

EDUCATION

2018–2024 **Ph.D. in Materials Science and Engineering**, University of California Davis (UCD)
2013–2017 **B.S. in Mechanical Engineering**, University of Hawaii at Manoa

EXPERIENCE

- 2024–Now **Postdoctoral Associate**, Dept. of Physics, Massachusetts Institute of Technology (MIT) and Advanced Light Source, Lawrence Berkeley National Laboratory (LBNL)
Advised by Prof. Riccardo Comin (MIT) and Dr. Sujoy Roy (LBNL)
- Developing high vacuum x-ray instrumentation in collaboration with LBNL scientists to enable the investigation of new x-ray microscopy techniques based on coherent lensless imaging.
 - Investigating nanoscale magnetism in moiré heterostructures of 2D magnetic materials using resonant x-ray magnetic scattering.
 - Developing a photon correlation spectroscopy (dynamic light scattering) setup for characterizing nano- and micro-scale particles in suspension.
- 2019–2024 **Research Assistant**, Dept. of Materials Science and Engineering, University of California Davis
Advised by Prof. Yayoi Takamura
- Fabricated and characterized epitaxial oxide thin films for collaborations aimed at developing devices with voltage-controlled magnetism, resulting in 4 papers.
 - Led collaborations with Dept. of Energy scientists to investigate nanoscale magnetism in lithographically patterned oxide thin films, resulting in 2 scientific papers and 3 awarded proposals
 - Designed magnetic microscopy experiments to study patterned magnetic thin films.
 - Developed MATLAB image analysis routines to automate the detection and characterization of nanomagnets in over 100 microscopy images.
 - Developed micromagnetic simulations to understand how nanoscale magnetism in patterned films can be engineered through material properties, pattern geometries, and magnetic interactions.
 - Mentored graduate and undergraduate students on performing scientific research and repairing XRD/XRR and PLD systems.
- 2022–2023 **Research Fellow**, Advanced Light Source, Lawrence Berkeley National Laboratory
Advised by Dr. Padraic Shafer and Dr. Christoph Klewe
- Investigated methods to enhance the sensitivity of a hybrid x-ray and microwave spectrometer, leading to a ~10x improvement in measurement sensitivity through detector hardware development.
 - Worked with vendors and internal engineering staff to develop plans for upgrading an x-ray detector in a high-vacuum synchrotron XRD tool.
- 2018–2021 **Teaching Assistant**, Dept. of Chemistry, Chemical Engineering, and Materials Science and Engineering
University of California Davis
- Led chemistry laboratory classroom sessions with over 20 students, providing chemical safety training and ensuring the safe completion of experiments performed by the students.
 - Planned and led lectures teaching students concepts such as electronic and magnetic properties of materials, general chemistry, and MATLAB programming.
- 2016–2017 **Research Assistant**, Dept. of Mechanical Engineering, University of Hawaii at Manoa
Advised by Prof. Bardia Konh
- Worked in a team of several students to develop a robotic surgical instrument called an active needle, whose design was awarded 2nd place in an ASME engineering design competition.
 - Simulated the mechanical behavior of an active needle design with shape memory actuators using ANSYS Mechanical, resulting in 1 scientific publication.

SKILLSET

Thin film growth – Pulsed laser deposition (PLD) for epitaxial magnetic oxide growth

Microscopy – Scanning electron microscopy (SEM) and magnetic and atomic force microscopy (AFM)

Scattering – High resolution x-ray diffraction (XRD) and x-ray reflectivity (XRR)

Magnetometry – Vibrating sample magnetometry (VSM)

Synchrotron techniques – Soft x-ray photoemission electron microscopy, x-ray absorption spectroscopy (XAS) with circular/linear dichroism, x-ray detected ferromagnetic resonance, resonant hard x-ray reflectometry, resonant soft x-ray magnetic scattering (transmission and reflection), scanning transmission x-ray microscopy, x-ray ptychography, and x-ray microdiffraction.

Laboratory instrumentation – Operation, maintenance, and repair of XRD/XRR systems and high vacuum deposition systems. Operation and maintenance of Class 4 ultraviolet excimer laser and optics.

Programming – MATLAB for coding image analysis and processing routines, developing GUI, and creating Monte Carlo simulations. Python for developing data analysis scripts and macros for the mask layout software KLayout.

Simulations – MuMax³ for micromagnetic simulations. Stopping and Range of Ions in Matter for calculating doses for ion implantation based oxide patterning. ANSYS Mechanical for performing finite element analysis simulations. OASYS/SHADOW for ray tracing optics at synchrotron beamlines.

CAD – Autodesk Inventor and Solidworks for generating 3D CAD models and assemblies. KLayout to create mask designs for electron beam lithography.

HONORS AND AWARDS

2022–2023 Office of Science Graduate Student Research Fellowship, US Department of Energy

2022 Travel Award to present at the MMM 2022 conference, UC Davis Graduate Studies

2020–2021 Graduate Assistance in Areas of National Need Fellowship, US Department of Education

2019 Academic Scholarship, Pedrozzi Foundation, Livermore, CA

2017 2nd place in the Francis Rhodes Montgomery Design Competition, American Society of Mech. Engineers

PUBLICATIONS

Refereed Journal Articles

I. Nihal, **D. Sasaki**, M. Feng, C. Klewe, P. Shafer, A. Scholl, Y. Takamura, “Spin-flop coupling at La_{0.5}Sr_{0.5}FeO₃/La_{0.7}Sr_{0.3}MnO₃ interfaces”, *Physical Review B*, **110**, 014411 (2024)

P. Salev, L. Frantino, **D. Sasaki**, S. Bag, Y. Takamura, M. Rozenberg, I. Schuller, “Magnetoresistance anomaly during the electrical triggering of a metal-insulator transition”, *Physical Review B*, **108**, 174434 (2023).

M. Feng, N. Ahlm, **D. Sasaki**, I. Chiu, A. N’Diaye, P. Shafer, C. Klewe, A. Metha, Y. Takamura, “Tuning in-plane magnetic anisotropy and interfacial exchange coupling in epitaxial La_{2/3}Sr_{1/3}CoO₃/La_{2/3}Sr_{1/3}MnO₃ Heterostructures”, *ACS Appl. Mater. Interfaces*, **15**, 53086-53095 (2023).

P. Salev, I. Volvach, **D. Sasaki**, P. Lapa, Y. Takamura, V. Lomakin, and I. Schuller, “Voltage-controlled magnetic anisotropy enabled by resistive switching”, *Physical Review B*, **107**, 054415 (2023).

M. Feng, N. Ahlm, A. Kane, I. Chiu, **D. Sasaki**, P. Shafer, A. N’Diaye, A. Mehta, and Y. Takamura, “Strain- and thickness-dependent magnetic properties of epitaxial La_{0.67}Sr_{0.33}CoO₃/La_{0.67}Sr_{0.33}MnO₃ bilayers”, *Journal of Applied Physics*, **132**, 195301 (2022).

D. Sasaki, R. Chopdekar, S. Retterer, D. Jiang, J. Mason, M. Lee, and Y. Takamura, “Formation of complex spin textures in thermally demagnetized La_{0.7}Sr_{0.3}MnO₃ artificial-spin-ice structures”, *Physical Review Applied*, **17**, 064057 (2022). (Editor’s Selection)

P. Salev, L. Frantino, **D. Sasaki**, R. Berkoun, J. del Valle, Y. Kalcheim, Y. Takamura, M. Rozenberg, and I. Schuller, “Transverse barrier formation by electrical triggering of a metal-to-insulator transition”, *Nature Communications* **12**, 5499 (2021).

B. Konh, **D. Sasaki**, T. Podder, and H. Ashrafiuon, “3D manipulation of an active steerable needle via actuation of multiple SMA wires”, *Robotica* **38**, 410-426 (2020).

In Submission

- D. Sasaki**, R. Chopdekar, S. Retterer, J. Mason, M. Lee, and Y. Takamura, “Energetics of Ising-Vortex interactions in $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ brickwork artificial spin ice”.
- P. Salev, E. Kisiel, **D. Sasaki**, B. Gunn, W. He, M. Feng, J. Li, N. Tamura, I. Poudyal, Z. Islam, Y. Takamura, A. Frano, I. Schuller, “Local strain inhomogeneities during the electrical triggering of a metal-insulator transition revealed by the x-ray microscopy”, arXiv:2310.07001.
- T. Chen, H. Ren, N. Ghazikhanian, R. Hage, **D. Sasaki**, P. Salev, Y. Takamura, I. Schuller, A. Kent, “Voltage control of spin resonance in phase change materials”, arXiv:2406.11679.

PRESENTATIONS

- 2023 **D. Sasaki**, “Imaging nanoscale magnetism in perovskite-based artificial spin ices.”, contributed oral presentation, UC Davis Chemical Engineering and Materials Science and Engineering Research Symposium
- 2022 **D. Sasaki**, M. Feng, I. Nihal, S. Retterer, A. Scholl, R. Chopdekar, and Y. Takamura, “Imaging thermally-induced Ising-vortex transformations in $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ -based artificial spin ices.”, contributed oral presentation, 67th Annual Magnetism and Magnetic Materials Conference
- 2022 **D. Sasaki**, R. Chopdekar, S. Retterer, D. Jiang, J. Mason, M. Lee, and Y. Takamura, “Energetics of complex spin textures in LSMO artificial spin ice structures.”, contributed oral presentation, 15th Joint MMM-Intermag Conference
- 2020 **D. Sasaki**, R. Chopdekar, S. Retterer, D. Jiang, J. Mason, M. Lee, and Y. Takamura, “The formation of complex spin textures in $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$ artificial spin ice arrays.”, contributed oral presentation, 65th Annual Conference on Magnetism and Magnetic Materials