International Research Centre of Nanotechnology for Himalayan Sustaiability (IRCNHS)

Focus of Centre:

SDG 3: Good Health and Well-being, SDG 6: Clean Water and Sanitation
SDG 11: Sustainable Cities and Communities

Vision: To facilitate advanced research in various fields of Science & Technology at Nanoscale leading to the development of innovative products for societal benefits especially environmental remediation.

Mission:

1. To support responsible development of nanotechnology
2. To support the fabrication of sustainable materials for the benefits of nanotechnology to the environment and human health and safety.
3. To synthesize and develop a new generation of multifunctional nanomaterials having some societal value and benefit almost every sector of technology.
4. Corporate sustainability in the responsible development of nanotechnology.

Location: F Block

Year of Establishment: 2018

Faculty In-charge: Dr. Guarav Sharma

Members: Dr Amit Kumar, Dr Dinesh Chatanta, Dr Pankaj Raizada

No. of Publications in following SDGs (2018-2023):

Name of SDG	No. of Publications
SDG 3: Good Health and Well-being	516
SDG 6: Clean Water and Sanitation	253
SDG 11: Sustainable Cities and Communities	31

Extracted from Scopus database

This centre was established to enhance advanced research in nanotechnology and create state-of-the-art facilities for nanotechnology research. In keeping with the central purpose of Himalayan Biodiversity that remains a key focus for Shoolini University, here also there is a special relevance to water purification, materials synthesis for applications in defense, biomedical and communication engineering. The centre was established to promote interdisciplinary research

among different faculties. It was formally inaugurated by Hon'ble Justice Swatanter Kumar, Chairperson, and National Green Tribunal on 31st January 2016.

Thrust Areas: Research Centre in Nanotechnology is a fully dedicated Innovation centre for the synthesis of nanostructures such Nanotube, Nanofibers, Nano-roads, and carbon quantum dots for various energy harvesting applications like multi-layer ceramics capacitors, hybrid nanomaterials for environmental remediation, Nanogenerator, Sensors and Supercapacitors.

Research Collaborations/MoU's

Following are the collaborators of "Himalayan Centre of Nanotechnology"

National:

- Guru Nanak Dev University, Amritsar, Punjab, India
- Aligarh Muslim University, UP, India
- CSIO-CSIR Lab Chandigarh, India
- Himachal Pradesh University, Shimla, India
- Chandigarh University, Chandigarh, India
- University of Gujrat, Gujrat, India
- Indian Military Academy, Dehradun, India
- JP University, Himachal Pradesh, India
- Jawaharlal Nehru University, New Delhi, India

International:

- King Abdullah Institute of Nanotechnology, King Saud University, Saudi Arabia
- University of Pannonia, Veszprem, Egyetem, Hungary

Research Projects:

S. No	Topic	PI/ Co-PI	Year	Agency	Funding
1	Fabrication and characterization of substrate for patch antenna by using nano magneto-dielectric materials for the	Dr. Atul Thakur (PI) Dr. Preeti Thakur (Co. PI)	2012-2014	DRDO	₹ 9,90,000

	missile applications				
2	Nano magneto-dielectric materials for high frequency applications	Dr. Atul Thakur (PI)	2012-2015	DAE	₹ 17,24,000
3	Synthesis and characterization of nano-ferrites for the development of radar absorbing materials	Dr. Preeti Thakur	2014-2017	DST	₹ 21,72,000
4	Efficiency improvement of packed bed solar thermal energy storage using different fin shapes on absorber plate in solar air collector	Dr. Rajesh Kumar (PI), Dr. Anil Kumar (Co-PI)	2019-2020	HIMCOSTE	₹ 6,50,000
5	UK-India Educational and Research Partnership to Develop Industrially Focused Curriculum in Advanced Manufacturing Technology	Dr. Pankaj Thakur, Dr. Rajesh Kumar	2016-2019	Royal Academy of Engineering	₹ 40,06,718
6	Development of Lead-free piezoelectric nanofibers via Electrospinning for piezoelectric energy harvesting	Dr. Radheshyam Rai, Dr. Virender Pratap Singh	2015-2018	DRDO	₹ 2,690,000
7	Solar Steam Cooking	Dr. Munish Sethi, Dr. Rajesh	2012-2015	MNRE	₹ 25,60,192

8	Photovoltaic behaviour of rare-earth doped bismuth ferrite nano fibers for potential application in perovskite solar cells	Dr. Mamta Shandilya	2021-2022	HIMCOSTE	₹ 4,90,000

Patents Filed:

Title	**Inventors**	**Patent filing number**	**Date of filing**
Nano ferrite substrate and its process of production for use in large bandwidth miniaturized antenna.	Atul Thakur, Preeti Thakur	201611013315	April 16, 2016
Magneto-dielectric substrate for miniaturized microstrip patch antenna for use in high bandwidth in uhf band.	Atul Thakur, Preeti Thakur	201611018053	May 25, 2016
Nano composites material with enhanced magnetic properties.	Atul Thakur, Preeti Thakur, Kush Rana	201611022599	June 30, 2016
Hexa-ferrites nanomaterial and microwave applications thereof.	Virender Pratap Singh, Gagan Bhargava, R.K Kotnala, Mahavir Singh	201711034816	September 29, 2017
A method for Dielectric relaxation in $BaCaTiO_3$ material for multilayer ceramic capacitor	Dr. Mamta Shandilya, Dr. Shweta Thakur, Dr. Radheshyam Rai, Dr. Rajesh Kumar	201811030271	August 12, 2018
A solar cooking system based on preheated water to reduce Co_2 emission	Dr. Rajesh Kumar, Er Ankit Gupta, Prof. Raja Sekhar Y, Prof SS Chandel	201811031068	August 20, 2018
Green synthesized TiO2 nanofluid for enhanced	Dr. Rajesh Kumar, Ankush Chauhan, Ritesh	201811031209	August 21, 2018

thermal storage capacity of (CH2OH)2	Verma, Allah Dekama Jara, Dr. Mamta Shandilya		
Dielectric relaxation in bamgtio3 material synthesized by hydrothermal method	Dr. Mamta Shandilya, Dr. Shweta Thakur, Dr. Radheshyam Rai, Dr. Rajesh Kumar	201811035173	September 18, 2018
Prototype of natural mode indirect solar dryer for drying of ginger (zingiber officinale) in himalayan region	Dr. Rajesh Kumar, Mr Ritesh Verma, Mr Humesh Thakur	201811035172	September 18, 2018
A system of artificial neural network model for precise estimation of global solar radiation	Dr. Rajesh Kumar, Er Sunil Pathania, Dr. Rajeev Kumar Aggarwal	201811036457	September 27, 2018
New empirical system for the estimation of global solar radiation for indian locations	Dr. Rajesh Kumar, Mr Ritesh Verma, Dr. Rajeev Kumar Aggarwal	201811036456	September 27, 2018
Nanoscale Restraint of polar coupling in $Ba_{0.85}Mg_{0.15}TiO_3$ relaxor ferroelectric	Dr. Mamta Shandilya, Dr. Radheshyam Rai, Dr. Rajesh Kumar, Ms Poonam Kumari, Mr Ritesh Varma	201811036624	September 28, 2018
High dielectric lead free material $Ba_{0.95}Ca_{0.05}TiO_3$ synthesized by hydrothermal method for energy harvesters	Dr. Mamta Shandilya, Dr. Radheshyam Rai, Dr. Steven J.Milne, Dr. Rajesh Kumar	201811038017	October 08, 2018
A Method for Low temperatures synthesis of $Ba_{0.85}Ca_{0.15}$ $Zr_{0.05}Ti0.95O_3$ Ceramic for capacitor application	Dr. Mamta Shandilya, Dr. Radheshyam Rai, Dr. Rajesh Kumar, Dr. Madan Lal, Sapna	201811038019	October 08, 2018
A method for the biosynthesis of Ag doped ZnO	Ankush Chauhan, Swati, Ritesh Verma, Dr.	201811045729	December 04, 2018

nanoparticles using Moringa Olifera seed extract and their uses thereof	Saurabh Kulshrestha, Dr. Mamta Shandilya, Dr. Rajesh Kumar		
Nanosize multi-ferroic composite material and method of preparing the same	Rajesh Sharma, Mamta Shandilya, Ritesh Verma, Pankaj Raizada	201811049035	December 26, 2018
Copper nanoparticles (cunps) and nanoparticles (cunps) and method of producing the same	Rajesh Sharma, Sapna Thakur, Mamta Shandilya, Shweta Thakur, Ankush Chauhan	201811049036	December 26, 2018
Nanoferrites for memory storage	Rajesh Sharma, Rohit Jasrotia, Virender Partap Singh, Mahavir Singh	201811049037	December 26, 2018
Solar-nanomaterial energy-storage	Anil Kumar, Robin Thakur, Neeraj Chandel, Sunil Kumar, Rajesh Kumar, Pankaj Thakur	313480	December 27, 2018
Iron oxide nanoparticles, iron oxide-cellulose nanocomposite and method of producing thereof	Mamta Shandilya, Sapna Thakur, Shweta Thakur	201811050133	December 31, 2018
Zinc oxide nanoparticles and method of producing the same	Rajesh Sharma, Ankush Chauhan, Mamta Shandilya, Sapna Thakur, Susham Chauhan, Pankaj Thakur	201811050057	December 31, 2018
Synthesis of silver substituted mg-mn nanoferrites for application in recording media	Rohit Jasrotia, Dr. Virender Pratap Singh, Dr. Rajesh Kumar, Dr. Mahavir Singh	201811049897	December 31, 2018
Synthesis of silver doped strontium w-type nanohexaferrites for magnetic	Rohit Jasrotia, Dr. Virender Pratap Singh, Dr. Mahavir Singh, Dr.	201811050121	December 31, 2018

recording application	Rajesh Kumar		
A synthesis of lead free K0.5Na0.5nbo3 ceramics at low sintering temperature	Dr. Mamta Shandilya, Mr Shammi Kumar, Mr Ankush Chauhan, Dr. Rajesh Kumar, Dr. Shweta Thakur, Prof Nagesh Thakur	201811050120	December 31, 2018
Sol-gel synthesized barium m-type hexagonal ferrites for high density recording media application	Mr. Rohit Jasrotia, Dr. Virender Pratap Singh, Dr. Rajesh Kumar, Dr. Mahavir Singh	201911001088	January 09, 2019
Materials to enhance the efficiency of solar receiver in concentrated solar power plant (csp)	Dr. Rajesh Kumar, Ritesh Verma, Ankush Chauhan, Satvinder Kour, Dr. Mamta Shandilya, Dr. Pardeep Singh	201911005623	February 13, 2019
A kit for identification of best harvesting time for the extraction of essential oil of mentha longifolia	Dr. Amita Kumari, Ms. Sonam Thakur, Dr. Vikas Kumar, Ms. Prakriti Nidhi, Prof. Anuradha Sourirajan	201911005624	February 13, 2019
Lead free, ferroelectric, nano sized ceramic compound (bzt-bct) for industrial use	Mamta Shandilya, Shweta Thakur, Amit Mahajan, Poonam Kumari, Radheshyam Rai	201911007198	February 25, 2019
Method of low temperature synthesis of lead free, ferroelectric, nano sized monophasic ceramic compounds	Mamta Shandilya, Shweta Thakur	201911007200	February 25, 2019
Zinc oxide nanorods and method of producing the same	Rajesh Kumar, Ankush Chauhan, Ritesh Verma, Mamta Shandilya, Pankaj	201911008270	March 03, 2019

	Raizada, Saurabh Kulshreshtha		
Plant material extraction solar equipment	Dr. Anil Kumar, Dr.Mamta Sharma, Dr. Rajesh Kumar, Dr. Robin Thakur	316064	March 26, 2019
Solar Equipment to Extract Substances from Plants	Dr. Anil Kumar, Dr.Mamta Sharma, Dr. Rajesh Kumar, Dr. Robin Thakur	316069	March 26, 2019
A Process of Synthesis of Ag-zno Nanoparticles using Trillium Govanianum	Ankush Chauhan, Swati, Rajesh Kumar, Saurabh Kulshreshtha, Mamta Shandilya, Sonu, Vikrant Sharma	201911012292	March 28, 2019
Barium strontium titanate material and method of manufacturing the same	Mamta Shandilya, Shweta Thakur, Radheyshyam Rai, Sapna Thakur	201911012842	March 30, 2019
Barium zirconate titanate material and method of manufacturing the same	Mamta Shandilya, Radheyshyam Rai, Poonam Kumar, Gun Anit Kaur	201911012843	March 30, 2019
A Process for synthesis of Lead Free Barium, Strontium Titanate Ba0.90Sr10TiO3	Dr Mamta Shandilya	201911012931	March 30, 2019
A Process for synthesis of Silver Doped Zinc Oxide using Cannabis Sativa Leaf Extract	Ankush Chauhan, Swati, Rajesh Kumar, Saurabh Kulshreshtha, Mamta Shandilya, Anil Kumar, Zubin Thakur	201911012932	March 30, 2019
A process of synthesis of barium titanate zirconate bati1-xzrxo3 ceramics nanoparticles	Dr Mamta Shandilya, Dr Radheshyam Rai, Gun Anit Kaur, Dr Shweta Thakur	201911012933	March 30, 2019

Solar water heater	Rajesh Kumar, Anil Kumar, Robin Thakur, Amar Raj Singh Suri	317840	May 19, 2019
Solar plant growth chamber	Mamta Sharma, Anil Kumar, Rajesh Kumar	319295	July 02, 2019
A method of synthesis of Zinc Oxide (zno) Nanoparticles	Ritesh Verma, Swati, Ankush Chauhan, Dr Rajesh Kumar, Dr Saurabh Kulshreshtha, Dr Mamta Shandilya, Dr Anil Kumar, Nisha Kumari	201911031031	July 31, 2019
Spin-dependent transport properties of graphite nanostructures and methods thereof	Dr. Rajesh Kumar, Allah Dekama Jara, Ritesh Verma, Ankush Chauhan	201911039611	September 30, 2019
Apparatus For Extraction of Oil From Plants	Anil Kumar, Mamta Sharma, Rajesh Kumar, Sameer Rahatekar	323335	November 06, 2019
Silver doped zinc oxide nanoparticles and method of synthesis thereof	Mamta Sharma, Harish Bassi, Ankush Chauhan, Ritesh Verma, Garima Rana, Rajesh Kumar	202011008749	March 01, 2020
Gold doped zinc oxide nanoparticles and method of synthesis thereof	Mamta Sharma, Rajesh Kumar, Harish Bassi, Priyanka Chauhan, Himani Pathania, Ankush Chauhan, Ritesh Verma	202011011336	March 16, 2020
Holmium and Yttrium doped Ba-Sr Co2 Z-Type Hexaferrite based nanomaterials and a process for the preparation thereof	Mrs. Kirti Singha, Dr. Virender Pratap Singh, Mrs. Monika Chandel, Dr. Rajesh Kumar	202011013746	March 29, 2020
Ba-Nd-Cd-In Hexaferrite Based Nanomaterial and a	Mr. Rohit Jasrotia, Mr. Ankit Verma, Ms.	202011013744	March 29, 2020

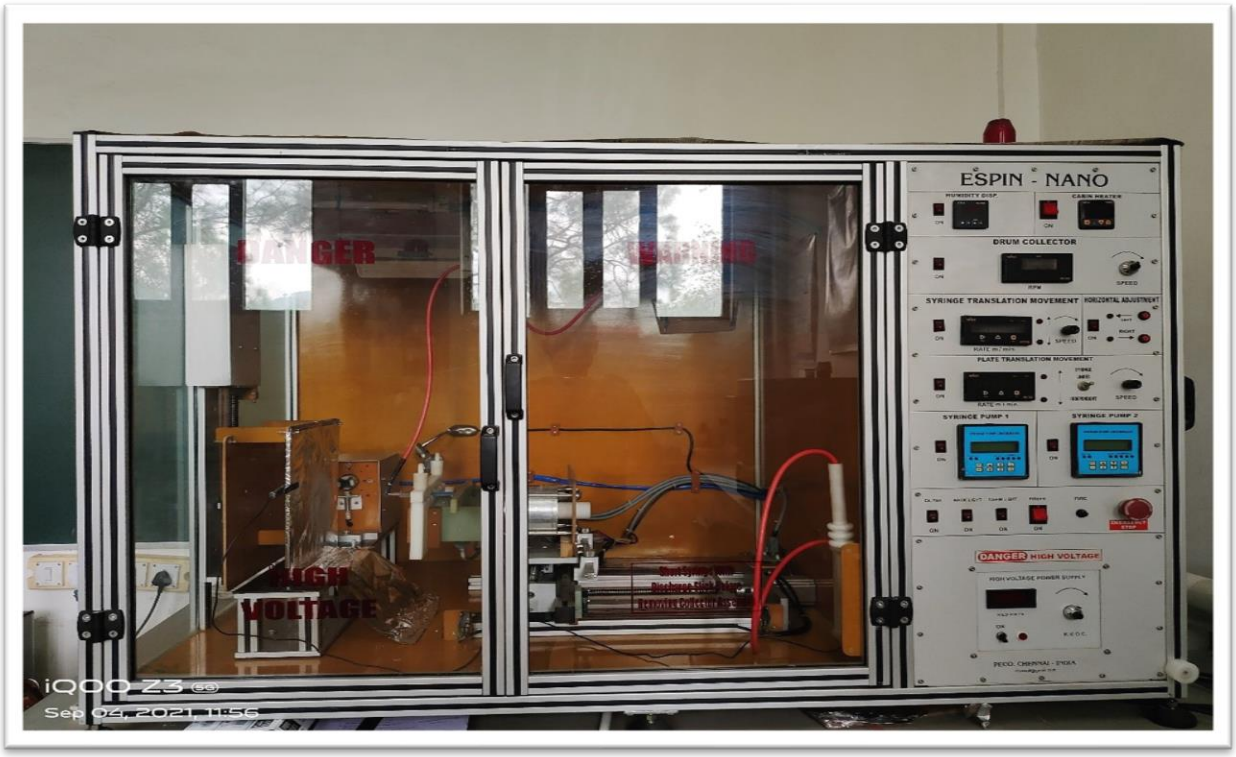
process for the preparation thereof	Bhawna Sharma, Dr. Virender Pratap Singh, Dr. Rajesh Kumar		
Mg-Ag-Mn Ferrite Based Nanomaterials and Process for the Preparation Thereof	Mr. Rohit Jasrotia, Mr. Ankit Verma, Ms. Bhawna Sharma, Dr. Virender Pratap Singh, Dr. Rajesh Kumar	202011013745	March 29, 2020
Nanofiber membrane with enhanced polar phase of pristine polymers and a process for the preparation thereof	Mamta Shandillya, Gun Anit Kaur, Sahil Kumar	202011014188	March 31, 2020
CNF Nanofiber Membrane and a process for the preparation thereof	Dr. Mamta Shandilya, Gun Anit Kaur, Dr. Nagesh Thakur, Mr. Shammi Kumar	202011014158	March 31, 2020
Ba-Sr CO2Z–Type Ferrite Based Nanomaterial and a Process for the Preparation Thereof	Mrs. Kirti Singha, Dr. Virender Pratap Singh, Mrs. Monika Chandel, Dr. Rajesh Kumar	202011014157	March 31, 2020
La3+ / Ni2+ ions doped Sr2Co2Fe12O22 Y-type hexaferrite based nanomaterial and a process for the preparation thereof	Mrs. Monika Chandel, Dr. Virender Pratap Singh, Mrs. Kirti Singha, Mr. Rohit Jasrotia, Dr. Rajesh Kumar	202011014156	March 31, 2020
Dy3+ / Ni2+ ions doped Sr2Co2Fe12O22 Y-type hexaferrite based nanomaterial and a process for the preparation thereof	Mrs. Monika Chandel, Dr. Virender Pratap Singh, Mrs. Kirti Singha, Mr. Rohit Jasrotia, Dr. Rajesh Kumar	202011014159	March 31, 2020
A Process for Synthesis of Reduced Graphene Oxide	Dr. Mamta Shandilya, Gun Anit Kaur, Sahil	202011014155	March 31, 2020

	Kumar		
A method for waste water treatment by substitution of mgfe2o4 nanoferrites with Ce3+ and Ni2+	Rohit Jasrotia, Ankit Verma, Pooja Puri, Virender Pratap Singh, Rajesh Kumar	202011034248	August 10, 2020
Flexible energy harvesters for shoes based on piezoelectric nanofibers	Mamta Shandilya, sahil kumar, Gun Anit Kaur	202011042868	October 01, 2020
Flexible energy harvesters for scavenging mechanical energy based on piezoelectric nanofibers	Mamta Shandilya, Gun Anit Kaur	202011042867	October 02, 2020
Sol-Gel synthesized Zinc and Lanthanum doped Manganesenanoferrites with enhanced magnetic property and photocatalytic degradation of Malachite Green Dyefor Waste Water Treatment.	Rohit Jasrotia, Ankit Verma, Virender Singh, Pratap Singh, Rajesh Kumar	202111006739	February 18, 2021
Synthesis of nanoparticles and a process of preparation thereof	Dr. Rajesh Kumar, Dr Amita Kumari, Sohan Lal, Ankush Chauhan, Ritesh Verma, Kumari Mansi	202111014582	March 30, 2021
Novel plant based synthesis and photocatalytic dye degradation nanoparticles and a process of preparation thereof	Dr. Rajesh Kumar, Dr Amita Kumari, Jyoti Dhatwalia, Ankush Chauhan, Shabnam Thakur, Kumari Mansi	202111013857	March 30, 2021
A green synthesis of nanoparticles and a process of preparation thereof	Dr. rajesh Kumar, Dr Amita Kumari, Jyoti Dhatwalia, Ankush Chauhan, Shabnam Thakur, Kumari Mansi	202111013533	March 30, 2021
Green synthesis of	Dr. Rajesh Kumar, Dr	202111013856	March 30, 2021

nanoparticles using plant extract and a process of preparation thereof	Amita Kumari, Jyoti Dhatwalia, Ankush Chauhan, Shabnam Thakur, Kumari Mansi		
Method and composition of magnetic cobalt ferrite (CoFe2O4) nanoparticles with dual substitution of Li-Cr ions	Dr. Rajesh Kumar Sharma, Ankush Chauhan, Ritesh Verma, Kumari Mansi, Anand Sharma	202111023718	May 28, 2021
Method for performing synthesis of carbonquantum dots via electrospinning	Mamta Shandilya, Gun Anit Kaur	202111023658	May 28, 2021
Copper oxide nanoparticles comprising zanthoxylumarmatum plant extract and method of synthesis thereof	Dr. Rajesh Kumar Sharma, Dr. Sourabh Kulshretha, Ankush Chauhan, Ritesh Verma, Swati Kumari, Mansi Kumari	202111030588	July 08, 2021
Gadolinium and niobium co-doped barium titanate ceramic material and method of manufacturing the same	Dr. Rajesh Kumar Sharma, Ritesh Verma, Ankush Chauhan	202111030589	July 08, 2021
Vanadium doped barium calcium zirconate titanate cermamic material and method of manufacturing the same	Dr. Rajesh Kumar Sharma, Ritesh Verma, Ankush Chauhan, Khalid Mujasam Batoo	202111030590	July 08, 2021

Activities:

- Centre organized 3 day's International workshop on advanced characterization of materials (ACTM-2021) during 16-18 Feb 2020.
- International Workshop on Advanced Materials for Engineering and Solar Energy Applications during 16-17th Dec 2019.
- 3rd National conference on multifunctional advanced materials during (MAM-2016) May 11-13, 2016.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Facility at Centre of Nanotechnology