

Curriculum Vitae – Christopher A. Mizzi

Personal Information

Date of Birth: January 11, 1993

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Education

Northwestern University, McCormick School of Engineering (2015 – Present)

Ph.D. (in progress)

Cumulative GPA: 3.867

Cornell University, College of Engineering (2011 – 2015)

BS *magna cum laude* with Honors in Materials Science and Engineering

Cumulative GPA: 3.766

Major GPA: 3.874

Awards and Honors

Searle Graduate Teaching Fellowship (2019 – 2020)

Northwestern MSE Teaching Assistant of the Year (2019)

ICDD Ludo Frevel Crystallography Scholarship (2017)

Tau Beta Pi Member (2014 – present)

Cornell Dean's List (2012 – 2015)

Research

LDM group (2015 – Present)

My current interests lie in combining *ab initio* calculations with experimental measurements to understand the physical origin of the flexoelectric effect (the linear coupling between polarization and strain gradient) in crystalline solids. At the present, I am exploring the role of crystallography (octahedral rotations and distortions, cation displacements), surface structure (surface terminations and reconstructions), and microstructure (twin boundaries, grain boundaries, and grain size) on the flexoelectric response of oxides. Additionally, I work to understand the atomic and electronic structure of surfaces in f-electron materials using x-ray photoelectron spectroscopy, ultraviolet photoelectron spectroscopy, atomic force microscopy, and density functional theory.

van Dover group (2012 – 2015)

While working as an undergraduate researcher in Professor Robert B. van Dover's group at Cornell University, I gained experience with PVD growth and clean-room nanofabrication techniques including photolithography, photo-mask development, and ellipsometry. For my senior thesis, I developed a high-throughput method to search for Pd alloys suitable for H₂ separation membranes by assessing H₂ permeability as a function of temperature, gas ambient composition, and Pd alloy membrane composition.

Publications

1. **C.A. Mizzi***, A.Y.W. Lin*, and L.D. Marks, Phys. Rev. Lett. **123** (2019) 116103.
2. **C.A. Mizzi**, P. Koirala, A. Gulec, and L.D. Marks, Ultramicroscopy **203** (2019) 119-124.
3. P. Koirala, **C.A. Mizzi**, and L.D. Marks, Nano Lett. **18** (2018) 3850-3856.
4. **C.A. Mizzi**, P. Koirala, and L.D. Marks, Phys. Rev. Mater. **2** (2018) 025001.

Talks

1. *Flexoelectric Bending in Lanthanide Scandates*, EMC 61 (2019)
2. *Flexoelectricity and Twins in LaAlO₃*, APS March Meeting (2019)

Mentorship

1. Binghao Guo, Honors Thesis (2018 – 2019)
After two years as research mentor for Binghao Guo, he graduated with a BS with Honors. In his senior thesis entitled “Flexoelectricity in Polycrystalline SrTiO₃ Ceramics”, Guo studied the impact of ceramic microstructure, particularly grain size, on flexoelectricity in the cubic perovskite SrTiO₃.

Teaching

Teaching Experience

1. MSE 405 Physics of Solids (2018, 2019)
2. Evanston Scholars ETHS Math Tutor (2017 – 2019)
3. MSE 3120 Junior Lab II (2015)
4. MSE 3070 Junior Design (2014)

Pedagogical Training

1. Graduating Teaching Fellowship (2019 – present)
2. CIRTLL Associate (2018)
3. Teaching Certificate Program (2018)
4. Mentored Discussions of Teaching (2018)
5. Academic Excellence Workshops (2013 – 2015)

Course Design

1. Graduate Teaching Fellowship (2019 – present)
Developed interactive visualization modules for graduate MSE core courses
2. MSE 3120 Junior Lab II (2015)
Developed a lab in which students characterized the anisotropic resistivity of graphite
3. Academic Excellence Workshop Facilitator (2013 – 2015)
For 5 semesters I designed and led weekly collaborative problem-solving sessions for ~20 students enrolled in a differential equations course

Community Engagement

Science in Your Community Center Saturdays, Co-founder (2016 – Present)

Monthly program in which ~30 middle-school students from under-represented backgrounds work with graduate student mentors on collaborative STEM challenges

McCormick Graduate Leadership Council, Co-director (2016 – 2017)

MGLC is the graduate student organization liaison between Northwestern University's engineering graduate students and the dean's office

Northwestern Splash!, Volunteer Coordinator and Treasurer (2016 – 2018)

Local chapter of a national program which strives to promote interest in college among socioeconomically disadvantaged students by providing access a full day of classes taught by Northwestern students

Engineering Grand Prix, Co-chair (2015 – 2016)

Organized an annual all-day engineering competition that matches ~80 local middle school students with ~30 graduate student mentors

Industrial Experience

P&G Quality Assurance Process Engineering Intern (2014)

Managing 4 projects aimed at improving finished product quality and reducing waste product generated by the manufacturing process, yielding approximately \$500,000 in annual savings