Dr. Nishant Shankhwar

Assitant Professor

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EDUCATION & QUALIFICATIONS

Ph.D.	Applied Physics Delhi Technological University
	Year: 2020
	Area of research : Optics and Photonics
	Topic: Application Specific Metamaterial Structures, Devices and Components
M.SC.	Electronics
	University of Delhi
	Year: 2013
	Subjects Studied: Optical Electronics, Control Electronics, Network Analysis and
	Synthesis, Signal and Systems, Semiconductor Physics, Analog and Digital Electronics,
	Microwave Electronics, etc.
	Final Sem project: Laser based optical communication system.
	Marks: 971/1400
	Percentage: 69.35%
B.Sc.	Electronic Science
	University of Delhi
	Year: 2011
	Subjects Studied: Solid State Physics, Network Analysis and Linear Circuits, Analog
	Electronics, Digital Electronics, Thermal Physics, Engineering Physics, Mathematical
	Physics, etc.
	Final Year project: Study of diffraction of laser beam by a grating using a photodiode and
	8085 microprocessor .
	Marks: 1070/1500
	Percentage : 71.33%
NET Qualification:	UGC NET – Junior Research Fellowship (DEC- 2013) [Score: 266/350 = 76.00%].

TEACHING EXPERIENCE

August 2019 - July 2021	Guest Faculty Delhi Technological University		
	Subjects taught Applied Physics (B. Tech. Sem 1, Sem 2) Nanophotonics (M.Tech. Sem 2)		
September 2021- April 2022	Guest Faculty Department of Physics & Astrophysics		

University of Delhi

Subjects taught C programming Advanced Electronics

Research Associate School of Physics

April 2022 - September 2022

October 2022 - present

University of Hyderabad Assistant Professor Hansrai College

University of Delhi

INTERNATIONAL PROJECTS I HAVE BEEN A PART OF

- DST-RMES (Indo-Russian) joint research project on "All-Dielectric, Plasmonic and Hybrid Photonic Nanostructures"
- DST-RFBR (Indo-Russian) joint research project entitled "From Plasmonic to Dielectric and Hybrid Nanoantenna: Novel approaches to control electromagnetic waves and light."
- DST, Govt. of India for BRICS multilateral project on "All Dielectric and Hybrid Nano Antennas for Multifunctional Sensors"

COMPUTATIONAL SKILLS

Programming Languages Known	Proficiency in MATLAB Basic knowledge of C, FORTRAN and Python.			
Computational Methods Known	Finite Difference Time Domain Method, Finite Element Method, Transfer Matrix Method, Fast Fourier Transform Algorithm.			
Computational and Designing Tools Known	MEEP (MIT's open-source FDTD program), MPB (MIT's Photonic Bands) COMSOL Multiphysics, Ansys HFSS, Blender3D, Inskscape.			

AREAS OF INTEREST

- Photonic Crystals, Plasmonics and Metamaterials
- Fiber Optics and Optical Communication
- Computational Electromagnetics
- Network analysis and Circuit Theory
- Semiconductors and Solid State Physics
- Quantum Electrodynamics

MEMBERSHIP OF PROFESSIONAL SOCIETIES

■ SPIE – The international society for optics and photonics

■ OSA – The optical society

AWARDS/ FELLOWSHIPS

- UGC NET Junior Research Fellowship (DEC- 2013) [Score: 266/350 = 76.00%].
- SPIE Officer Travel Grant to participate in Optics and Photonics 2017 at San Diego, USA.
- Commendable Research Award 2018
- Commendable Research Award 2019
- Avishkar Achievers Award 2022 for Best Researcher of the Year.

INTERNET FOOTPRINT

- Google scholar profile: https://scholar.google.co.in/citations?user=5X9WyfMAAAAJ&hl=en&oi=ao
- Youtube channel: <u>https://www.youtube.com/channel/UCFPkI4p4ONJKQ170TI614pw/videos</u>
- Linkedin profile: <u>https://www.linkedin.com/in/nishant-shankhwar-ph-d-1b098160/</u>
- Research Gate profile: https://www.researchgate.net/profile/Nishant-Shankhwar

LIST OF PUBLICATIONS

Books:

1. **Nishant Shankhwar** and Ravindra Kumar Sinha, Zero index metamaterials trends and applications, Springer Nature (2021) [Hardcover ISBN: 978-981-16-0188-0]

International Journals:

1. **Nishant Shankhwar**, Ravindra Kumar Sinha, Yogita Kalra, Sergey Makarov, Alexander Krasnok, Pavel Belov, "High Quality Laser Cavity based on All-Dielectric Metasurfaces ", Photonic and Nanostructures-Fundamentals and Applications 24 (2017): 18-23, Elsevier. [/SSN: 1569-4410]

Impact Factor	Scopus Index			Whether UGC listed?
3.008	Cite Score	SNIP	SJR	Yes
	4.4	1.01	0.553	

2. **Nishant Shankhwar**, Yogita Kalra and Ravindra Kumar Sinha, "Splitnanotube based negative index metamaterial at mid infrared wavelengths ". Journal of Nanophotonics 11.2 (2017): 026014, SPIE - The international society for optics and photonics. [*ISSN*:1934-2608]

Impact Factor	Scopus Index			Whether UGC listed?
1.494	Cite Score	Yes		
	2.7	0.481	0.323	

3. **Nishant Shankhwar**, Yogita Kalra and Ravindra Kumar Sinha, "LiTaO3 based metamaterial perfect absorber for terahertz spectrum", Superlattices and Microstructures, 111 (2017): 754-759, Elsevier. [*ISSN:* 0749-6036]

Impact Factor	Scopus Index	Whether UGC listed?
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2.658	Cite Score	SNIP	SJR	Yes
	5.0	0.832	0.493	

4. **Nishant Shankhwar**, Yogita Kalra and Ravindra Kumar Sinha, "All dielectric zero-index metamaterial for TE/TM polarization", Journal of Optics 20.11 (2018): 115101, Institute of Physics Publishing. [*ISSN: 2040-8986*]

Impact Factor	Scopus Index			Whether UGC listed?
2.516	Cite Score	SNIP	SJR	Yes
	5.0	0.967	0.918	

5. **Nishant Shankhwar**, Yogita Kalra, Qiang Li and Ravindra Kumar Sinha," Zero-index metamaterial based all-dielectric nanoantenna", AIP Advances 9.3 (2019): 035115, American Institute of Physics [*ISSN:* 2158-3226]

Impact Factor	Scopus Index			Whether UGC listed?
1.548	Cite Score	SNIP	SJR	Yes
	2.6	0.683	0.421	

International Conferences:

1. **Nishant Shankhwar**, Ravindra Kumar Sinha, "Design of Near-field Superlens with silver multilayer in silicon host", Proceedings of International OSA Network of Students Asia 6, 10 -12 December 2014, Kharagpur, West Bengal , India.

2. **Nishant Shankhwar**, Ravindra Kumar Sinha, "Design and analysis of near perfect metamaterial reflector in visible range." Metamaterials, Metadevices, and Metasystems 2015. Vol. 9544. International Society for Optics and Photonics, 2015.

3. **Nishant Shankhwar**, Ravindra Kumar Sinha, Yogita Kalra, "Controlling the evanescent waves using metamaterials." Metamaterials, Metadevices, and Metasystems 2016. Vol. 9918. International Society for Optics and Photonics, 2016.

4. **Nishant Shankhwa**r, Ravindra Kumar Sinha and Yogita Kalra, "Magnetic response of split nanotube type metamaterial at near infrared frequency." Frontiers in Optics. Optical Society of America, 2016.

5. **Nishant Shankhwar**, Yogita Kalra, and Ravindra Kumar Sinha, "LiTaO 3 microcubes based metamaterial perfect absorber." Metamaterials, Metadevices, and Metasystems 2017. Vol. 10343. International Society for Optics and Photonics, 2017

6. Shubhanshi Sharma, **Nishant Shankhwar**, Yogita Kalra, Ravindra Kumar Sinha, "Design and analysis of tip slotted square patch nano-antenna." Metamaterials, Metadevices, and Metasystems 2017. Vol. 10343. International Society for Optics and Photonics, 2017.

7. Sonia Tomar, **Nishant Shankhwar**, Yogita Kalra, Ravindra Kumar Sinha, "Plasmonic waveguides based optical AND gate." Plasmonics: Design, Materials, Fabrication, Characterization, and Applications XV. Vol. 10346. International Society for Optics and Photonics, 2017

8. Reena Dalal, **Nishant Shankhwar**, Yogita Kalra, Ajeet Kumar, Ravindra Kumar Sinha, "All-dielectric cylindrical nanoantennas in the visible range." Nanophotonic Materials XIV. Vol. 10344. International Society for Optics and Photonics, 2017.

9. **Nishant Shankhwar**, Ravindra Kumar Sinha and Yogita Kalra, "Magnetic response of split nanotube type metamaterial at near infrared frequency." Frontiers in Optics. Optical Society of America, 2016.

10. **Nishant Shankhwar**, Yogita Kalra, Ravindra Kumar Sinha, "Dielectric veins type photonic crystal as a zero-index-metamaterial." Frontiers in Optics. Optical Society of America, 2017.

11. Parul Goyal, **Nishant Shankhwar**, Yogita Kalra, Ravindra Kumar Sinha, "Design of a cross structure nanoantenna." AIP Conference Proceedings. Vol. 2009. No. 1. AIP Publishing, 2018.

12. **Nishant Shankhwar**, Yogita Kalra, Ravindra Kumar Sinha, " All Dielectric Zero Index Metamaterial Based Beam Splitter", AIP conference proceedings Vol. 2009, for AMN-2018, 15-17 March 2018 in Jaypee Institute of Information Technology, Noida.

13. **Nishant Shankhwar**, Yogita Kalra, Ravindra Kumar Sinha, "Highly reflective broadband dielectric metasurface for terahertz applications", IEEE International Conference on Photonics & High Speed Optical Networks (ICPHON 2018), 12-13 April 2018, S. A. Engineering College, Chennai.

14. Parul Goyal, **Nishant Shankhwar,** Yogita Kalra, Ravindra Kumar Sinha, "Field enhancement in Victoria cross type nanoantenna", IEEE International Conference on Photonics & High Speed Optical Networks (ICPHON 2018), 12-13 April 2018, S. A. Engineering College, Chennai.

15. Parul Goyal, **Nishant Shankhwar**, Yogita Kalra, Ravindra Kumar Sinha, " Design and Analysis of a Polarization Independent Flower Shaped Nanoantenna", International Conference on Advances in Science & Technology (ICAST-2018), 04-05 May 2018, Swami Keshavananda Institute of Technology, Management and Gramothan, Jaipur.

16. Parul Goyal, **Nishant Shankhwar**, Yogita Kalra,"Design and analysis of a hollow bowtie nanoantenna." Plasmonics: Design, Materials, Fabrication, Characterization, and Applications XVI. Vol. 10722. International Society for Optics and Photonics, 2018

17. **Nishant Shankhwar**, Yogita Kalra, Ravindra Kumar Sinha, "Dielectric zero-index metamaterial filled photonic crystal defect waveguide: design and analysis." Metamaterials, Metadevices, and Metasystems 2018. Vol. 10719. International Society for Optics and Photonics, 2018."

18. Ritika Ranga, **Nishant Shankhwar**, and Yogita Kalra. "Design and Analysis of Broadband Square Spiral Shaped Nanoantenna." Frontiers in Optics. Optical Society of America, 2018.

19. Parul Goyal, **Nishant Shankhwar**, and Yogita Kalra. "Near Field Enhancement in a Hollow Flower Shaped Nanoantenna." Laser Science. Optical Society of America, 2018.

20. **Nishant Shankhwar**, Yogita Kalra, and Ravindra Kumar Sinha. "Honeycomb photonic crystal as a zero index metamaterial." Laser Science. Optical Society of America, 2018.

21. **Nishant Shankhwar**, Ritika Ranga., Yogita Kalra, & Ravindra Kumar Sinha (2019, September). Dielectric ring based metamaterial perfect reflector. In *Metamaterials, Metadevices, and Metasystems 2019* (Vol. 11080, p. 110802W). International Society for Optics and Photonics.

22. Ritika Ranga, **Nishant Shankhwar**, Yogita Kalra, and Kamal Kishor. "Design of hexameric flower shaped nanoantenna for energy harvesting." In *AIP Conference Proceedings*, vol. 2136, no. 1, p. 030005. AIP Publishing LLC, 2019.

23. **Nishant Shankhwar**, Ritika Ranga, Yogita Kalra, and Ravindra Kumar Sinha. "Controlling the radiation pattern of a microstrip patch antenna using a checkerboard patterned metasurface." In *AIP Conference Proceedings*, vol. 2136, no. 1, p. 030003. AIP Publishing LLC, 2019.