



2016 Quantum Metaphonics & Metamaterials MURI Review

Drs. Gernot Pomrenke and Harold Weinstock | November 7, 2016 | Arlington, VA

Basic Research Innovation and Collaboration Center (BRICC)
4075 Wilson Blvd., Suite 350 | Liberty Room
Arlington, VA 22203

Agenda Day 1 | Monday, November 7, 2016

| Time | Title | Speaker |
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| 0730-0800 | Registration | |
| 0800-1200 | QUANTUM METAPHOTONICS & METAMATERIALS MURI REVIEW | |
| 0800-0815 | Opening Remarks | Dr. Harold Weinstock and Dr. Gernot Pomrenke, AFOSR |
| 0815-0830 | Introduction and Overview of MURI Activities | Prof. Rashid Zia, Brown |
| 0830-0830 | Active and Magnetic Metaphotonic Structures | Prof. Harry Atwater, Caltech |
| 0850-0900 | Optical Magnetism in Metallic and Dielectric Metamaterials | Georgia Papadakis, Caltech |
| 0900-0920 | Plasmon Mediated Fluorescent Decay in Two-dimensional Molecular Aggregates | Prof. Nicholas Fang, MIT |
| 0920-0940 | Photon-photon Interaction Mediated by Systems with Multiple Ground States | Prof. Shanhui Fan, Stanford |
| 0940-1000 | Cavity QED with Inverse Designed Meta-cavities | Prof. Jelena Vuckovic, Stanford |
| 1000-1020 | Morning Coffee and Discussion Break | |
| 1020-1040 | Salient Features of Low-Index Photonics | Prof. Nader Engheta, U Penn |
| 1040-1040 | Metasurface Quantum Engineering | Prof. Xiang Zhang, UC Berkeley |
| 1100-1120 | Achieving Directional Emission with Dielectric Antennas | Prof. Mark Brongersma, Stanford |
| 1120-1140 | Emerging Materials Capabilities | Prof. Seth Bank, UT Austin |
| 1140-1200 | Computational Methods for Qubit Discovery and Exploitation | Prof. Rashid Zia, Brown |
| 1200 | Quantum Metaphotonics & Metamaterials MURI Review Concluded | |
| 1200-1300 | LUNCH | |

2016 Triservice Metamaterials Review

Drs. Richard Hammond and Harold Weinstock | November 7-9, 2016 | Arlington, VA

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| 1300-1700 | ARMY'S METAMATERIAL REVIEW | |
| 1300-1330 | Nonlinear Light-matter Interactions in Engineered Optical Media | Prof. Natasha Litchinitser University of Buffalo |
| 1330-1350 | Orbital Angular Momentum Microlaser | Prof. Liang Feng University of Buffalo |
| 1350-1410 | (Micro)Rectenna Arrays and Nano-enhanced Photovoltaics as Metadevices | Dr. Richard Osgood NSRDEC |
| 1410-1430 | Interface and Surface Ferroplasmons in Ag-transition Metal Bimaterial Nanostructures | Prof. Ramki Kalyanaraman University of Tennessee at Knoxville |
| 1430-1450 | Control of Light-matter Interaction with Metamaterials | Prof. Mikhail Noginov Norfolk State University |
| 1450-1520 | BREAK | |
| 1520-1540 | From Passive to Active, Time-varying Metasurfaces | Prof. Vladimir Shalaev Purdue |
| 1540-1600 | Negatively Spatially Dispersive Metamaterials: Extraordinary Transients in the Parametric Amplification and Nonlinear Reflectivity | Prof. Alex Popov Purdue |
| 1600-1620 | Quantum and Nonlinear Optics in Nonlocal Nanowire Metamaterials | Prof. Viktor Podolskiy University of Massachusetts |
| 1620-1640 | Study on High Permeability Flexible Metamaterial Structures with Very Small Thickness | Dr. Amir Zaghloul ARL |
| 1700 | MEETING ADJOURNED FOR THE DAY | |

2016 Triservice Metamaterials Review

Drs. Mark Spector and Harold Weinstock | November 7-9, 2016 | Arlington, VA

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Agenda Day 2 – Tuesday, November 8, 2016

| Time | Title | Speaker |
|--|---|--|
| 0730-0800 | Registration | |
| NAVY'S METAMATERIALS PROGRAM REVIEW | | |
| 0800-0815 | Introduction of ONR Metamaterials Program | Mark Spector ONR |
| 0815-0845 | Spoof and Hybrid Spoof Metamaterials in the SWIR Spectral Region | Joe Tischler Naval Research Laboratory |
| 0845-0915 | Dielectric Metamaterials with Low Loss and Tunability | Costas Soukoulis Iowa State University |
| 0915-1000 | Time-Modulated Optical Gradient Metasurfaces | Andrea Alù University of Texas at Austin Ewold Verhagen FOM Institute AMOLF |
| 1000-1015 | BREAK | |
| 1015-1045 | Dielectric Based Optical Metamaterials | Jason Valentine Vanderbilt University |
| 1045-1110 | Chalcogenide Thin Films for Meta-Structures Operating in the MWIR | Jesse Franz Naval Research Laboratory |
| 1110-1135 | Design of Chalcogenide Meta-Structures for MWIR | Natalia Litchinitser SUNY Buffalo |
| 1135-1200 | Reconfigurable Metamaterials at Infrared Frequencies | Yongmin Liu Northeastern University |
| 1200-1300 | LUNCH | |
| 1300-1330 | Metasurfaces with Electric, Magnetic, and Magneto-electric Responses | Anthony Grbic University of Michigan |
| 1330-1355 | Generation and Separation of Pure Optical Vortex Beams with Plasmonic Metasurfaces | Xiaodong Yang Missouri University of Science and Technology |
| 1355-1425 | Tunable and Reconfigurable Infrared Metamaterials | Gennady Shvets Cornell University |
| 1425-1455 | Pushing the Limits of Imaging with Metamaterial Lenses and Plasmon Injection Scheme | Durdu Guney Michigan Technological University |

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| 1455-1510 | BREAK | |
| 1510-1540 | Acoustic Surface Effects of Bistable, Negative-Stiffness Elements | Greg Orris Naval Research Laboratory |
| 1540-1630 | Expanding the Limits of Acoustic Metamaterials | Steve Cummer Duke University |
| 1630-1700 | "Filtered" Near-field Thermal Radiation: Isolating Surface Phonon Polariton Resonances in Near-field Radiative Transfer | Arvind Narayanaswamy Columbia University |
| 1700 | MEETING ADJOURNED FOR THE DAY | |

2016 Metamaterials Program Review

Drs. Marshall, Nachman, Pomrenke; Weinstock | November 9, 2016 | Arlington, VA

Basic Research Innovation and Collaboration Center (BRICC)
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Agenda Day 3 | Wednesday, November 9, 2016

| Time | Title | Speaker |
|---|---|--|
| 0730-0745 | Registration | |
| AFOSR METAMATERIALS PROGRAM REVIEW | | |
| 0745-0750 | Introduction AFOSR POs: Jason Marshall, Arje Nachman, Gernot Pomrenke and Harold Weinstock sponsors of research being reported | Harold Weinstock, AFOSR |
| 0750-0805 | Fascinating Nonlinear Interactions in Metamaterials | Andrea Alu, UT-Austin |
| 0820-0835 | Anisotropic Impedance Surfaces for Control of Surface Wave Propagation and Scattering | Daniel Sievenpiper, UCSD |
| 0835-0850 | Reflective Photonic Limiters for Sensor Protection from High Power Laser Radiation | Ilya Vitebskiy and Nicholas Limberopoulos, AFRL/RYDP |
| 0850-0920 | VBFF: Extreme Platforms for Extreme Manipulation of Fields and Waves | Nader Engheta, Penn |
| 0920-0935 | Photonics-Driven, Optically-Coherent Networks for Meta-Surface-Current Sheets as RF Array Antennas | Dennis Prather, Delaware |
| 0935-0950 | Wave Engineering with Metasurfaces Nanoantennas | Hossein Mosallaei, Northeastern |
| 0950-1015 | BREAK | |
| 1015-1030 | Chiral Nanophotonic Metadevices and Metasurface MURI | Reza Khorasaninejad and Federico Capasso, Harvard |
| 1030-1045 | Device Applications of Metafilms and Metasurfaces | Mark Brongersma, Stanford |
| 1045-1100 | On-Chip Nanophotonics with CMOS-Compatible Plasmonic Materials | Alexandra Boltasseva, Purdue |
| 1100-1115 | Tailoring Radiative Processes by Nanoengineering for Ultrafast Optoelectronics | Maiken Mikkelsen, Duke |
| 1115-1130 | Tuning Chiroptical Response in Optical Metamaterials | Vivian Ferry, Minnesota |
| 1130-1145 | Coupling of Gap Plasmon-ENZ Modes Structured Surfaces for Perfect Absorbers, | Joshua Hendrickson, AFRL/RYDH |

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| | Filters and Detectors | Justin Cleary, RYDH |
| 1145-1200 | PECASE: Parity-Time Symmetric Nanophotonic Materials and Metamaterials | Jennifer Dionne, Stanford |
| 1200-1300 | LUNCH | |
| 1300-1330 | Dispersion Engineering Using Metamaterials for Transformational Electromagnetics FY12 MURI | Edl Schamiloglu, UNM |
| 1330-1345 | Pulsed Laser Deposition of Multiferroic Complex Oxide Superlattices | John Jones and Gail Brown, AFRL/RXAN |
| 1345-1400 | Tailoring Magnetic Nanomaterials for Electromagnetic Wave Absorption | Chao Wang, Johns Hopkins |
| 1415-1430 | Transport Property Studies of Structurally Modified Graphene | Qing Hao, Arizona |
| 1430-1445 | Visible Light Metasurfaces Based on Single Crystal Silicon | Jon Fan, Stanford |
| 1445-1500 | Widely Tunable Semiconductor Antennas for Reconfigurable Metasurfaces | Jon Schuller, UCSB |
| 1500-1525 | BREAK | |
| 1525-1540 | Reflective Photonic Limiters for Sensor Protection from High Power Laser Radiation | Nicholaos Limberopoulos, AFRL/RYPD and Ilya Vitebskiy, AFRL/RYPD |
| 1540-1555 | Toward Active Circuits and Metamaterials Utilizing Bandgap-Less Hydrodynamic Gain from Ultra-Slow 2D Plasmons | Donhee Ham, Harvard |
| 1555-1610 | Polaritonic Metamaterials Based on van der Waals Heterostructures | Dmitri N. Basov, Columbia |
| 1610-1625 | Compressive Sensing and Enhanced Detectors with Plasmonics and Photonic Nanojets | Augustine Urbas, AFRL/RXAP |
| 1625-1655 | Film-Coupled NanoPatch Platform for Novel Apertures at Infrared and Visible Wavelengths | David R. Smith, Duke |
| 0745-1655 | Posters (All Day) | |
| | Tailoring Radiative Processes by Nanoengineering for Ultrafast Optoelectronics | Maiken Mikkelsen, Duke |
| | Atomic Layered Two Dimensional Materials-based Metasurfaces for Terahertz Modulators | Thomas A. Searles, Howard |
| | Design and Fabrication of Metasurface Lenses in Midwave Infrared | Bryan Adomanis, AFIT, D. Bruce Burckel, Sandia, and Michael Marciniak, AFIT |
| | Metasurface Absorbers for Multispectral Pixel Arrays | Jon W. Stewart and Maiken H. Mikkelsen, Duke |
| 1655 | MEETING ADJOURNED | |