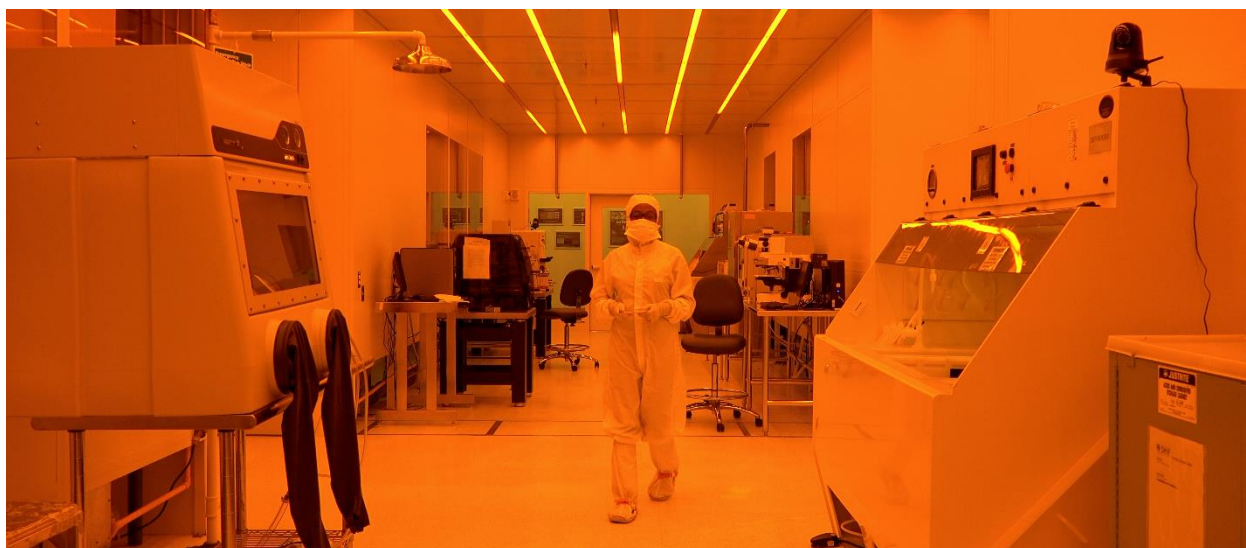


2018 NNCI REU Convocation



Research Triangle Nanotechnology Network

August 5-7, 2018



**National Nanotechnology
Coordinated Infrastructure**

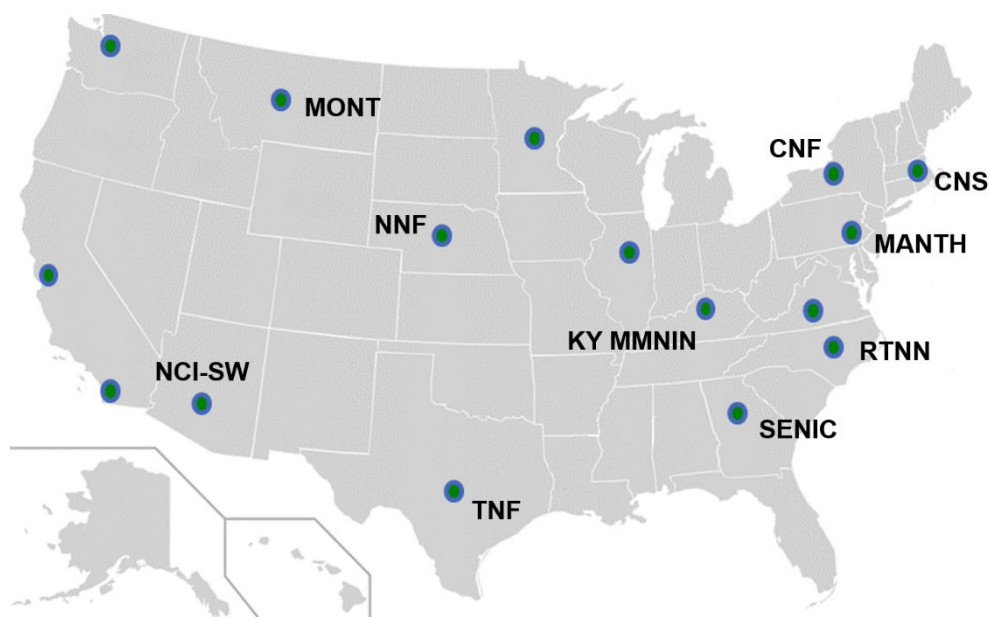


Supported by NSF Award ECCS 1626153



**Acronyms and university affiliation(s) of the NNCI sites
participating in the 2018 NNCI REU Convocation**

| | | |
|-----------------|--|---|
| CNF | The Cornell NanoScale Science & Technology Facility | Cornell University |
| CNS | Center for Nanoscale Systems | Harvard University |
| MANTH | Mid Atlantic Nanotechnology Hub | University of Pennsylvania |
| KY MMNIN | Kentucky Multi-Scale Manufacturing and Nano Integration Node | University of Louisville |
| MONT | Montana Nanotechnology Facility | Montana State University |
| NCI-SW | Nanotechnology Collaborative Infrastructure Southwest | Arizona State University |
| NNF | Nebraska Nanoscale Facility | University of Nebraska – Lincoln |
| RTNN | Research Triangle Nanotechnology Network | North Carolina State University, Duke University, and University of North Carolina at Chapel Hill |
| SENIC | Southeastern Nanotechnology Infrastructure Corridor | Georgia Institute of Technology |
| TNF | Texas Nanofabrication Facility | University of Texas at Austin |



2018 NNCI REU Convocation

RTNN – Raleigh, NC

Sunday, August 5, 2018

12:00 – 5:00 pm Intern Check-in at Doubletree Hotel

1707 Hillsborough St, Raleigh, NC 27605; Phone: (919) 828-0811

6:00 – 8:30 pm Welcome Dinner and Team Scavenger Hunt (*Talley 3222*)

Monday August 6, 2018

8:00 – 8:30 am Breakfast and Welcome (*Talley 4140*)

Jacob Jones (RTNN Site Director, Professor, Materials Science and Engineering, NC State University)

Larry Goldberg (Senior Engineering Advisor, NSF Division of Electrical, Communications & Cyber Systems)

8:30 – 8:45 am NNCI Overview (*Talley 4140*)

Oliver Brand (Director, NNCI Coordinating Office; Professor, Georgia Tech Electrical and Computer Engineering)

8:45 – 9:45 am Student Talks (Two Sessions)

Talley 4140; Moderator: Nicole Hedges

1. Graphene as a Corrosion Inhibitor

Shelly Phillips (SENIC, Georgia Institute of Technology)

2. Characterization of ALD Gate Oxide Films via Electrical Measurements, Wet Etch, and Other Techniques

Karlie McDaniel (CNS, Harvard University)

3. Rational Synthesis of Pt Icosahedral Nanocrystals with a Controllable Size and High Quality

Joseph Holder (SENIC, Georgia Institute of Technology)

4. Fabrication of Nanoscale Silicon Membranes on SOI Wafers Using Photolithography and Selective Etching Techniques

Moriah Faint, Marcos Rodriguez (NCI-SW, Arizona State University)

5. Bilayer Fabrication of Transient Devices using Poly(phthalaldehyde)

Alexa Espinoza (SENIC, Georgia Institute of Technology)

Talley 4101; Moderator: Wallace Ambrose

1. Toward a Cleaner Future: NO Binding and Conversion in Individual Cement Phases

Samuel Lucas (SENIC, Georgia Institute of Technology)

2. Organic Batteries on Chip

Chelsea Draper (CNS, Harvard University)

3. **Improving the Cycling Life of a Li-ion Battery**
Johnathan O'Neil (SENIC, Georgia Institute of Technology)
4. **Electrical Transport Properties of 3D Hybrid Perovskites**
Jack Wei (KY MMNIN, University of Louisville)
5. **Thermoelectric Properties of $\text{CuBi}_x\text{Sb}_{1-x}\text{Te}_2$ Bulk Alloys**
Akshay Paruchuri (RTNN, NC State University)

9:50 – 10:30 am International REU Program Presentation

Paola Perez, Jace Waybright, Carl Felstiner, Peter Chang, Daniel Teal, Isabel Castillo

Talley 4140

10:30 – 10:45 am Coffee Break

10:45 – 11:45 am Student Talks (Two Sessions)

Talley 4140; Moderator: Kathryn Hollar

1. **Boron Gallium Arsenide Alloys for Photodetectors on Silicon**
R. Corey White (TNF, Texas Nanofabrication Facility)
2. **Photonic Wire Bonding with 3D Laser Lithography**
Stanley Feeney (CNS, Harvard University)
3. **Cleaving of (111) face diamonds**
Hannah Kline (MANTH, University of Pennsylvania)
4. **Fabricating 2D Silica using Atomic Layer Deposition**
Reed Yalisove (CNF, Cornell University)
5. **Charge Transport through Molecules Supported by Flexible Electrodes**
Victoria Quirós (CNS, Harvard University)

Talley 4101; Moderator: Ana Sanchez Galiano

1. **Material and structure design for Anti-HIV Drug Delivery Devices using FFF 3D Printing**
Corinne Warlick (KY MMNIN, University of Louisville)
2. **Optimizing Substrate Fabrication for Induced Pluripotent Stem Cells**
Daniel Villarreal (CNS, Harvard University)
3. **Optimizing Photolithography for Neurofluidic Devices**
Kendra Hergett (MONT, Montana State University)
4. **Microfluidic Device Fabrication for Cell Sorting and Delivery of Particles to Cells; Microfluidic Chip Holder Design**
Matthew Johnson (SENIC, Georgia Institute of Technology)
5. **Topics in Nano-biophotonics: Fabrication of Plasmonic Metasurfaces that Attract and Spectroscopically Interrogate Cancer Cells**
Vivek Anil (CNF, Cornell University)

11:45 – 12:30 pm They See Me... What is YOUR Imposter Syndrome? (Talley 4140)

Christine Grant (Associate Dean of Faculty Advancement, NC State College of Engineering; Professor, NC State Chemical Engineering)

- 12:30 – 1:30 pm Networking Lunch** (*Talley 3222 and 3223*)
Theme – Discussion Leader
 NC State ECE – Paul Franzon
 NC State Textiles – Jess Jur
 Interdisciplinary work/fellowships – Ashleigh Wright
 International Experiences – Lynn Rathbun
 Entrepreneurship – Stephen Furst
 Georgia Tech Engineering – Oliver Brand
 Non-profit/industry jobs – Phil Barletta
 Materials Science – Albena Ivanisevic
 NNCO/Government – Quinn Spadola
- 1:30 – 2:15 pm Effective Science Communication: Why We Struggle To Communicate Our Work To The Public, and What We Can Do About It** (*Talley 4140*)
Jory Weintraub (Science Communication Program Director, Duke Initiative for Science & Society)
- 2:15 – 2:25 pm Break**
- 2:25 – 3:25 pm Student Talks (Two Sessions)**
Talley 4140; Moderator: Lynn Rathbun
- 1. Microsensors with Nanostructured Surfaces Fabricated by 3D Lithography**
Biya Haile (SENIC, Georgia Institute of Technology)
 - 2. Microfabricated Sensor for Detection of Trace VOC's**
Josh Brodzik (KY MMNIN, University of Louisville)
 - 3. Integral Tandem NanoFET Thermometers**
Philip Faint, Casey Haller (NCI-SW, Arizona State University)
 - 4. Humidity Sensing via Cellulose Nanofibril Films with Printed Silver Electrodes**
Deborah Wang (MANTH, University of Pennsylvania)
 - 5. Micropreconcentrators for detection of trace level gasses**
Alton O'Neal (SENIC, Georgia Institute of Technology)
- Talley 4101; Moderator: Anja Kunze*
- 1. Optimization of Nanoscale Electrode Fabrication for Poling Nonlinear Crystals**
Jose Figueroa Jr. (MONT, Montana State University)
 - 2. Fabrication of Nanoscale Columnar Diodes by Glancing Angle Deposition**
Jacob Weightman (KY MMNIN, University of Louisville)

3. Novel Structures and Magnetism in Nanomagnets

Hiroaki Komuro (NMF, University of Nebraska-Lincoln)

4. New Photopatterning Materials for Advanced Lithography

Jordan Howard-Jennings (CNF, Cornell University)

5. Curvature Induced Promotion of Nucleation and Growth

Ethan Davis (CNS, Harvard University)

3:25 – 4:25 pm

Professional Development ([Talley 4140](#))

Marcy Bullock (Director of Professional Development, NC State Career Development Center)

[Talley 4140](#)

4:30 – 5:30 pm

Travel to Duke and poster set up (leave from Talley)

[Buses will leave Talley promptly at 4:40 pm](#)

5:30 – 7:30 pm

Dinner and Poster Session A, Networking, Departmental Booths

7:30 – 8:30 pm

Travel back to NC State

[Buses will leave Duke promptly at 7:30 pm](#)

Tuesday, August 7, 2018

8:00 – 8:30 am **Breakfast**

8:30 – 9:30 am **Student Talks** ([Talley 4140](#))

Moderator: Nancy Healy

1. **Ti₃C₂ MXene Electrodes for Surface Electromyography**
Patrick Mulcahey (MANTH, University of Pennsylvania)
2. **Compact Light Sources for Biological Applications**
Ronald Reliford Jr. (SENIC, Georgia Institute of Technology)
3. **Optimization of flow through oil-infused tympanostomy tubes**
Minh-Chau Le (CNS, Harvard University)
4. **Isomotive Dielectrophoresis: An Analysis of Particles**
Lincoln Curry (KY MMNIN, University of Louisville)
5. **Bio-inspired degradable tough adhesives for diverse wet surfaces**
Nadja Maldonado Luna (CNS, Harvard University)

9:30 – 10:30 am **NSF Graduate Research Fellowship** ([Talley 4140](#))

Moderator: Oliver Brand

Lynn Rathbun (Laboratory Manager for the Cornell Nanoscale Facility and Assistant Director of PARADIM)

Panel on applying to grad school and funding

Lynn Rathbun

Jim Cahoon (Associate Professor, UNC Chemistry)

Doug Reeves (Dean of Graduate Education, NC State College of Engineering)

Shelby Boyd (Graduate Student, NC State Materials Science and Engineering, NSF-GRF Recipient)

Ashleigh Wright (Coordinator, NC State NSF Research Traineeship (NRT) in Data Enabled Science and Engineering of Atomic Structure (SEAS))

Jocelyn Chi (NC State Statistics, NRT SEAS Fellow)

Carolyn Hartley (UNC Chemistry, NSF-GRF Recipient)

10:30 – 10:45 am **Coffee Break**

10:45 – 11:45 am **Student Talks** ([Talley 4140](#))

Moderator: Melanie-Claire Mallison

1. **Experimental and Simulation Studies on Electrothermal Microactuators**
John Ronkainen (KY MMNIN, University of Louisville)
2. **MEMS Origami for Energy Harvesting at Soft Surfaces**
Canisha Ternival (KY MMNIN, University of Louisville)
3. **A Piezoresistive MEMS Memory Device Using a Buckled Beam**
Jerry Yang (KY MMNIN, University of Louisville)

| | |
|------------------|--|
| | 4. Development of a MEMS Tool to Study the Physics of Water and Ice <u>Kody Whisnant</u> (CNF, Cornell University) |
| | 5. Compressive Beam for a Bistable MEMS Memory Element <u>Ana Alba</u> (KY MMNIN, University of Louisville) |
| 11:45 – 12:15 pm | Lunch with graduate students (Talley 3222 and 3223) |
| 12:15 – 12:30 pm | Group photo |
| 12:15 – 1:30 pm | Site photos Professional Development: document review (Talley 3222) Professional headshots (Talley 3220) (Note: a schedule for the above activities will be provided.) |
| 1:30 – 2:15 pm | Professional Careers Panel (Talley 4140) Moderator: Jacob Jones <u>Mark Walters</u> (Director, Duke Shared Materials Instrumentation Facility) <u>Jennifer West</u> (Professor; Duke Biomedical Engineering) <u>Kristin Thoney Barletta</u> (Associate Professor, NC State Textile and Apparel Management) <u>Stephen Furst</u> (CEO and Founder, Smart Materials Solutions) <u>Barbara Nsiah</u> (Senior Scientist, United Therapeutics) <u>Catherine Heyer</u> (Assistant Director, UNC Energy Frontier Research Center – Solar Fuels) |
| 2:15 – 2:30 pm | Break |
| 2:30 – 3:30 pm | Student Talks Talley 4140 ; Moderator: Bob Geil |
| | 1. Characterization of Magnetic Thin Films for Actuating Origami Devices <u>Sierra Russell</u> (CNF, Cornell University) |
| | 2. Biomimetic microstructures <u>Roman Shevchenko</u> (SENIC, Georgia Institute of Technology) |
| | 3. High Force, Low Voltage Nano-scale Capacitor Actuator Performance in Dilute Salt Solutions <u>Lisanne de Groot</u> (MANTH, University of Pennsylvania) |
| | 4. Gold Nanocrystal Synthesis with Large Footprint Ligands <u>Andrew Baublis</u> (CNS, Harvard University) |
| | 5. Onboard Hydrogen Production Methods and Development of Nanoporous Silver Battery <u>Alexander Ng</u> (MANTH, University of Pennsylvania) |
| 3:30 – 4:30 pm | Travel to UNC (Pick up at Talley) and poster set up Buses will leave Talley promptly at 3:45 pm |
| 4:30 – 6:30 pm | Dinner and Poster Session B, Networking, Departmental Booths |
| 6:30 – 7:30 pm | Travel back to NC State Buses will leave UNC promptly at 6:30 pm |

Poster Session A, Monday, August 6th

1. **Ana Alba** *Compressive Beam for a Bistable MEMS Memory Element*
2. **Andrew Baublis** *Gold Nanocrystal Synthesis with Large Footprint Ligands*
3. **Isabel Castillo** *Nanobiointerfaces to Study Cell-ECM Interactions*
4. **Lincoln Curry** *Isomotive Dielectrophoresis: An Analysis of Particles*
5. **Ethan Davis** *Curvature Induced Promotion of Nucleation and Growth*
6. **Chelsea Draper** *Organic Batteries on Chip*
7. **Philip Faint, Casey Haller** *Integral Tandem NanoFET Thermometers*
8. **Stanley Feeney** *Photonic Wire Bonding with 3D Laser Lithography*
9. **Jose Figueroa Jr.** *Optimization of Nanoscale Electrode Fabrication for Poling Nonlinear Crystals*
10. **Joseph Holder** *Rational Synthesis of Pt Icosahedral Nanocrystals with a Controllable Size and High Quality*
11. **Matthew Johnson** *Microfluidic Device Fabrication for Cell Sorting and Delivery of Particles to Cells; Microfluidic Chip Holder Design*
12. **Hiroaki Komuro** *Novel Structures and Magnetism in Nanomagnets*
13. **Minh-Chau Le** *Optimization of flow through oil-infused tympanostomy tubes*
14. **Nadja M Maldonado Luna** *Bio-inspired degradable tough adhesives for diverse wet surfaces*
15. **Karlie McDaniel** *Characterization of ALD Gate Oxide Films via Electrical Measurements, Wet Etch, and Other Techniques*
16. **Alton O'Neal** *Micropreconcentrators for detection of trace level gasses*
17. **Paola Perez** *STM Observation and Manipulation of Dimethyl Indolino Benzo-Nitrile (IBN) Molecules on Au(111) Surfaces*
18. **Victoria Quirós** *Charge Transport through Molecules Supported by Flexible Electrodes*
19. **John Ronkainen** *Experimental and Simulation Studies on Electrothermal Microactuators*
20. **Roman Shevchenko** *Biomimetic microstructures*
21. **Daniel Villarreal** *Optimizing Substrate Fabrication for Induced Pluripotent Stem Cells*
22. **Corinne Warlick** *Material and structure design for Anti-HIV Drug Delivery Devices using FFF 3D Printing*
23. **Jack Wei** *Electrical Transport Properties of 3D Hybrid Perovskites*
24. **Kody Whisnant** *Development of a MEMS Tool to Study the Physics of Water and Ice*
25. **Reed Yalisove** *Fabricating 2D Silica using Atomic Layer Deposition*
26. **Jerry Yang** *A Piezoresistive MEMS Memory Device Using a Buckled Beam*

Poster Session B, Tuesday, August 7th

1. **Vivek Anil** *Topics in Nano-biophotonics: Fabrication of Plasmonic Metasurfaces that Attract and Spectroscopically Interrogate Cancer Cells*
2. **Josh Brodzik** *Microfabricated Sensor for Detection of Trace VOC's*
3. **Peter Chang** *Investigation of Intrinsic Defects in Sputtered Titanium Oxide Surfaces*
4. **Lisanne de Groot** *High Force, Low Voltage Nano-scale Capacitor Actuator Performance in Dilute Salt Solutions*
5. **Alexa Espinoza** *Bilayer Fabrication of Transient Devices using Poly(phthalaldehyde)*
6. **Moriah Faint, Marcos Rodriguez** *Fabrication of Nanoscale Silicon Membranes on SOI Wafers Using Photolithography and Selective Etching Techniques*
7. **Carl Felstiner** *Wetting Layer Engineering for GaSb Quantum Dots*
8. **Biya Haile** *Microsensors with Nanostructured Surfaces Fabricated by 3D Lithography*
9. **Kendra Hergett** *Optimizing Photolithography for Neurofluidic Devices*
10. **Jordan Howard-Jennings** *New Photopatterning Materials for Advanced Lithography*
11. **Hannah Kline** *Cleaving of (111) face diamonds*
12. **Samuel Lucas** *Toward a Cleaner Future: NO Binding and Conversion in Individual Cement Phases*
13. **Patrick Mulcahey** *Ti₃C₂ MXene Electrodes for Surface Electromyography*
14. **Alexander Ng** *Onboard Hydrogen Production Methods and Development of Nanoporous Silver Battery*
15. **Johnathan O'Neil** *Improving the Cycling Life of a Li-ion Battery*
16. **Akshay Paruchuri** *Thermoelectric Properties of CuBi_xSb_{1-x}Te₂ Bulk Alloys*
17. **Shelly Phillips** *Graphene as a Corrosion Inhibitor*
18. **Ronald Reliford Jr.** *Compact Light Sources for Biological Applications*
19. **Sierra Russell** *Characterization of Magnetic Thin Films for Actuating Origami Devices*
20. **Daniel Teal** *Modeling Random Memristive Nanowire Networks*
21. **Canisha Ternival** *MEMS Origami for Energy Harvesting at Soft Surfaces*
22. **Deborah Wang** *Humidity Sensing via Cellulose Nanofibril Films with Printed Silver Electrodes*
23. **Jace Waybright** *Synthesis, preparation, and thermoelectric properties of synthetic mineral sulfides*
24. **Jacob Weightman** *Fabrication of Nanoscale Columnar Diodes by Glancing Angle Deposition*
25. **R. Corey White** *Boron Gallium Arsenide Alloys for Photodetectors on Silicon*

Presenter and Panelist Bios

Alphabetical Order by Last Name

Oliver Brand: Prof. Oliver Brand is a Professor in the School of Electrical and Computer Engineering and the Executive Director of the Institute for Electronics and Nanotechnology at the Georgia Institute of Technology. He received his diploma degree in Physics from Technical University Karlsruhe, Germany in 1990 and his Ph.D. degree from ETH Zurich, Switzerland in 1994. From 1995 to 1997, he worked as a postdoctoral fellow at the Georgia Institute of Technology. From 1997 to 2002, he was a lecturer at ETH Zurich in Zurich, Switzerland and deputy director of the Physical Electronics Laboratory (PEL). In 2003, he joined the faculty in the School of Electrical and Computer Engineering at the Georgia Institute of Technology. Professor Brand was promoted to Full Professor in 2009 and was named the Executive Director of Georgia Tech's Institute for Electronics and Nanotechnology in 2014. Since 2016, he serves as the Director of the Coordinating Office of the NSF-funded National Nanotechnology Coordinated Infrastructure (NNCI). Dr. Brand has co-authored more than 200 publications in scientific journals and conference proceedings. His research interests are in the areas of integrated microsystems, microsensors, MEMS fabrication technologies, and microsystem packaging.

Shelby Boyd: Shelby Boyd is a graduate student researcher and NSF Graduate Research Fellow at North Carolina State University in the Department of Materials Science and Engineering, under the supervision of Prof. Veronica Augustyn. She received her B.S. in Materials Engineering from California Polytechnic State University in 2015. Her current research is on the synthesis and characterization of sodium ion transition metal oxides for aqueous electrochemical energy storage.

Marcy Bullock: As the Director of Professional Development at NC State University, in the Career Development Center, with an MS degree in Counseling from San Diego State University and a BS degree in Sociology and Communication from the University of California, San Diego, Ms. Bullock teaches 4 classes on career exploration, career readiness and professional development at NC State. She has published articles on career issues and has presented at national conferences. She received the Governor's Award for Excellence and the Outstanding Faculty Award from the CALS Alumni Society. She spent a semester abroad in Brisbane Australia learning about new career programs. Ms. Bullock enjoys soccer, karaoke and cooking/eating fish tacos.

Keynote Speaker and career coach certified in the MBTI and Gallup Strengths with expertise in career / strengths / purpose / personality/ goals / professionalism / team building / values. She encourages her audiences to reach their full professional potential by enthusiastically sharing what she has learned. She has done it for thousands over her career at four Universities from Australia, to California to North Carolina.

Jim Cahoon: Dr. James Cahoon is an associate professor in the Department of Chemistry at UNC-Chapel Hill. His research is focused on the chemical synthesis of semiconductor nanomaterials with unique physical properties that can enable a range of technologies, from solar cells to solid-state memory. His Ph.D. background is in experimental physical chemistry, and his post-doctoral training focused on nanomaterial synthesis, a topic at the border of physical chemistry, inorganic materials, and engineering. At UNC, he has combined these backgrounds to develop a research program that emphasizes nanomaterials synthesis coupled with detailed physical characterization and computational modeling. By combining these three key areas - synthesis, measurement, and modeling - his research group has a general strategy to develop new materials with specific properties and function under the overarching theme "morphology encodes function." Professor Cahoon has received several accolades including an IC Postdoctoral Fellow, Harvard University (2009-2011); Barry M. Goldwater Scholarship (2002); National Science Foundation Graduate Research Fellowship (2004); ACS Physical Chemistry Division Post-doctoral Research Award (2010); Packard Fellowship for Science and Engineering (2014); Sloan Research Fellowship (2015); Cottrell Scholar Award (2015); and NSF CAREER Award (2016). He received his B.S. in Chemistry from William & Mary in 2003 and Ph.D. in Physical Chemistry

from the University of California, Berkeley in 2008. He also trained as a postdoc under the leadership of Prof. Charles Lieber at Harvard University before joining the faculty at UNC in 2011.

Jocelyn Chi: Jocelyn Chi is a fourth year PhD student in the Statistics Department at NC State. Prior to beginning her studies in statistics, she studied legal studies as an undergraduate at UC Berkeley and obtained a master's degree in public policy from UCLA. Jocelyn currently works on harnessing randomized matrix methods in the development of fast and accurate algorithms for big data problems, where the data are too large for traditional full-data computations. Her work focuses on employing randomized methods in targeted ways to retain important information in the data, providing rigorous guarantees on the quality of the solutions obtained from randomized methods, and characterizing the statistical trade-offs incurred from the randomization.

Stephen Furst: Dr. Stephen Furst (furst@smartmaterialsolutions.com), the founder and CEO of Smart Material Solutions, is an expert in precision engineering, metrology, diamond turning, and optical system design and fabrication. He completed a BS in Aerospace Engineering at NC State University (NCSU), an MS in Mechanical Engineering at the NCSU Precision Engineering Center (the lab that invented nanocoining), and a Dr.-Ing. in Mechanical Engineering at Saarland University in Germany. Stephen has worked with students and faculty members on projects for the NIH, NSF, NASA, and several companies. He is also an accomplished runner, winning ACC Champion in both the 5k and 10k in 2008 and competing in the 2012 and 2016 Olympic Team Trials for the 5k and marathon.

Larry Goldberg: Lawrence S. Goldberg was born in St. Louis, Missouri. He received his B.S. degree in Engineering Physics from Washington University in 1961, and his Ph.D. degree in Solid State Physics from Cornell University in 1966. From 1966-67, he spent a postdoctoral year at the Physikalisches Institut, Universität Frankfurt, Germany. From 1967-1985, he was with the Naval Research Laboratory as research physicist in the Optical Sciences Division where his research interests were in ultrashort pulse lasers and nonlinear optics. During 1976-1977, he was on sabbatical leave at Imperial College, London, England.

Dr. Goldberg came to the National Science Foundation in 1985, where he currently is Senior Engineering Advisor in the Division of Electrical, Communications and Cyber Systems, Directorate for Engineering. He served previously as Division Director, and earlier as Program Director in areas of quantum electronics, optics, plasmas, and electromagnetics. In the summer of 1989, he served as Acting Head of the NSF Office in Tokyo, Japan. In 1995, he was appointed by the President's Science Advisor to the interagency management committee for the U.S.-Japan Joint Optoelectronics Project. He served in 2005 as U.S. Embassy Science Fellow in Chisinau, Moldova, where he worked in close cooperation in an advisory role with the President of the Academy of Sciences of Moldova. He has since participated in U.S. government-level science studies in Ukraine, Kazakhstan, and Romania.

At NSF, Dr. Goldberg provided oversight for the National Nanotechnology Infrastructure Network (NNIN). He currently is lead program officer and guided the competition for the newly established National Nanotechnology Coordinated Infrastructure (NNCI), as successor to the NNIN. He has coordinated joint activities on nanoelectronics with the Semiconductor Research Corporation, conducted under NSF's emphasis area on Nanoscale Science and Engineering. He led federal agency funding for the 2012 National Academies study on Optics and Photonics: Essential Technologies for Our Nation. He serves as NSF member of the interagency Wireless Spectrum Research and Development Senior Steering Group, and represents the Engineering Directorate on the NSF program Enhancing Access to the Radio Spectrum (EARS). He also coordinates the Major Research Instrumentation (MRI) program for the Engineering Directorate.

Christine Grant: Dr. Christine Grant obtained her degrees in Chemical Engineering (B.S., Brown University; M.S. and Ph.D., Georgia Institute of Technology). A Professor of Chemical and Biomolecular engineering at NC State, she's conducted research in surface and interfacial science. As Associate Dean of Faculty Advancement in the College of Engineering, she is responsible for faculty development, special initiatives and promotion and tenure for the college. A recipient of the AAAS Mentor Award and

the NSF Presidential Award for Excellence in Science, Math and Engineering Mentoring (PAESMEM); Grant's been recognized for broadening the participation, promotion and retention of underrepresented minorities (URM) and women in STEM. She has been a Visiting Senior Scholar at AAAS and a Grant Expert at NSF. Her book, "Success Strategies from Women in STEM: A Portable Mentor" by Elsevier/Academic Press is the culmination of Grant's over 30 years of leadership broadening the participation of diverse populations in STEM fields.

Carolyn Hartley: Carolyn grew up in Alexandria, Virginia before attending the College of William and Mary (W&M) in Williamsburg, VA. At W&M, Carolyn received her B.S. in Chemistry with a minor in Hispanic Studies. During her sophomore year, she joined the inorganic research group of Professor Bill McNamara to study iron complexes in systems for artificial photosynthesis. Funded by a Virginia Space Grant Consortium Fellowship in her senior year, Carolyn compared the efficiency of several complexes for catalyzing hydrogen generation when irradiated with visible light. After graduating from W&M in 2016, Carolyn moved to Chapel Hill, NC to begin graduate school in Inorganic Chemistry as an NSF Graduate Research Fellow. Carolyn is now beginning her third year working in the laboratory of Professor Jillian Dempsey where she studies charge transfer in semiconductor nanocrystals.

Catherine Heyer: Catherine Heyer received her Ph.D. in inorganic chemistry from the University of Dublin, Trinity College Dublin, in her native Ireland. She held postdoctoral fellowships in inorganic chemistry, photochemistry, and electrochemistry with Jean-Marie Lehn (Nobel Laureate) at Université Louis Pasteur, Strasbourg, France, and subsequently with Richard Eisenberg at the University of Rochester, NY. Dr. Heyer then moved to North Carolina as a research scientist in the polymer chemistry department at BD Technologies, the corporate technology R&D center for Becton Dickinson and Company, developing novel solid supports for immunoassays using plasma chemistry. Dr. Heyer returned to academia at Duke University as the Manager of Advanced Undergraduate Laboratories, where she redesigned the physical and analytical chemistry laboratory programs and developed a new upper level laboratory course in inorganic chemistry. In this role, she successfully obtained federal and foundation grant funding for instrumentation, and for computational resources to update experimental data collection and analysis in the undergraduate labs. Since 2009, she has been the Assistant Director of the UNC Energy Frontier Research Center in Solar Fuels headquartered at the University of North Carolina at Chapel Hill where she provides administrative, operations and budgetary leadership for a 75-member research Center with four partner institutions.

Jacob Jones: Dr. Jacob Jones received his PhD from Purdue University in 2004, after which he completed an international postdoctoral fellowship from the National Science Foundation at the University of New South Wales (UNSW) in Sydney, Australia. He was an Assistant and Associate Professor in the Department of MSE at the University of Florida from 2006-2013 and joined NC State in August of 2013. He is currently a Professor of Materials Science and Engineering, Director and Principal Investigator of the Research Triangle Nanotechnology Network (www.rtnn.org), Director of the Analytical Instrumentation Facility (www.aif.ncsu.edu), and a University Faculty Scholar.

Jones research interests involve developing structure-property-processing relationships in emerging functional materials, primarily through the use of advanced X-ray and neutron scattering tools. Jones has published over 200 papers and delivered over 100 invited lectures on these topics since 2004. Jones is a Fellow of the American Ceramic Society and has received numerous awards for his research and education activities, including an NSF CAREER award, a Presidential Early Career Award for Scientists and Engineers (PECASE), the IEEE Ferroelectrics Young Investigator Award, a National Nuclear Security Administration (NNSA) Defense Program Award of Excellence, a UF-HHMI Science for Life Distinguished Mentor Award for his mentoring of undergraduate researchers, and two Edward C. Henry "Best Paper" awards from the Electronics Division of the American Ceramic Society. Jones is active in the IEEE Ultrasonics, Ferroelectrics and Frequency Control (UFFC) Society and the American Ceramic Society.

Dr. Jones is known for promoting international science and engineering initiatives. He has been Principal Investigator on three NSF awards to provide international research experiences to U.S. students at foreign research laboratories. Using these programs, Jones has enabled over 50 U.S. students to obtain international research experiences overseas and has hosted a multitude of foreign students at U.S. institutions. Since 2012, he has been a Senior Visiting Fellow in the School of Materials Science and Engineering at the University of New South Wales. At NC State, he is engaged in the University Global Partnership Network (UGPN) and promotes interactions with the University of Surrey in the U.K. and the University of Wollongong in Australia. In recognition of his international activities, Jones received the International Educator of the Year award (Senior Faculty Awardee) from the University of Florida International Center in 2012.

Barbara Nsiah: Dr. Barbara Nsiah, is a native of Houston, TX. She is a first generation African American as her parents moved from Ghana to Houston, TX in the 70s. She completed her Bachelor's of Science in Mechanical Engineering at Iowa State University. There she was George Washington Carver Scholar and a Ronald E. McNair Scholar. She then went on to obtain her Master's and PhD in Bioengineering at the Georgia Institute of Technology in Atlanta, GA. Before entering industry, she completed a short Postdoctoral Associateship in the Biomedical Engineering Department at Duke University. In 2014, she began her first industry position as an Associate Scientist at United Therapeutics in the Regenerative Medicine Lab. She is now a Scientist and leads a 7-member team who is working to develop transplantable lung organs.

Lynn Rathbun: Lynn Rathbun is the Laboratory Manager for the Cornell Nanoscale Facility and Assistant Director of PARADIM, both user facilities at Cornell University. He served as Deputy Director/Program Manager of the National Nanotechnology Infrastructure Network (NNIN) (the predecessor to NNCI) over its entire 12-year span (2004-2015). In that capacity he coordinated the network wide REU program and implemented other national and international education programs. In 2007, with Nancy Healy of Georgia Tech, he developed an international undergraduate research program (iREU) to promote development of global perspectives in young scientists. This program had activities in Japan, Germany, Belgium, France and the Netherlands. This program continues today with students conducting summer research in Japan at the National Institute for Materials Science.

Douglas Reeves: Dr. Douglas Reeves, professor of computer science and electrical and computer engineering, is the associate dean for graduate programs in the College of Engineering at North Carolina State University. He previously served as an assistant dean working with graduate programs. Under his leadership, the College's academic departments have recruited a record number of high-quality students, particularly at the Ph.D. level, with the highest levels of support ever from the College of Engineering and the Office of the Provost.

Reeves also served as director of graduate programs in the Department of Computer Science from May 2010 to December 2013. During that time, graduate enrollment within the department saw more than 600 students, as well as an additional 180 Ph.D. students. Reeves and his students have published more than 100 papers in the areas of VLSI design, parallel and distributed computing, computer networking and computer and network security. At NC State, he has supervised the theses of 20 Ph.D. students and more than 20 master's students. His research has been funded by the National Science Foundation, the Air Force Office of Scientific Research, the Defense Advanced Research Projects Agency, the Advanced Research Development Activity, the Army Research Office and others. He has served as chair, program chair or program committee member of dozens of conferences.

He received a B.A. in biology from Indiana University, an M.S. in computer science/engineering from the University of Louisville and a Ph.D. in computer science from Pennsylvania State University. Reeves joined the NC State faculty in 1987.

Kristin Thoney-Barletta: Dr. Kristin A. Thoney-Barletta is an Associate Professor in the Department of Textile and Apparel, Technology and Management. She grew up in Elmhurst, Illinois, a suburb of Chicago. Dr. Thoney-Barletta received a B.S. in Mathematics in 1994 from Valparaiso University. She

began her studies at North Carolina State University in August 1994. She graduated in 1997, with a M.S. in Operations Research. Dr. Thoney-Barletta received her Ph.D. from NC State University in 2000, co-majoring in Industrial Engineering and Operations Research. She is a member of INFORMS and IIE.

Mark Walters: Dr. Walters is the Director of the Shared Materials Instrumentation Facility (SMIF) at Duke University. He is responsible for the operations, administration and finances of SMIF; which operates as an interdisciplinary shared use facility that provides advanced capabilities in clean room fabrication, imaging, and materials characterization to Duke University researchers from the various schools and departments as well as to external users from other Universities, government laboratories or industry. SMIF is a member of the Research Triangle Nanotechnology Network (RTNN), an NSF funded site in the National Nanotechnology Coordinated Infrastructure (NNCI) network. Dr. Walters is also an adjunct professor in the Mechanical Engineering and Materials Science Department of Duke University's Pratt School of Engineering. He is the instructor for an interdisciplinary nanotechnology materials laboratory course. Dr. Walters' areas of expertise include micro and nano fabrication, electron microscopy, and x-ray photoelectron spectroscopy. He is an author on over 15 papers and holds 10 patents.

Jory Weintraub: Jory Weintraub is the Science Communication Director with the Duke Initiative for Science & Society and a Senior Lecturing Fellow at Duke University. In these roles, he teaches science communication courses to undergrads and grad students, and runs scicomm workshops for Duke faculty and postdocs. He also serves on the Board of Directors of Science Communicators of North Carolina (SCONC). He has a BS in Biochemistry/Cell Biology from UC San Diego and a PhD in Immunology from UNC Chapel Hill.

Jennifer West: Jennifer West joined the faculty at Duke in 2012, after having been the department chair and Cameron Professor of Bioengineering Rice University. Professor West was one of the founding members of Rice's Department of Bioengineering, building it to a top ten program over the prior sixteen years. Professor West has authored more than 180 research articles. She also holds 18 patents that have been licensed to eight different companies.

Professor West's research focuses on the development of novel biofunctional materials. Part of her program has developed nanoparticle-based approaches to biophotonics therapeutics and diagnostics. An example of this work is the application of near-infrared absorbing nanoparticles for photothermal tumor ablation. In animal studies, this therapeutic strategy has demonstrated very high efficacy with minimal side effects or damage to surrounding normal tissues. In 2000, Professor West founded Nanospectra Biosciences, Inc. to commercialize the nanoparticle-assisted photothermal ablation technology, now called AuroLase. Nanospectra Biosciences, Inc., located in Houston, TX, is the recipient of a NIST ATP Award and a grant from the Texas Emerging Technology Fund. Professor West is a director of the company. The company has built manufacturing facilities, and AuroLase cancer therapy is now in human clinical trials.

Professor West has received numerous accolades for her work. In 2017, she was elected to the National Academy of Inventors. In 2016, she was elected to the National Academy of Engineering. In 2015, she received the Society for Biomaterials Clemson Award. In 2014, she was recognized by Thomson Reuters as a Highly Cited Researcher, the top 1% in the field of materials science. In 2010 she was named Texas Inventor of the Year and also Admiral of the Texas Navy (highest honor the governor of Texas can bestow on a civilian). In 2008, The Academy of Medicine, Engineering and Science of Texas honored her with the O'Donnell Prize in Engineering as the top engineer in the state. In 2006, she was named one of 20 Howard Hughes Medical Institute Professors, recognizing integration of world class research and teaching. She has been listed by MIT Technology Review as one of the 100 most innovative young scientists and engineers worldwide. Other recognitions include the Christopher Columbus Foundation Frank Annunzio Award for scientific innovation, Nanotechnology Now's Best Discovery of 2003, Small Times Magazine's Researchers of the Year in 2004, and the Society for Biomaterials Outstanding Young Investigator Award.

Ashleigh Wright: Dr. Ashleigh R. Wright is the Coordinator of the Science and Engineering of Atomic Structure (SEAS) NSF Research Traineeship in the Department of Materials Science and Engineering at NC State. She has earned degrees in chemistry from Wofford College (BS), North Carolina A&T State University (MS), and Louisiana State University (PhD) where her research focused on the development and characterization of gold-coated organic nanoparticles, nano GUMBOS (Group of Uniform Materials Based on Organic Salts), and biocompatible, designer ionogels for drug delivery. She decided to pursue a career path which has led her to directing education mentoring programs for underrepresented groups in science, technology, engineering, and mathematics (STEM) disciplines.

Her passion for education and mentoring evolved over years of her involvement with teaching, outreach, advising, and directing initiatives focused on increasing diversity and preparing students in science and mathematics. Prior to joining North Carolina State University, Dr. Wright served as the Coordinator of Initiatives and Outreach and Manager of the Howard Hughes Medical Institute Professors, Scholarships in STEM (S-STEM), Louis Stokes- Louisiana Alliance for Minority Participation (LS-LAMP) and Bridge to the Doctorate Programs for the Office of Strategic Initiatives at Louisiana State University.