PRIYANKA SAINI

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Research Profile
Priyanka_Google_Scholar

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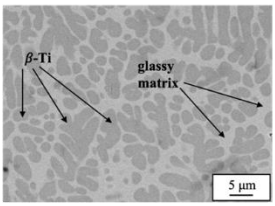
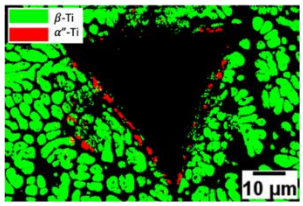
Orcid ID: 0009-0004-1753-7821

Date of Birth: 16-10-1997

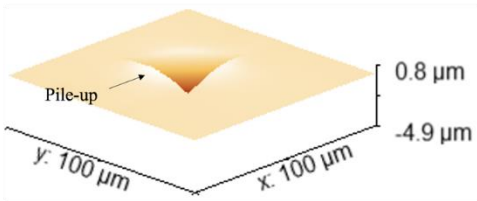
Research Interests

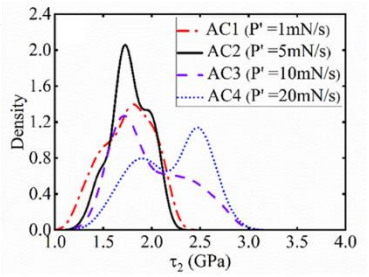
- Mechanical behavior of advanced materials at multiscale (micro- to macro-) covering wide range of temperatures
- Structure-Property correlations in bulk metallic glass, composites, high entropy alloys, coatings, additive manufacturing metals, and alloys
- Special emphasis on **fracture** and **micromechanical behavior**, such as **nanoindentation** of materials
- Statistical modeling





Structure-Property Correlation





Statistical modeling

Academic Career

National Institute of Technology, Rourkela — **8th July 2024- present**
Assistant Professor Grade-II, Metallurgical and Materials Engineering Department

Indian Institute of Technology Delhi, India — **29th Dec, 2023 – 28th March, 2024**
Early Post-doctoral Researcher, Department of Materials Science and Engineering

- Supervisor: Prof. Lakshmi Narayan Ramasubramanian
- Project topic: Fracture Studies of 3-D Printed Ti-6Al-4V Hollow Honeycomb Structures Integrated With Zinc

Indian Institute of Technology Delhi, India — **20th July, 2019 – 29th Dec, 2023**
Ph.D., Department of Materials Science and Engineering

- Thesis Topic: Understanding plasticity in bulk metallic glass and its composites using the indentation technique
- Supervisor: Prof. Lakshmi Narayan Ramasubramanian
- Laboratory: Laboratory for Multi-scale Mechanical Behavior of Materials
- CGPA: 9.167/10**,** Coursework:
  - Fracture Mechanics
  - Mathematical and Computational Methods in Materials
  - Applied Elasticity
  - Mechanical Behaviour of Materials
  - Phase Transformation
  - Structure and Characterization of Materials
  - Thermodynamics of Materials
  - Special Topics in Materials

Defence Metallurgical Research Laboratory Hyderabad, India — **18th Dec 2017 – 13th Feb 2018**
B.Tech. Research Internship, Forming Technology Division

- Title: Multi-axial forging of nickel-base superalloy to refine the grain size
- Supervisor: Dr. Balasundar IIangovan

National Institute of Technology Srinagar, India **1st July 2015 – 10th June 2019**
B.Tech., Metallurgical and Materials Engineering Department

- CGPA: 8.788/10 (Secured 2nd rank in department)
- Thesis Title: Cyclic oxidation of INCONEL 718 at high temperatures

Academic projects

- Experimental and statistics-based investigation of understanding plasticity in bulk metallic glasses and their composites.
- Experimental investigations include Nanoindentation, Vickers Hardness tester, Compressive Testing, Four-Point Bend Testing, Telemicroscope, Annealing, Scanning Electron Microscope (SEM), Electron Back Scattered Diffraction (EBSD), Fractography, Electron Dispersive Spectroscopy (EDS), X-Ray Diffraction (XRD), Differential Scanning Calorimeter (DSC), Atomic Force Microscopy (AFM), Optical microscope.
- Statistical modeling of shear band propagation in Metallic Glasses under nanoindentation.
- Crack initiation and propagation study of bulk metallic glasses and 3-D printed Ti-6Al-4V hollow honeycomb structure integrated with Zinc.

List of Publications

1. **Priyanka Saini**, R. L. Narayan, On simultaneous enhancement in local yield strength and plasticity of short-term annealed bulk metallic glasses, *Journal of Alloys and Compounds*, 898 (2022), 162960.
2. **Priyanka Saini**, Shankha Nag, Jae-il Jang, In-Chul Choi, Upadrasta Ramamurty, R. L. Narayan, A statistical analysis of the second 'pop-in' behaviour of the spherical-tip nanoindentation of Zr-based bulk metallic glasses, *Materialia*, 31 (2023), 101862.
3. **Priyanka Saini**, Yakai Zhao, Biao Li, Long Zhang, Upadrasta Ramamurty, R.L. Narayan, Temperature dependence of pressure sensitivity in metallic glass composites, *Journal of Materials Science & Technology*, 181 (2024), 165-175.
4. **Priyanka Saini**, Shafaq Ashraf Lone, Yashwant Mehta, Zahida, Cyclic oxidation of IN 718 at high temperatures, *Journal of Material Science and Mechanical Engineering*, 6 (2019), 227-232.
5. Abhilasha Jain, Yogesh Prabhu, Dmitry Gunderov, R. Lakshmi Narayan, **Priyanka Saini**, S. Vincent, Priya Sudha, Ashutosh D. Bagde, Jatin Bhatt, Structural characterization, biocorrosion and in-vitro investigation on Zr62Cu22Al10Fe5Dy1 metallic glass for bio-implant applications, *Journal of Non-Crystalline Solids*, 598 (2022), 121928.
6. Yogesh Prabhu, Abhilasha Jain, R. Lakshmi Narayan, **Priyanka Saini**, S. Vincent, E. S. Park, Jatin Bhatt, Crystallization Kinetics and Nanoindentation Studies of Cu46Zr40Ti8.5Al5.5 Glassy Alloy, *Journal of Non-Crystalline Solids*, 625 (2024), 122753.
7. D. Mishra, A. Dhal, **Priyanka Saini**, P. Ghosal, R.L. Narayan, R.S. Mishra, J. Singh, S.S. Nene, Unexpected mechanical response in Cu-Mn-Fe-Co containing as-cast high entropy alloy with high Cu concentration (*under review in Scripta Materialia*).

Conference Oral Presentations

1. **IIW7** (Seventh International Indentation Workshop), Hyderabad, India, 17 - 21 Dec 2023
2. **ASATM** (Advances in Structural Alloys and Their Manufacturing), Singapore, 10 - 13 Jan 2023
3. **TMS** (The Minerals, Metals and Materials Society) Annual Meeting and Exhibition, USA, 27 Feb - 3 Mar 2022
4. **ICAMMC** (International Conference on Advanced Materials and Mechanical Characterization), India, 2- 4 Dec 2021
5. 75th Annual Technical Meeting of the **IIM** (Indian Institute of Metals), India, 13 - 15 Nov 2021

Work Experience

1. Teaching assistant and head teaching assistant for introduction to **materials science** (July 2019 - June 2023)
2. Material science tutor at **Delhi Skill and Entrepreneurship University** (July 2022 - Mar 2023)
3. Gate metallurgy tutor in **National Programme on Technology Enhanced Learning** (Aug 2023 - Oct 2023)

Training & Courses

1. Hands-on training: Nano Indenter, FESEM, EDS, and EBSD from Dec 2020 to July 2021 at IIT Delhi
2. Short-term course on "Electron Microscopy in Materials Science" organized by the Department

of Materials Science and Engineering, Indian Institute of Technology Delhi from 3rd – 9th January 2024

3. Short-term course on "Research Communication Workshop" organized by Indian Institute of Technology Delhi from 18th – 22nd March 2024

Instrument Proficiency

- Nano/Micro Indentation
- Fracture Testing
- FE-SEM: Field emission Scanning **Electron Microscopy**
- EDS: Electron Dispersive Spectroscopy
- EBSD: **Electron Back Scatter Diffraction**
- Tensile/Compression
- Optical microscopy
- Electro-polishing, electro-etching
- DSC: Differential Scanning Calorimetry
- AFM: Atomic Force Microscopy
- LPBF: Laser Powder Bed Fusion

Awards & Academic Merits

- Awarded **Prime Minister's Research Fellowship (PMRF)** for pursuing doctoral degree at IIT Delhi, 2021
- Awarded a **merit certificate** from NIT Srinagar for securing 2nd position in B. Tech, Metallurgical and Materials Engineering Department, 2019
- Inducted as **student member** of Indian National Academy of Engineering (INAE), 2022
- Secured 1st position in the **3-minute thesis** competition conducted by TRYST IIT Delhi, 2023
- Secured 1st position in **3-minute thesis** conducted by INAE-SERB youth conclave at IIT Jodhpur, 2022
- Secured 2nd position in the **SARANSH thesis competition** conducted by INYAS, 2022
- Won the **best oral presentation award** at the International Conference on Advanced Materials and Mechanical Characterization (ICAMMC), 2021
- Won the **best scanning electron microscopy metallography award** at the 75th Annual Technical Meeting of the Indian Institute of Metals, 2021
- Awarded a **merit certificate** from K.V. No.2 Jammu Cantt. for securing a 10 CGPA in 10th class, 2013

References

1. **Prof. Lakshmi Narayan Ramasubramanian**
   Assistant Professor, Department of Materials Science and Engineering
   Indian Institute of Technology Delhi, New Delhi- 110016, India
   Email: rlnarayan@mse.iitd.ac.in, Phone: +91-8860996485

2. **Prof. Jae-il Jang**
   Professor, School of Materials Science and Engineering,
   Hanyang University, Seoul- 04763, Korea
   Email: jijang@hanyang.ac.kr, Phone: +82-2-2220-0402

3. **Dr. Yakai Zhao**
   Senior Scientist, Institute of Materials Research and Engineering (IMRE)
   Agency for Science, Technology and Research (A*STAR), 138634, Singapore
   Email: zhao_yakai@imre.a-star.edu.sg, Phone: +65-8306-2285

Declaration: I certify that the foregoing information is correct and complete to the best of my knowledge and belief, and nothing has been concealed/distorted. If at any time I am found to have concealed/distorted any material information, my appointment shall be liable to be summarily terminated without notice/compensation.

Place: NIT Rourkela **Signature of the candidate**