

Symposium on Photonics Science and Technology

2016 Fitzpatrick Institute for Photonics (FIP) Annual Meeting
March 14-15, 2016, Duke University

PROGRAM AGENDA *(with Lecture Titles)*

Monday, March 14, 2015 (Fitzpatrick Center) – Morning Session

- 8:00-9:00 am **Registration**
- 8:55-9:00 **Introduction**
Tuan Vo-Dinh, Director of the Fitzpatrick Institute for Photonics, R. Eugene and Susie E. Goodson Professor of Biomedical Engineering and Professor of Chemistry, Duke University
- 9:00-9:05 **Opening Welcome Address**
Sally Kornbluth, Provost, Duke University
- 9:05-9:15 **George Truskey**, Vinik Dean, Pratt School of Engineering, Duke University
- 9:15-9:25 **Valerie Sheares Ashby**, Dean of Trinity College of Arts & Sciences, Duke University
- 9:25-10:10 **Symposium Keynote**
William E. Moerner
2014 Nobel Laureate in Chemistry.
Harry S. Mosher Professor in Chemistry
Department of Chemistry, Stanford University, Stanford, California
“The Story of Photonics and Single Molecules, from Early Spectroscopy in Solids, to Super-Resolution Nanoscopy in Cells and Beyond”
- 10:10-10:20 **FIP Award Presentation – 2016 Pioneer in Photonics Award**
- 10:20-10:30 **Introduction to OSA Centennial Celebration**
Joseph A. Izatt, OSA Fellow and Member of the OSA Strategic Planning Committee and Publications Council Vice Chair
Michael J. Fitzpatrick Professor of Engineering, Professor of Ophthalmology, Duke University
- 10:30-10:40 **COFFEE BREAK**
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- 10:40-11:10 **Plenary Lecture**
co-sponsored by Duke MedX Mobile and Wireless Technology
Russell H. Taylor
John C. Malone Professor of Computer Science
Director, Laboratory of Computational Sensing & Robotics
Director, Engineering Research Center for Computer-Integrated Surgical Systems and Technology
John Hopkins University, Baltimore, Maryland
“Medical Robotics and Computer-Integrated Interventional Medicine”



11:10-11:55 **Session 1: Special Topic - Photonics Biomedical Robotics and Autonomous Systems**
Chair: Adam Wax

11:10-11:35 **Invited Lecture**
Curtis Padgett, Group Supervisor, Maritime and Aerial Perception Systems Group, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California
"Evolution of Image-Based Stereo for Sea Surface Navigation"

11:35-11:55 **Joseph A. Izatt**, Michael J. Fitzpatrick Professor of Engineering, Professor of Ophthalmology, Duke University, Durham, North Carolina
"New Technologies for Real-Time Ophthalmic Imaging and Surgical Guidance"

11:55-1:30 pm **LUNCH BREAK** (Lunch provided)

Poster Session & Industry Booths

Posters and Industry Booths are exhibited in the Atrium area of the Fitzpatrick Center

Monday, March 14 Afternoon Session

Session 2. Advanced Photonic Technologies
Chair: Jungsang Kim

1:30-2:30

1:30-1:50 **Adam Wax**, Theodore Kennedy Professor of Biomedical Engineering Duke University, Durham, North Carolina
"Automated methods for detecting disease at the cellular level"

1:50-2:10 **Chris Dwyer**, Associate Professor, Department of Electrical and Computer Engineering and Department of Computer Science Duke University, Durham, North Carolina
"Self-assembly and Accelerating Stochastic Algorithms"

2:10-2:30 **Sina Farsiu**, Assistant Professor, Department of Biomedical Engineering and Ophthalmology (joint appointment) and Department of Computer Engineering and Computer Science (secondary appointments) Duke University, Durham, North Carolina
"Photonics imaging and image processing for ocular and neurodegenerative diseases"

2:30- 3:00 **COFFEE BREAK**

Session 3: Special Topic on Mobile, Wireless Technology, Biomedical Robotics and Autonomous Systems
Chair: Joseph A. Izatt

3:00-4:10

3:00-3:25 **Invited Lecture**
Abdollah Homaifar
Duke Energy Eminent Professor
Autonomous Control and Information Technology (ACIT) Center
North Carolina A&T State University, Greensboro, North Carolina
"Data Management from sensing to mining"

- 3:25-3:50 **Edward Grant**
Professor, Department of Electrical and Computer Engineering
North Carolina State University, Raleigh, North Carolina
"Using Optical Systems for Free Space Autonomous Robotic Communications and Collision Avoidance in Piloted Unmanned Aerial Vehicle Control"
- 3:50-4:10 **Patrick J. Codd**, Assistant Professor of Neurosurgery
Director, Brain Tool Laboratory
Duke University, Durham, North Carolina
"When These Hands Are No Longer Enough: Tackling the Next Frontier of (Neuro)Surgery"
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4:10-5:00 **POSTER SESSION & INDUSTRY BOOTHS**
Posters and Industry Booths are exhibited in the Atrium area of the Fitzpatrick Center

5:00-6:30 **COCKTAIL RECEPTION – Exhibit & Industry Booths**
(Heavy hors d'oeuvres will be served)

Tuesday, March 15, (Fitzpatrick Center) – Morning Session

- 8:30-9:00 am **Registration**
- 9:00-10:05 **Session 4: Advanced Photonics and Renewable Energy**
Chair: Jie Liu
- 9:00-9:25 **Invited Lecture**
Hans Joachim Lewerenz
Principal Investigator, Joint Center for Artificial Photosynthesis
California Institute of Technology, Pasadena, California
"Photonic Properties of Efficient Water Splitting Structures"
- 9:25-9:45 **David Mitzi**, Professor of Mechanical Engineering and Materials Science,
Duke University, Durham, North Carolina
"Prospects for Earth-Abundant Copper-Based Thin-Film Photovoltaics"
- 9:45-10:05 **Nico Hotz**, Assistant Professor of Mechanical Engineering and Materials
Science, Duke University, Durham, North Carolina
"Plasmon-enhanced Photocatalytic Hydrogen Generation from Biofuels"
- 10:05-10:30 **COFFEE BREAK**
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- 10:30-11:45 **Session 5: Advances in Photonics**
Chair: David Mitzi
- 10:30-10:45 **Poster Award Winners Announced**

- 10:45-11:05 **Jie Liu**, George B. Geller Professor, Department of Chemistry
Duke University, Durham, North Carolina
"UV Plasmonics Based on Rh Nanostructures"
- 11:05-11:25 **Steve M. Taylor**, Assistant Professor of Medicine, Infectious Diseases
Duke University School of Medicine, Durham, North Carolina
"Nanophotonic arrays to detect tropical blood-borne pathogens "
- 11:25-11:45 **Yiyang Gong**, Assistant Professor of Biomedical Engineering,
Duke University, Durham, North Carolina
"Spike detection with engineered optical voltage sensors"

11:45am

SYMPOSIUM ADJOURNS

Post-Symposium Workshop

(Open to All)

1:30-3:00pm

Schiciano Auditorium, FCIEMAS -Workshop



Workshop Co-Chairs

Ryan Shaw, Assistant Professor

Duke School of Nursing and Duke School of Medicine

Tuan Vo-Dinh, R. Eugene and Susie E. Goodson Professor of BME, Professor of Chemistry
Director of Fitzpatrick Institute for Photonics, Duke University

Workshop Administrative Managers

August Burns, Business Manager, Fitzpatrick Institute for Photonics, Duke University

Julie Counts, MS, RD, LDN, Duke Molecular Physiology Institute, Duke University

Erica Levine, Programs Director, Duke Global Digital Health Science Center, Duke University

Teji Rakhra-Burris, MA, Program Leader, Precision Medicine, Duke University

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