Tara P. Mishra

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Curriculum Vitæ

National University of Singapore
Materials Science and Engineering
Singapore-MIT Alliance for Research and Technology
Low Energy Electronic System

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Professional Preparation

2018–Present	National University of Singapore (Singapore) Singapore-MIT Alliance for Research and Technology Advisors: Prof.s Canepa, Pennycook & Gradečak	Ph.D. Material Science and Engineering CAP: 5.0/5.0
2014-2018	Indian Institute of Science (India)	B.Sc., Research CAP: 7.2/8.0
May 2017- August 2017	National University of Singapore (NUS) Advisor: Prof. Stephen Pennycook	Summer Internship
May 2016- August 2016	Japan Advanced Insitute of Science and Technology (JAIST) Advisor: Prof. Yoshifumi Oshima	Summer Internship

Honours & Awards

May 2018	Institute Gold Medal for best performance in materials B.Sc. (Research), IISc Bangalore.
April 2018	Singapore-MIT Alliance for Technology and Research (SMART) fellowship. Fellowship to pursue Ph.D. under supervision of Professors from NUS and MIT.
August 2017	Most Promising Young Researcher in Materials Students Symposium, IISc Bangalore.
May 2016	JASSO (Japan Student Services Organization) scholarship for summer internship at Japan Advanced Institute of Science and Technology (JAIST)
March 2014	University Entrance Exam (KVPY) All India Rank: 105
April 2012	Chief Minister Award for State Level Mathematics Olympiad

Submitted and Under Preparation Publications

3. **T. P. Mishra**, C. Li, S. Gradečak, P. Canepa, S. Pennycook, *Channeling-enhanced depth resolution in Scanning Transmission Electron Microscopy*, (In preparation).

2. Z.Y. Deng, **T. P. Mishra**, J. N. Chotard, V. Seznec, A. K. Cheetam, C. Masquelier, G. S. Gautam, and P. Canepa, *Microsecond Ion-Transport Simulations of Mixed Poly-Anion Solid Electrolytes*, (Under revision).

1. **T. P. Mishra**, J.Y. Chung, Z.Y. Deng, L. Zhang, S. Pennycook, S. Gradečak, M. Bosman, and P. Canepa, *Mitigation of compositional fluctuations and stacking fault in high Indium content InGaN Light Emitting Diodes*, (In preparation).

Peer-reviewed Publications

6. Y. Gao, **T. P. Mishra**, S. H. Bao, G. S. Gautam, and P. Canepa, *Design and Characterization of Host-Frameworks for Facile Magnesium Transport*, **Annual Review of Materials Research** (Accepted, In press).

5. J-Y Chung, Z. Li, S. A. Goodman, J. So, G. J. Syaranamual, **T. P. Mishra**, E. A. Fitzgerald, M. Bosman, K. Lee, S. J. Pennycook, and S. Gradečak, *Light-Emitting V-Pits: An Alternative Approach toward Luminescent Indium-Rich InGaN Quantum Dots*, **ACS Photonics** (2021). 10.1021/acsphotonics.1c01009.

4. #**T. P. Mishra**, G. J. Syaranamual, Z. Deng, J.-Y. Chung, L. Zhang, S. A. Goodman, L. Jones, M. Bosman, S. Gradečak, S. J. Pennycook, and P. Canepa, *Unlocking the origin of compositional fluctuations in InGaN light emitting diodes*, **Phys. Rev. Mater.** 05, 024605 (2021). 10.1103/PhysRevMaterials.5.024605.

3. M. Li, Z. Huang, C. Tang, D. Song, **T. P. Mishra**, A. Ariando, T. Venkatesan, C. Li, S. J. Pennycook, *"Correlated Lattice Instability and Emergent Charged Domain Walls at Oxide Heterointerfaces"*, **Adv. Funct. Mat.** 29(49), 1906655 (2019) 10.1002/adfm.201906655.

2. #**T. P. Mishra**, M.Koyano and Y. Oshima, "Detection of large thermal vibration for Cu atoms in tetrahedrite by high-angle annular dark-field imaging", **Appl. Phys. Express** 10, 045601 (2017) 10.7567/APEX.10.045601.

1. **T. P. Mishra**, B.Sc. Dissertation Thesis: Three Dimensional Structure Reconstruction from Scanning Transmission Electron Micrographs, Indian Institute of Science (2018), India

Oral Talks & Poster Presentation

5. **T. P. Mishra**, Z.Y. Deng, J.Y. Chung, S. Gradečak, S.J. Pennycook, and P. Canepa, "Detection and suppression of compositional fluctuations in InGaN Light Emitting Diodes." Accepted for 2021 MRS Fall Meeting to be held at Boston, MA, USA. (Oral Talk).

4. **T. P. Mishra**, Z.Y. Deng, J.Y. Chung, S. Gradečak, S.J. Pennycook, and P. Canepa, "Origin of Compositional fluctuations in InGaN Light Emitting Diodes." **Institute of Physics Singapore 2021** T2.128. (Oral Talk).

3. **T. P. Mishra**, G. J. Syaranamual, L. Jones, J. Y. Chung, Z. Li, S. A. Goodman, S. J. Chua, E. A. Fitzgerald, P. Canepa, S. Gradečak, and S. J. Pennycook, "Quantitative Measurement of Subnanometer In Fluctuations in InGaN Quantum Well", **ICMASS, Nagoya**, 1392 (2019) (Poster)

2. **T. P. Mishra**, M. Koyano and Y. Oshima, "Detection of large thermal vibration for Cu atoms in tetrahedrite by high-angle annular dark-field imaging", **ICMAT** 10, 045601 (2019). (Poster)

1. **T. P. Mishra**, M. Koyano and Y. Oshima, "Anomalous scattering at high angles stemming from anisotropic atomic vibrations", **Materials Student Symposium, Indian Institute of Science, Bangalore** (2017). (Oral Talk)

Teaching and Mentoring

1. **Fall, 2021** Mentoring Mr. Preston Lim (NUS) for his Final Year Project on "Machine Learning of Interatomic Potentials in InGaN alloys".

2. **Fall, 2017** Teaching Assistant, Undergarduate Core Module, UMT 202: Structure of Materials at Indian Institute of Science.

Research in the News

1. **April 28, 2021** MIT News Office: SMART investigates the science behind varying performance of different colored LEDs. https://news.mit.edu/2021/smart-performance-different-colored-leds-0428

Areas of Interest

1. Computational materials modelling involving density functional theory and molecular dynamics.
2. Computational and experimental scanning transmission electron microscopy.
3. Bridging experimental and theoretical measurements through data science.

Other skills

1. Maintenance and usage of linux based high performance computing cluster (HPC).
2. Proficient in programming language such as Python, C++, C and MATLAB and packages such as Pymatgen, CASM, VASP, and abTEM.
3. Experienced in signal and image processing techniques.
4. Basic knowledge of characterisation techniques such as Optical Characterisation (Profilometry and Ellipsometry) and Material Characterisation (AFM, Raman Spectroscopy, XRD and SEM).

References

1. Prof. Pieremanuele CANEPA
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2. Prof. Stephen John Pennycook
   Dept. of Materials Science and Engineering
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3. Prof. Silvija Gradecak-Garaj
   Dept. of Materials Science and Engineering
   Massachusetts Institute of Technology
   Email: gradecak@mit.edu
4. Prof. Yoshifumi Oshima
   School of Material Science
   Japan Advancement Institute of Science and Technology
   Email: oshima@jaist.ac.jp