

2018 AFOSR Biophysics Program Review

Dr. Sofi Bin-Salamon | April 16-20, 2018 | Arlington, VA

Holiday Inn Arlington
4610 Fairfax Drive, Arlington, VA 22203

Day 1 - Monday, 16 April 2018

TIME	TOPIC	SPEAKER
0800-0850	REGISTRATION	
0850-0900	Introduction	Dr. Sofi Bin-Salamon Air Force Office of Scientific Research
0900-0930	Optical Magnetic Imaging of Neuronal Currents and Impedance Using Quantum Defects in Diamond	Prof. Ronald Walsworth Harvard University
0930-1000	Tools for Understanding Molecular Scale Mechanisms in LGICs: Single Molecule Kinetics, Super-Resolution Imaging, and Hidden Markov Walks	Prof. James Brozik Washington State University
1000-1030	Sub-Diffraction Temperature Mapping of Protein Interconversions	Prof. Somin Lee University of Michigan
1030-1100	BREAK	
1100-1130	New Approaches to Magnetometry and Sensing with Single Crystal Diamond	Prof. Andrew Greentree Royal Melbourne Institute of Technology University
1130-1200	Smart Sensor Systems for Human Health Applications: Steps Toward Distributed Intelligence	Dr. Gary Hunter National Aeronautics and Space Administration
1200-1230	Graphene Microfluidics for Dynamic Electron Microscopic Imaging	Prof. Jiang Xiaocheng Tufts University
1230-1330	LUNCH	
1330-1400	Molecular Modeling of Bio-nano Interfaces for Possibilities in Bio-sensing and Bio-imaging	Prof. Tiffany Walsh Deakin University
1400-1430	When Noise is the Signal	Prof. Francesco Zerbetto University of Bologna
1430-1500	Understanding the "Mission Versatility" of Membrane Proteins via Nanoscopic Imaging	Prof. Qian Chen University of Illinois Urbana-Champaign
1500-1530	BREAK	
1530-1600	Application of Cutting-Edge Technologies to Understand Biomolecular Interaction of Engineered Nanomaterials: Safety Issues and Challenges	Dr. Saber Hussain Air Force Research Laboratory 711th HPW

1600-1630	De Novo Design of Functional Protein Nano-materials at the University of Washington Institute for Protein Design	Dr. Lance Stewart University of Washington
1630-1700	Future of Fluorescent Nano-Diamonds (and Phosphors) for Bio-sensing	Prof. Philip Hemmer Texas A&M University
1700	MEETING ADJOURNED FOR THE DAY	

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Day 2 - Tuesday, 17 April 2018

TIME	TOPIC	SPEAKER
0800-0900	REGISTRATION	
0900-0915	The Importance of International Collaboration in Basic Research for Supporting the Needs of Mission Agencies, Advancing the Scientific Frontier, and Contributing to Diplomacy	Dr. E. William Colglazier American Association for the Advancement of Science
0915-0935	The Role of Research Infrastructure in Supporting Research Collaborations	Ms. Rosie Hicks Australian National Fabrication Facility
0935-0955	The National Research Council of Italy - Smart Materials and Bio Interfaces	Prof. Luigi Ambrosio National Research Council of Italy
0955-1015	Overview of Mintek's Research and Development	Dr. Makhapa Makhafola MINTEK National Science Council of South Africa
1015-1030	AFOSR International Initiatives	Dr. Misoon Mah Air Force Office of Scientific Research
1030-1100	BREAK	
1100-1130	Elucidating the Cellular and Sub-Cellular Dynamics during Electromagnetic Modulation of the Nervous System	Prof. Anita Mahadevan-Jansen Vanderbilt University
1130-1200	Shedding Light in Brain Microdomains	Dr. Valentina Benfenati National Research Council of Italy
1200-1230	Shining Light on the Neuroimmune Interface	Prof. Mark Hutchinson University of Adelaide
1230-1330	LUNCH	
1330-1400	Exploring New Biophysical Processes with Quantum Entanglement	Prof. Theodore Goodson University of Michigan
1400-1430	Transducers as Remote Photoactivators to Aid in Functional Cell Imaging and Photobiomodulation	Prof. Kelly Nash University of Texas San Antonio
1430-1500	Multimodal Sensing with Hybrid Fluorescent Nanodiamond Complexes for Quantum Biological Measurements	Prof. Brant Gibson Royal Melbourne Institute of Technology University
1530-1600	BREAK	
1500-1530	Improving Optical Measurement and Trapping using Quantum Mechanics	Prof. Warwick Bowen University of Queensland

1600-1615	The Role of Research Administrators in International Research Cooperation	Ms. Claire Chen National Council of University Research Administrators
1615-1630	Research Priorities at Texas A&M Engineering	Prof. Dimitris Lagoudas Texas A&M University
1630-1700	Nano-Biosensing Program	Dr. Chenzhong Li National Science Foundation
1700	MEETING ADJOURNED FOR THE DAY	

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Day 3 - Wednesday, 18 April 2018

TIME	TOPIC	SPEAKER
0800-0830	REGISTRATION	
0830-0845	Multi-Disciplinary University Research Initiative: Nanoelectropulse-Induced Electromechanical Signaling and Control of Biological Systems	Prof. Andrei Pakhomov Old Dominion University
0845-0900	Universality of Bipolar Cancellation for Nanoporation and Nanoelectropulse Stimulation	Prof. Andrei Pakhomov Old Dominion University
0900-0920	Instrumentation for Studying Cancellation Effects Caused by Nanosecond Pulses	Prof. Shu Xiao Old Dominion University
0920-0940	Membrane Biophysics of Biphasic Electrostimulated Molecular Transport	Prof. Thomas Vernier Old Dominion University
0940-1000	A New Biophysical Model Can Explain Bipolar Cancellation of Molecule Transport	Prof. James Weaver Massachusetts Institute of Technology
1000-1020	Nascent Biophysical Tools to Elucidate Nanoelectropulse-Induced Electromechanical Interactions	Prof. Vladislav Yakovlev Texas A&M University
1020-1040	BREAK	
1040-1100	Nanoelectropulse and Excitable Membranes: Uncovering Mechanisms of Activation of Voltage-Gated Ca²⁺ Channels	Prof. Olga Pakhomova Old Dominion University
1100-1120	Toward the Application of CAN-CAN Technology – Attenuation of Ca²⁺ Signaling by Bipolar nsPEFs in a Neurosecretory Cell Type Involved in the “Flight or Fight” Response	Prof. Gale Craviso University of Reno Nevada
1120-1140	Summary of the Project Status: Principal Accomplishments, Scientific Impact, and Future Developments	Prof. Andrei Pakhomov Old Dominion University
1140-1240	LUNCH	
1240-1250	Multi-Disciplinary University Research Initiative: Cells and Cell Groups as Coupled Biochemical, Electrical, and Mechanical Systems	Prof. Wolfgang Losert University of Maryland
1250-1315	Electric Field Effects in Cells and Cell Groups	Prof. Min Zhao University of California Davis
1315-1340	Excitable Systems in Cells	Prof. Peter Devreotes Johns Hopkins University

1340-1350	Quantifying Excitable Systems	Mr. Leonard Campanello University of Maryland
1350-1400	Electric Field Effects on Excitable Systems	Ms. Abby Bull University of Maryland
1400-1410	Non-Invasive Measurements of Excitable Systems and Electric Field	Dr. Kate O'Neil University of Maryland
1410-1430	BREAK	
1430-1455	Integrating AC-Electric Fields into the Cell Microenvironment	Prof. Quan Qing Arizona State University
1455-1520	ErK Activation - An Example of Coupled Biochemical, Mechanical, and Electrical Systems	Dr. Liang Guo University of California Davis Mr. Houpu Li Arizona State University
1520-1545	In Vivo Neuronal Imaging	Prof. Patrick Kanold University of Maryland
1645-1600	Summary and Outlook	Prof. Wolfgang Losert University of Maryland
1600-1615	BREAK	
1615-1630	Smart Bandage for Monitoring Wound Perfusion	Dr. Yoojeong Kim Triton Systems
1630-1700	Nanomanufacturing Program	Dr. Khershed Cooper National Science Foundation
1700	MEETING ADJOURNED FOR THE DAY	

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Day 4 - Thursday, 19 April 2018

TIME	TOPIC	SPEAKER
0800-0900	REGISTRATION	
0900-0930	AFOSR Principal Investigators and U.S. Government Only	Dr. Sofi Bin-Salamon Air Force Office of Scientific Research
0930-1000	NIH's Investments in Research Innovation: Program Snapshots	Dr. Stephanie Morris National Institutes of Health
1000-1030	Fe Doping-Induced Magnetism in Nano-Apatite: Application in Regenerative Medicine and Nanomedicine	Dr. Anna Tampieri National Research Council of Italy
1030-1100	BREAK	
1100-1130	MINTEK Biomedical Research within the Advanced Materials Division: Inhibitors of the HIV-1 Integrase - LEDGF Interactions	Dr. Mabel Coyanis MINTEK National Science Council of South Africa
1130-1200	Non-Invasive Detection of Unique Molecular Signatures in Laser-Induced Retinal Injuries: Future Battle Field Applications	Dr. Rafat Ansari National Aeronautics and Space Administration
1200-1230	Quantum Coherence and Dynamics in Biological Processes: Molecular Isomerization in Vision	Prof. Paul Brumer University of Toronto
1230-1330	LUNCH	
1330-1400	Probing Quantum Coherence in Bacterial Photosynthesis at the Ensemble and Single Complex Level	Prof. Jennifer Ogilvie University of Michigan
1400-1430	Detail Mechanism of the Visual Process	Prof. Peter Rentzepis Texas A&M University
1430-1500	DNA-Wrapped Carbon Nanotubes for Multiplex Sensing and Imaging	Dr. Ming Zheng National Institute of Standards and Technology
1500-1530	BREAK	
1530-1600	Bio-Templated Metal Nanoclusters: A New Class of Multifunctional Platform	Dr. Shashi Karna Army Research Laboratory
1600-1630	Forest of Disordered Gold Covered Silicon Nanowires: A Versatile Platform for Interfacing Cells	Dr. Annalisa Convertino National Research Council of Italy

1630-1700	The Chilean Neuromorphic Computer Initiative	Dr. Tomas Perez Life and Science Foundation Dr. Samuel Hevia Catholic University of Chile
1700	MEETING ADJOURNED FOR THE DAY	

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Day 5 - Friday, 20 April 2018

TIME	TOPIC	SPEAKER
0800-0900	REGISTRATION	
0900-0930	Experimental and Theoretical Investigation of the Mechanisms of Free-Electron-Mediated Modification of Biomolecules in Nonlinear Microscopy	Prof. Alfred Vogel University of Luebeck
0930-1000	Cell Membrane Dynamics in Infrared Nerve Stimulation and Blocking	Prof. Michelle Sander Boston University
1000-1030	Polariton Enabled Spectroscopy and Dynamics	Dr. Jeffrey Owrutsky Naval Research Laboratory
1030-1100	BREAK	
1100-1130	Bioinspired Nanomaterials	Dr. Kenan Fears Naval Research Laboratory
1130-1200	Imaging 3D Cell Culture Systems, Challenges and Opportunities for the Biophysics Community	Prof. Sally McArthur Swinburne University of Technology
1200-1230	Biological Approaches to Nuclear Security; the Bionuclear Working Group	Dr. Heather Meeks Defense Threat Reduction Agency
1230-1330	LUNCH	
1330-1400	Quantum Coherence in Reactive Oxygen Species Biology	Prof. Robert Usselman Montana State University
1400-1430	Electron Paramagnetic Resonance for Bionanomaterial Measurements	Dr. Veronika Szalai National Institute of Standards and Technology
1430-1500	Potentiality and First Steps in the Design of Electrochemical Nano Sensors	Dr. Felice Simeone National Research Council of Italy
1500-1530	BREAK	
1530-1600	Photovoltaic Approach for Quantifying Electronic Transport in Biological Materials	Prof. Shashank Priya Pennsylvania State University
1600-1630	Blending Engineering and Physics into Biomedical Research	Dr. Larry Nagahara Johns Hopkins University
1630-1700	AFOSR Principal Investigators and U.S. Government Only	Dr. Sofi Bin-Salamon Air Force Office of Scientific Research
1700	MEETING CONCLUSION	