

# 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: Sept. 2018 **PhD in Applied Physics**, *University of Michigan*, Ann Arbor, MI.  
Relevant Coursework:
  - 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 \[Link\]](#), Rensselaer Physics Department
- 2010 [Founder's Award of Excellence \[Link\]](#), Rensselaer Polytechnic Institute
- 2008 Boy Scouts of America, Eagle Scout

## Leadership

- 2018-Present **Organizer**, *ComSciCon Michigan*, Ann Arbor, MI.  
Work 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.  
Organize and run meetings, ensure that skill workshops have teachers, plan future workshops based on the needs of University of Michigan students.
- 2009-2011 **President**, *Local Chapter of Society of Physics Students*, Troy, NY.  
Organize meetings and social events, foster a community of physics students, act as intermediary between faculty and students, help organize and run engagement events in local area.

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## 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](#)
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](#)
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](#)

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## 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.

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

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## 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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**IDA Science and Technology Policy Institute**  
4850 Mark Center Drive  
Alexandria, VA 22311

August 10, 2018

Dear Dr. Ian Simon and the hiring team,

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 stable and well functioning country. The Science and Technology Policy Institute helps provide rigorous and objective understanding of new scientific developments to government agencies. I am excited to bring my unique combination of skills and experience to STPI and support STPI's applied physics portfolio as a science and technology research analyst. My experiences throughout my doctorate have given me technical, social, and communicative abilities that would be valuable for this position.

My research experiences have given me many technical skills related to physics and materials science. 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 the responsibilities of this position. I also have experience collaborating with other scientists. Because my work is entirely computational, I have worked closely with scientists in different fields. These collaborations have given me practice in understanding different methods and communicating between different types of research and different fields. This is highly relevant to a job at the STPI, where I would need to learn about an array of different subjects while working with different experts. While my own expertise is on light-emitting diode (LED) materials, I am confident I have the skills to work on a diverse set of scientific topics, including space weather and other hazards that can affect our technological and infrastructure systems.

Throughout my scientific training, I have 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 the 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 at STPI, the ideas behind effective writing and communicating can be applied to different domains. I have already had a small change to do this in the policy domain, when I took a course on science and technology policy during the winter 2018 semester. In addition to learning about science and technology policy around the world (including some history of the OSTP, NSF and other organizations that STPI works with) I had to practice distilling technical problems into succinct written documents appropriate for government audiences. This knowledge and practice are directly relevant to a position at STPI.

I am looking forward to discussing my skills and experiences with you and can be reached at [mcala@umich.edu](mailto:mcala@umich.edu) or at 732-275-5051.

Sincerely,

**Andrew McAllister**