

# Tanuj Kumar

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## Education

<b>University of Wisconsin-Madison</b>	Fall 2021 - *
Ph.D., Department of Electrical & Computer Engineering	4.0/4.0
Advisor: Dr. Mikhail Kats	
<b>Birla Institute of Technology &amp; Science (BITS), Pilani, India</b>	2015 - 2020
Integrated Dual Degree program	7.96/10
Bachelor of Engineering (Honours) in Electrical and Electronics	
Master of Science (Honours) in Chemistry	

## Awards

1. Marie Christine Kohler Fellow at the Wisconsin Institute for Discovery, University of Wisconsin-Madison, 2023
2. Student Research Grants Competition (SRGC) Research Travel Award, University of Wisconsin-Madison, 2022
3. ECE Chancellors Opportunity Fellowship (COF) award, University of Wisconsin-Madison, 2021

## Journal Publications

1. **T. Kumar**, R.E. Owyung, S. Sonkusale, *Rapid Cleanroom-Free Fabrication of Thread Based Transistors Using Three-Dimensional Stencil-Based Patterning*, Flexible and Printed Electronics, Feb 2021. [\[DOI\]](#)

## Patents

1. S. Sonkusale, R.E. Owyung, **T. Kumar**, *Fabrication of Thread Based Transistors*, provisional patent application filed Jan 2021.

## Conference Presentations

1. **T. Kumar**, D. Feng, S. Yin, P. Lin, M. Mah, M. Fortman, G. Jaffe, C. Wan, C. Fang, R. Warzoha, V. Brar, J. Talghader, M. Kats, *Photothermal Commonpath Interferometry of Silicon Nitride Membranes for Laser Light Sails*, Conference on Lasers and Electro-Optics (CLEO), May 2023.
2. **T. Kumar**, A. Sugathan, K.L. Narasimhan, A. Pandey, S. Avasthi, *CuFeSe<sub>2</sub> Quantum-Dot Based Infrared Photodetectors with Functionality in the Ambient* (Poster), IEEE Sensors Conference (online), Nov 2021. [\[DOI\]](#)
3. **T. Kumar**, R. E. Owyung, S. Sonkusale, *High Throughput Cleanroom-Free Fabrication of Thread Based Transistors*, Materials Research Society Fall Meeting (online), Nov 2020.

## Talks

1. *Building a Satellite Isn't Rocket Science*, TEDx BITS Pilani, India, Jan 2019 [\[Link\]](#).
2. *Role of Open Source in the Development of a Student-Built Nanosat & its Team Members*, Open Source Cubesat Workshop - European Space Agency, Madrid, Sep 2018 [\[Link\]](#).

## Research Experience

1. Characterization of low-loss laser-sail materials Sep 2021 - ongoing  
*University of Wisconsin-Madison - with Prof. Mikhail Kats*  
We are designing and conducting experiments to find the optical parameters of very low-loss materials. These materials have applications in laser sails, to be used in the Breakthrough Starshot project.
2. Quantum Dot Photodetectors Aug 2020 - Jul 2021  
*Indian Institute of Science - with Prof. Sushobhan Avasthi*  
We designed the fabrication flow and materials for ambient-operation broadband CuFeSe<sub>2</sub> and CuFeS<sub>2</sub> quantum dot photodetectors.
3. Rapid Fabrication Process for Thread-Based Transistors Aug 2019 - June 2020  
*Tufts University - with Prof. Sameer Sonkusale*  
We developed a high-throughput, cleanroom-free fabrication method for Thread-Based Transistors (TBTs). This improved on the throughput of a previous fabrication method by 2 orders of magnitude.

## Internships

1. CentraleSupélec, Paris May 2019 - July 2019  
*With Prof. Caroline Lelandais-Perrault*
2. Indian Space Research Organization May 2018 - July 2018  
*With Dr. Vinod Kumar, FIE, FIETE, Scientific Officer*

## Teaching Assistantships (During Undergraduate)

1. Microelectronic Circuits (EEE F244) Jan 2019 - May 2019
  - Designed and conducted tutorial sessions on SPICE & Cadence simulation techniques and graded tests
  - Group coordinator for my TA group.
2. Computer Programming (CS F111), Aug 2018 - Dec 2018
  - Conducted twice-a-week lab classes on Linux commands and C programming for freshman year students.
  - Developed problem sets and answer keys and invigilated quizzes.

## Professional Service

1. President-elect Sep 2023 - Aug 2024  
Graduate Student Association of the Department of Electrical and Computer Engineering (ECE-GSA), University of Wisconsin-Madison

## **Music and Photography**

Available on my website - <https://tanuj.co>