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Education

2012–2018 Ph.D. in Chemistry, University of California, Davis

Thesis Title: *Investigation of Novel Europium-Based Zintl Phases for Thermoelectric Applications.*

Advisor: Professor Susan Kauzlarich

2008–2012 B.S. Chemistry, Furman University

Thesis Title: *Characterization of Self-Assembled Monolayers of Octadecanethiol and Dodecanethiol Using Polarization Modulation Reflection-Absorption Spectroscopy and Optical Tensiometry.*

Advisor: Professor Marion Martin (Current institution: North Carolina State University)

2008–2012 B.A. Music, Furman University

Instructor: Mrs. Gail Schoonmaker

Professional experience

2020–Present Assistant Professor, California State University, Fullerton
Department of Chemistry & Biochemistry

2018–2020 Postdoctoral Researcher, University of California, Santa Barbara Materials Research Laboratory

Advisor: Professor Ram Seshadri

Publications

14. Y. M. Oey, D. A. Kitchaev, J. D. Bocarsly, E. C. Schueller, **J. A. Cooley**, R. Seshadri. Magnetocaloric behavior and magnetic ordering in MnPdGa. *Phys. Rev. Materials* **5** (2021) 014414. [DOI: [10.1103/PhysRevMaterials.5.014414](https://doi.org/10.1103/PhysRevMaterials.5.014414)]
13. P. Vishnoi, J. L. Zuo, **J. A. Cooley**, L. Kautzsch, A. Gomez-Torres, J. Murillo, S. Fortier, S. D. Wilson, R. Seshadri, A. K. Cheetham. Chemical control of spin-orbit coupling and charge transfer in vacancy-ordered Ru(IV) halide perovskites. *Angew. Chemie Int. Ed.* **60** (2020) 5184–5188. [DOI: [10.1002/anie.202013383](https://doi.org/10.1002/anie.202013383)]
12. K. E. Wyckoff, D. D. Robertson, M. B. Preefer, S. M. L. Teicher, J. Bienz,* L. Kautzsch, T. E. Mates, **J. A. Cooley**, S. H. Tolbert, and R. Seshadri. High capacity Li⁺ storage through multielectron redox in the fast-charging Wadsley–Roth phase (W_{0.2}V_{0.8})₃O₇. *Chem. Mater.* **32** (2020) 9415–9424. [DOI: [10.1021/acs.chemmater.0c03496](https://doi.org/10.1021/acs.chemmater.0c03496)]
11. E. C. Schueller, D. A. Kitchaev, J. L. Zuo, J. D. Bocarsly, **J. A. Cooley**, A. van der Ven, S. D. Wilson, and R. Seshadri. Structural evolution and skyrmionic phase diagram of the lacunar spinel GaMo₄Se₈. *Phys. Rev. Materials* **4** (2020) 064402. [DOI: [10.1103/PhysRevMaterials.4.064402](https://doi.org/10.1103/PhysRevMaterials.4.064402)]
10. **J. A. Cooley**, J. D. Bocarsly, E. C. Schueller, E. E. Levin, E. E. Rodriguez, A. Huq, S. H. Lapidus, S. D. Wilson, and R. Seshadri. Evolution of non-collinear magnetism in magnetocaloric MnPtGa. *Phys. Rev. Mater.* **4** (2020) 044405. [DOI: [10.1103/PhysRevMaterials.4.044405](https://doi.org/10.1103/PhysRevMaterials.4.044405)]

9. J. A. Cooley, M. K. Horton, E. E. Levin, S. H. Lapidus, K. A. Persson, and R. Seshadri. From waste-heat recovery to refrigeration: Compositional tuning of magnetocaloric Mn_{1+x}Sb . *Chem. Mater.* **32** (2020) 1243–1249. [DOI: 10.1021/acs.chemmater.9b04643]
8. M. B. Preefer, J. H. Grebenkemper, F. Schroeder,* J. D. Bocarsly, K. P. Pilar, J. A. Cooley, W. Zhang,* J. Hu, S. Misra, F. Seeler, K. Schierle-Arndt, and R. Seshadri. Rapid and tunable assisted-microwave preparation of glass and glass-ceramic thiophosphate $\text{Li}_7\text{P}_3\text{S}_{11}$ Li-ion conductors. *ACS Appl. Mater. Interfaces* **11** (2019) 42280–42287. [DOI: 10.1021/acsami.9b15688]
7. K. Pilar, Z. Deng, M. B. Preefer, J. A. Cooley, R. Clément, R. Seshadri, and A. K. Cheetham. *Ab initio* computation for solid-state ^{31}P NMR of inorganic phosphates: Revisiting X-ray structures. *Phys. Chem. Chem. Phys.* **21** (2019) 10070–10074. [DOI: 10.1039/C9CP01420A]
6. K. P. Devlin, N. Kazem, J. V. Zaikina, J. A. Cooley, J. R. Badger, J. C. Fettinger, V. Taufour, and S. M. Kauzlarich. $\text{Eu}_{11}\text{Zn}_4\text{Sn}_2\text{As}_{12}$: A ferromagnetic Zintl semiconductor with a layered structure featuring extended Zn_4As_6 sheets and ethane-like Sn_2As_6 units. *Chem. Mater.* **30** (2018) 7067–7076. [DOI: 10.1021/acs.chemmater.8b02749]
5. M. Stavinoha, J. A. Cooley, S. G. Minasian, T. M. McQueen, S. M. Kauzlarich, C.-L. Huang, and E. Morosan, Charge density wave behavior and order-disorder in the antiferromagnetic metallic series $\text{Eu}(\text{Ga}_{1-x}\text{Al}_x)_4$. *Phys. Rev. B* **97** (2018) 195146. [DOI: 10.1103/PhysRevB.97.195146]
4. J. A. Cooley, P. Promkhan,* S. Gangopadhyay, D. Donadio, B. R. Ortiz, E. S. Toberer, and S. M. Kauzlarich, High Seebeck coefficient and unusually low thermal conductivity near ambient temperatures in layered compound $\text{Yb}_{2-x}\text{Eu}_x\text{CdSb}_2$, *Chem. Mater* **30** (2018) 484–493. [DOI: 10.1021/acs.chemmater.7b04517]
3. E. L. Kunz-Wille, J. A. Cooley, J. C. Fettinger, N. Kazem, and S. M. Kauzlarich, A new solid solution compound with the $\text{Sr}_{21}\text{Mn}_4\text{Sb}_{18}$ structure type: $\text{Sr}_{13}\text{Eu}_8\text{Cd}_3\text{Mn}_1\text{Sb}_{18}$, *Z. Kristallogr.* **232** (2017) 593–599. [DOI: 10.1515/zkri-2016-2034]
2. N. Kazem, J. A. Cooley, E. C. Burks, K. Liu, and S. M. Kauzlarich, Synthesis, characterization, and low temperature transport properties of $\text{Eu}_{11-x}\text{Yb}_x\text{Cd}_6\text{Sb}_{12}$ solid solution Zintl phases, *Inorg. Chem.* **55** (2016) 12230–12237. [DOI: 10.1021/acs.inorgchem.6b01947]
1. J. A. Cooley, N. Kazem, J. V. Zaikina, J. C. Fettinger, and S. M. Kauzlarich, Effect of isovalent substitution on the structure and properties of $\text{Eu}_7\text{Cd}_4\text{Sb}_{8-x}\text{As}_x$, *Inorg. Chem.* **54** (2015) 11767–11775. [DOI: 10.1021/acs.inorgchem.5b01909]

* denotes undergraduate student co-author

Teaching experience

Assistant Professor, California State University Fullerton (2020–present)

- Prepared and delivered lectures, homework sets, exams, and projects for a variety of classes
- CHEM325 (Inorganic Chemistry), CHEM120B Lab (second semester General Chemistry)

Guest Lecturer, UC Santa Barbara (2018–2020)

- Prepared and delivered lecture for Materials Structure and Properties for undergraduate students (MAT100A, Fall 2018)
- Prepared and delivered lecture, and prepared homework assignment for Honors General Chemistry undergraduate students (CHE2C, Spring 2019)

Teaching Assistant Consultant Fellow, UC Davis Center for Educational Effectiveness (Spring 2015–Winter 2017)

- Attended weekly meetings with the dual purposes of workshop planning and general professional development in areas of teaching and facilitation
- Responsible for planning and executing Teaching Assistant Orientation in Fall for all incoming teaching assistants, plus additional workshops intended professional development for current graduate student/postdoctoral instructors
 - Details of workshops facilitated can be found at www.joyacooley.com/teaching.html
- Conducted one-on-one consultations on various subjects including Statement of Teaching Philosophy, mid-quarter inquiries, video recordings, and presentation skills with current graduate student/postdoctoral instructors

Teaching Assistant, UC Davis Advanced Inorganic Chemistry (124A) (Fall 2015)

- Graded weekly quizzes and homework, held office hours, made quizzes and homework keys
- Held class-wide midterm review session
- Gave guest lecture attended and evaluated by GAANN faculty mentor (see GAANN Fellowship below)

Safety Teaching Assistant, UC Davis General Chemistry (2ABC) (Winter 2014–Fall 2014)

- Supervised other TAs in lab, observed of labs to ensure proper personal protective equipment and safety procedures, and led weekly TA meetings
- Led midterm and final exam review sessions for students
- Led weekly discussions with TAs on leading effective discussions, including composing, discussing, and distributing worksheets for TAs to go over with students
 - Examples of worksheets created can be found at www.joyacooley.com/teaching.html

Teaching Assistant, UC Davis General Chemistry (2ABC) (Fall 2012–Fall 2013, Winter 2016)

- Led two sections of weekly labs and discussion/recitation sections
- Held office hours to assist students individually
- Proctored and graded exams

Mentoring

Sam Adler, CSUF undergraduate (Spring 2021–present)

Carolina Avalos, CSUF undergraduate (Spring 2021–present)

Maureen Sison, CSUF undergraduate (Spring 2021–present)

Kyle Currier, CSUF undergraduate (Spring 2021–present)

Linh Nguyen, CSUF undergraduate (Fall 2020–present)

Gregor Dairaghi, UCSB Future Leaders in Advanced Materials student (summer 2019)

Johnny Johnson, UC Davis Undergraduate Researcher (fall 2016 – spring 2017)

Phichit Promkhan*, UC Davis Mentorships for Undergraduate Research Participants in the Physical and Mathematical Sciences undergraduate student (winter 2015–spring 2016)

Ali Keyani*, UC Davis Summer Research Internship Program for Economically Disadvantaged High School Students student (summer 2015)

Justina Robleto-Barkley*, Vallejo High School Biotechnology Academy Mentee (spring 2015)

Catherine Jovez*, Vallejo High School Biotechnology Academy Mentee (spring 2015)

Kaelinn Ocampo*, Vallejo High School Biotechnology Academy Mentee (spring 2015)

Alex Brown*, Research Experience for Undergraduates student (summer 2013)

*denotes student from a community historically underserved in STEM and/or higher education

Invited talks

Guided discovery of Mn-based materials for magnetocaloric applications, University of Florida, Gainesville, FL, 2021. (virtual)

Faster discovery, better performance: Toward rational design of functional materials, Bradley University, Peoria, IL, USA, November 2019.

Faster discovery, better performance: Toward rational design of functional materials, Whittier College, Whittier, CA, USA, November 2019.

Faster discovery, better performance: Toward rational design of functional materials, Kalamazoo College, Kalamazoo, MI, USA, November 2019.

Toward guided, rational design of functional materials, St. Edward's University, Austin, TX, USA, November 2019.

Upcycling waste heat using functional materials: Two approaches to clean energy conversion, Trinity University, San Antonio, TX, USA, October 2019.

Toward guided, rational design of functional materials, California State University, Fullerton, CA, USA, October 2019.

Guided discovery of Mn-based materials for magnetocaloric applications, University of Liverpool Materials Innovation Factory, Liverpool, UK, 2019.

Select contributed presentations (10 of 17)

Guided discovery of Mn-based materials for magnetocaloric applications, North American Solid State Chemistry Conference, Golden, CO, USA, July 2019. *Oral; see awards.*

Compositional tuning of magnetocaloric performance in Mn_{1+x}Sb , American Chemical Society Spring Meeting, Orlando, FL, USA, 2019. *Oral.*

Magnetocaloric materials based on binary and ternary Mn compounds: Screening and testing, International Workshop on Advanced Materials, Ras al Khaimah, UAE, February 2019. *Oral.*

Magnetocaloric materials based on binary and ternary Mn compounds: Screening and testing, Materials Research Society Fall Meeting, Boston, MA, USA, November 2018. *Poster.*

DFT-screened magnetocaloric material: MnPtGa , Gordon Research Conference on Solid State Chemistry, New London, NH, USA, July 2018. *Poster.*

Thermoelectric performance of Zintl phase $\text{Yb}_{2-x}\text{Eu}_x\text{CdSb}_2$ exhibiting low thermal conductivity, American Chemical Society Spring Meeting, San Francisco, CA, USA, April 2017. *Oral.*

$\text{Yb}_{2-x}\text{Eu}_x\text{CdSb}_2$: Potential thermoelectric material exhibiting high Seebeck and low thermal conductivity, Gordon Research Conference on Solid State Chemistry, New London, NH, USA, July 2016. *Poster.*

Investigating the effect of cationic rare-earth substitution on new Zintl phase solid solution $\text{Eu}_{1-x}\text{Yb}_x\text{Cd}_6\text{Sb}_{12}$, International Conference on Thermoelectrics, Dresden, Germany, July 2015. *Poster*.

Investigation of new solid solution $\text{Eu}_{1-x}\text{Yb}_x\text{Cd}_6\text{Sb}_{12}$, ICMR Summer School on Modeling Materials in 3D, Santa Barbara, CA, USA, August 2013. *Poster*.

Characterization of self-assembled monolayers of octadecanethiol and dodecanethiol, Furman Engaged!, Greenville, SC, USA, May 2012. *Oral*.

Service

- Reviewer for *Journal of Solid State Chemistry*
- Reviewer for *Chemistry of Materials*
- UCSB FirstGen Scholars Program Mentor
- Graduate Students for Diversity in Science UCSB Chapter Member (2018–present)
- Co-chair of the inaugural *Gordon Research Seminar on Solid-State Chemistry* (July 2016)
- Vice President of *ADSE@UCD* (Alliance for Diversity in Science and Engineering, UC Davis Chapter) (2016–2017)
- UC Davis Chemistry Department Admissions Committee Graduate Student Representative (2015–2016)

Awards and recognition

- Outstanding Postdoctoral Oral Presentation Award at the North American Solid State Chemistry Conference (July 2019)
- Dow Materials Institute and Materials Research Laboratory Travel Fellowship (July 2018, January 2019)
- American Chemical Society Division of Inorganic Chemistry Travel Award Recipient (April 2017)
- Ford Foundation Dissertation Fellowship Honorable Mention (2016)
- International Thermoelectric Society Outstanding Poster Award at the International Conference on Thermoelectrics (2015)
- Department of Education Gaining Assistance in Areas of National Need (GAANN) Teaching Fellowship Recipient (2014)
- UC Davis Chemistry Department Outstanding Teaching Assistant Award (2014)
- Alfred P. Sloan Minority Ph.D. Program Fellow (2013)
- UC Davis Bradford Borge Fellowship recipient (2012)
- Second Place Poster Presentation prize at 2011 National NSF EPSCoR Conference (2011)
- Nathan A. Einstein Music Scholarship Recipient (2011–2012)
- Viola and Grady E. Hodgens Music Scholarship Recipient (2011–2012)
- Phi Eta Sigma Honor Society, Treasurer (Inducted 2009)
- Furman University Dean's List (2008–2012)

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