

Jeremy Roger Poindexter

Business Address

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EDUCATION

Massachusetts Institute of Technology, Cambridge, Massachusetts
Candidate for Ph.D. in Materials Science and Engineering
Expected Graduation: Spring 2018
Cumulative GPA: 4.5/5.0

Yale University, New Haven, Connecticut
Degree: B.S. Mechanical Engineering (ABET) with Distinction
Graduated: May 23, 2011
Cumulative GPA: 3.7/4.0

Polytechnic School, Pasadena, California
Degree: high school diploma
Graduated: June 6, 2007

RESEARCH AND WORK EXPERIENCE

Massachusetts Institute of Technology, PhD Candidate, Tonio Buonassisi (advisor),
Photovoltaics Research Laboratory
September 1, 2013 – present

- Model photoluminescence decay and quantum efficiency to extract minority carrier lifetime in absorber layer of devices
- Fabricate thin-film solar cells based on tin monosulfide (SnS) using sputtering and evaporation
- Perform high-throughput device characterization using an integrated testing station

Caelix Corporation, Research Engineer
October 17, 2011 – July 19, 2013

- Developed and documented fabrication procedures through experimentation and iteration to improve the device performance of flexible silicon microwire array solar cells
- Operated machinery in a cleanroom to perform thin film deposition, photolithography, and chemical etches
- Characterized samples using profilometry, electron microscopy, and focused ion beam techniques
- Selected and installed lab equipment at new facility alongside team members and contractors

Yale University, Mechanical Engineering Senior Project, Ainissa Ramirez (advisor)

December 2010 – May 2011

- Investigated the size dependence of the shape memory effect in NiTi microfilaments using focused ion beam, scanning electron microscopy, wafer curvature, and conductivity measurements
- Examined the effect of Hf addition on the transition temperature and structural morphology of NiTi thin films

Northwestern University, Summer Student Researcher, MRSEC REU, Poeppelemeier Research Group

June 21, 2010 – August 20, 2010

- Successfully grew single crystals of indium oxide by adopting and altering procedures from previously published studies
- Performed powder X-Ray diffraction analysis on samples to identify their crystal structures

Jet Propulsion Laboratory, Student Support Intern

June 15, 2009 – August 14, 2009

- Executed a self-run experiment with an infrared camera to determine the temperature rise in resistors under various power, pressure and mounting conditions

June 9, 2008 – August 15, 2008

- Researched and categorized problems found during reliability tests performed on parts and components for the Mars Curiosity rover project

PUBLICATIONS

J. R. Poindexter, R. E. Brandt, N. M. Mangan, and T. Buonassisi, "Extracting Mobility-Lifetime Product in Solar Cell Absorbers Using Quantum Efficiency Analysis," in *MRS Proceedings*, 2015, vol. 1771, pp. mrss15-2131250.

D. Berney Needleman, **J. R. Poindexter**, R. C. Kurchin, I. M. Peters, G. Wilson, and T. Buonassisi, "Economically Sustainable Scaling of Photovoltaics to Meet Climate Targets," *Energy Environ. Sci.*, Apr. 2016.

R. L. Z. Hoye, R. E. Brandt, A. Osherov, V. Stevanović, S. D. Stranks, M. W. B. Wilson, H. Kim, A. J. Akey, J. D. Perkins, R. C. Kurchin, **J. R. Poindexter**, E. N. Wang, M. G. Bawendi, V. Bulović, and T. Buonassisi, "Methylammonium Bismuth Iodide as a Lead-Free, Stable Hybrid Organic-Inorganic Solar Absorber," *Chemistry - A European Journal*, vol. 22, no. 8, pp. 2605-2610, Feb. 2016.

R. E. Brandt, R. C. Kurchin, R. L. Z. Hoye, **J. R. Poindexter**, M. W. B. Wilson, S. Sulekar, F. Lenahan, P. X. T. Yen, V. Stevanović, J. C. Nino, M. G. Bawendi, and T. Buonassisi, "Investigation of Bismuth Triiodide (BiI₃) for Photovoltaic Applications," *J. Phys. Chem. Lett.*, pp. 4297-4302, Oct. 2015.

N. M. Mangan, R. E. Brandt, V. Steinmann, R. Jaramillo, C. Yang, **J. R. Poindexter**, R. Chakraborty, H. H. Park, X. Zhao, R. G. Gordon, and T. Buonassisi, "Framework to predict optimal buffer layer pairing for thin film solar cell absorbers: A case study for tin sulfide/zinc oxysulfide," *J. Appl. Phys.*, vol. 118, no. 11, p. 115102, Sep. 2015.

R. Chakraborty, V. Steinmann, N. M. Mangan, R. E. Brandt, **J. R. Poindexter**, R. Jaramillo, J. P. Mailoa, K. Hartman, A. Polizzotti, C. Yang, R. G. Gordon, and T. Buonassisi, "Non-monotonic effect of growth temperature on carrier collection in SnS solar cells," *Appl. Phys. Lett.*, vol. 106, no. 20, p. 203901, May 2015.

R. Jaramillo, V. Steinmann, C. Yang, K. Hartman, R. Chakraborty, **J. R. Poindexter**, M. L. Castillo, R. Gordon, and T. Buonassisi, "Making Record-efficiency SnS Solar Cells by Thermal Evaporation and Atomic Layer Deposition," *J. Vis. Exp.*, no. 99, p. e52705, May 2015.

V. Steinmann, R. Jaramillo, K. Hartman, R. Chakraborty, R. E. Brandt, **J. R. Poindexter**, Y. S. Lee, L. Sun, A. Polizzotti, H. H. Park, R. G. Gordon, and T. Buonassisi, "3.88% Efficient Tin Sulfide Solar Cells using Congruent Thermal Evaporation," *Adv. Mater.*, vol. 26, no. 44, pp. 7488–92, Nov. 2014.

R. Chakraborty, V. Steinmann, R. Jaramillo, K. Hartman, R. E. Brandt, H. H. Park, **J. Poindexter**, Y. S. Lee, R. G. Gordon, and T. Buonassisi, "Phase-pure evaporation of tin (II) sulfide for solar cell applications," in *2014 IEEE 40th Photovoltaic Specialist Conference (PVSC)*, 2014, pp. 2304–2306.

N. M. Mangan, R. E. Brandt, V. Steinmann, R. Jaramillo, J. V. Li, **J. R. Poindexter**, K. Hartman, L. Sun, R. G. Gordon, and T. Buonassisi, "A path to 10% efficiency for tin sulfide devices," in *2014 IEEE 40th Photovoltaic Specialist Conference (PVSC)*, 2014, pp. 2373–2378.

PATENT APPLICATIONS

Provisional application for patent, "Waffle structured solar cells and methods of manufacture." M. Putnam, M. Kelzenberg, J. Iannelli, B. Buller, **J. Poindexter**, B. Hunt. U.S. Patent Application 61770808. Filed February 28, 2013.

Provisional application for patent, "Etching and sputtering applications and processes." M. Putnam, E.J. Vesseur, **J. Poindexter**, M. Kelzenberg. U.S. Patent Application 13724951. Filed December 12, 2012.

PRESENTATIONS

"Extracting Mobility-Lifetime Product in Solar Cell Absorbers Using Quantum Efficiency Analysis." J. R. Poindexter. Poster Presentation, 2015 MRS Spring Meeting & Exhibit, San Francisco, CA, April 8, 2015.

"Synthesizing efforts to strengthen campus sustainability." J.R. Poindexter. SustainabilityConnect 2015, Massachusetts Institute of Technology, Cambridge, MA, March 2, 2015.

"Examining microscale properties of NiTi thin films." J.R. Poindexter. Mechanical Engineering – Senior Projects, Yale University. May 2, 2011.

"Universal power: an innovative approach to technology for smallholder farmers in Africa." J. Wang, D. Ayele, N. Hardesty-Dyck, J. Morrell, **J. R. Poindexter**, et al. Linsly-Chittenden Hall, Room 10, Yale University. April 28, 2011.

“Designing a Door Energy Harvesting Device.” **J.R. Poindexter**, J. Brink, K. Matheus, R. Carlisle, W.M. Sutter, K. Leveille, Z. Rotholz. Yale University. December 13, 2010.

“Single crystal growth of indium oxide.” J.R. Poindexter. NU-MRSEC REU Closing Symposium, Northwestern University. August 19, 2010.

“Insights Into Infrared Imaging.” J.R. Poindexter. Reliability Engineering Office, Jet Propulsion Laboratory. August 12, 2009.

COMMUNITY SERVICE AND VOLUNTEER WORK

DOW/MIT ACCESS program, <http://access.mit.edu/index.php>. Volunteered October 2013–2015.

LEADERSHIP EXPERIENCES

Co-coordinator, Yale STAND, a Student Anti-Genocide Coalition.

July 2009 – June 2010

- Organized a month-long awareness campaign to highlight atrocities in the Democratic Republic of Congo
- Raised \$1300 for Jewish World Watch to provide children in Darfuri refugee camps with educational, health and hygiene supplies
- Educated students by organizing speaking events and movie screenings about social justice

Eagle Scout Project, Troop 5, San Gabriel Valley Council Boy Scouts of America

August 6, 2004

- Consulted with local city officials to assess the need for local community cleanups
- Organized fellow scouts to remove trash, erase graffiti, and perform landscaping for the Oneonta-Olancha neighborhood stairway
- Was commended by the City Council of the City of Los Angeles for my and my fellow scouts' efforts

ACTIVITIES

Student member, November 2013–present, Materials Research Society

Member 2013–present, Fossil Free MIT

Student member 2010-2011, American Society of Mechanical Engineers

Member 2007-2011, Yale STAND, a Student Anti-Genocide Coalition

Member 2007-2011, Yale C2 Club Soccer

DISTINCTIONS AND AWARDS

Martin Family Society of Fellows for Sustainability (April 2016)

Distinction in Mechanical Engineering, Yale University (May 2011)

Polytechnic School Hale Integrity Award (June 2007)

Eagle Scout (2005)

CONFERENCES

2015 MRS Spring Meeting & Exhibit, April 2015, San Francisco, CA.

IEEE Photovoltaics Specialists Conference, June 2014, Denver, CO.

MIT Energy Conference, March 2011, Cambridge, MA.