Symposium on Photonics Science and Technology

2017 Fitzpatrick Institute for Photonics (FIP) Annual Meeting

March 13-14, 2017, Duke University

ADVANCE PROGRAM AGENDA

Monday, March 13, 2017 (Fitzpatrick Center) – Morning Session

8:00-9:00 am **Registration**

9:00-9:05 **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

Opening Welcome Address
9:05-9:15 **Sally Kornbluth**, Provost and James B. Duke Professor of Pharmacology and Cancer Biology Duke University

9:15-9:25 **Ravi Bellamkonda**, Vinik Dean, Pratt School of Engineering, Duke University

9:25-9:35 **Nancy Andrews**, Dean and Vice Chancellor for Academic Affairs, Duke School of Medicine

9:35-10:15 **Symposium Keynote**
Eric Betzig, 2014 Nobel Laureate in Chemistry
Janelia Research Campus, Howard Hughes Medical Institute, Ashburn, Virginia
"Imaging Life at High Spatiotemporal Resolution"

10:15-10:25 **FIP Award Presentation – *2017 Pioneer in Photonics Award***

10:25-10:45 **COFFEE BREAK**

10:45-11:20 **Plenary Lecture**
Chad A. Mirkin, George B. Rathmann Professor of Chemistry
Director of the International Institute for Nanotechnology, Northwestern University
Evanston, Illinois
"Unlocking the Potential of Spherical Nucleic Acids in Biology and Medicine"

11:20-12:00 **Session 1: Special Topic – Biophotonics for the Medicine of the Future I**
Chair: Dan Kiehart, Dean of the Natural Sciences Division, Professor and Chair of the Department of Biology, Duke University

- 11:20-11:40 **Nimmi Ramanujam**, Director of Center for Global Women's Health Technologies, Robert W. Carr, Jr. Professor of Biomedical Engineering, Duke University and
  John Schmitt, Professor of Obstetrics and Gynecology and Global Health Duke University School of Medicine
  "Innovations in see and treat strategies for cervical pre-cancer – a disease of excess mortality"
- 11:40-12:00 **Tuan Vo-Dinh**, Director of the Fitzpatrick Institute for Photonics, R. Eugene and Susie E. Goodson Professor of Biomedical Engineering, Professor of Chemistry, Duke University and
  Brant Inman, Cary N. Robertson Associate Professor of Urology, Vice Chief, Division of Urology, Duke School of Medicine
  "Synergistic Immuno Photothermal Nanotherapy (SYMPHONY): A New Concept for Cancer Treatment"

12:00-1:30 pm **LUNCH BREAK** (Lunch provided)

Poster Session
Posters are exhibited in the Atrium area of the Fitzpatrick Center

Monday, March 13 Afternoon Session

1:30-2:40 **Session 2: Biophotonics for the Medicine of the Future II**
Chair: Raphael H. Valdivia, Vice Dean for Basic Science, Associate Professor of Molecular Genetics and Microbiology, Duke University School of Medicine

1:30-2:00 **Invited Lecture**
Paul French, Professor, Vice Dean (Research) for the Faculty of Natural Sciences, Imperial College London
Kensington, London, United Kingdom
"Fluorescence lifetime imaging and spectroscopy for high content analysis, preclinical and clinical applications"

2:00-2:20 **Adam P. Wax,** Professor, Department of Biomedical Engineering, Duke University and
Howard Levinson, Associate Professor of Surgery, Assistant Professor in Pathology and Associate Professor in Dermatology, Duke School of Medicine
"Spectroscopic Characterization of Skin Injury"

2:20-2:40 **Cynthia Ann Toth**, Joseph A.C. Wadsworth Professor of Ophthalmology Professor of Biomedical Engineering, Duke School of Medicine
"Transforming eye examination and surgery through bioimaging with optical coherence tomography"

2:40-3:00 **COFFEE BREAK**

3:00-4:30 **Session 3: Special Topic – Biophotonics for the Medicine of the Future III**
Chair: Warren Warren, Chair of the Department of Physics, James B. Duke Professor of Chemistry, Professor of Radiology, Biomedical Engineering, and Physics, Duke University

3:00-3:30 **Invited Lecture**
Mingjun Zhang, Professor, Department of Biomedical Engineering
Ohio State University, Columbus, Ohio
"Lighting Up From the Inside Using Peptide Nanoparticles"

3:30-3:50 **Fan Yuan**, Professor of Biomedical Engineering, Professor of Ophthalmology, Duke University
"Optical tracking of intracellular vesicles involved in gene delivery"

3:50-4:10 **Xiling Shen**, Associate Professor, Department of Biomedical Engineering
Duke University
"In vivo tracking of intestinal stem cell and neuron dynamics"

4:10-4:30 **Brenton D. Hoffman**, Assistant Professor of Biomedical Engineering
Assistant Professor of Cell Biology, Duke University
"Rational Design of FRET-based Biosensors for Detection of Mechanical Loads within Living Cells"

4:30-5:00 **POSTER SESSION**
Posters are exhibited in the Atrium area of the Fitzpatrick Center

5:00-6:00 ***COCKTAIL RECEPTION***
(Heavy hors d'oeuvres will be served)

Tuesday, March 14, (Fitzpatrick Center) – Morning Session

9:30- 10:00am **Poster Session**
Posters are exhibited in the Atrium area of the Fitzpatrick Center

10:00- 11:30am **Session 4: MEDX (Medicine and Engineering at Duke) Session and Panel**

Establishing and Sustaining Interdisciplinary Collaborations
Arranged by
Geoffrey S. Ginsburg, Director of MEDx (Medicine and Engineering at Duke)
Director of Duke Center for Applied Genomics and Precision Medicine
Professor of Medicine, Professor of Biomedical Engineering
Professor in Pathology, Professor in the School of Nursing, Duke University
and
Ken Gall, Associate Director of MEDx
Professor of Mechanical Engineering and Materials Science,
Professor in Orthopaedic Surgery, Duke University

10:00-10:10am **Introduction**
Geoff Ginsburg, Director of MEDx

10:10-11:15am **MEDx Collaborations**
Nimmi Ramanujam, Robert W. Carr, Jr. Professor of Biomedical Engineering, Duke University
Adam Wax, Professor, Department of Biomedical Engineering, Duke University
Xiling Shen, Associate Professor, Department of Biomedical Engineering, Duke University
Matthew Kirley, Research Scientist, Electrical and Computer Engineering, Duke University
Steve Brousell, Medical Resident, Department of Surgery, Duke School of Medicine
Pei Zhong, Anderson-Rupp Professor of Mechanical Engineering and Materials Science, Duke University

11:15 – 11:30am **Panel discussion – Geoff Ginsburg and Ken Gall** (Moderators)

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Tuesday, March 14 Afternoon Session

11:30-1:00 pm **LUNCH BREAK** (Lunch provided)

Poster Session
Posters are exhibited in the Atrium area of the Fitzpatrick Center

1:00-2:10pm **Session 5: Advanced Photonic Technologies and Systems**
Chair: Gleb Finkelstein, Professor of Physics, Duke University

1:00-1:30 **Invited Lecture**
Daniel J. C. Herr, Professor and Nanoscience Department Chair
Director, Nanomanufacturing Innovation Consortium (NIC)
The Joint School of Nanoscience and Nanoengineering
University of North Carolina at Greensboro, Greensboro, North Carolina
"Photonics and Electronics in the Internet-of-Things Era"

1:30-1:50 **Gregory M. Palmer,** Associate Professor of Radiation Oncology
Duke University
"Intravital Hyperspectral And Fluorescence Microscopy For Biomedical Research And Applications To Cancer Physiology And Therapeutics"

1:50-2:10 **Regis Kopper,** Assistant Research Professor of Mechanical Engineering and Materials Science, Director of Duke immersive Virtual Environment (DiVE), Duke University
"Learning, interaction and emotion in immersive virtual reality"

2:10-2:40 **COFFEE BREAK**

2:40-4:00pm **Session 5: Advanced Photonic Technologies and Systems II**
Chair: Gregory M. Palmer, Associate Professor of Radiation Oncology, Duke School of Medicine

2:40-3:00 **Poster Award Winners Announced**

3:00-3:20 **Martin Fischer,** Associate Research Professor of Chemistry and Associate Research Professor of Physics, Duke University
"Pump-probe microscopy for (nearly) everyone"

3:20-3:40 **Kevin D. Welsher,** Assistant Professor, Department of Chemistry
Duke University
"Probing Fast Processes with Real-Time 3D Microscopy"

3:40-4:00 **Junjie Yao**, Assistant Professor, Department of Biomedical Engineering and Department of Computer Science, Duke University
"Photoacoustic Imaging at Depths"

4:00pm **SYMPOSIUM ADJOURNS**