# Nikhil Khatavkar

Assistant Professor; Materials and Metallurgical Engineering; MANIT-Bhopal
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## EDUCATION

### PhD in Materials Science                                     Jan 2018 – Jan 2023

Materials Research Centre, Indian Institute of Science, Bangalore
- o Development of AI based solutions for swift and accurate prediction of mechanical and environmental properties of Nickel(Ni) based superalloys for application in jet engines
- o Density functional based study of the interfaces and dopants for stronger Ni-superalloy interfaces

### B. Tech + M. Tech (Integrated Dual Degree)                              2012 –2017

School of Materials Science and Technology, Indian Institute of Technology (BHU), Varanasi

## PROFESSIONAL EXPERIENCE

### Assistant Professor | MME | MANIT-Bhopal                        Oct 2025 - Current
- o Computational Material Science; Density Functional Theory; AI/ML for Materials Research

### Software Engineer | Magnit (Western Digital)                   Aug 2023 - May 2024
- o Development of new hard disk technology (HAMR) using AI/ML

### Scientist 3 | Sandisk India Pvt. Ltd. (Western Digital)          May 2024 - Oct 2024
- o Supply chain optimization using linear programming and AI/ML

### Scientist 3 | Western Digital                                  Oct 2024 - Sept 2025
- o Line qualification for streamlining defect identification in hard disks

### Associate Consultant | Capgemini, Hyderabad                       Sept - Dec 2017
- o Training of SQL, HTML, CSS, JAVA
- o Professional writing and communication training

## ACADEMIC EXPERIENCE

### PhD | Indian Institute of Science, Bangalore

Development of machine learning based solutions for development of high strength nickel based superalloys with increased corrosion resistance. Establishment of a framework for prediction of mechanical properties
- o Data mining, and filtering: Established an in house database for materials and performed data cleaning
- o Image processing: Feature extraction and statistical feature (2-point correlations) generation
- o Correlation analysis and feature engineering: Dimensionality reduction and identification of relevant descriptors for the materials property
- o ML modelling: Development of regression models utilizing various ML algorithms such as SVR, GPR, XGBoost
- o Property improvement: Evolutionary algorithms utilized to further enhance the current state of the art properties of superalloys

Contribution to webpage development of aNANt, India's first and world's largest 2D materials database, using Django, python and SQL

Teaching assistant experience of four months on computational materials science

### Master of Technology | Indian Institute of Technology (BHU), Varanasi          2017

Stabilization of long range ordered anti-ferroelectric phase transition in barium zirconate as a result of lead doping
- o Responsible for handling ultralow temperature dielectric measurement equipment and high temperature furnaces
- o Synthesis and dielectric analysis of lead-barium zirconate for low temperature dielectric properties
- o Detected rare phenomena of quantum paraelectric effect in the LBZ system

## PUBLICATIONS

1. **Khatavkar, Nikhil**; Singh, Abhishek Kumar; Combined approach to capture the evolution of oxidation of Nickel based superalloys using data driven approaches; Physical Review Materials; 8(5); 53601; 2024
2. Pandey, Prafull; **Khatavkar, Nikhil**; Kumar, Sarvesh; Oh, Hyunseok; Godha, Akshat; Makineni, Surendra K; Singh, Abhishek; Tasan, Cemal Cem; Chattopadhyay, Kamanio; Plastic deformation and strengthening mechanisms in CoNiCrFe high entropy alloys: The role of lattice site occupancy; International Journal of Plasticity; 183; 104145; 2024
3. Pandey, Prafull; Heczko, Milan; **Khatavkar, Nikhil**; Mazumder, Namrata; Sharma, Abhishek; Singh, Abhishek; Mills, Michael J; Chattopadhyay, Kamanio; On the faulting and twinning mediated strengthening and plasticity in a γ' strengthened CoNi-based superalloy at room temperature; Acta Materialia; 252; 118928; 2023
4. **Khatavkar, Nikhil**; Singh, Abhishek Kumar; Highly interpretable machine learning framework for prediction of mechanical properties of nickel based superalloys; Physical Review Materials; 6; 12; 123603; 2022
5. **Khatavkar, Nikhil**; Swetlana, Sucheta; Singh, Abhishek Kumar; Accelerated prediction of Vickers hardness of Co- and Ni-based superalloys from microstructure and composition using advanced image processing techniques and machine learning; Acta Materialia; 196; 295-303; 2020
6. Swetlana, Sucheta; **Khatavkar, Nikhil**; Singh, Abhishek Kumar; Development of Vickers hardness prediction models via microstructural analysis and machine learning; Journal of Materials Science; 55; 33; 15845-15856; 2020
7. **Khatavkar, Nikhil**; Balasubramanian, K; Composite materials for supersonic aircraft radomes with ameliorated radio frequency transmission-a review; RSC advances; 6; 8; 6709-6718; 2016

## TECHNICAL SKILLS

- Python: Successfully demonstrated utilization of packages related to image processing, data handling and machine learning, dash for web development
- SQL
- Adobe Illustrator, WordPress, Django
- Bash scripting, Density functional theory (VASP)