

## Nathan P. Guisinger

### Education and Training:

Northwestern University

Materials Sci. and Eng.

Ph.D. 2005

University of Illinois

Electrical Engineering

B.S. 1999

**Career Goals:** Sustain and grow a research program that explores the big questions at the cutting edge of materials science and discovery, leads the field and sets scientific direction, and provides an environment of leadership, risk-taking, innovation, results and thoughtful advising in which to mold and develop the next generation of scientists.

### Research and Professional Experience:

(The referencing relates to the following 10 publications)

2007-Present Scientist (ANL)

- Staff scientist at the Center for Nanoscale Materials who has developed a leading effort towards materials discovery, synthesis, characterization, and processing. We are leading the discovery on new materials,<sup>1</sup> the exploration of novel synthesis and characterization,<sup>2-7</sup> and tailoring material properties.<sup>8,9</sup>

### Ten Highlight Publications:

**(2 Science, 4 Nature Journals, and over 1500 citations combined for these 10)**

1. A. J. Mannix, X.-F. Zhou, B. Kiraly, J. D. Wood, D. Alducin, B. D. Myers, X. Liu, B. L. Fisher, U. Santiago, J. R. Guest, M. J. Yacaman, A. Ponce, A. R. Oganov, M. C. Hersam, **N. P. Guisinger**, "Synthesis of borophenes, anisotropic, two-dimensional boron polymorphs." *Science* **350**, 1513 (2015).
2. R. M. Jacobberger, B. Kiraly, M. Fortin-Deschenes, P. L. Levesque, K. M. McElhinny, G. J. Brady, R. R. Delgado, S. S. Roy, A. Mannix, M. G. Lagally, P. G. Evans, P. Desjardins, R. Martel, M. C. Hersam, **N. P. Guisinger**, M. S. Arnold, "Direct oriented growth of armchair graphene nanoribbons on germanium." *Nat. Comm.* **6**, 8006 (2015).
3. A. J. Mannix, B. Kiraly, B. L. Fisher, M. C. Hersam, **N. P. Guisinger**, "Silicon growth at the two-dimensional limit on Ag(111)." *ACS Nano* **8**, 7538-7547 (2014).
4. B. Kiraly, E. V. Iski, A. J. Mannix, B. L. Fisher, M. C. Hersam, and **N. P. Guisinger**, "Solid source growth and atomic-scale characterization of graphene on Ag(111)." *Nat. Comm.* **4**, 2804 (2013).
5. T.-Y. Chien, L. F. Kourkoutis, J. Chakhalian, B. Gray, M. Kareev, **N. P. Guisinger**, D. A. Muller, and J. W. Freeland, "Visualizing short-range charge transfer at the interfaces between ferromagnetic and superconducting oxides," *Nat. Comm.* **4**, 2336 (2013).
6. Y. Qinkai, L. A. Jauregui, W. Wu, R. Colby, J. Tian, Z. Su, H. Cao, Z. Liu, D. Pandey, D. Wei, T. F. Chung, P. Peng, **N. P. Guisinger**, E. A. Stach, J. Bao, S.-S. Pei, and Y. P. Chen, "Control and characterization of individual grains and grain boundaries in graphene grown by chemical vapour deposition," *Nat. Materials*, **10**, 443 (2011).
7. L. Gao, J. R. Guest, and **N. P. Guisinger**, "Epitaxial graphene on Cu(111)," *Nano Lett.*, **10**, 3512 (2010).
8. P. Sessi, J. R. Guest, M. Bode, and **N. P. Guisinger**, "Patterning graphene at the nanometer scale via hydrogen desorption," *Nano Lett.*, **9**, 4343 (2009).
9. **N. P. Guisinger**, G. M. Rutter, J. N. Crain, P. N. First, and J. A. Stroscio, "Exposure of epitaxial graphene grown on 6H-SiC(0001) to atomic hydrogen," *Nano Lett.*, **9**, 1462 (2009).
10. G. M. Rutter, J. N. Crain, **N. P. Guisinger**, T. Li, P. N. First, and J. A. Stroscio, "Interference and localization in epitaxial graphene," *Science*, **317**, 219 (2007).

## Honors and Awards

Director's Award for Outstanding Safety Leadership (2011);  
AVS (TFD) Outstanding Young Researcher Award (2007);  
National Research Council Postdoctoral Fellowship (2006);  
AVS Top Level Graduate Research Award (2005);  
Physical Electronics Conference - Nottingham Prize – For probing isolated molecules on silicon (2005);  
Hilliard Symposium - Runner Up “Best Student Presentation”(2005);  
Northwestern University Graham Fellowship – terminal year fellowship (all academic departments at Northwestern put forward their top 4 candidates) (2004)

## Synergistic Activities, Outreach, & Community Service (\*\* National Level; \* Local Level)

- (1) \*\*Advisory Board - Nanoscience Program Harper College and CLC, (2008-Present);
- (2) \*\*Advisory Board - Nanotechnology Law & Business, (2005-Present)
- (3) \*\*AVS Program Committee, (2008-Present)
- (4) \*\*AVS Thin Film's Division Program Committee, (2008-Present)
- (5) \*Guest Lecturer, Northwestern Materials Science Dept. MSE376, (2015)
- (6) \*\*Interdisciplinary Consortium for Research and Educational Access in Science and Engineering (INCREASE) Workshop STM Lecture, (2015)
- (7) \*Argonne's Mentoring Exchange, select member of pilot group, (2014-Present)
- (8) \*Department of Educational Programs, Argonne, Student Research Participation Program, (2014)
- (9) \*Session Organizer, Argonne User Science Meeting, ANL, (2012)
- (10) \*\*Chair Thin Films Division, AVS, (2012)
- (11) \*\*Division Chair Elect, Thin Films Division AVS (2010-2011)
- (12) \*\*Organizing Committee, IEEE Nano – Birmingham, UK (2012)
- (13) \*\*Chair Student Chapters, AVS, (2010-2012)
- (14) \*\*Guest Editor - MRS Bulletin, (2009-2010)
- (15) \*\*Topic Chair, Graphene Topical Conference, AVS Symposium, (2008-2010)  
(Started the first graphene topical sessions at the AVS with support from AFOSR)
- (16) \*\*Program Chair, Thin Films Division, AVS, (2008-2011)
- (17) \*Northwestern Young Alumni Committee (Materials Science) (2009-2011)
- (18) \*Department of Educational Programs, STM Course, Argonne (2010)
- (19) \*\*ACT-SO Mentor for DuPage County Chapter, (2014-Present)
- (20) \*Science Fair Judge, Downers Grove School District 58, (2014-Present)
- (21) \*Youth Leader Volunteer, Middle School, (COW) CCOB, (2014-Present)
- (22) \*Youth Leader Volunteer, Elementary, (KidZone) CCOB, (2015-)
- (23) \*Assistant Coach, Lemont Youth Basketball, (2014-2015)
- (24) \*Volunteer Leader, Middle School, Camp Stampede, (2014)
- (25) \*Volunteer Leader, Middle School, Camp COW, (2015)
- (26) \*Volunteer Leader, Elementary, Camp Roc n' Canoe (2015)
- (27) \*Volunteer Leader, Sleep Out Saturday, Addressing Homelessness in Dupage County, (2015)
- (28) \*Volunteer Leader, 30 hr Famine, Addressing Hunger and Poverty, (2015)
- (29) \*Volunteer, Childrens Hunger Fund, Food Packing Events, (2013-Present)
- (30) \*Volunteer, Pacific Garden Mission, Chicago, (2013-Present)
- (31) \*STEM Workshop, Museum of Science and Industry, Chicago (2015)
- (32) \*Park Forest Library Lecture (2014)
- (33) \*Guest Lecturer, AP Physics Class, Downers Grove South High School, (2014-Present)
- (34) \*Guest Lecture, 5th grade class, Prairieview Elementary, (2014)
- (35) \*Lab tour for Downers Grove South Science Club, (2014)
- (36) \*\*NPR WBEZ Guest, Graphene and Nobel Prize, (2010)

## Collaborators

Prof. Jak Chakhalian, University of Arkansas; Prof. Yong Chen, Purdue University; Prof. Mark Hersam, Northwestern University; Prof. Franz Himpsel, University of Wisconsin – Madison; Prof. Saw Hla, Argonne

National Laboratory and Ohio University; Prof. Thomas Kuech, University of Wisconsin – Madison; Prof. Carmen Lilley, University of Illinois – Chicago; Prof. Ale Lukaszew, William and Mary; Prof. David Muller, Cornell University; Dr. Paul Snijders, Oak Ridge National Laboratory; Dr. Valeri Stepanyuk, Max Planck – Halle; Prof. Mike Arnold, University of Wisconsin – Madison; Dr. John Freeland, Argonne National Laboratory

**Co-Editor:**

Prof. Mike Arnold, University of Wisconsin – Madison

**Graduate and Professional Advisors**

M.S. Advisor - Prof. Joseph Lyding, Elec. Eng. Dept., Univ. of Illinois at Urbana-Champaign

Ph.D. Advisor - Prof. Mark Hersam, Department of Materials Science, Northwestern University

NRC Advisor - Dr. Joseph Stroschio, Electron Physics Group, NIST - Gaithersburg

**Postdoctoral Fellows Supervised**

(1) Asst. Prof. Li Gao, Postdoctoral Fellow, 2009-2012, (Joint with Jeff Guest), Currently Faculty California State University – Northridge

(2) Asst. Prof. TeYu Chien, Postdoctoral Fellow, 2009-2012, (Joint with John Freeland), Currently Faculty University of Wyoming

(3) Dr. Jongweon Cho, Postdoctoral Fellow, 2010-2011, Currently Postdoc with Prof. Ahmed Zewail - Caltech

(4) Dr. Esmeralda Yitamben, CNM Distinguished Postdoctoral Fellow, 2010-2013, Currently Scientific Staff Sandia National Laboratory

(5) Asst. Prof. Erin Iski, Postdoctoral Fellow, 2011-2013, Currently Faculty Tulsa University

(6) Dr. Adina Luican-Mayer, Argonne Named Postdoctoral Fellow, 2012-

**Ph.D. Students Supervised**

(1) Brian Kiraly, Department of Materials Science, Northwestern University, (Joint with Prof. Mark Hersam), Expected degree date: June 2016 (Note: funded by and works almost exclusively at Argonne)

(2) Andrew Mannix, Department of Materials Science, Northwestern University, (Joint with Prof. Mark Hersam), Expected degree date: June 2017 (Note: funded by and works almost exclusively at Argonne)

**External Ph.D. Committees**

(1) Pohkeong Ng, Department of Electrical Engineering, University of Illinois – Chicago, June 2014

(2) Jian-Yi Cheng, Department of Mechanical Engineering, University of Illinois – Chicago, Expected degree date: June 2016

**Undergraduate Supervision**

(1) Joseph Fiala, Purdue University, Argonne Summer Research Program (2014)

**Visiting Scientists**

(1) Sheri Starks, Richardson High School, Argonne Research Opportunities for High School Teachers, Summer 2009

(2) Professor Carmen Lilley, University of Illinois – Chicago, Sabbatical (2014-2015)

**Related Invited Talks:**(1) EMN Fall Meeting, Las Vegas, NV (2015); (2) University of Illinois-Chicago, Mechanical Engineering Colloquium, Chicago, IL (2015); (3) University of Giessen, Physics Colloquium, Giessen, Germany (2014); (4) University of Notre Dame, Physics Colloquium, South Bend, IN (2014); (5) Argonne National Laboratory Materials Science Colloquium, Lemont, IL (2012); (6) APS March Meeting, Atlanta, GA (2011); (7) NSRC Contractor's Meeting, Annapolis, MD (2011); (8) Tufts University, Chemistry Colloquium, Medford, MA (2011); (9) University of Wisconsin – Madison, Materials Science Colloquium, Madison, WI (2010); (10) University of Illinois-Urbana-Champaign, Electrical Engineering Colloquium, Urbana, IL (2010).