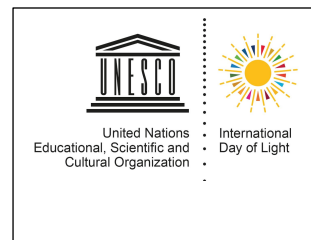




Symposium on Frontiers in Photonics

*2022 Fitzpatrick Institute for Photonics (FIP)
Virtual Annual Meeting
March 7-8, 2022, Duke University, Durham, NC*



ADVANCE PROGRAM AGENDA

Monday, March 7, 2022

- 1:00-1:05 pm **Introduction**
Tuan Vo-Dinh, Ph.D., R. Eugene and Susie E. Goodson Distinguished Professor of Biomedical Engineering, Professor of Chemistry, and Director of the Fitzpatrick Institute for Photonics, Duke University, Durham, NC
- 1:05-1:10 pm **Opening and Welcome Address**
Sally Kornbluth, Ph.D., Duke University Provost and Jo Rae Wright University Distinguished Professor of Biology, Duke University, Durham, NC
- 1:10-1:15 pm **Jerome P. Lynch, Ph.D., F.EMI**, Vinik Dean of Engineering of the Pratt School of Engineering, Professor of Civil and Environmental Engineering and Professor of Electrical and Computer Engineering, Duke University, Durham, NC
- 1:15-1:55pm **Symposium Keynote**
Andrea Ghez, Ph.D.
2020 Nobel Laureate in Physics
Professor of Physics & Astronomy
University of California, Los Angeles, CA
"From the Possibility to the Certainty of a Supermassive Black Hole"
- 1:55- 2:00 pm **Fitzpatrick Institute for Photonics Award Presentation**
2022 Pioneer in Photonics Award
- 2:00-2:10 pm **BREAK**
- 2:10-2:40 pm **Plenary Lecture**
Duncan Graham, Ph.D.
Distinguished Professor, Head of Department of Pure and Applied Chemistry, Technology and Innovation Centre, University of Strathclyde, Glasgow, Scotland
"Raman, SERS and SRS Analysis of Biomolecules"
- 2:40-4:15 pm **Session 1: Special Topic – Photonics For Health: Tracking Germs and Viruses in the Pandemic Era**

Chair: Christoph Schmidt, Ph.D., Hertha Spöner Distinguished Professor of Physics, Professor of Biomedical Engineering, Professor of Biology, Duke University, Durham, NC

2:40-3:05 pm **Invited Lecture**
Laura M. Lechuga, Ph.D.
Professor, Group Leader of NanoBiosensors and Bioanalytical Applications
Group, Catalan Institute of Nanoscience and Nanotechnology, Bellaterra,
Barcelona, Spain
*“Nanophotonics Biosensors for ultrasensitive diagnostics at the Point-of-
Need”*

3:05-3:30 pm **Invited Lecture**
Kimberly Hamad-Schifferli, Ph.D.
Associate Professor, Department of Engineering, Affiliate Faculty, School for
the Environment, University of Massachusetts Boston, Boston, MA
“Rapid Diagnostics for Infectious Diseases Using Gold Nanoparticles”

3:30-3:55 pm **Invited Lecture**
Zachary Schultz, Ph.D.
Associate Professor, Department of Chemistry and Biochemistry,
The Ohio State University, Columbus, OH
“SERS imaging in live cells”

3:55-4:15 pm **Tuan Vo-Dinh, Ph.D.**
R. Eugene and Susie E. Goodson Distinguished Professor of Biomedical
Engineering, Professor of Chemistry, and Director of the Fitzpatrick Institute
for Photonics, Duke University, Durham, NC
*“Nanoplasmonics Platforms: From Early Cancer Diagnostics to Infectious
Disease Detection”*

4:15-4:25pm **BREAK**

4:25-6:00 pm **Session 2: Special Topic – Photonics and Astronomy: Light Path Beyond the Stars**

Chair: Christopher Walter, Ph.D., Professor, Cosmology and Astrophysics, Department
of Physics, Interim Associate Chair of Physics, Duke University, Durham, NC

4:25-4:50 pm **Invited Lecture**
Anna Frebel, Ph.D.
Professor of Physics, Principal Investigator, MIT Kavli Institute for
Astrophysics and Space Research, Massachusetts Institute of Technology,
Boston, MA
*“Discovering the oldest stars in the Milky Way and its dwarf galaxies
with high-resolution optical spectroscopy”*

4:50-5:15 pm **Invited Lecture**
Catherine Heymans, Ph.D.
Professor, Astronomer Royal of Scotland, Institute for Astronomy,
University of Edinburgh, Edinburgh, Scotland
“New directions in Cosmology”

5:15-5:40 pm **Invited Lecture**
Feryal Özel, Ph.D.
Professor, Departments of Astronomy and Physics, University of Arizona,
Tucson, AZ

5:40-6:00 pm Duke Cosmology & Astrophysics Team
Daniel Scholnic, Ph.D., Assistant Professor
Michael Troxler, Ph.D., Assistant Professor
Christopher Walter, Ph.D., Professor
Department of Physics, Duke University, Durham, NC

Tuesday, March 8, 2022

1:00-1:30 pm **Plenary Lecture**

Thomas Thundat, Ph.D.

Professor, Empire Innovation Professor, Chemical and Biological Engineering, School of Engineering and Applied Sciences, University of Buffalo, The State University of New York, Buffalo, NY

“Molecular Recognition Using Nanomechanical Photothermal Effects”

1:30-3:05 pm **Session 3: Special Topic – Next-Generation Photonics Sensing & Imaging**

Chair: Christopher Monroe, Ph.D., Gilhuly Family Presidential Distinguished Professor, Departments of Electrical and Computer Engineering and Physics, Director, Duke Quantum Center, Duke University, Durham, NC

1:30-1:55 pm **Invited Lecture**

Sylvain Gigan, Ph.D., Professor of Physics, Laboratoire Kastler-Brossel, Sorbonne University, Paris, France

“A sneak peek with light into opaque materials: from imaging to computing”

1:55-2:20 pm **Invited Lecture**

Dan Oron, Ph.D., Professor, The Harry Weinrebe Professional of Laser Physics, Weizmann Institute of Science, Rehovot, Israel

“Quantum enhanced superresolution microscopy”

2:20-2:45 pm **Invited Lecture**

Raphael C Pooser, Ph.D., Distinguished Research Scientist, Group Leader, Quantum Computing and Sensing Group, Oak Ridge National Laboratory, Oak Ridge, TN

“21st century quantum optical sensors”

2:45-3:05 pm **Christopher Monroe, Ph.D.**, Gilhuly Family Presidential Distinguished Professor, Departments of Electrical and Computer Engineering and Physics, Director, Duke Quantum Center, Duke University, Durham, NC

3:05-3:25 pm **BREAK**

3:25-5:30 pm **Session 4: *Advanced Photonics Systems***

Chair: Natalia Litchinitser, Ph.D., Professor, Department of Electrical and Computer Engineering, Duke University, Durham, NC

3:25-3:50 pm **Invited Lecture**

Hatice Altug, Ph.D., Professor, Department of Bioengineering, Head of Bionanophotonic Systems Laboratory, Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland

3:50-4:15 pm **Invited Lecture**

Joerg Bewersdorf, Ph.D., Professor, Cell Biology and of Biomedical Engineering, Yale University, New Haven, CT

4:15-4:30 pm **Short Break**

4:30-4:50 pm

Jessilyn Dunn, Ph.D., Assistant Professor of Biomedical Engineering, Assistant Professor of Biostatistics and Bioinformatics, Assistant Professor of Electrical and Computer Engineering, Duke University, Durham, NC
“Optical sensing for digital biomarker development”

4:50-5:10 pm

Alberto Bartesaghi, Ph.D., Associate Professor of Computer Science, Associate Professor of Biochemistry, Duke University, Durham, NC

5:10-5:30 pm

Po-Chun Hsu, Ph.D., Assistant Professor of Mechanical Engineering and Materials Science, Duke University, Durham, NC
“Electrochemical dynamic solar and mid-infrared thermoregulation”

5:30-5:45 pm **PRESENTATION OF POSTER WINNERS and CLOSING REMARKS**

Tuan Vo-Dinh, Ph.D., R. Eugene and Susie E. Goodson Distinguished Professor of Biomedical Engineering, Professor of Chemistry, and Director of the Fitzpatrick Institute for Photonics,
Duke University, Durham, NC

5:45 pm

SYMPOSIUM ADJOURNS



*2022 Fitzpatrick Institute for Photonics (FIP) Annual Meeting
Program Committee*

Symposium Chair: Tuan Vo-Dinh, Director of Fitzpatrick Institute for Photonics

Symposium Manager: August Burns, Department Business Manager of Fitzpatrick
Institute for Photonics

Scientific Program Committee: Professors Steve Cummer, Martin Fischer, Charles Gersbach, Nan Jokerst, Jungsang Kim, Daniel Scholnic, Micheal Troxel, Christopher Walter, Warren Warren, Weitao Yang, and Fan Yuan