

SHIV NADAR

INSTITUTION OF EMINENCE DEEMED TO BE
UNIVERSITY
DELHI NCR

Report on
**Sustainable
Development**

GOAL
9



Build resilient infrastructure, promote sustainable industrialization, and foster innovation



India stands at the confluence of technological progress and societal transformation, driving innovation in advanced technologies and tackling global challenges like climate change, healthcare, and economic equity.

At Shiv Nadar University, we believe transformative research thrives at the intersection of academic rigour and real-world relevance. With innovation at its core, we support start-up ideas through the [Atal Incubation Center \(AIC\)](#) to encourage and create an active entrepreneurship culture. Besides, the 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

At Shiv Nadar University, many departments offer 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 a core common curriculum to all undergraduate students across the university. Many of these courses inspire the idea of sustainability into daily life and encourage critical thinking on debates across the globe such as, 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.

Venture Lab – From Idea to Impact with Seed Funding and Mentorship

The Venture Lab at Shiv Nadar University is a unique experiential learning program that offers students of the Bachelor of Management Studies the opportunity to 'learn business by doing business.' The entrepreneurial experience at the Lab offers them opportunity to learn to ideate and run a business enterprise while receiving mentorship and funding for their ventures.

The Venture Lab has helped incubate innovative student-led start-ups that address pressing challenges.



Student Stories

[Tasneem Ahmad](#), a Ph.D. scholar at Shiv Nadar University, is on researching start-ups at the School of Management and Entrepreneurship. His prime focus is “Study of Factors Impacting the Performance of Start-ups”. Tasneem has noteworthy achievements to his name, including winning the Best Paper Award at the international conference on ‘The Role of Innovation, Entrepreneurship and Management for Sustainable Development (ICRIEMSD-2022)’ for his work titled ‘The impact of intellectual property assets on the valuation of start-ups (Unicorns).’

He also presented a paper on ‘The Impact of Founders’ Characteristics on Fundraising by Start-



I won the Best Paper Award at ICRIEMSD-2022 for my work on “The impact of intellectual property assets on the valuation of start-ups (Unicorns).” My case study titled “GODI India: A Kickstart to Innovative Batteries for Electric Vehicle” has also been published in ‘The Case Journal’ of Emerald Publishing.



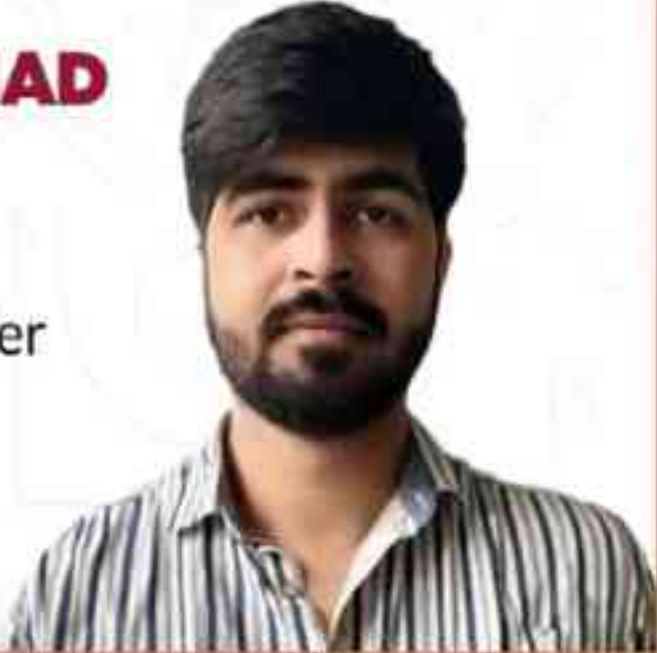
- TASNEEM AHMAD
Ph.D. Scholar at the School of Management and Entrepreneurship

ups: A Study of Indian Start-ups’ at the British Academy of Management 2023 Conference (BAM 2023) held at the University of Sussex, UK. His case study titled ‘GODI India: A Kickstart to Innovative Batteries for Electric Vehicle’ has also been published in ‘The CASE Journal’ of Emerald Publishing.



Meet

TASNEEM AHMAD
Currently pursuing Ph.D. in Strategy and Entrepreneurship under the guidance of **Dr Vinita Krishna**



Alumni Spotlight

Many of our alumni are making their mark in the world, thriving in meaningful careers, or on the path to one.

Girik Malik is an alumnus of 2017, B.Tech in Computer Science Engineering, who has made a remarkable journey from Shiv Nadar University to becoming an Applied Scientist at Amazon. He is passionate about Artificial Intelligence and Neuroscience and focuses on creating innovative solutions that drive social impact.

His notable accomplishments include developing advanced algorithms that enhance data efficiency and storage, showcasing his commitment to technology and research. Girik's work reflects a deep dedication to harnessing technology for meaningful societal change and continues to make strides in the tech industry!



ALUMNI SPOTLIGHT

From Shiv Nadar University
to pursuing passions in Neuroscience and AI

Girik Malik
B.Tech in Computer Science Engineering
Class of 2017

Applied Scientist
Amazon



RESEARCH

Finding new ways to produce maleic anhydride

Dr. Rajesh VM, Associate Professor, Department of Chemical Engineering, offers a potential path for India to be self-reliant in producing maleic anhydride.

Maleic anhydride, a white powder, is the proverbial pivot that propels industries worldwide. The sheer




Dr. V M Rajesh
Associate Professor
Department of Chemical Engineering

Spearheading research to produce maleic anhydride domestically, a chemical that India currently spends **\$127 million** to import.

Dr. Rajesh focuses on optimizing reactor designs for the oxidation of n-butane, a highly exothermic reaction that generates significant heat.

His research is in collaboration with Bharat Petroleum's Corporate Research and Development Centre.

<https://snu.edu.in/blogs/finding-new-ways-to-produce-maleic-anhydride/>



versatility of this chemical pegs its global market value at a staggering \$4.8 billion, projected to cross \$7 billion by 2032.

Dr. Rajesh's research, in collaboration with Bharat Petroleum's Corporate Research and Development Centre, also stands as an example of the symbiotic relationship between industry and academia.

"We explore the parallelization of millireactors to achieve scalable production rates, catering to industrial demands while ensuring superior thermal management and operational safety," says Dr. Rajesh.

Developing sustainable building solutions for the economically weaker section (EWS)

Dr. Ghanshyam Pal, Associate Professor in the School of Engineering, is researching phase change materials to ensure buildings remain relatively cooler during summer and warm during winter. He has




Dr. Ghanshyam Pal
Associate Professor
School of Engineering

Developed nano-enhanced phase change material system to improve building energy performance.

The research is being conducted at the Advanced Materials and Building Energy (AMBE) Lab, Shiv Nadar University, Delhi-NCR. AMBE has received a grant of Rs. 92.2 lakh from DST, Government of India.

<https://snu.edu.in/blogs/researching-the-blocks-of-sustainability-modern-buildings/>



developed a nano-enhanced phase change material system using organic materials, biopolymers, and industrial by-products.

Dr. Pal's research is directly connected to SDG 7 (Clean Energy), SDG 11 (Sustainable Cities and Communities), and SDG 9 (Innovation and Infrastructure).

Working at the Advanced Materials and Building Energy (AMBE) Lab at Shiv Nadar University, Dr. Pal says his passion for developing sustainable building solutions for the economically weaker section (EWS) housing has been the fundamental driving force behind his research work.

Research to facilitate seamless communication in areas with weak 5G networks

Dr. Shankar Kumar Ghosh, Assistant Professor in the School of Engineering, is engaged in research

SHIV NADAR
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Dr. Shankar K. Ghosh

Assistant Professor
School of Engineering



Working to enable seamless communication using fog technology in places where 5G networks fail to perform at their full potential, in collaboration with the Indian Statistical Institute, Kolkata.

Dr. Ghosh has developed an algorithm to help mobile operators design efficient handover algorithms for IoT networks to improve a connection's reliability and data rate.

<https://snu.edu.in/blogs/clearing-the-air-on-fog-enabled-networks>



to bridge the issues caused by limited wireless coverage. His work is at the forefront of facilitating seamless communication in areas with weak 5G networks.

Dr. Ghosh proposes a handover algorithm considering received signal strength and available computing resources in neighboring fog nodes. His analysis and simulation have revealed that the algorithm outperforms the existing approaches regarding job completion delay and service rate.

"For example, consider an augmented reality-assisted tour guide where a trekker is streaming his progress live using nearby Fog Networks. If the trekker is using this to instruct those following him for the challenges ahead, any latency in transmission may raise an issue of life and death. The algorithm I have developed will navigate this challenge," he says.

From the collection of one of the most impactful research articles published in the Journal of the American Chemical Society over the past 25 years of chemistry research in India

Dr. Kshatresh Dutta Dubey, Assistant Professor, Department of Chemistry, authored an article titled "[Solvent Organization and Rate Regulation of a Menshutkin Reaction by Oriented External Electric Fields are Revealed by Combined MD and QM/MM Calculations](#)", which has been included in the special collection of the Journal of the American Chemical Society (JACS) called "Celebrating the 25th Anniversary of the Chemical Research Society in India".

The article is one of the most impactful and significant research articles published in the Journal of the American Chemical Society (JACS), which has been published over the past 25 years of chemistry research in India. The topic is fundamental research that can influence the development of new chemical processes, materials, or catalysis techniques.

Dr. Dubey published the article as the first and corresponding author back in 2020. This was his debut publication with a Shiv Nadar University, Delhi-NCR affiliation.

JACS

JOURNAL OF THE AMERICAN CHEMICAL SOCIETY

pubs.acs.org/JACS

Article

Solvent Organization and Rate Regulation of a Menshutkin Reaction by Oriented External Electric Fields are Revealed by Combined MD and QM/MM Calculations

Kahatresh Dutta Dubey,^{*,†} Thijs Stuyver,^{*,‡} Surajit Kalita, and Sason Shaik^{*}

Cite This: *J. Am. Chem. Soc.* 2020, 142, 9955–9965

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ABSTRACT:

When and how do external electric fields (EEFs) lead to catalysis in the presence of a (polar or nonpolar) solvent? This is the question that is addressed here using a combination of molecular dynamics (MD) simulations, quantum mechanical/molecular mechanical calculations with EEF, and quantum mechanical/local electric field calculations. The paper focuses on a model reaction, the Menshutkin reaction between CH₃I and pyridine in three solvents of varying polarity. Using MD simulations, we find that the EEF causes the solvent to undergo organization; the solvent molecules gradually align with the applied field as the field strength increases. The collective orientation of the solvent molecules modifies the electrostatic environment around the Menshutkin species and induces a global electric field pointing in the opposite direction of the applied EEF. The combination of these two entangled effects leads to partial or complete screening of the EEF, with the extent of screening being proportional to the polarity/polarizability of the solvent. Nevertheless, we find that catalysis of the Menshutkin reaction inevitably emerges once the EEF exceeds the opposing field of the organizing solvent, i.e., once polarization of the Menshutkin complex is observed to set in. Overall, our analysis provides a lucid and pictorial interpretation of the behavior of solutions in the presence of EEFs and indicates that EEF-mediated catalysis should, in principle, be feasible in bulk setups, especially for nonpolar and mildly polar solvents. By application of the charge-transfer paradigm, it is shown that the emergence of OEEF catalysis in solution can be generalized to other reactions as well.

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One day seminar on

Process Safety in Industry

30th August 2024

Shiv Nadar Institution of Eminence, Delhi NCR

Organized by:

The Institution of Engineers, India under the aegis of Safety and Quality forum in association with IICHE-NRC, Student Chapter, Department of Chemical Engineering, Shiv Nadar University

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ATAL

INCUBATION

CENTRE

STARTUP BOOTCAMP

Develop your startup ideas

Live session with successful founders and investors

Apply concepts with real-time feedback

Master the Entire Startup Journey, from Ideation to Pitch

5th Aug - 9th Aug, 2024

Shiv Nadar University

Contact Us:

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Talks on Campus

Department of Civil Engineering

TALK ON

Empowering Tomorrow's Innovators: A Workshop Integrating Computing and Engineering for Sustainable Development Goals

SHIV NADAR

SCHOOL OF ENGINEERING

SPEAKERS

Dr. Sarah Dunn

Senior Lecturer in Structural Engineering and Director of Student Recruitment School of Engineering

Dr. Gary Ushaw

Director of Business and Engagement, School of Computing at Newcastle University

ABSTRACT

Students will actively engage in brainstorming and developing sustainable engineering solutions that contribute to the global goals. The culmination of this will be a hands-on session where attendees will collaborate to design a video game that would effectively translate their ideas into an interactive medium that showcases the impact of sustainable engineering on solving real-world challenges.

MODERATOR

Dr. Ellora Padhi

Assistant Professor Department of Civil Engineering Shiv Nadar IoE

DATE

13th Feb., 2024 (Tuesday)

TIME

3:30 to 4:30 PM

VENUE

D-022, Shiv Nadar IoE

TATA

SOCIAL ENTERPRISE CHALLENGE

GET BETTER AT DOING GOOD WITH TSEC SPARK SOCIAL SEMINAR

OUR SPEAKERS

MANEET GOHIL

Co-Founder, Laid

RADHESH AGRAHARI

Co-Founder, Diksha Feedhubs

24 April, 2024

10:30 am to 01:30 pm

Atal Innovation Hub, Shiv Nadar University, Delhi NCR, India

PROGRAM BENEFITS

- Seed Funding up to ₹5 Lakhs
- Recognition by the Government of India
- Incubation at Atal Innovation Hub
- Prize Money up to ₹10 Lakhs PM
- Become part of the social entrepreneurship community
- Networking, capacity building & Accelerator Programs

Register Now to learn the secrets of social entrepreneurship!

Official Host Partner

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UNIVERSITY OPERATIONS

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.

We have supported 100+ startups to date, and in 2023, we incubated 45+ startups. 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

Shiv Nadar University co-hosted the first-ever Innovation and Impact Summit in partnership with Times Higher Education.

Shiv Nadar University co-hosted the first-ever Innovation and Impact Summit in India in partnership with Times Higher Education. Exploring the role of higher education in empowering innovation globally and measuring its impact on the world, the summit brought together 100+ speakers and 300+ delegates from 36 countries.

Held over three days, the summit explored critical domains spanning AI, neuroscience, health, innovations, clean energy, sustainability, and many more. The event's success was a testament to the power of partnerships and dialogue on perspectives. Aligning aspirations of leading institutions, industry experts, and policymakers.





Collaborating on mitigating circuit ageing

Dr. Sonal Singhal, Associate Professor in the School of Engineering, is working to mitigate circuit ageing. In line with Shiv Nadar University, Delhi-NCR's vision of collaborative research, the work is being conducted with the University of Michigan, Shanghai Jiao Tong University, the Joint Institute Shanghai, and BITS Pilani. Collaborations are essential as they involve shared resources.

“Circuits designed at advanced technology nodes are prone to device degradation. Bias Temperature Instability (BTI) is the most common device degradation mechanism in Static Random Access Memory (SRAM). At advanced technology nodes, time-dependent process variability is a dominant degradation mechanism besides time-zero process variability. Ensuring the lifetime reliability of advanced computing systems such as SRAM-based In-Memory Computing (IMC) is of paramount importance,” says Dr. Singhal.

The research aims to recognize how traditional computing reaches its threshold and provide circuits that can make a computer work like a human brain.

Circuits designed at advanced technology node are prone to device degradation.

[*https://snu.edu.in/blogs/circuits-hold-the-key-to-future-computing/](https://snu.edu.in/blogs/circuits-hold-the-key-to-future-computing/)

A Fully Open Access (FOA) Memorandum of Understanding (MoU) was signed between the University and Springer Nature India at the Conclave.

Shiv Nadar Institution of Eminence, in collaboration with Springer Nature in India, hosted the India Sustainability Conclave 2025 on February 25 at the University campus.

This event brought together visionaries, experts, and change-makers to discuss pressing sustainability challenges and explore how research can bridge the gap between industry and academia while encouraging open access to foster scientific innovation and strengthening global research infrastructure.

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Dr. Sonal Singhal

Associate Professor

Department of Electrical Engineering

Researching the possibility of reinventing the von Neumann computing architecture to mitigate circuit ageing in collaboration with the University of Michigan, Shanghai Jiao Tong University, Joint Institute Shanghai, and BITS Pilani.



Events to thrive partnerships and innovation between academia and industry

GTIPA 2024 Summit

The Global Trade and Innovation Policy Alliance - GTIPA Summit 2024, hosted by Shiv Nadar University, Delhi-NCR, in partnership with the Institute for Competitiveness, was held on November 15-16, 2024, on the theme 'India - Innovation Hub of Tomorrow'.

At Shiv Nadar University, we believe sustainable innovation flourishes where science, technology, policy, and the humanities intersect. True innovation shapes a better tomorrow by addressing today's challenges with inclusivity and sustainability. Platforms like the GTIPA Summit thus become

crucial for fostering collaboration and amplifying diverse voices to solidify India's leadership in innovation.

Global Trade and Innovation Policy Alliance (GTIPA) is a network of over 50 think tanks from 35 countries across the world that inspires a vision that trade, globalization, and innovation, when conducted on private enterprise-led, market-based, rule-governed terms, can maximize welfare for the world's citizens. The summit resulted in many sessions, robust knowledge exchange on best practices and innovation methods, and network opportunities.

InvestoPitch 2.0 - a unique investment platform

Atal Incubation Center at the Shiv Nadar University organized InvestoPitch 2.0, a platform to foster innovation and entrepreneurship for startups to raise funds, generate leads, and enable deal closures. The event saw active participation of startups from diverse sectors, including biotechnology, industry 4.0, AI/ML, AR/VR, renewable energy, health tech, circular economy, and green energy.

The event's success was in excellent participation, elevator pitches, networking opportunities, and investor speed mentor dating, where investors shared their advice and insights with the startups.



International Conference on Advances in Control and Optimization of Dynamic Systems (ACODS) in association with Automatic Control and Dynamical Optimization Society (ACDOS)

Shiv Nadar University hosted the eighth edition of the International Conference on Advances in Control and Optimization of Dynamic Systems (ACODS) in association with the Automatic Control and Dynamical Optimization Society (ACDOS), which is an Indian NMO of the International Federation of Automatic Control (IFAC). The biennial conference was organized in physical mode from March 12-15, 2024.

The four-day conference brought together an international community of researchers and



practitioners from academia, industry, and research labs to disseminate new developments and advances in control and optimization of dynamical systems. The conference featured six plenary talks on modeling and controlling large nuclear reactors, controlling floating offshore wind turbines, innovations in aerospace, cyber-physical systems for Industry 4.0, and the Diabetes Simulator: from birth to adolescence. Highlighting the focus on advances in control theory and dynamic systems optimization that enables innovation in critical sectors—such as smart manufacturing, energy systems, transportation, and infrastructure—fostering sustainable industrialization and resilient infrastructure.

Industry Partnership Meet

Shiv Nadar University Delhi-NCR hosted the Hyderabad edition of the Industry Partnership Meet on April 19, 2024, which convened over 50 organizations to foster collaboration between industry and academia in the “Emerging Technologies.” Discussions during the event highlighted the importance of students cultivating expertise in automation and design technology and stressed the value of experiential learning through internships and project work.



Global Bio-India 2024

Shiv Nadar University participated in the Global Bio-India from September 12-14, 2024, an international congregation of biotechnology stakeholders, including regulatory bodies, government ministries, SMEs, industries, bioclusters, research institutes, investors, and the startup ecosystem.

Many Departments in the School of Natural Sciences showcased their research projects at the event, which underlined the growth and opportunities in India’s biotech sector.



Industry Partners Summit 2025 to Innovate, Educate, Elevate

Shiv Nadar University, Delhi-NCR Industry Partners Summit 2025, brought together distinguished leaders, 150+ companies, and 250+ professionals from 14 multidisciplinary sectors. Unified by the vision to Innovate, Educate, Elevate, the summit fostered engaging dialogues with some of the most influential business leaders shaping the future of industry and innovation, exclusive insights, and actionable strategies to shape a future-ready workforce.

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INDUSTRY

PARTNERS SUMMIT

INNOVATE | EDUCATE | ELEVATE



RAJIV MEMANI
CHAIRMAN AND
MANAGING PARTNER
EY INDIA



ARUN KARNA
MD & CEO
AT&T GLOBAL
NETWORK SERVICES INDIA



SHISHAR MALHOTRA
CHANCELLOR
SHIV NADAR UNIVERSITY
VICE CHAIRMAN AND CEO
HCL HEALTHCARE



ANANYA MUKHERJEE
VICE CHANCELLOR
SHIV NADAR UNIVERSITY
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MODERATOR

LEADERS IN CONVERSATION

A CEO'S PERSPECTIVE

FRIDAY, FEBRUARY 28, 2025

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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.**

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