

Dr. Sandip Patil

Director (2010-Present)

E-Spin Nanotech Pvt. Ltd.

SIDBI Incubation Center

Indian Institute of Technology Kanpur-208016

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PERSONAL DATA

DOB: June 21, 1981; Male; Married; Two child

EDUCATION

Ph.D., Chemical Engineering, Indian institute of Technology, 2013

Advisor: Prof. Ashutosh Sharma and Prof. Animangsu Ghatak

M.E., Polymer Technology, M S University, Baroda,(2006). (Dissertation carried out at IIT Bombay)

Advisor: Prof. Vinay Juvekar (IIT Bombay) and Prof. M. H. Dewekar (MSU Baroda)

B.Tech., Chemical Technology, UDCT, NMU Jalgaon (MH), 2004.

SPECIAL COMPETENCIES AND INTERESTS

- Nano fiber product design and commercialization
 - Air/water filtration membrane development
 - Hydrophobic and hydrophilic coating development
 - Engineering instrumentation
 - Synthesis of novel material through electrospinning technology
 - Nano-Fiber and Microfluidics
 - Polymer Rheology
 - Structural adhesion of elastic and viscoelastic materials
 - fracture mechanics of elastic and viscoelastic films
 - Thin films and Nano-composites
 - Smart and functional material
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SERVICES TO THE SOCIETY

1. Motivational speaker
 2. Associated with Unnat Bharat Abhiyan
 3. Associated with Skishya Sopan
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SOCIAL ACTIVITIES

Involved in many social activities for betterment of the society. The activities that I am socially executing, like creating digital platform for school children, engaging villagers for water harvesting, creating platform for advance farming, instrumental to bring drip irrigation model at one of the villages at IIT Kanpur unnat bharat abhiyan.

PATENTS

1. Indian Patent: 338299
Method of Fabricating Microporous Elastomer Thin Films with Controllable Surface Pore Morphology and Monomodal Pore Size Distributions (2018)
 2. US Patent: US9540546B2
Composite reusable adhesive-2017
 3. Indian Patent: 9540546
Composite reusable adhesive-2017
 4. World Intellectual Property Organisation: WO2013093652A1
Composite reusable adhesive-2013
 5. Indian Patent: IN201811025128A
Electrospun Fibrous Nanomat Composition and A Method Of Synthesizing The Same For Cancer Cell Detection-2020
 6. Chinese Patent: CHINA CN20128057431
Composite Reusable Adhesives-2012
 7. JAPAN - 2014-546674
Composite Reusable Adhesives-2012
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RESEARCH PUBLICATIONS

1. R. Kamal Saravanan, Tania K. Naqvi, **Sandip Patil**, Prabhat K. Dwivedi and Sandeep Verma "Purine-blended nanofiber woven flexible nanomats for SERS-based analyte detection" **Chem. Commun.**, 2020
2. Tushar D. Deshpande, Yogesh R. G. Singh, **Sandip Patil**, Yogesh M. Joshi and Ashutosh Sharm "Adhesion strength and viscoelastic properties of polydimethylsiloxane (PDMS) based elastomeric nanocomposites with embedded electrospun nanofibers" **Soft Matter**, **2019**,15, 5739-5747
3. Gagandeep Kaur, Savita, Kumari, Piyali Saha, Rafat Ali, **Sandip Patil**, Subramaniam Ganesh, and Sandeep Verma "Selective Cell Adhesion on Peptide-Polymer Electrospun Fiber Mats" **ACS Omega** **2019**, 4 (2) 4376-4383
4. Tushar D. Deshpande, Yogesh R.G. Singh, **Sandip Patil**, Yogesh M. Joshi and Ashutosh Sharma "To study surface and sub-surface nanomechanical properties of electrospun polyacrylonitrile (PAN) nanofibers/polydimethylsiloxane (PDMS) composites" **Soft Matter**, **2018**,14, 7829-7838
5. **Sandip Patil**, Tushar Deshpande, Nayantika Chaudhari, Yogesh R. G. Singh, Janhavi Raut, Yogesh M. Joshi, and Ashutosh Sharma "Making Nonsticky Surfaces of Sticky Materials: Self-Organized Microtexturing of Viscoelastic Elastomeric Layers by Tearing" **Langmuir**, **2018** 34, 12, 3767-3774
6. Shashi Kiran Misra, Himanshu Pandey, **Sandip Patil**, Pramod W. Ramteke and Avinash C. Pandey "Tolnaftate-Loaded Polyacrylate Electrospun Nanofibers for an Impressive Regimen on Dermatophytosis Tolnafate-Loaded Polyacrylate Electrospun Nanofibers for an Impressive Regimen on Dermatophytosis" **Fibers** **2017**, 5(4), 41
7. Nayantika Chaudhari, Tushar Deshpande, Yogesh R. G. Singh, **Sandip Patil**, Manish Kulkarni, Janhavi Raut and Ashutosh Sharma "Cavity shape transformation during peeling on elastic microchannel-patterned substrates filled with a viscous liquid " **Soft Matter**, **2017**,13, 2394
8. Shilpa, Sudip Kumar Das, Mohammad Atif Faiz Afzal, Shalabh Srivastava, **Sandip Patil** and Ashutosh Sharma "Enhanced Electrical Conductivity of Suspended Carbon Nanofibers: Effect of Hollow Structure and Improved Graphitization" **Carbon** **2016**, 108, 135-145
9. **Sandip Patil**, Amit Ranjan, Tanmoy Maitra and Ashutosh Sharma "One-Step Fabrication of Microchannels Lined with a Metal Oxide" **ACS Appl. Mater. Interfaces** **2016**, 8, 10494-10498
10. **Sandip Patil**, Rahul Mangal, Abhinav Malasi and Ashutosh Sharma "Biomimetic wet adhesion of viscoelastic liquid films anchored on micropatterned elastic substrates" **Langmuir** **2012**; 28, 14784-14791
11. **Sandip Patil**, Abhinav Malasi, Abhijit Majumder and Ashutosh Sharma "Reusable antifouling viscoelastic adhesive with an elastic skin" **Langmuir** **2012**, 28, 42-4
12. **Sandip Patil**, Amit Ranjan, Ashutosh Sharma "Pre-fracture instabilities govern generation of self affine morphology in fracture generated surface and dynamics of cracks in tearing of soft viscoelastic elastomeric sheets" **Macromolecules**, **2012**, 45 (4), 2066-2073

13. Karthik Nayani, Hari Katepalli, Chandra Sharma, Ashutosh Sharma, **Sandip Patil**, Venkataraghavan, R. "Electrospinning combined with nonsolvent-induced phase separation to fabricate highly porous and hollow submicrometer polymer fibers" *Ind. Eng. Chem. Res.* **2012**, 51, 1761-1766
 14. Chandra S Sharma, **Sandip Patil**, Suman Saurabh, Ashutosh Sharma and R Venkataraghavan, "Resorcinol-formaldehyde based carbon nanospheres by electrospaying". *Bulletin of Material Sci.* **2009**, 32, 239-246
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BOOK CHAPTER

1. Charu Dwivedi, Ishan Pandey, Himanshu Pandey, Pramod W. Ramteke, Avinash C. Pandey, Shanti Bhushan Mishra, **Sandip Patil**, Electrospun Nanofibrous Scaffold as a Potential Carrier of Antimicrobial Therapeutics for Diabetic Wound Healing and Tissue Regeneration *Nano- and Microscale Drug Delivery Systems*. 2017 Elsevier Inc. **2017**, 147-162
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PEER-REVIEWED CONFERENCE PROCEEDINGS

1. **Sandip Patil**, Ashutosh Sharma and Animangsu Ghatak "Adhesion of Viscoelastic Thin Films: Effects of Surface and Subsurface Micro-Patterns" *In Proceedings of the 8th Annual Session of Students' Chemical Engineering Congress, Excellent Publishing House, New Delhi, September 21-22, 2012*, p.17,
2. **Sandip Patil**, Rahul Mangal, Abhijit Majumder, Ashutosh Sharma "Fabrication of Porous Polydimethylsiloxane (PDMS) Adhesives and to Study its Mechanical and Surface Properties" *Society of Adhesion 32nd annual meeting, Savannah, USA (February 2011)*
3. **Sandip Patil**, Abhinav Malasi, Abhijit Majumder, Ashutosh Sharma "Novel approach to design a reusable adhesive by using bilayers of fine-tuned rheological properties" *The Society of Rheology 82nd annual meeting, Santa Fe, USA (October-2010)*
4. Ashutosh Sharma, Abhijit Majumder, **Sandip Patil**, Animangsu Ghatak "Making adhesion independent of rheology: Microfluidic and structural control of adhesion in soft visco-elastic surfaces" *The society of rheology 82nd annual meeting, Santa Fe, USA (October-2010)*
5. **Sandip Patil**, Ashutosh Sharma. "Fabrication of clay/polymer nanocomposite at air-water interface". *International conference on Nanoscience and Nanotechnology, at IIT Bombay, India (February-2010)*
6. **Sandip Patil**, Prabhat K Dwivedi and Ashutosh Sharma. "Preparation of Poly (ethylene oxide) / Laponite clay Nanocomposite film by Langmuir-Blodgett

method". *INDO-US International Conference on Fabrionics: Science of advance Fabrication, at IIT Kharagpur, India (Dec-2009)*

7. Karthik N, Hari K, Chandra S Sharma, **Sandip Patil**, Ashutosh Sharma and R. Venkataraghavan. "Combined thermally induced and non-solvent induced phase separation to prepare pan based eletrospun porous carbon nanofibers" *INDO-US International Conference on Fabrionics: Science of advance Fabrication, at IIT Kanpur, India (Dec-2009)*
 8. Chandra S Sharma, **Sandip Patil**, Suman Saurabh, Ashutosh Sharma and R Venkataraghavan. "Resorcinol-Formaldehyde Based Electrospayed Carbon Nanospheres: A Novel Anode Material for Lithium Ion Batteries". *AICHE Conference, at Washington, USA (November-2009)*
 9. **Sandip Patil**, Abhjit Majumder, Ashutosh Sharma. "Resorcinol-Formaldehyde Based high aspect ratio carbon fibers". *International conference on Nanoscience and Nanotechnology, Chennai, India (February-2008)*
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AWARDS AND ACHIEVEMENTS

1. Corona Yodha Award by Dainik Jagran (2021)
2. CEO of the year by CEO Insights Magazine (2020)
3. Bangalore Nano : Nano Innovation Award (2020)
4. Cover page interview by Silicone India (2017)
5. TIME India Start-up Innovator for the year (2017) (Top 3 Finalist)
6. Awarded Top 5 Nano Technology Companies in India 2016 by SiliconIndia (2016)
7. Awarded 10 young outstanding business leader in Kanpur (2016)
8. Spirit of Manufacturing Awards: Most Promising International Business Leader Award (2015)
9. Indian Leadership award for industrial development by All India Achievers Foundation (2014)
10. Rajeev Motwani Young Entrepreneur award by Motwani foundation (2014)
11. IChE Shah-Schulman Award for the best PhD Thesis in the area of Colloid and Interface Sciences (2013)
12. Indian School of Business Hyderabad Scholarship (2013)
13. UICT Jalgaon alumni award for Young Entrepreneur (2013)
14. IChE M. P. Chary Memorial Medal award for being an outstanding young Chemical Engineer (2012)
15. Intellectual Ventures Invention Award (2012)
16. TePP awarded by (2011)
17. Micrography contests award 2011, IIT Kanpur (2009)

INVITED TALKS

1. **Expert talk on “Nanofiber Technology & Its Commercial Opportunities: Future Start-ups”**
SRM institute of science and technology, Chennai (2021)
2. **Motivational Speech** in Kanpur Institute of Technology (2021)
3. Panel Discussion on “Eco-Initiatives for Sustainable Textiles Industry”
TiE Sustainability Summit – (2021)
4. Expert talk on “Adhesion of Viscoelastic Thin Films: Effects of Surface and Subsurface Micro-Structure”
National Institute of Technology, Calicut (2021)
5. Motivational speech at the Independence Day Programme
Shree Sanatan Dharm Education Centre, Kanpur (2021)
6. Expert Talk on Innovative Technology & Application
India Physics Association, (2021)
7. Expert Talk on Use of Nanotechnology in Education and Research
IIIT, Surat (2021)
8. Panel discussion on Employability Skills in Nanoscience & Nanotechnology graduates Industry 4.0
Amity University, Noida (2021)
9. Lab research to entrepreneurship: Nanofiber Technology for advance application including COVID 19 protection”
Amity University, Noida (2021)
10. Panel discussion on “Startups – Torchbearers and Champions of Innovation”
Derby Foundation (2021)
11. Expert Talk on “Lab research to entrepreneurship: Nanofiber Technology for advance application including COVID 19 protection”
IIT Hyderabad (2021)
12. **Panel discussion on “ Building Smart and Sustainable Cities with Tech Innovations”**
Kolhapur Incubation Centre and SIIC, IIT Kanpur (2021)
13. Expert talk on “Design and Development of Nano-carriers”
Parul University, Gujarat (2021)
14. Panel discussion on Online Lab & Analytix World . IE 2021 conference
Jasubhai Media Pvt Ltd, Mumbai (2021)
15. External Expert take on Curriculum development workshop
MNIT, Jaipur (2021)

16. Entrepreneurship talk on Textile startups **UPTI Kanpur (2016)**
17. Entrepreneurship talk on Bio startups, **PSIT Kanpur (2016)**
18. Entrepreneurship talk on Engineering startups **IIT Guwahati (2016)**
19. Entrepreneurship talk on Engineering startups, **IIT Hyderabad (2015)**
20. Entrepreneurship Talk on Create a brand & Transform Your Dream Into Reality.
RGIPT Raebareli, UP, INDIA (2015)
21. Electrospun Nanofibre Technology & Potential Applications.
Santh Gadegebaba University Amravati, INDIA (2015)
22. Nanofiber Technology in Agriculture Applications
Allahabad Agriculture University, Allahabad (2015)
23. Electrospun Nanofiber Technology & its Potential Industrial Applications.
Biocurious, SFO, USA (2014)
24. Fabrication of Reusable, Antifouling and Non-sticky Visco-elastic Adhesives.
ICT Matunga, Mumbai, INDIA (2013)
25. Nanotechnology-Nanofiber-Application
Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad, INDIA (2013)
26. Adhesion of Viscoelastic Thin Films: Effects of Surface and Subsurface Micro-patterns.
CSIR-Central Electrochemical Research Institute, Karaikudi, INDIA (2012)
27. Making adhesion independent of rheology: Microfluidic and structural control of adhesion in soft visco-elastic surfaces.
Adhesion Society Meeting, Santa Fe, USA (2010)

WORK EXPERIENCE

- Director, E-Spin Nanotech Pvt. Ltd. (2010- till date)
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TEACHING EXPERIENCE

Teaching assistance

Department of Chemical Engineering, IIT Kanpur, India

Courses: Chemical Engineering Unit Operations (January 2007 and August 2010)

SERVICES

- Member of the Advisory Board in Amity University, Noida (2021)
- Board of Council Member in IIIT Surat (2021)
- Student's Startup Innovation Policy (SSIP) Committee Member-IIIT Surat (2021)
- Members of the Board of Studies at Sam Higginbottom Institute of Agriculture, Technology and Sciences (Deemed University), Allahabad (2013-present)
- Member of Adhesion society (2010-2011)
- Member of Rheology society (2010-2011)
- Senior student advisor in Chemineers magazine (2010-2011)
- Departmental annual function organizer, IIT Kanpur (2010-2011)
- Departmental postgraduate committee member, IIT Kanpur (2009-2011)
- Adviser officer in SBRA committee, IIT Kanpur (2009-2010)
- Convener SBRA committee, IIT Kanpur (2008-2009)
- Group leader in Chemference, National Conference, IIT Kanpur (2008)

Dr. Sandip Patil

Director

E-Spin Nanotech Pvt. Ltd