Devin M. Rourke

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EDUCATION

University of Colorado, Boulder

Ph.D. Electrical, Computer, and Energy Engineering *Expected Spring 2018*
M.S. Physics *2014*
B.S. Engineering Physics, Minor in Applied Mathematics *2009*
Summa Cum Laude Honors in Physics

PROFESSIONAL and RESEARCH EXPERIENCE

University of Colorado, Boulder ***Scientific Computing, Multiphysics Modeling, STEM Outreach***

Graduate Research Assistant to Dr. Wounjhang Park *2011 - Present*

- Developing multiphysics numerical models of engineered materials which demonstrate novel photonic and electronic phenomena.
- Optically characterized and tested nanostructured photonic devices.

GK-12 Fellow for the College of Engineering and Applied Science *2015 - Present*

- Collaborating with teachers and underrepresented students in K-12 schools to enrich STEM education.

National Institute of Standards Technology (NIST) ***Semiconductor Fabrication and Characterization***

Research Contractor in Optoelectronics Manufacturing with Dr. Kristine Bertness *2006 - 2011*

- 6+ years of experience in process development within a class 100 clean room.
- Fabricated semiconductor nanostructures to serve both as test structures for measurement techniques and as building blocks for novel metrology tools.
- Characterized optoelectronic devices using industry-standard tools (SEM, ellipsometer, photoluminescence, photoconductivity, current-voltage, optical microscope).

Boulder Valley School District ***Coaching***

Head Coach for the Centaurus High School Track and Cross Country Teams *2010 - Present*

- Instilling values of teamwork, communication, dedication, and respect in athletes' academics and athletics.
- Writing training plans; scheduling meets; coordinating transportation and entries; organizing team functions; building, maintaining and utilizing team websites and email lists.

TEACHING EXPERIENCE

Department of Physics, University of Colorado, Boulder *2011 - 2014*

Instructor - Fundamentals of Scientific Inquiry
Teaching Assistant - Calculus-based and Algebra-based General Physics 1 and 2, Energy and the Environment

PROJECTS and CODE

Colorado Water: Aggregated NOAA data from 1900 to present to visualize precipitation patterns in Colorado.
Milesplit: Web scraped 17 years worth of runner data and plotted trends with Python/Pandas.
Website: devinrourke.github.io
Languages and Software Tools: COMSOL, Matlab, Python, IPython/Jupyter, AWS/EC2, LabView, Mathematica, Tex, Solidworks/Inventor, Xic, Google Apps, Microsoft Office

HONORS and AWARDS

Department of Electrical, Computer, and Energy Engineering Teaching Award *2016*

- Recognition for outstanding contributions to advancing the teaching mission of the department.

Colorado School of Education Scholarship (Anthony & Judith Cuzzucolli) *2014*

- Recognition as part of the new-generation of teachers devoting their lives to teaching.

All-Colorado High School Coach of the Year *2011*

- Statewide recognition as an inspirational and influential coach.

Active Learning Award *2009*

- Recognition for pursuits in discovery, service, and professional learning.

SERVICE and GRANTS

Science Fair Judge- Boulder Valley School District

Mentor and founding member of CU-Prime student group

- ➢ Increased inclusion in Physics/ STEM fields, especially among traditionally underrepresented groups, through mentorship and community building.

Project Lead for Engineers Without Borders (EWB)

- ➢ In collaboration with NGOs in rural Nepal, conducted projects in solar-powered telemedicine, clean water, sanitation, and education.

Grants awarded:

Lead Author: $18,000 (IEEE- Engineers without Borders Teach Sustainable Technology) *2010 - 2011*

Co-author: $34,526 (Engineering Excellence Fund- Engineers without Borders) *2009 - 2010*

PROFESSIONAL AFFILIATIONS

American Physical Society (APS)- Four Corners Section; Sigma Pi Sigma (SPS) Physics Honor Society; American Association of Physics Teachers (AAPT); Colorado High School Coaches Association (CHSCA)

PUBLICATIONS

Sungmo Ahn, **Devin Rourke**, Wounjhang Park. 2016. Plasmonic nanostructures for organic photovoltaic devices. *Journal of Optics*. (18). 033001. (http://dx.doi.org/10.1088/2040-8978/18/3/033001)

D Rourke, S Ahn, AM Nardes, J van de Lagemaat, N Kopidakis, W Park. 2014. Integrated optical and electrical modeling of plasmon-enhanced thin film photovoltaics: A case-study on organic devices. *Journal of Applied Physics.* 116 (11). 114510. (http://dx.doi.org/10.1063/1.4896167)

S Ahn; **D Rourke**; A. M Nardes; J van de Lagemaat; N Kopidakis; W Park. 2014. Surface Plasmon Enhanced Infrared Absorption in the Sensitized Polymer Solar Cell. *PVSC 2014*. (http://dx.doi.org/10.1109/PVSC.2014.6925451)

Rourke, D.; Sungmo Ahn; Nardes, A.; van de Lagemaat, J.; Kopidakis, N.; Park, W. Comprehensive device modeling of plasmon-enhanced and optical field-dependent photocurrent generation in organic bulk heterojunctions. *PVSC 2014*. (http://dx.doi.org/10.1109/PVSC.2014.6925430)

D. Rourke; S. Ahn; D. Lu; J. van de Lagemaat; N. Kopidakis; W. Park. Combined Optical and Electrical Modeling of Plasmon-Enhanced Organic Photovoltaic Devices. *OSA 2014*. (http://dx.doi.org/10.1364/PV.2013.PW3B.5)

Matt D. Brubaker, Igor Levin, Albert V. Davydov, **Devin M. Rourke**, Norman A. Sanford. 2011. Effect of AlN buffer layer properties on the morphology and polarity of GaN nanowires grown by molecular beam epitaxy. *Journal of Applied Physics.* 110 (5). 053506. (http://dx.doi.org/10.1063/1.3633522)

Aric Sanders, Kris Bertness, Andrew Herrero, Alexana Roshko, Norman Sanford, John Schlager, Todd Harvey, **Devin Rourke**. 2011. Precise Placement and Diameter Control of Catalyst-Free Molecular Beam Epitaxy Grown GaN Nanowires. Minerals, Metals and Materials Society/AIME.

Aric Sanders, Paul Blanchard, Kris Bertness, Matthew Brubaker, Christopher Dodson, Todd Harvey, Andrew Herrero, **Devin Rourke**, John Schlager, Norman Sanford, Ann N Chiaramonti, Albert Davydov, Abhishek Motayed and Denis Tsvetkov. 2011. Homoepitaxial n-core: p-shell gallium nitride nanowires: HVPE overgrowth on MBE nanowires. *Nanotechnology.* 22 (46). 465703. (http://dx.doi.org/10.1088/0957-4484/22/46/465703)

Kris A. Bertness, Aric W. Sanders, **Devin M. Rourke**, Todd E. Harvey, Alexana Roshko, John B. Schlager, and Norman A. Sanford. 2010. Controlled Nucleation of GaN Nanowires Grown with Molecular Beam Epitaxy. *Advanced Functional Materials*. 20 (17). 2911-2915. (http://dx.doi.org/10.1002/adfm.201000381)

D. J. Guo, A. I. Abdulagatov, **D. M. Rourke**, K. A. Bertness, S. M. George, Y. C. Lee, and W. Tan. 2010. GaN nanowire functionalized with atomic layer deposition techniques for enhanced immobilization of biomolecules. *Langmuir*. 26 (23). 18382-18391. (http://dx.doi.org/10.1021/la103337a)

PRESENTATIONS and TALKS

D Rourke. A Case Study Using Extracurricular Activities for Interactive Physics Engagement. BJ01. 2014 American Association of Physics Teachers (AAPT) Summer Meeting. Minneapolis, MN. July 28, 2014.

D Rourke, S Ahn, AM Nardes, J van de Lagemaat, N Kopidakis, W Park. Comprehensive device modeling of plasmon-enhanced and optical field-dependent photocurrent generation in organic bulk heterojunctions. Oral presentation. Photovoltaic Specialist Conference (PVSC), 2014 IEEE 40th, 0147-0150.

S Ahn, **D Rourke**, AM Nardes, J van de Lagemaat, N Kopidakis, W Park. Surface plasmon enhanced infrared absorption in the sensitized polymer solar cell. Poster presentation. Photovoltaic Specialist Conference (PVSC), 2014 IEEE 40th, 2554-2556.

Alexandre Mantovani Nardes, Sungmo Ahn, **Devin Rourke**, Andrew Ferguson, Wounjhang Park, Jao van de Lagemaat, Dana Olson, Nikos Kopidakis. Laminated Organic Photovoltaic Device with Nanostructured Electrodes. Oral presentation. December 4, 2013. MRS Fall Meeting.

Alexandre Mantovani Nardes, Sungmo Ahn, **Devin Rourke**, Andrew J Ferguson, Wounjhang Park, Jao van de Lagemaat, Dana Olson, Nikos Kopidakis. Inverted Organic Photovoltaics with Laminated Nanostructured Electrodes. Oral presentation. December 3, 2013. MRS Fall Meeting.

Devin Rourke, Sungmo Ahn, Dawei Lu, Jao van de Lagemaat, Nikos Kopidakis, Wounjhang Park. Combined Optical and Electrical Modeling of Plasmon-Enhanced Organic Photovoltaic Devices. Oral presentation. November 6, 2013. Optical Nanostructures and Advanced Materials for Photovoltaics.

Devin Rourke, Sungmo Ahn, Caroline Hughes, Dawei Lu, Won Park. Multi-resonant Nanoplasmonic Gratings for Optical Absorption Enhancement in Organic Photovoltaics. Poster presentation. October 15, 2013. Colorado Photonics Industry Association annual meeting.

Andrew M. Herrero, Paul Blanchard, **Devin Rourke**, Aric Sanders, Matthew Brubaker, Chris Dodson, Norman A. Sanford, Alexana Roshko, Kris A. Bertness. Void Evolution and Microstructure of Annealed Ni/Au Contacts to GaN Nanowires. Oral presentation. April 11, 2012. MRS Spring Meeting.

Devin Rourke, Aric W. Sanders, Paul T. Blanchard and Kristine A. Bertness. Electron Beam Evaporated Indium Contacts to p-GaN Films and Dispersed Catalyst-free MBE Grown p-GaN Nanowires. Oral presentation. April 29, 2011. MRS Spring Meeting.

Norman Sanford, **Devin Rourke**, Paul Blanchard, Matthew Brubaker, Kris Bertness, John Schlager and Aric Sanders. Persistent Photoconductivity of GaN Nanowires in Vacuum and Various Gas Ambients. Oral presentation. April 28, 2011. MRS Spring Meeting.

Alexana Roshko, Aric Sanders, **Devin Rourke**, Kristine Bertness, Todd Harvey and Matthew Brubaker. The Role of Strain in Catalyst-free Nucleation of GaN Nanowires. Oral presentation. April 28, 2011. MRS Spring Meeting.

Andrew M. Herrero, Paul Blanchard, **Devin Rourke**, Aric Sanders, Matthew Brubaker, Chris Dodson, Norman Sanford and Kristine Bertness. Microstructure Evolution and Development of Annealed Ni/Au Contacts to p-GaN Nanowires. Oral presentation. April 26, 2011. MRS Spring Meeting.

Matt D. Brubaker, Albert V. Davydov, Igor Levin, **Devin M. Rourke** and Kris A. Bertness. Effect of AlN Buffer Layer and Nitrogen Plasma Conditions on the Growth of GaN Nanowires by Plasma Assisted Molecular Beam Epitaxy. Oral presentation. April 26, 2011. MRS Spring Meeting.

Devin Rourke, Christopher Dodson, Aric Sanders, Kristine Bertness, Norman Sanford. Functionalization Studies on GaN Nanowires. Oral presentation. June 24, 2010. Electronic Materials Conference.

Alexana Roshko, Kris Bertness, Todd Harvey, Aric Sanders, Matthew Brubaker, **Devin Rourke**. Homoepitaxial Nucleation of GaN Nanowires in Grooves. Oral presentation. June 23, 2010. Electronic Materials Conference.

Kris Bertness, Lorelle Mansfield, Aric Sanders, Todd Harvey, **Devin Rourke** and Norman Sanford. Selective Placement of GaN Nanowires Grown with Molecular Beam Epitaxy. Oral presentation. December 1, 2008. MRS Fall Meeting.

D. Rourke, C. Dodson. Fabrication and Characterization of Biologically Functionalized GaN Nanowires. Poster presentation. April 17, 2008. Professional Research Experience Program (PREP), University of Colorado, Boulder.