

BIOGRAPHICAL SKETCH: KAYLA NGUYEN

University of Oregon
Department of Physics
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(A) EDUCATION:

Cornell University (Ithaca, NY) **2018**
Ph.D. Chemical Physics
Thesis: *New capabilities for materials enabled by the Electron Microscope Pixel Array Detector (EMPAD)*
supervised by David A. Muller

University of California Santa Barbara (Santa Barbara, CA) **2011**
B.S. Physics (Honors)
Bachelor's Honors Thesis: *Electrostatic Force Microscopy on Organic Photovoltaics*
supervised by Thuc-Quyen Nguyen

(B) RESEARCH AND PROFESSIONAL EXPERIENCE:

ASSISTANT PROFESSOR **2023 - PRESENT**
DEPARTMENT OF PHYSICS, *UNIVERSITY OF OREGON*

ILLINOIS DISTINGUISHED POSTDOCTORAL FELLOW **2019-2023**
UNIVERSITY OF ILLINOIS, URBANA-CHAMPAIGN

GRADUATE RESEARCH ASSISTANT **2012-2018**
CORNELL UNIVERSITY

(C) HONORS AND AWARDS:

1. National Research Fellowship, *Singapore* (3 million SGD ~2.25 million USD, declined) (2023)
2. The Japan Times: One of Five Promising Asian Researchers (2021)
3. Rising Star in Materials Science and Engineering, *Stanford University* (2021)
4. L'Oréal For Women in Science Postdoctoral Fellowship (2020)
5. Microscopy Today Innovations Award (2019)
6. Illinois Distinguished Postdoctoral Research Associate and Visiting Scholar (2019)
7. Lemelson-MIT Student Prize (2018).
8. Cornell University Commercialization Fellow (2017)
9. Student Scholar Award, 8th International Workshop on Electron Energy Loss Spectroscopy & Related Techniques, *Okinawa, Japan* (2017).
10. Distinguished Presidential Scholar, Microbeam Analysis Society, *Indianapolis, Indiana* (2013).
11. Undergraduate Research Honors, *University of California, Santa Barbara* (2011).
12. Cooperative International Science and Engineering Internship, *Oxford University* (2010).
13. Center for Energy Efficient Materials Research Student Fellowship, *University of California, Santa Barbara* (2010).

(D) INVENTIONS:

1. ELECTRON MICROSCOPE PIXEL ARRAY DETECTOR LICENSED TO **THERMO FISHER SCIENTIFIC**
MAIN CO-INVENTOR - SYSTEMS, HARDWARE AND SOFTWARE DEVELOPMENT

(E) PUBLICATIONS (organized by date, *equal contribution):

19. **KX Nguyen***, Y Jiang*, CH Lee*, P Kharel, Y Zhang, A van der Zande, PY Huang, *Deep Sub-Angstrom Electron Ptychography in an Uncorrected Electron Microscope*, Science **383**, 865-870 (2024).
18. **KX Nguyen**, Y Jiang, MC Cao, P Purohit, AK Yadav, P García-Fernández, MW Tate, CS Chang, P Aguado-Puente, J Íñiguez, SM Gruner, J Junquera, R Ramesh, DA Muller, *Orbital Angular Momentum and Torque Transfer to an Electron Beam from Polarization Vortices*, Physical Review B **107**, 205419 (2023).
17. **KX Nguyen***, J Huang*, M Karigerasi, K Kang, DG Cahill, JM Zuo, A Schleife, D Shoemaker, PY Huang, *Direct Electron Imaging of Antiferromagnets using 4D-STEM*, Ultramicroscopy **247**, 113696 (2023).
16. Z Chen, E Turgut, Y Jiang, **KX Nguyen**, MJ Stolt, S Jin, DC Ralph, GD Fuchs, DA Muller. *Lorentz Electron Ptychography towards sub-nanometer resolution imaging of magnetic textures*, Nature Nanotechnology **17**, 1165 – 1170 (2022).
15. **KX Nguyen***, XS Zhang*, E Turgut, MC Cao, J Glaser, Z Chen, MJ Stolt, CS Chang, YT Shao, S Jin, GD Fuchs, DA Muller. *Disentangling magnetic and grain contrast in polycrystalline FeGe thin films using 4-D Lorentz Scanning Transmission Electron microscopy*, Physical Review Applied **17**, 034066 (2022).
14. AK Yadav*, **KX Nguyen***, Z Hong*, P García-Fernández*, P Aguado-Puente, CT Nelson, AI Khan, J Íñiguez, J Junquera, LQ Chen, DA Muller, R Ramesh and S Salahuddin. *Spatially resolved steady state negative capacitance*, Nature **565**, 468-471 (2019).
13. S Das, YL Tang, Z Hong, MAP Gonçalves, MR McCarter, C Klewe, **KX Nguyen**, F Gómez-Ortiz, Padraic Shafer, Elke Arenholz, VA Stoica, S-L Hsu, Baoming Wang, Colin Ophus, JF Liu, CT Nelson, Sahar Saremi, Bhagwati Prasad, Antonio B Mei, DG Schlom, Jorge Iniguez, Pablo García-Fernández, DA Muller, Long-Qing Chen, Javier Junquera, LW Martin, R Ramesh, *Observation of room-temperature polar skyrmions*, Nature **568**, 368-372 (2019).
12. JAMR Kunitake, S Choi, **KX Nguyen**, MM Lee, F He, D Sudilovsky, PG Morris, M Jochelson, CA Hudis, DA Muller, P Fratzl, C Fischbach, A Masic, LA Estroff, *Multimodal Imaging of Breast Microcalcifications in High Grade Ductal Carcinoma In-Situ and Invasive Cancer*, Journal of Structural Biology, **202** 25-34 (2018).
11. E Turgut, H Paik, **KX Nguyen**, DA Muller, DG Schlom, GD Fuchs, *Engineering Dzyaloshinskii-Moriya interaction in B20 thin film chiral magnets*, Physical Review Materials **2**, 1-8 (2018).
10. Y Han, **KX Nguyen**, MC Cao, P Cueva, S Xie, MW Tate, P Purohit, SM Gruner, J Park, DA Muller, *Strain Mapping of Two-Dimensional Heterostructures with Sub-Picometer Precision*, Nano Letters **18**, 3746-3751 (2018).
9. MC Cao, Y Han, Z Chen, Y Jiang, **KX Nguyen**, E Turgut, GD Fuchs, DA Muller, *Theory and practice of electron diffraction from single atoms and extended objects using an EMPAD*, Microscopy **67**, 150-161

(2018).

8. E Turgut, A Park, **KX Nguyen**, A Moehle, DA Muller, GD Fuchs, *Chiral Magnetic Excitations in FeGe films*, Physical Review B **13**, 1-11 (2017).
7. BDA Levin, MJ Zachman, JG Werner, R Sahore, **KX Nguyen**, Y Han, B Xie, L Ma, LA Archer, EP Giannelis, U Wiesner, LF Kourkoutis, DA Muller, *Characterization of Sulfur and Nanostructured Sulfur Battery Cathodes in Electron Microscopy Without Sublimation Artifacts*, Microscopy and Microanalysis **13**, 155-162 (2017).
6. Y Han, **KX Nguyen**, Y Ogawa, J Park, DA Muller, *Atomically Thin Graphene Windows That Enable High Contrast Electron Microscopy without a Specimen Vacuum Chamber*, Nano Letters **16**, 7427-7432 (2016).
5. MW Tate, P Purohit, D Chamberlain, **KX Nguyen**, R Hovden, CS Chang, P Deb, E Turgut, JT Heron, DG Schlom, DC Ralph, GD Fuchs, Katherine S Shanks, Hugh T Philipp, David A Muller, Sol M Gruner, *High Dynamic Range Pixel Array Detector for Scanning Transmission Electron Microscopy*, Microscopy and Microanalysis **22**, 237-249 (2016).
4. N Zhelev, M Reichl, TS Abhilash, EN Smith, **KX Nguyen**, EJ Mueller, JM Parpia, *Observation of a new superfluid phase for ^3He embedded in nematically ordered aerogel*, Nature Communications **7**, 1-6 (2016).
3. **KX Nguyen**, ME Holtz, J Richmond-Decker, DA Muller, *Spatial resolution in scanning transmission electron microscopy without a specimen vacuum chamber*, Microscopy and Microanalysis **22**, 754-767 (2016).
2. NR Jungwirth, YY Pai, HS Chang, ER MacQuarrie, **KX Nguyen**, GD Fuchs, *A single-molecule approach to ZnO defect studies: single photons and single defects*, Journal of Applied Physics **116**, 1-10 (2014).
1. S Stoughton, M Showak, Q Mao, P Koirala, DA Hillsberry, S Sallis, LF Kourkoutis, **K Nguyen**, LFJ Piper, DA Tenne, NJ Podraza, DA Muller, C Adamo, DG Schlom, *Adsorption-controlled growth of BiVO_4 by molecular-beam epitaxy*, APL Materials **1**, 1-8 (2013).

(F) INVITED TALKS:

29. Stanford University, *Stanford, California* (2023)
Colloquium: Department of Materials Science and Engineering
28. Yale University, *New Haven, Connecticut* (2023)
Solid State and Optics Seminar: Department of Applied Physics
27. University of Oregon, *Eugene, Oregon* (2023)
Colloquium: Department of Physics
26. University of Virginia, *Charlottesville, Virginia* (2023)
Colloquium: Department of Physics
25. University of Delaware, *Newark, Delaware* (2023)
Seminar: Department of Materials Science and Engineering
24. Materials Research Society Fall Meeting, *Boston, Massachusetts USA* (2022)
23. University of Illinois Urbana-Champaign, *Urbana, Illinois USA* (2022)
Condensed Matter Physics Seminar: Department of Physics
22. University of Massachusetts, Amherst, *Amherst, Massachusetts USA* (2022)
Amherst Center for Fundamental Interactions Seminar: Department of Physics

21. Brazilian Materials Research Society, *Foz do Iguaçu, Brazil* (2022)
20. Quantum Oxide Research Online Meeting, *Twente, Netherlands* (2022).
19. University of Virginia, *Charlottesville, Virginia USA* (2022)
Seminar: Department of Materials Science and Engineering
18. Northwestern University, *Evanston, Illinois USA* (2022)
Seminar: Department of Materials Science and Engineering
17. Northwestern University, *Evanston, Illinois USA* (2022)
Condensed Matter Physics Seminar: Department of Physics and Astronomy
16. University of Southern California, *Los Angeles, California USA* (2022)
Mork Family Spring Seminar: Department of Chemical Engineering and Materials Science
15. Carnegie Mellon University, *Pittsburgh, Pennsylvania USA* (2022)
Colloquium: Department of Physics
14. Materials Research Society Fall Meeting, *Boston, Massachusetts USA* (2021)
13. University of Virginia, *Charlottesville, Virginia USA* (2021)
Condensed Matter Seminar: Department of Physics
12. The Ohio State University, *Columbus, Ohio USA* (2021)
Seminar: Department of Materials Science and Engineering
11. Friedrich-Alexander University of Erlangen-Nuremberg, *Erlangen, Germany* (2021)
Computational Materials Microscopy Colloquium: Department of Materials Science and Engineering
10. National University of Singapore, *Singapore, Singapore* (2021)
Seminar: Department of Materials Science and Engineering
9. Microscopy and Microanalysis, *Pittsburgh, Pennsylvania, USA* (2021)
8. University of Washington, Seattle, *Seattle, Washington USA* (2021)
Seminar: Department of Materials Science and Engineering
7. Northwestern University, *Evanston, Illinois USA* (2021)
Women in Microscopy: Northwestern U. Atomic and Nanoscale Characterization Experimental Center (NUANCE)
6. Stanford University, *Stanford, California, USA* (2021)
Rising Star Colloquium: Department of Materials Science and Engineering
5. Materials Research Society Fall Meeting, *Boston, Massachusetts USA* (2020)
4. Lawrence Berkeley National Laboratory, *Berkeley, California, USA* (2020)
Molecular Foundry: National Center for Electron Microscopy (NCEM)
3. University of California, Los Angeles, *Los Angeles, California, USA* (2020)
STROBE Seminar: Department of Physics and Astronomy
2. Materials Research Society Fall Meeting, *Boston, Massachusetts USA* (2019)
1. TEDxVienna, *Vienna, Austria* (2018)

(G) SYNERGISTIC ACTIVITIES:

1. Book Contributor, *Today's Wonder Woman*. This is a book with essays, and interviews from women role models in different fields such as science, film, literature, music etc., where the main goal of this book is to encourage girls and young women to become future leaders in whatever field they choose.
2. Founder of a science kit lending library group at the University of Illinois Urbana-Champaign. This consists of a group of graduate students and postdoctoral scholars who develop science kits for middle to high school students. The goal of the kits is to send out to teachers from rural schools around Champaign. In this way, teachers and students can have access to science demonstrations in

the field of optics, magnetism and polymers which can be too expensive to develop for their school's budget.

3. Lecturer at Weill Cornell Medical College Workshop for Middle and High School STEM Teachers, and Math for America, a non-profit organization
4. Lecturer for Biology and Physics for middle and high school students at New Visions Charter High School, The Bronx, NY and Howard University Middle School, Washington, DC. I worked as a science demonstrator for middle and high school students from low-income neighborhoods to encourage scientific curiosity.