536643	60	Ongoing	Global warming and energy security leads to hunt for the alternative energy source and CO2 mitigation technologies like carbon capture utilization and storage (CCUS). CCUS is a prominent technique but its success depends upon the site of storage and agents influencing the storage ability. Geological formations, a type of abiotic method is considered to be much safer as compared to oceanic injection. Geological formations like hydrocarbon reservoirs, igneous formations are prospective sites for CO2 storage. Igneous formation	1. Comprehensive Estimation of CO2 storage potential of deccan volcanic provinces, India 2. First project to focus on the mineralogical and petrophysical characterization of DVP Basalts."	1. Aligns with the net zero targets of India. 2. Will aid in tackling climate change and will open a new area of co2 storage"
35	["Research Project"]	River health estimate using diatoms as pollution indicators and remediators of microplastic and heavy metal pollution		Smriti Arora(UPES)	Ramendra Pati Pandey(UPES)		Uttrakhand State Council for Science and Technology-UCOST	SOHST	UCOST-RND/35/2024-UCOST-DPT/26730	03-12-2024	500000	24	Ongoing	Uttarakhand is a tourist destination with pleasant weather year around and back drop of hills. The beauty is accentuated by its rivers and tributaries. However, in 2017-19 disturbing images of Suswa, Bindal and Rispana were posted by Uttarkhand residents to gain attention of CM, Uttarakhand to foster a river reclamation campaign. Following that several reports in Times of India and other media sources came about regarding same tributaries being more polluted than ever with high levels of lead, fluoride, nitrate and phosphate	River reclamation, Biodiversity, Pollution	Detection and degradation of microplastic using biomonitring and degradative capapcity of diatoms
36	["Fellowship"]	SRF-DIRECT	Huma Naz(PI) & Dr. Neelu Jyoti Ahuja(Supervisor)	Huma Naz(PhD Student);Neelu Jyothi Ahuja(UPES)			Council Of Scientific And Industrial Research-CSIR	SOCS	09/1415(18743)/2024-EMR-I	24-05-2024	480356	24	Ongoing	3.The proposed work presents a hybrid deep clustering algorithm that combines the proposed modified FCM and CNN for severity grading of the DR fundus images.	The proposed study validates the developed tool at Shri Mahant Indiresh Hospital, Dehradun, India, with guidance from ophthalmologists.	Early detection of Diabetic Retinopathy using Deep learning based techniques
37	["Research Project"]	Sustainable Management of municipal and medical plastic waste for production of hydrocarbon fuels	1-Dr. Bhawana Yadav Lamba(P.I) 2-Dr Amit Kumar Sharma(Co-PI)	Bhawna Lamba(UPES)	Amit Kumar Sharma(UPES)		Uttarakhand Science Education & Research Centre-USERC	SOAE	USERC/2023-24/447	28-11-2023	245000	18	Ongoing	Converting plastic waste into high-value petrochemical feedstocks together with the high calorific fuels may provide a sustainable solution for plastic waste. Among various processes, pyrolysis could be one of the most important processes, that involves the advanced thermochemical schemes, consisting of the thermal degradation of waste in an oxygen-free environment or with low oxygen content. To maintain a consistent pyrolysis environment, plastic waste is largely thermally converted in an inert atmosphere (N2 or carrier gas)	Physicochemical analysis of MSW and medical plastic wastes of Dehradun district. •Production of hydrocarbon fuels from plastic wastes. •Awareness on plastic waste segregation and applications in nearby rural area. •Support the Smart City flagship project - By sustainable management of the municipal and covid-19 plastic waste for	•Report on Physicochemical analysis of MSW and medical plastic wastes of Dehradun district. •Production of hydrocarbon fuels from plastic wastes. •Awareness on plastic waste segregation and applications in nearby rural area.

38	["Research Project"]	Himalayan Calling		Seema Shukla(UPES)	Jitendra Kumar Pandey(UPES)		Hyundai Motor India Foundation-HMIF	SOLS&M		30-12-2024	200000	12	Ongoing	Himalayan Calling" is an artistic initiative dedicated to preserving and promoting the folk stories of the Jaunsari tribe through audio storytelling. This project merges oral traditions, storytelling, and sustainable practices to engage local communities and a wider audience in meaningful discussions about cultural heritage, climate change, and biodiversity conservation. By collaborating with local storytellers, artisans, and environmentalists, the project seeks to bridge the gap between artistic expression and cultural preservation.	•Collection and curation of traditional folk stories from the Jaunsari tribe. •Creation of engaging audio stories to ensure accessibility and reach. •Integration of eco-friendly materials and sustainable artistic techniques. •Collaboration with local communities and traditional artisans. •Use of multimedia storytelling to communicate environmental and	•Encourages cultural preservation through digital storytelling. •Empowers local storytellers and artisans by promoting traditional narratives. •Engages youth and local communities in heritage and climate action initiatives. •Strengthens cultural identity and ecological awareness among people.
39	["Research Project"]	Investigation of interaction of hydrogen with Pd-Ag and Pd-GO alloy thin films for hydrogen sensing and storage applications	Shikha Wadhwa (PI); Dr Amit K Chawla (Co-PI); Prof Ramesh Chandra (Co-PI); Dr K Saravanan (Co-PI)	Shikha wadhwa(UPES)	Amit Kumar Chawla(UPES)		UGC - DAE	SOAE	CRS/2021-22/04/630	24-06-2022	132324	48	Ongoing	The project investigates the effect of GO and Ag on the properties of Palladium for hydrogen sensing and storage applications.	** Upon adding GO in Palladium, hydrogen sensing response is enhanced * Upon treating Pd-GO films with swift heavy ions (Ag ions), the sensing response increased upto 24% in comparison to pristine Pd * There is a change in mechanism from p-type to n-type semiconductor upon swift heavy ion treatment * For Pd-Ag films, the lower concentrations of Ag in Pd are better in terms of extent of peak-shift on hydrogenation/dehydrogenation and faster response/recovery	The leakage of hydrogen gas is impossible to detect due to its colourless and odourless nature. The study is important for developing hydrogen sensors for industrial applications where hydrogen gas is used.
40	["Research Project"]	Development of Ferrite nanomaterials for photocatalytic production of Hydrogen and conversion of Carbon dioxide into hydrocarbon	Dr Sanjeev Kumar Dubey	Sanjeev Kumar(UPES)			UGC - DAE	SOAE	CRS/2022-23/01/652	15-05-2023	90000	48	Ongoing	Spinel-ferrites are potential photocatalysts in photocatalytic reaction system due to their room temperature magnetization, the high thermal and chemical stability, narrow bandgap with broader visible light absorption, and proper conduction band energy level with strong oxidation activity for water or organic compounds. However, the fast recombination of the photoexcited electrons and holes is a critical drawback of ferrites. In the literature, the photocatalytic activity of spinel ferrites is found to depend upon	1. Synthesis and characterization of a series of Ferrite nanoparticles with desired composition and structure to achieve improved efficiency for photocatalytic conversion of hydrogen production , 2. To use low temperatre/high field Mossbauer spectroscopy and XPS to determine the site occupancy, magnetic structure, valance state etc., which play an important role in deciding the efficiency of photocatalytic conversion of hydrogen production. This information will be used to optimize the synthesis process like concentration,	1. The initiative might considerably lower the atmospheric concentration of CO2 by turning it into hydrocarbons, thereby reducing the effects of climate change. 2. Reliance on fossil fuels and pollution are decreased by the clean and sustainable energy source provided by photocatalytic hydrogen generation. 3. The establishment of new companies and jobs could result from the energy sector being revolutionised by the discovery of an
41	["Research Project"]	Upgrading bio-oil produced from waste biomass using Nanocatalyst	Dr. Leena Kapoor	Leena Kapoor(UPES)			UGC - DAE	SOAE	CRS/2021-22/01/432	24-06-2022	90000	36	Ongoing	The biomass selected for the project were spent coffee grounds, tea waste, lantana flower, ground nutshell and rice straw. The biomass selected were all waste and are available freely in larger scale in Dehradun region. The spent coffee grounds were collected from UPES coffee vending machines that uses roasted coffee beans and leave wastage. Around 14 coffee vending machines are available in UPES bidholi campus and produces on an average produces 10 to 15 kg waste per day. The tea waste was collected from local tea shops	•To produce an environmentally safe biofuel using waste biomass. •To synthesize high quality nano catalysts using chemical synthesis route. •To determine physiochemical properties of as-prepared catalyst. •To upgrade the bio-oil using the nano catalysts. •To analyze upgraded bioil	This project will be helpful in converting biomass, which is otherwise a waste into asset. Pyrolysis process also produces large amount of solid product know as bio char. This biochar when mixed with soil will enhance the soil properties, consequently increased crop yield. Bio char can also be used for household cooking purposes in the rural areas. This project will help in making small and marginal farmers self-reliant, promoting sustainable livelihood.
42	["Research Project"]	Study of phase transformation processes in thin films	Prof. Santosh Dubey	Santosh Dubey(UPES)			UGC - DAE	SOAE	CRS/2021-22/01/412	30-03-2022	90000	36	Ongoing	Investigation of various phases in Ni/Si thin films	NA	Important for microelectronics industry
43	["Research Project"]	Study of Radiation Stability of Tungsten Carbide nanostructures towards neutron irradiation	Dr. Ratnesh K Pandey(PI)	Ratnesh Kumar Pandey(UPES)			UGC - DAE	SOAE	CRS/2022-23/03/862	15-05-2023	89332	48	Ongoing	"The project focuses on investigating the radiation stability of tungsten carbide (WC) nanostructures when subjected to neutron irradiation. Neutron irradiation is a critical factor in the harsh environment of nuclear reactors, particularly in applications such as fusion reactors. Tungsten carbide, known for its hardness and resilience, is explored at the nanoscale to understand how it responds to the damaging effects of neutron radiation.	The key highlights of the project lie in its specific focus on nanostructured tungsten carbide, controlled neutron irradiation, structural and mechanical analyses, and the potential implications for the development of radiation-resistant materials in the context of nuclear applications.	"Nuclear Safety and Reliability: Understanding the radiation stability of WC nanostructures contributes to the development of materials that can withstand the harsh conditions within nuclear reactors. This research can enhance the safety and reliability of nuclear energy, assuring the public of the secure operation of nuclear power plants. Clean Energy Advancements: As nuclear energy is considered a low-carbon energy source, the project's outcomes could contribute to the advancement of clean energy technologies. Improved radiation
44	["Research Project"]	Origin and modulation of interfacial magnetic anisotropy in HM/CeFeB/MgO heterostructure for magnetic memory application	DR. SACHIN PATHAK(PI) & Prof. Ajay Gupta(CO-PI)	Sachin Pathak(UPES)	Dr. Ajay Gupta(UPES)		UGC - DAE	SOAE	CRS/2022-23/01/675	15-05-2023	87315	48	Ongoing	Perpendicular magnetic anisotropy (PMA) is receiving a lot of attention due to its prospective uses in data storage applications such as magnetic random-access memory (MRAM).[1] The structure consists of heavy metal (HM)/CoFeB/MgO and is one of the most popular heterostructures as far as magnetic tunnel junction (MTJ) in high-retention MRAM devices is concerned. However, till now PMA has been observed in CoFeB layer thicknesses of less than 2 nm only.[2] There is a strong need to increase the strength of PMA in	The purpose of the proposed research is to better control the PMA of heterostructure by examining the impact of systematic interface modifications like roughness, atomic intermixing, and Fe or/and O migration at the interface due to various phenomena like thermal annealing, ion irradiation, and metal insertion. Furthermore, such interface alterations produce strain modulation, and electronic bond orientation modulation results in PMA modulation in the heterostructure, all of which contribute to a more thorough	The stated project has substantial potential societal consequences, namely in the domain of data storage technology. Here is a detailed analysis of the process: Progress in Data Storage Technology: Gaining knowledge and mastery over perpendicular magnetic anisotropy (PMA) in heterostructures has the potential to drive improvements in data storage devices. Enhanced PMA leads to more stability and efficiency in data storage, providing advantages to multiple sectors