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McAllisterSci
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Andrew McAllister

PhD in Applied Physics, science communicator

Summary

- Goal** A career where I can use my technical expertise to understand complicated problems and communicate those efforts (and possible solutions) to a wide variety of audiences.
- Analytical Thinking** 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 and relevant for audiences.

Education

- Expected:** **PhD in Applied Physics**, *University of Michigan*, Ann Arbor, MI.
January 2019 Relevant Coursework:
o Public Policy 650 – Introduction to Science and Technology Policy Analysis
- 2012** **B.S. in Physics**, *Rensselaer Polytechnic Institute*, Troy, NY.
Magna cum laude, dual major in mathematics

Awards

- 2014** National Science Foundation Graduate Research Fellowship Program
- 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

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.

Selected Technical Publications

1. **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)
2. 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)
3. **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)

Selected General Audience Writing

1. [Using LEDs to Tell Plants What We Want From Them \[Link\]](#), *Harvard's Science in the News Blog*, 2018.
Worked with the "Friends of Joe's Big Idea" program by National Public Radio.
2. [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.

Selected Presentations

Contributed Technical Oral Presentations

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, Radiative and Auger Recombination of Degenerate Carriers in InN American Physical Society March Meeting, 2017, New Orleans, LA
3. **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
4. **Andrew McAllister**, Predictive modeling of quantum processes for optoelectronic devices, Physics Graduate Student Symposium, 2014, Ann Arbor, MI

Public Engagement

1. [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? \[Link\]](#)

Communication Training

August 2017 [ComSciCon Chicago \[Link for more information\]](#), Chicago, IL.

2016 **Researchers Expanding Lay-Audience Teaching and Engagement (RELATE) Workshops.**

- o Over 3 months, worked on crafting messages and narratives, considering different audiences and making visual aids.
- o Developed and produced a [YouTube video \[Link\]](#) highlighting my research.

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National Security Institute
Antonin Scalia Law School
George Mason University
3301 Fairfax Dr.
Arlington, VA 22201

December 7th, 2018

Dear Fellowship Committee,

Science can provide solutions to both national and global scale challenges, but often those solutions come with large societal change. Making sure those changes are anticipated by the government is a part of a safe, stable and well functioning country. The National Security Institute helps provide policy makers with rigorous and objective understandings of new scientific developments in the domain of national security. Doing this requires understanding science and technology and being able to communicate it to non-experts. Both of these are skills that I have been working on throughout my PhD. But the third element, having a deep understanding of policy, is where I am lacking. This is why I am excited to apply for the NSI's Technologist Fellowship. This fellowship would help me better learn how to apply my technical and communicative skills towards helping policy-makers with problems in science and technology.

My technical experiences comes from my PhD, which I will be defending in January. This has given me many skills related to physics, materials science, and high-performance computing. Some of this has been from coursework, but much of it has been from searching and reading relevant technical literature. This ability to quickly find, read, and see the big picture behind modern research is a key part of translating between scientists and policymakers. I also have experience collaborating with other scientists. My work is entirely computational and I have worked closely with scientists in different fields. These collaborations have given me practice in understanding different methods of doing research and communicating between them. This is highly relevant to a job in public policy, where I would need to learn about an array of different subjects while working with different experts. While my own expertise is on the efficiency of light-emitting diode (LED) materials, I am confident I have the skills to work on a diverse set of scientific topics related to the hard questions facing the country.

Throughout my scientific training, I have also sought out experiences to develop, practice and teach communication skills in various mediums and to various audiences. I helped found the Students of Applied Physics program, where I am the senior editor. In this program, I work with other PhD students to write accessible articles about the research being done in our department. The writing experience varies greatly among the students and I have been able to develop my own skills by working with them. This involves teaching both big picture (storytelling, flow, style) and small scale (avoiding jargon, conciseness, proper grammar) topics in science communication. While these articles are for a different audience than I would be writing for in policy, the ideas behind effective writing and communicating can be applied to many different domains.

Unfortunately, I realized too late that public policy could connect my interest in science communication, science, and serving others. I didn't get to take advantage of all of the programs University of Michigan offers in science policy, but I did what I could with the time I had. Last winter, I took a course on science and technology policy. In addition to learning about science and technology policy around the world I had to practice distilling technical problems into succinct written documents appropriate for government audiences. More recently, I attended the National Science Policy Network's Annual Science Policy Symposium, where I got to learn about opportunities in policy, see examples of science policy in action, and network with like-minded graduate students.

After my defense I will be seeking a career in science policy. I hope to use my skills, experience and interests to serve the country and it's citizens. I will be applying to the Congressional Fellowships for scientific societies in the coming months and the NSI fellowship will better prepare me for the work I would be doing either as a fellow or in another related job. I'd be happy to talk more about my experiences, qualifications and career goals, and can be contacted at 732-275-5051 or mcala@umich.edu.

Sincerely,

Andrew McAllister