Kraig J. Andrews

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Education

- **Wayne State University** — **Detroit, MI**
  Ph.D. Physics — *2014 – Present*
- **Wayne State University** — **Detroit, MI**
  M.Sc. Physics — *2017*
- **Michigan State University** — **East Lansing, MI**
  B.Sc. Physics — *2014*
- **Michigan State University** — **East Lansing, MI**
  B.Sc. Astrophysics — *2014*

Experience

- **Nano Fabrication & Electron Transport Laboratory** — **Wayne State University, Detroit, MI**
  Graduate Research Assistant — *2015 – Present*
  - Fabricate field-effect transistors using two-dimensional semiconductors to invesitgate their intrinsic transport properties.
  - Develop novel techniques for making low-resistance Ohmic contacts to a wide variety of two-dimensional semiconductors.
- **National Institute of Materials Science** — **Tsukuba, Ibaraki Prefecture, Japan**
  Visiting Graduate Researcher, Summer Intern — *2017*
  - Investigate methods for surface modification of two-dimensional semiconductors for the use of creating a new low-resistance Ohmic contact strategy.
- **Interational Course on Computational Physics** — **Delft, The Netherlands & East Lansing, MI**
  Undergraduate Researcher — *2014*
  - A Joint collaboration with Technische Universiteit Delft and Michigan State University involving the development of computational models of various physical systems to model interactions of materials and optimize employed techniques.
- **Jenoptik Laser Technologies** — **Brighton, MI**
  Summer Intern — *2013*
  - Contributed in development of a user interface for laser welding machine that allows user manipulation of robotic end-arm tooling.
  - Incorporated microcontroller program via interfaced electronic devices and several developed algorithms to analyze physical data and feedback in real-time.

Selected Publications

1. "*High Performance WSe_2 Phototransistors with 2D/2D Ohmic Contacts.*" Tianjiao Wang, **Kraig Andrews**, Arthur Bowman, Tu Hong, Michael Koehler, Jiaqiang Yan, David Mandrus, Zhixian Zhou, and Ya-Qiong Xu. *Nano Letters, (18)*5:2766-2771. 2018.

Selected Presentations

1. "*Palladium Diselenide as a New Two-Dimensional Electronic Material Beyond Silicon.*" **Kraig Andrews**, Arthur Bowman, Upendra Rijal, Amanda Haglund, David Mandrus, and Zhixian Zhou. Society of Vacuum Coaters TechCon, Orlando, FL. May 2018.

2. "*Improved On-Off in Ratio Black Phosphorus Field-Effect Transistors with True Ohmic Contacts.*" **Kraig Andrews**, Arthur Bowman, Upendra Rijal, Michael Koehler, David Mandrus, and Zhixian Zhou. APS March Meeting, Los Angeles, CA. March 2018.

3. "*High Mobility Palladium Diselenide Field-Effect Transistors Using Heaving $n-$Doped Graphene Contacts.*" Arthur Bowman, **Kraig Andrews**, Upendra Rijal, Amanda Haglund, David Mandrus, and Zhixian Zhou. APS March Meeting, Los Angeles, CA. March 2018.

4. "*Measuring the Barrier Height at Transition Metal Dichalcogenide Heterojunctions.*" Upendra Rijal, Arthur Bowman, **Kraig Andrews**, Michael Koehler, David Mandrus, and Zhixian Zhou. APS March Meeting, Los Angeles, CA. March 2018.

5. "*High-Performance Top-Gated WSe_2 Transistors with Two-Dimensional Ohmic Contacts.*" **Kraig Andrews**, Upendra Rijal, Arthur Bowman, Hsun-Jen Chuang, Sagar Paduel, Michael Koehler, David Mandrus, and Zhixian Zhou. 41^{st} Annual Symposium American Vacuum Society- Michigan Chapter, Ann Arbor, MI. May 2017.

6. "*Substrate Dependence of Hall and Field-Effect Mobilities in Few-Layer MoS_2 Field-Effect Transistors.*" Bhim Chamlagain, Perera Meeghage, Hsun-Jen Chuang, Arthur Bowman, Upendra Rijal, **Kraig Andrews**, Joseph Klesko, Charles Winter, and Zhixian Zhou. APS March Meeting, Boston, MA, March 2016.

Teaching Experience

Teaching Assistant, Wayne State University — Autumn 2014 – Winter 2018
Teaching Assistant, Michigan State University — Winter 2012 – Winter 2014

Core Technical Skills

Nanofabrication: Atomic force microscopy (AFM), Electron beam lithography, Photolithography, Scanning electron microscopy (SEM), General clean room abilities (> 1000 hours), Physical vapor deposition (PVD), Plasma etching, Reactive ion etching (RIE)

Languages & Software: C++, Fortran, Java, JavaScript, LaTeX, Python, shell script, Microsoft Office, Matlab, Mathematica

Operating Systems: OS X, Linux OS, Microsoft Windows