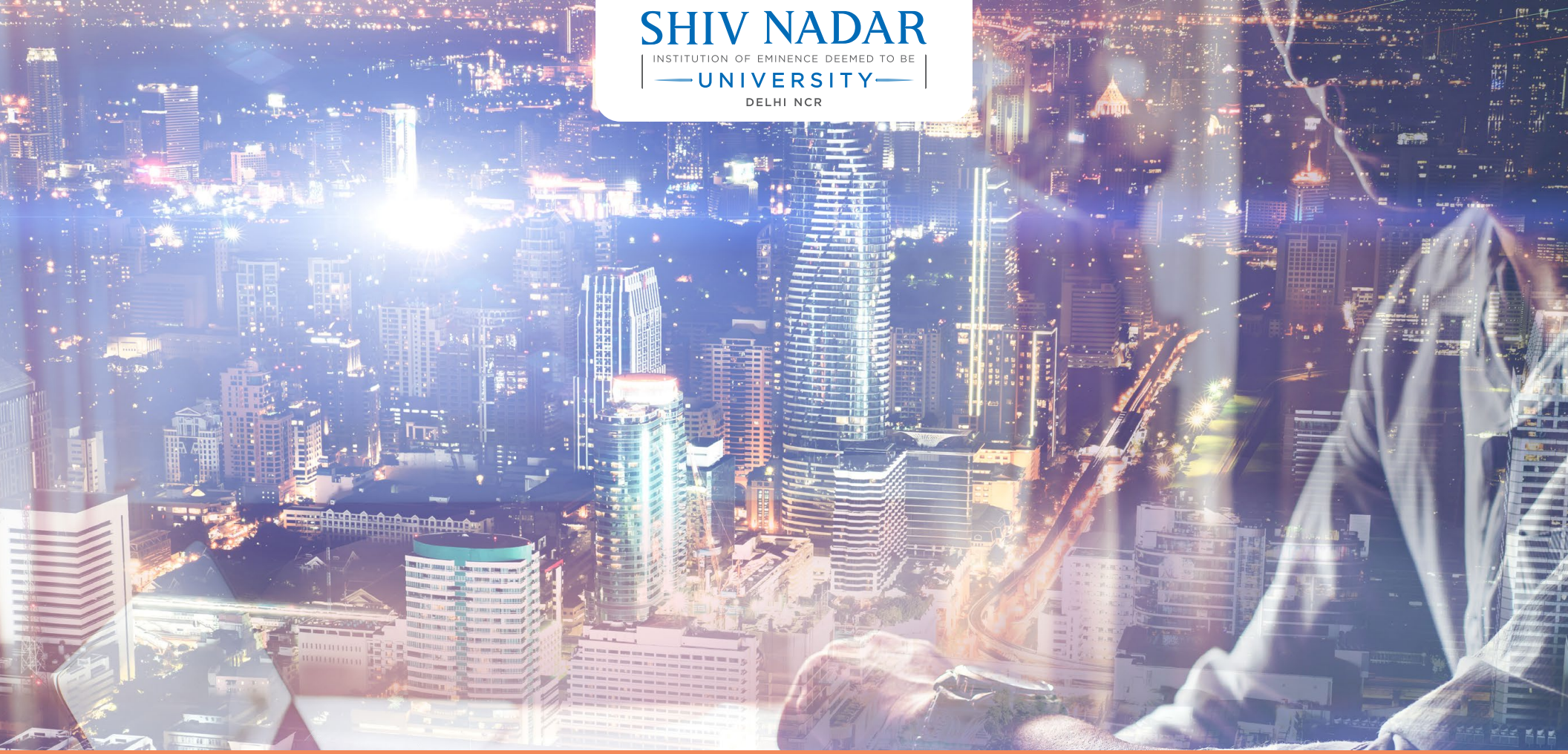
SHIV NADAR
INSTITUTION OF EMINENCE DEEMED TO BE
UNIVERSITY
DELHI NCR



SUSTAINABLE DEVELOPMENT GOAL 9

Industry, Innovation and Infrastructure

Build resilient infrastructure, promote sustainable industrialization, and foster innovation.

Overview

At Shiv Nadar University, the schools play a critical role in encouraging, investing, and making innovation possible through industry partnerships. With innovation at its core, we support start-up ideas through the Atal Incubation Center (AIC) to encourage and create an active entrepreneurship culture.

All schools have state-of-the-art labs and centers dedicated to nurturing industry partnerships.

Here is a glimpse of our work in SDG 9 through our teaching, research, institutional practices, and partnerships.

Teaching and Learning

The university departments offer many core courses with sustainability elements integrated across the curriculum of undergraduate and graduate programs. Business Model Innovation & Digital Transformation (STO 505), From Creativity to Innovation Management (STM 103), Design Thinking and Innovation (STM 510), Creating Entrepreneurial Ventures (STM 651), Creativity and Innovation (MGT 602), Innovation Strategies for Emerging Technologies (EXC 404), Design thinking & Innovation (STM 955), New Product Development and Open Innovation (MGT 605), IP Analytics for Business Innovation (MGT 202).

Besides, we offer courses on sustainability and related areas to all students across the university. For undergraduate students, many compulsory courses are regularly offered, such as Design Thinking and Innovation (CCC 513), From Creativity to Innovation Management (CCC 514), Environmental Studies (CCC 704), Biodiversity: Assessment & Conservation (CCC 706), Environmental Impact Assessment (CCC 406), and Energy for Sustainable Future (CCC 614), Use of Energy in our Daily Life (CCC 624), and Green Energy Technologies (CCC613) to name a few.

Student Alumni Success

2015 alumnus is on the Forbes list of 200 Select Companies with Global Business Potential

Shiv Nadar University alumnus Rakesh Munnanooru (B.Tech. Computer Science, Batch of 2015), Founder and CEO of startup WhistleDrive, and his cofounder Prashanth M., CGO have made it to the coveted Forbes 200 Select Companies with Global Business Potential list. WhistleDrive focuses on urban mobility and logistics to help businesses build effective transportation solutions with its AI platform, WhistleOS.

Research

Mapping innovation in India's creative industries: Policy, context and opportunities

The first in-depth study of the Indian creative industries, this book provides a comprehensive mapping of the Indian creative industries and its policy landscape, developing and defining key concepts and terms and offering detailed case studies of specific sectors, geographic regions, and governance structures. Using an ecosystem framework, this book focuses on strategy/policy, tangible and intangible infrastructure, and funding and investment to understand the main drivers and barriers across nine sub-sector value chains. With investment from global brands into many sectors, it tracks how Indian creative industries are fostering innovation and design for social and ecological sustainability. It also delves into India's informal economy to share key policy insights. The volume will greatly interest scholars and researchers in public policy, business studies, and South Asian studies. It will also be a key document for foreign investors willing to invest in one of the fastest-growing and stable economies in the world.

Dasgupta, Rohit K., Jennie Jordan, Graham Hitchen, Kishalay Bhattacharjee, Diviani Chaudhuri, D. Deepa, and Adrija Roychowdhury. *Mapping Innovation in India's Creative Industries: Policy, Context and Opportunities*. Taylor & Francis, 2023.

Remote Sensing in Precision Agriculture: Transforming Scientific Advancement into Innovation

This book compiles the latest applications of remote sensing in agriculture using spaceborne, airborne, and drone geospatial data. The book presents case studies, new algorithms, and the latest methods surrounding crop sown area estimation, determining crop health status, assessment of vegetation dynamics, crop diseases identification, crop yield estimation, soil properties, drone image analysis for crop damage assessment, and other issues in precision agriculture.

Lamine, Salim, Prashant K. Srivastava, Ahmed Kayad, Francisco Munõz-Arriola, and Prem Chandra Pandey. "Remote sensing in precision agriculture: *transforming scientific advancement into innovation.*" (2023).

Seismic risk assessment for the Northeastern Region of India by integrating seismic hazard and social vulnerability

This study conducts a comprehensive seismic risk assessment for the Northeastern Region of India at regional and sub-regional levels by integrating probabilistic seismic hazard and social vulnerability assessments. Bedrock-level peak ground acceleration varied from 0.14 to 0.69g for the return period of 475 years. Using PCA, the social vulnerability index (SVI) was generated considering district-level socioeconomic indicators. Built environment quality, illiteracy, access to amenities, dependent population, and employment opportunities contributed to high SVI. Most vulnerable districts were concentrated in the Brahmaputra floodplains, Tripura fold belt, and Imphal valley. At the regional level, significant parts of Assam, Meghalaya, Arunachal Pradesh, and Tripura lie in moderate to very high-risk zones. At the sub-regional level, Nagaland accounts for the highest proportion of areas in high to very high-risk zones. The findings will aid site-specific resilient infrastructure design, disaster risk reduction, and effective resource allocation for the risk-prone areas.

Agrawal, Navdeep, Laxmi Gupta, Jagabandhu Dixit, and Sujit Kumar Dash. "Seismic risk assessment for the Northeastern Region of India by integrating seismic hazard and social vulnerability." *Sustainable and Resilient Infrastructure 8*, no. sup1 (2023): 102-132.

Performance measurement of sustainable freight transportation: a consensus model and FERA approach

Sustainable freight transportation aims to reduce environmental emissions, social inequity, and economic inefficiency to drive the business. The lack of a continuous sustainability assessment and monitoring tool increases the reluctance of freight transporters to adopt world-class sustainability practices. This paper attempts to develop the performance index for a sustainable freight transportation system by innovatively integrating the Consensus Model (CM) with the Fuzzy Evidential Reasoning Algorithm (FERA). A CM has been used to determine the degree of importance of each Key Performance Indicator identified across three dimensions of sustainability. FERA has been used to aggregate subjective judgments with crisp quantitative values. This approach can uniquely handle various uncertainties related to impreciseness in decision-making. This study has demonstrated an integrated approach for developing a freight transportation system performance index. Sensitivity Analysis of the model provides logical inferences and an understanding of the robustness of the model outputs. The study results show that firms with higher profitability in the market are focusing more on making their operations sustainable. A proportionate approach of firms towards economic, environmental, and societal well-being may assist in achieving higher sustainability.

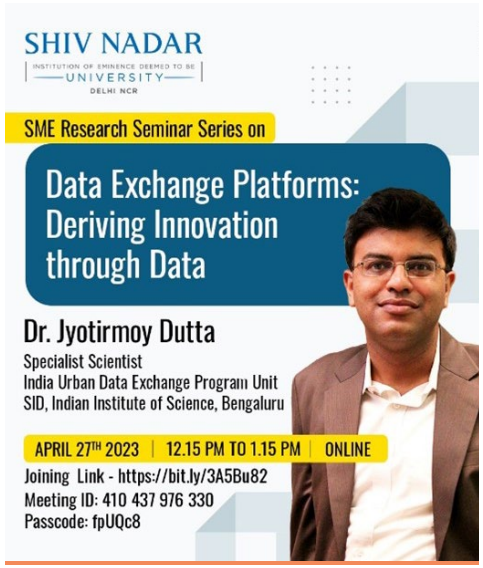
Fulzele, Vijayta, and Ravi Shankar. "Performance measurement of sustainable freight transportation: a consensus model and FERA approach." *Annals of Operations Research* 324, no. 1 (2023): 501-542.

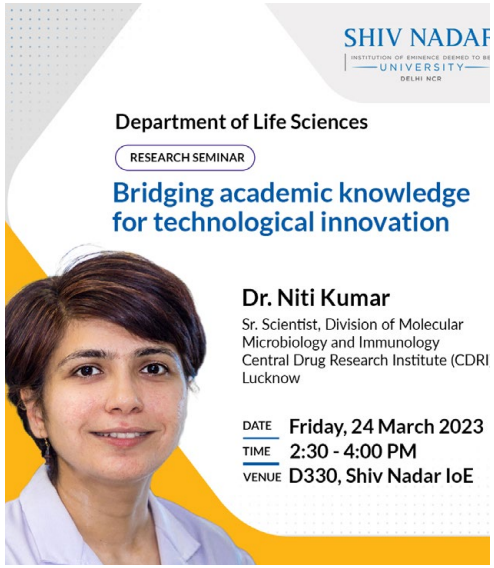
Hundreds of millions in the tropics need wild harvests and other economic development for their well-being.

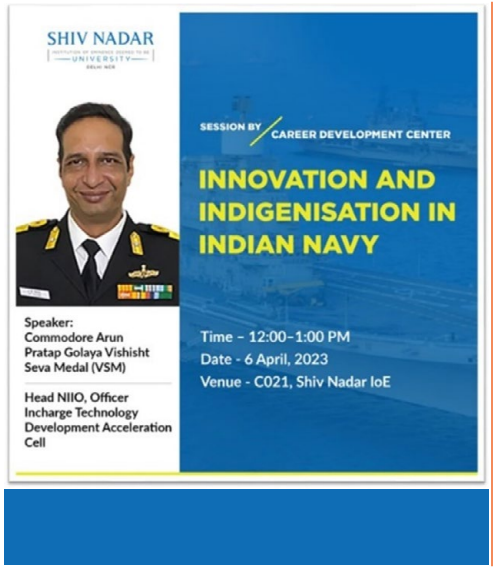
Local access to “wild,” common-pool terrestrial and aquatic resources is being diminished by global resource demand and large-scale conservation interventions. Many theories suggest that the well-being of wild harvesters can be supported through transitions to other livelihoods, improved infrastructure, and market access. However, new theories argue that such benefits may not always occur because they are context-dependent and vary across dimensions of well-being. We test these theories by comparing how wild harvesting and other livelihoods have been associated with food security and life satisfaction in different contexts across ₹ 10,800 households in the tropics. Wild harvests coincided with high well-being in remote, asset-poor, and less-transformed landscapes. Yet, overall, well-being increased with electrical infrastructure, proximity to cities, and household capital. This provides large-scale confirmation of the context dependence of nature’s contributions to people and suggests a need to maintain local wild resource access while investing in equitable access to infrastructure, markets, and skills.

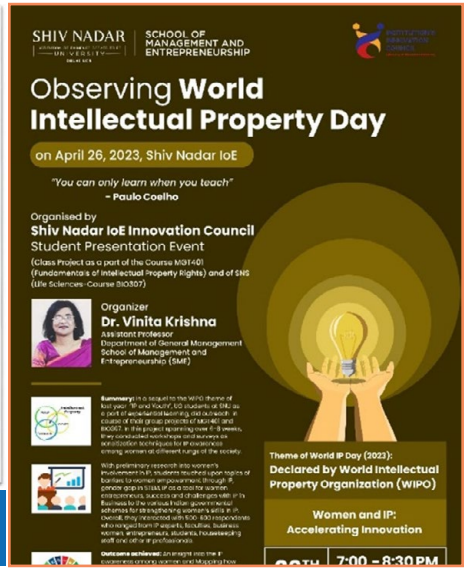
Wells, Geoff J., Casey M. Ryan, Anamika Das, Suman Attiwilli, Mahesh Poudyal, Sharachchandra Lele, Kate Schreckenberg, et al. “Hundreds of millions of people in the tropics need both wild harvests and other forms of economic development for their well-being.” *One Earth* 7, no. 2 (2024): 311-324.

Conversations on Campus









InvestoPitch'23

InvestoPitch'23, hosted by the Atal Incubation Center (AIC) set up at Shiv Nadar University, was organized at HCL Tech, Noida. One of the aims was to provide the incubated startups of Shiv Nadar AIC with an investment platform and networking opportunities.

InQube 2023 draws 10000+ participants from 2000+ institutions

InQube is the annual national-level business competition of the School of Management and Entrepreneurship. The competition includes rounds of business quizzes, real-world simulations, debates, and ideations. Starting in September 2023, the competition went through several rounds across many cities. The final national teams competed from October 13-15, 2023, at the Shiv Nadar University campus—this year's theme on "Sustainability and Innovation" witnessed 10000+ participants from 2000+ educational institutions across India.

The Venture Lab ™

The curriculum of the Bachelor of Management Studies (BMS) program at Shiv Nadar University is uniquely designed to prepare its students to thrive in an all-encompassing digital business environment. The curriculum offers students the invaluable opportunity to 'Learn Business by Doing Business' inside The Venture Laboratory. The Lab is a mandatory course requiring a group of students to ideate, develop, and incubate a startup. It provides students with an extensive, authentic, and rigorous entrepreneurial experience in which they learn to build and run a business enterprise from point zero. The program focuses on equipping students with the necessary competencies, skills, and attitudes to surmount business complexities and gain the confidence to handle tomorrow's real-life business challenges by experiencing them today.

The Venture Lab experience includes mentorship by faculty and domain experts. Students are guided on all the core and functional aspects of setting up and managing their business venture while the University provides funding.

The Atal Incubation Centre (AIC)

Atal Incubation Center at Shiv Nadar University is a tech-agnostic, hardware-focused premier incubation center established with Atal Incubation Mission, Niti Aayog, to foster a culture of innovation and entrepreneurship and create a holistic environment to help innovation-driven individuals develop and succeed in their business ventures under coordinated direction. The incubated startups receive business resources, technical assistance, and the benefit of a supportive and vibrant academia that leads and inspires them to build a sustainable business model. The incubation center is equipped with world-class facilities and state-of-the-art infrastructure spread over 10,000 sq. ft space amidst the sprawling 286 acres of land, well equipped with 154 labs, eight research centers, 24 departments, and infrastructure to attract startups from across the country to do transitional research and R&D. Some of the areas in which AIC focuses are Industry 4.0, Robot and Robotic Process, Automation, Additive Manufacturing, Life Science, EV & Power Batteries, Women-Led Startups, Space Tech, Health Tech, Ed Tech, Agri Tech and Other Disruptive Technologies.

Mr. Parameswaran Iyer, CEO of NITI Aayog, Government of India, commended the work at our Atal Incubation Center. We supported 100+ startups to date, and in 2023, we incubated 45+ start-ups. We currently have 28 tech-agnostic active startups in sectors such as Industry 4.0, Robotics, Artificial Intelligence & Machine Learning, B2B SAAS, Edu-Tech, Agri-tech, and others.

Infrastructure on campus

The University is home to excellent research infrastructure, including a dedicated Research Block with an area of 63000 sq. ft. that houses significant research equipment and facilities for experimental research. The University is the first in the country to establish a Center for Genomics and Spatial Transcriptomics (STOMICS).

At Shiv Nadar, all buildings are certified by the Indian Green Building Council (IGBC) or Leadership in Energy and Environmental Design (LEED). Several buildings, including the 120,000 square ft. sports complex, are LEED Gold certified; others are awaiting gold certification. The main features of these buildings include energy efficiency, renewable energy generation, water efficiency, stormwater management, and a superior indoor environment.

Partnerships

Atal Incubation Center (AIC) hosts InvestoPitch'23 in partnership with HCL.

InvestoPitch'23, hosted by the Atal Incubation Center (AIC) set up at Shiv Nadar University, Delhi-NCR, was organized at HCL Tech, Noida. One of the aims of this fest was to provide the incubated startups of Shiv Nadar AIC with an investment platform and networking opportunities.

Dassault Systèmes Center of Excellence

The Shiv Nadar University-Dassault Systèmes Center of Excellence (SDC) is over 5,000 square feet. This state-of-the-art center results from a novel academia-industry collaboration that aims to fuel research, innovation, design, and entrepreneurship through problem-solving on industry-based projects using Dassault Systèmes' globally recognized 3DExperience platform.

Students at the SDC receive training and exposure to real-world industry practices and challenges to devise innovative, deployable, and sustainable solutions. This collaborative approach facilitates creating an industry- and future-ready global workforce with a highly enhanced employability quotient. The center is equipped with a host of enviable facilities ranging from world-class Dassault Systèmes (DS) software to complementary high-end workstations, 3DExperience theater, VR setup, and a sophisticated lab alongside functional spaces with focus areas around product design, business analytics, and predictive sciences for drug discovery and systems biology analysis.

Industrial Partnerships through Carer Development Cell (CDC)

At Shiv Nadar Institution of Eminence, university-industry partnerships provide excellent opportunities to expose students to industry culture and better prepare them to start working at these companies after graduation. Through industry partnerships, students gain training in highly skilled industrial applications and the ability to navigate the treacherous industrial set-up. Mutually beneficial partnerships can produce groundbreaking research and innovation that solves complex problems, drive economic growth, and create a more skilled workforce. Our partnerships intend to foster a sense of individuality and responsibility in our future employees.

We also extensively partner with reputed industries for live projects, guest lectures, leadership talks, workshops, collaborative research, internships, and partnering with leading industry players in domains such as consulting, mechanics, science and technology, and telecommunication.

Entrepreneurship Cell- Shiv Nadar IoE

The entrepreneurship cell at Shiv Nadar University organized a fest in partnership with MIC ('MoE's Innovation Cell (MIC), Ministry of Education to promote innovation and entrepreneurship culture at the University. Held on January 13 and 14, 2023, the fest brought together 13 student clubs and societies, including various activities, events, and displays in technical, entrepreneurial, cultural, sports, and social-good domains.

Shiv Nadar University Delhi NCR hosts the inaugural Industry Partners Meet

Shiv Nadar University held its inaugural Industry Partners Meet on January 19, 2024. Themed "Innovate, Educate, Elevate," the event was attended by industry leaders from over 100 organizations spanning 11 major sectors: IT, core engineering, consulting, financial, FMCG, semiconductor, automobile, social sector, think tanks, startups, telecom, and more. The guests included CEOs of Microsoft, PwC, LinkedIn, and HR leaders from GAIL, McKinsey, and Hewlett Packard Enterprise India. The meet featured insightful sessions, including Leadership Panels.

Memorandum of Understanding signed with Silicon Lab Inc.

A Memorandum of Understanding was signed with Silicon Labs to establish a Center of Innovation at the university specializing in IoT and Embedded technology.

Shiv Nadar University participated in a Knowledge Session at UP International Trade Show 2023

Shiv Nadar University's representative faculty and staff participated in the panel discussion on the *Industry-Academia partnership in Amritkaal* in the Knowledge Session at the Uttar Pradesh International Trade Show (UPITS) 2023 on September 23, 2023. The UPITS 2023 was jointly organized by the Government of Uttar Pradesh and India Expo Centre and Mart from September 21 – 25, 2023.

Shiv Nadar University inks MoU with Bharat Petroleum's Corporate Research & Development Centre

Shiv Nadar University, in partnership with Bharat Petroleum's Corporate Research & Development Centre (CRDC), is a significant stride towards advancing sustainable chemical processing technologies. By focusing on process intensification for highly exothermic reactions, the project aims to develop novel reactor designs that enhance energy efficiency and reduce waste. This initiative aligns with several key sustainable development goals, including Goal 9: Industry, Innovation, and Infrastructure - By fostering sustainable industrial innovation and infrastructure development through advanced reactor designs. Goal 12: Responsible Consumption and Production – By emphasizing efficient heat management and reducing the environmental impact of chemical processes. Goal 13: Climate Action - By enhancing energy efficiency and minimizing waste, our collaboration contributes to efforts to mitigate climate change impacts. This partnership exemplifies how industry-academia collaborations can drive sustainable technological advancements, aligning with India's commitment to the United Nations Sustainable Development Goals (SDGs). This partnership project is going to have a positive impact on industry standards and environmental sustainability.

Shiv Nadar Institution of Eminence is fully committed to the UN Sustainable Development Goals (SDGs). We have embraced a four-pronged strategy for SDGs through **teaching, research, our core institutional practices, and partnerships.**

Deepa Hazrati
Sr. Manager, Office of the Vice-Chancellor
deepa.hazrati@snu.edu.in

Shiv Nadar Institution of Eminence
Gautam Buddha Nagar, Uttar Pradesh, India
www.snu.edu.in/home