

Andrew McAllister

PhD in Applied Physics, science communicator

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McAllisterSci
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Summary

- Goal** A career that allows me to use my technical expertise towards understanding complex problems and communicating those efforts to decision makers to affect societal change.
- Technical Knowledge** A PhD in applied physics with specific expertise in materials science, nanotechnology, energy efficiency, and high performance computing.
- Science Communication** Throughout my PhD I have sought out training and experiences presenting to, writing for, and working with diverse audiences. I relentlessly pursue context in making science understandable.

Education

- 2019 **PhD in Applied Physics**, *University of Michigan*, Ann Arbor, MI.
Thesis: *First-principles Calculations of Auger Recombination in Optoelectronic Materials*
Non-Expert: *Using computers to study how electrons bump into each other in materials that interact with light*
- 2012 **B.S. in Physics**, *Rensselaer Polytechnic Institute*, Troy, NY.
Magna cum laude, dual major in mathematics

Work Experience

- 2019 **Adjunct Professor**, *Concordia University Ann Arbor*, Ann Arbor, MI.
- June-August **Computational Chemistry and Materials Science Fellow**,
2013 *Lawrence Livermore National Laboratory*, Livermore, CA.

Awards

- 2019 National Security Institute Technologist Fellowship, (Official Announcement not made at time of application, can contact)
- 2014 National Science Foundation Graduate Research Fellowship Program, [\[Link \(search for me\)\]](#)
- 2012 [Nadia Trinkala Service Award \[Link for Verification\]](#), Rensselaer Physics Department
- 2010 [Founder's Award of Excellence \[Link for Verification\]](#), Rensselaer Physics Department
- 2008 Boy Scouts of America, Eagle Scout

Public Engagement

- 2019 **Engaging Scientists in Policy and Advocacy.**
Volunteer facilitator for the Washtenaw County Consensus Conference on Water Security being held in spring 2019. I will help the citizen panel digest provided materials, formulate questions for an expert panel, have a discussion with the expert panel, and write a report on their findings related to water security.
- 2018 **Engaging Scientists in Policy and Advocacy.**
Volunteer for "Ask a Scientist at Art Fair", where I spoke to adults interested in science at a large local event in an informal setting.

- 2018 **Skype a Scientist** [\[Link\]](#).
Volunteered for the Skype a Scientist program, where I skyped into multiple high school classrooms to talk about science, becoming a scientist, and other topics. More information on my blog, [here](#). [\[Link\]](#)
- 2017 **Nerd Nite** [\[Link\]](#) **Ann Arbor Talk**.
Gave a 20 minute talk about my research at a local bar to an audience of mostly non-scientists. A recording is available at: [LED Light Bulbs: Why Do They Cost an Arm and a Leg?](#) [\[Link\]](#)
- 2013-2016 **American Society for Engineering Education**.
Organized and ran a table at K-Grads Kid's Fair – an elementary school visit to University of Michigan. At the table, I helped demonstrate some concepts of signal analysis by using a laser to transmit music through open air.
- 2008-2012 **Society of Physics Students**.
Organized and ran multiple outreach events at local schools and on campus. A large project that I was involved with was organizing a full-day program on light and solar cells for the Harlem Academy's visit to Rensselaer with my advisor, Peter Persans.

Leadership

- 2018-Present **Organizer**, *ComSciCon Michigan*, Ann Arbor, MI.
I worked with other graduate students to organize, publicize and run a conference devoted to science communication in Ann Arbor Michigan.
- 2017-Present **Senior Editor**, *Students of Applied Physics Project*, *Applied Physics Student Council*, Ann Arbor, MI.
I work with PhD students to develop understandable and engaging articles about research in the applied physics department. [Example article](#) [\[Link\]](#)
- 2014-2015 **President**, *Local Chapter of American Society for Engineering Education*, Ann Arbor, MI.
I organized and ran meetings, made sure that skill workshops had teachers, and planned future workshops based on the needs of University of Michigan students.
- 2009-2011 **President**, *Local Chapter of Society of Physics Students*, Troy, NY.
I organized meetings and social events, fostered a community of physics students, acted as intermediary between faculty and students, and helped organize and run engagement events in the local area.

Writing and Editing for a General Audience

1. **Do These Eyes Freak You Out?**, *SciShow Psych*, 2019.
Wrote script for a popular (430,000 subscribers) science YouTube channel. [\[Link\]](#)
2. **Using LEDs to Tell Plants What We Want From Them** [\[Link\]](#), *Science in the News Blog*, 2018.
Worked with the "Friends of Joe's Big Idea" program by National Public Radio.
3. **Senior Editor**, *Students of Applied Physics*, *Applied Physics Student Council*.
I work with PhD students to develop understandable and engaging articles about research in the applied physics department. [Example article](#) [\[Link\]](#)
4. **Atomistic Calculations Predict That Boron Incorporation Increases The Efficiency Of LEDs** [\[Link\]](#), *University of Michigan Materials Science & Engineering News*, 2017.
Press release for research group. Picked up by the Department of Energy, National Energy Research Scientific Computer Center, and Semiconductor Today.
5. **How Gecko Feet Will Make Your Next Move Easier** [\[Link\]](#), *Michigan Science Writers*, 2017.
I also work as a content editor for Michigan Science Writers, where I provide feedback and help develop a rough draft developing of a piece by another graduate student.

Technical Publications

1. Jimmy-Xuan Shen, Daniel Steiauf, **Andrew McAllister**, Guangsha Shi, Emmanouil Kioupakis, Anderson Janotti, and Chris Van de Walle, Impact of phonons and spin-orbit coupling on Auger recombination in InAs, *submitted*
2. **Andrew McAllister**, Dylan Bayerl, Emmanouil Kioupakis, Auger and radiative recombination in indium nitride, *Applied Physics Letters*, **112**, 251108 (2018) [doi:10.1063/1.5038106](https://doi.org/10.1063/1.5038106)
3. Kyeongwoon Chung, **Andrew McAllister**, David Bilby, Bong-Gi Kim, Min Sang Kwon, Emmanouil Kioupakis, Jinsang Kim, Designing interchain and intrachain properties of conjugated polymers for latent optical information encoding, *Chemical Science* **6**, 6980-6985 (2015) [doi:10.1039/c5sc02403j](https://doi.org/10.1039/c5sc02403j)
4. **Andrew McAllister**, Daniel Åberg, André Schleife, and Emmanouil Kioupakis, Auger recombination in sodium-iodide scintillators from first principles, *Applied Physics Letters* **106**, 141901 (2015) [doi:10.1063/1.4914500](https://doi.org/10.1063/1.4914500)
5. Daniel Recht, David Hutchinson, Thomas Cruson, Anthony DiFranzo, **Andrew McAllister**, Aurore J. Said, Jeffrey M. Warrender, Peter D. Persans, and Michael J. Aziz, Contactless Microwave Measurements of Photoconductivity in Silicon Hyperdoped with Chalcogens, *Applied Physics Express* **5**, 041301 (2012) [doi:10.1143/apex.5041301](https://doi.org/10.1143/apex.5041301)

Technical Presentations

Contributed

1. **Andrew McAllister**, Dylan Bayerl, Christina Jones, Emmanouil Kioupakis, Auger Recombination From First-principles in Group-III Nitride Alloys, American Physical Society March Meeting 2018, Los Angeles, CA
2. **Andrew McAllister**, Dylan Bayerl, Emmanouil Kioupakis, Auger Recombination in Group-III Nitrides from First Principles, Materials Research Society Fall Meeting, 2017, Boston, MA
3. **Andrew McAllister**, Dylan Bayerl, Emmanouil Kioupakis, Radiative and Auger Recombination in InN, International Conference on Nitride Semiconductors, 2017, Strasbourg, France
4. **Andrew McAllister**, Dylan Bayerl, Emmanouil Kioupakis, Radiative and Auger Recombination of Degenerate Carriers in InN American Physical Society March Meeting, 2017, New Orleans, LA
5. **Andrew McAllister**, Emmanouil Kioupakis, Auger recombination in InN from first principles, American Physical Society March Meeting, 2016, Baltimore, MD
6. **Andrew McAllister**, Emmanouil Kioupakis, Daniel Åberg, André Schleife, Auger recombination in scintillator materials from first principles, American Physical Society March Meeting, 2015, San Antonio, TX
7. **Andrew McAllister**, Predictive modeling of quantum processes for optoelectronic devices, Physics Graduate Student Symposium, 2014, Ann Arbor, MI
8. **Andrew McAllister**, Emmanouil Kioupakis, Daniel Åberg, André Schleife, Auger recombination in sodium iodide, American Physical Society March Meeting, 2014, Denver, CO
9. **Andrew McAllister**, Computational Modeling of Auger Recombination, Computational Chemistry and Materials Science Summer Institute, Livermore, CA, Lawrence Livermore National Laboratory

Poster

1. Applied Physics Student Council, presented by **Andrew McAllister** Students of Applied Physics Interview Project, Applied Physics 30th Anniversary Symposium, 2017, Ann Arbor, MI [\[Link\]](#)
2. **Andrew McAllister**, Dylan Bayerl, Emmanouil Kioupakis Auger Recombination in Indium Nitride from First-Principles, Electronic Materials Conference, 2017, South Bend, IN
3. **Andrew McAllister**, Daniel Åberg, Emmanouil Kioupakis, André Schleife, Babak Sadigh, Computational modeling of Auger recombination in scintillators, Computational Chemistry and Materials Science Summer Institute, 2013, Livermore, CA

High-Performance Computing Awards

- 2015-2018 Electronic and optical properties of novel photovoltaic and thermoelectric materials from first-principles, National Energy Research Scientific Computing Center
PI: Emmanouil Kioupakis
- **2018:** 5,000,000 CPU Hours
 - **2017:** 7,300,000 CPU Hours
 - **2016:** 2,301,200 CPU Hours
 - **2015:** 8,000,000 CPU Hours

Communication Training

- August 2017 **ComSciCon Chicago** [[Link for more information](#)], Chicago, IL.
- 2016 **Researchers Expanding Lay-Audience Teaching and Engagement (RELATE) Workshops.**
- Over 3 months, worked on crafting messages and narratives, considering different audiences and making visual aids.
 - Developed and produced a [YouTube video](#) [[Link](#)] highlighting my research.

Teaching Experience

- At Concordia University Ann Arbor:*
- Spring 2019 Physics 152 – General Physics II
- At the University of Michigan:*
- April 2015 Flow in Technical Writing Workshop
- October 2014 Introduction to Mathematica Workshop
- April 2014 Introduction to \LaTeX Workshop
- At Rensselaer Polytechnic Institute:*
- Spring 2012 Teaching Assistant, Physics 4100 - Introductory Quantum Mechanics
- Fall 2011 Teaching Assistant, Physics 2961 - Modern Physics
- Fall 2011 Grader, Math 4400 - Ordinary Differential Equations
- Spring 2011 Teaching Assistant, Physics 1200 - Introductory Electromagnetism
- Fall 2010 Teaching Assistant, Physics 1200 - Introductory Electromagnetism

Service

- 2016-2018 Applied Physics Student Council
- 2017 Panelist and Editor for NSF Fellowship Workshop
- Journal Referee**
- Applied Physics Letters (1), Physical Review B (2)

Professional Memberships

American Association for the Advancement of Science ■ American Physical Society ■ American Society for Engineering Education ■ Materials Research Society ■ Society for the Social Studies of Science

Computer Skills

Software: Microsoft Office, \LaTeX , Basic Knowledge of Adobe Illustrator and Adobe InDesign

Programming: Python, Fortran, C++, Matlab, Shell, Git

High Performance Computing Codes: QuantumEspresso, Wannier90, BerkeleyGW, VASP
Further details and proficiencies available on request.