SCIENTIFIC PROGRAM

Sunday, November 3

5:00 – 8:00 PM  Registration, Rotunda, Jefferson Hotel

7:00 – 8:00 PM  Reception, Rotunda, Jefferson Hotel

*All scientific sessions will be held in the Ball Room of the Jefferson Hotel*

Monday, November 4

INAUGURAL SESSION
Chair: Barbara Boyan, Virginia Commonwealth University

9:00 – 9:10 AM  Introductory Remarks
Puru Jena, Symposium Chair, Virginia Commonwealth University, USA

9:10 – 9:20 AM  Welcome Address
Michael Rao, President, Virginia Commonwealth University, USA

9:20 – 10:00 AM  “Keynote Address: Regenerative Engineering and Nanotechnology”
Cato T. Laurencin, University of Connecticut, USA

10:00 – 10:30 AM  COFFEE BREAK

Session A: CARBON – Old and New
Chair: Robert L. Whetten, University of Texas, Arlington

10:30 – 11:00 AM  “The Aromatic Universe”
A.G.G.M. Tielens, Leiden University, Netherlands

11:00 – 11:30 AM  “Penta-graphene and its applications”
Qian Wang, Peking University, China

11:30 – 12:00 Noon  “A novel carbon allotrope grown via molecularly templated CVD”
Joel Therrien, University of Massachusetts, Lowell, USA

12:00 – 12:15 PM  Hot topic: “Graphene Nanocomposites with Exceptionally High Strength and Toughness”
Xiaodong Li, University of Virginia, USA

12:15 – 2:00 PM  LUNCH
Session B: BATTERIES
Chair: Jagjit Nanda, Oakridge National Laboratory

2:00 – 2:30 PM “Lithium, Magnesium and Silver Light Element Electrolytes”
Torben R. Jensen, Aarhus University, Denmark

2:30 – 3:00 PM “Cluster-inspired anti-perovskites as solid state electrolytes in Li and Na-ion batteries”
Hong Fang, Virginia Commonwealth University, USA

3:00 – 3:30 PM “Synthesis and Physical Properties of Cluster-Ion Based Antiperovskites”
Yet-Ming Chiang, Massachusetts Institute of Technology, USA

3:30 – 3:45 PM Hot topic: “Design of Topological Quantum Materials for Fast Charging Batteries”
Qiang Sun, Peking University, China

3:45 – 4:15 PM COFFEE BREAK

Session C: NANO MEDICINE - I
Chair: Jason Reed, Virginia Commonwealth University

4:15 – 4:45 PM “DNA: Not Merely the Secret of Life”,
Nadrian C. Seeman, New York University, USA

4:45 – 5:15 PM “Application of Nano Materials to Diagnostics and Drug Discovery”
Lance Liotta, George Mason University, USA

5:15 – 5:45 PM “Wireless electronic nano-biosensors for global health and security”
Ratneshwar Lal, University of California San Diego, USA

5:45 – 6:15 PM “Nanoparticles and Light for sustainability and societal impact”
Naomi Halas, Rice University, USA

6:15 – 8:00 PM DINNER

8:00 – 10:00 PM POSTER SESSION – I, Empire Room
Session D: 2D MATERIALS SYNTHESIS  
Chair: Qiang Sun, Peking University

8:30 – 9:00 AM  “Two-dimensional alloys and hybrid architectures”  
P. M. Ajayan, Rice University, USA

9:00 – 9:30 AM  “Why MXenes?”  
Michel W. Barsoum, Drexel University, USA

9:30 – 10:00 AM  “Nanoparticle Beam Deposition at the Gram Scale: A Novel Route to the Solvent-Free Creation of Heterogeneous Catalysts”  
Richard Palmer, Swansea University, UK

10:00 – 10:15 AM  Hot topic: “Extraordinary Nonlinear Optical Responses from Atomically Thin Metal Films”  
Kenneth L. Knappenberger, Jr., Pennsylvania State University, USA

10:15 – 10:45 AM  COFFEE BREAK

Session E: NANO/CLUSTERS - I  
Chair: Kit Bowen, Johns Hopkins University

10:45 – 11:15 AM  “Laser Synthesis and Spectroscopy of Ultra-Small Oxide Clusters and Nanoparticles”  
Michael Duncan, University of Georgia, USA

11:15 – 11:45 AM  “Structure and properties of size selected clusters on various substrates”  
Peter Lievens, KU Leuven, Belgium

11:45 – 12:15 PM  “Atomic resolution STEM-EDS and HRTEM microscopy of nano-materials”  
Sumio Iijima, Meijo University, Japan

12:15 – 12:30 PM  Hot topic: “Supported Copper Nanocatalysts for Selective CO₂ Hydrogenation”  
Mallory G. John, Virginia Commonwealth University, USA

12:30 – 2:00 PM  LUNCH
Session F: MEMORIAL SESSION
Chair: Puru Jena, Virginia Commonwealth University

2:00 – 2:30 PM  “Will Castleman: A Multifaceted Pioneer in Cluster Science”
Carl Lineberger, University of Colorado, USA

2:30 – 3:00 PM  “Millie Dresselhaus: Scientist, Leader and Humanist”
George Crabtree, Argonne National Laboratory, USA

3:00 – 3:30 PM  “Some Recent Advances in Density Functional Theory, and a Tribute to Walter Kohn”
John Perdew, Temple University, USA

3:30 – 4:00 PM  “Alkane Activation at Catalytic Metal Surfaces and the Pioneering Work of John T. Yates, Jr.”
Ian Harrison, University of Virginia, USA

4:00 – 6:00 PM  FREE TIME/NETWORKING

6:00 PM  Group Photo, Grand Stair Case, Jefferson Hotel

6:15 PM  RECEPTION, Rotunda, Jefferson Hotel

7:00 PM  Banquet: Grand Ball Room, Jefferson Hotel
After-Dinner Speaker: George Crabtree, Argonne National Laboratory

Session G: MATERIALS THEORY
Chair: Yuri Mishin, George Mason University

8:30 – 9:00 AM  “Sorting through messy nanoparticles with first principles calculations”
Giulia Galli, The University of Chicago, USA

9:00 – 9:30 AM  “Universal linear scaling of Topological Phase Transition in Band Theory”
Feng Liu, University of Utah, USA

9:30 – 10:00 AM  “Superhydrides under high pressure towards room-temperature superconductivity”
Yanming Ma, Jilin University, China
10:00 – 10:15 AM  **Hot topic:** “Optomechanically controlling material geometries”  
**Jian Zhou,** Xi’an Jiaotong University, China

10:15 – 10:45 AM  **COFFEE BREAK**

---

**Session H: SOLAR CELLS**  
**Chair:** Denis Demchenko, Virginia Commonwealth University

10:45 – 11:15 AM  “Thermal and photodriven mobility of halide ions in metal halide perovskite nanostructures”  
**Prashant Kamat,** University of Notre Dame, USA

11:15 – 11:45 AM  “Multiscale modelling of charge and energy transport in perovskite materials and organic semiconductors and devices”  
**Alison B. Walker,** University of Bath, UK

11:45 – 12:15 PM  “Quantification of Nanoparticle Composition and Structure”  
**David Castner,** University of Washington, USA

12:15 – 12:30 PM  **Hot Topic:** “Nanosurface Engineering of Oxide Based Semiconductor towards Full Solar Spectrum Harvesting: A Combined Experimental and Theoretical Investigation”  
**Tuhin K. Maji,** S. N. Bose National Centre for Basic Sciences, India

12:30 – 2:00 PM  **LUNCH**

---

**Session I: NANO MEDICINE - II**  
**Chair:** Juvencio Robles, University of Guanajuato

2:00 – 2:30 PM  “Nanotechnology Enables Hot Gold Nanorods to Kill Cancer Cells and to Stop Alive Sick Cells from Migrating to other Places in the Body”  
**Mostafa El Sayed,** Georgia Tech, USA

2:30 – 3:00 PM  “Detecting Intracellular analytes using nanoparticle-based platforms”  
**Devleena Samanta,** Northwestern University, USA

3:00 – 3:30 PM  “The use of Nano-enabled Chemo-immunotherapy for breast and pancreas cancer”  
**Andre Nel,** University of California Los Angeles, USA

3:30 – 3:45 PM  **Hot topic:** “Numerical Study on the Optical and Thermal Response of Laser Excited Gold Nanoshells for Photothermal Therapy”  
**Joshua Fernandes,** Dong-A University, South Korea

3:45 – 4:15 PM  **COFFEE BREAK**
Session J: THERMOELECTRICS
Chair: Subhendra D. Mahanti, Michigan State University

4:15 – 4:45 PM “Evaluation of electrical and thermal transports for designing advanced thermoelectrics”
   Wenqing Zhang, Southern University of Science and Technology, China

4:45 – 5:15 PM “Nanostructured Thermoelectric Materials”
   Jeff Snyder, Northwestern University, USA

5:15 – 5:45 PM “Intrinsically minimal thermal conductivity and phonon-glass behavior in crystalline solids”
   Donald T. Morelli, Michigan State University, USA

5:45 – 6:00 PM Hot topic: “High-Entropy Alloy Approach to Thermoelectric Materials”
   S. Joseph Poon, University of Virginia, USA

6:00 – 8:30 PM DINNER

8:30 – 10:00 PM POSTER SESSION – II, Empire Room

Thursday, November 7

Session K: NANO MEDICINE - III
Chair: Loren Picco, Virginia Commonwealth University

8:30 – 9:00 AM “Molecular Spin Crossover Phenomenon at the nanoscale: Motion and spintronic Properties, toward artificial Muscles”
   Azzedine Bousseksou, CNRS, Toulouse, France

9:00 – 9:30 AM “Cross Talk in the Amyloid Assembly of Peptides and Proteins: Implications for Alzheimer's Disease, Type 2 Diabetes and Amyotrophic Lateral Sclerosis (ALS)”
   Michael Bowers, University of California, Santa Barbara, USA

9:30 – 10:00 AM “Do you see the light? Cherenkov Spectroscopy for Radiation Therapy and Targeting”
   Roy Clarke, University of Michigan, USA

10:00 – 10:15 AM Hot topic: “Applications of Interferometry to Medicine on the Nanoscale”
   G. F. Murray, Virginia Commonwealth University, USA

10:15 – 10:45 AM COFFEE BREAK
Session L: NANO/CLUSTERS-II
Chair: Amal Dass, University of Mississippi

10:45 – 11:15 AM “Molecular Clusters: Building Blocks for Material Design”
Xavier Roy, Columbia University, USA

11:15 – 11:45 AM “The science of atom-precise ligand stabilized metal nanoclusters”
Hannu Hakkinen, University of Jyvaskyla, Finland

11:45 – 12:15 PM “C_{60}^+ in interstellar space”
John P. Maier, Universität Basel, Switzerland

Naga Arjun Sakthivel, University of Mississippi, USA

12:30 – 2:00 PM LUNCH

Session M: NANO/BIO
Chair: Joseph Poon, University of Virginia

2:00 – 2:30 PM “Photocatalysis and Chirality of Clusters”
Ueli Heiz, Technical University of Munich, Germany

2:30 – 3:00 PM "Metal Catalyzed Cross-coupling Reactions on Novel Carbon Support Systems”
Frank Gupton, Virginia Commonwealth University, USA

3:00 – 3:30 PM "Solutions of anionic 2D materials and phosphorene nanoribbons”
Chris Howard, University College, London, UK

3:30 – 3:45 PM Hot topic: “Fabrication and Electrical Characterization of a Flagella-Scaffolding Metallic Nanocluster Network” Patrick Edwards, University of Southern California, USA

3:45 – 4:00 PM CONCLUDING REMARKS
Weining Wang, Virginia Commonwealth University, USA