

## **CNM Workshop 7: Ultra-wide Bandgap Materials for Microelectronics**

**Wednesday, May 11**

### **Session 1      CVD-diamond: State-of-the-art in Synthesis, Doping, and Challenges (Chairs: Anirudha Sumant and Jessica Metcalfe)**

9:00 – 9:05    Anirudha Sumant (Argonne National Laboratory)  
*Welcome and Introduction*

9:05 – 9:15    Kawtar Hafidi (Argonne National Laboratory)  
*Kickoff Address to Participants*

9:15 – 9:45    Ian Friel (Element Six Global Innovation Centre)  
*A Snapshot of 20 Years of CVD Diamond Research and Production*

9:45 – 10:15   John Smedley (SLAC National Accelerator Laboratory)  
*Diamonds in a Platinum Setting: The Wedding of Beam Diagnostics and Wide Bandgaps*

10:15 – 10:45   Timothy Grotjohn (Michigan State University)  
*Diamond Growth, Doping, and Applications in High-power Electronics*

10:45 – 11:00   Break

### **Session 2      Diamond-based Heterojunction Devices (Chairs: Anirudha Sumant and Martin Holt)**

11:00 – 11:30   Can Bayram (University of Illinois at Urbana-Champaign)  
*From Wide (Al)GaN towards Ultra-wide Bandgap Diamond Electronics*

11:30 – 12:00   Zhenqiang (Jack) Ma (University of Wisconsin-Madison)  
*The Potential of Lattice-mismatched Heterostructures for UWBG Semiconductors*

12:00 – 1:30    Lunch Break

### **Session 3      Diamond Transistors for RF-electronics (Chairs: Anirudha Sumant and Martin Holt)**

1:30 – 2:00    Pankaj Shah (CCDC Army Research Laboratory)  
*Diamond Transistor Development for Future High-power RF Amplifiers*

2:00 – 2:30    David Moran (University of Glasgow)  
*Transfer-doped Diamond for High-performance Field Effect Transistors*

- 2:30 – 3:00 Alexander Balandin (University of California, Riverside)  
*Noise and Heat in Diamond Materials and Devices*
- 3:00 – 3:30 Mitra Dutta (University of Illinois at Chicago)  
*Ion-gated FETs on Hydrogenated Diamond Surfaces: Phonon Impact on Mobilities in Diamond FETs*
- 3:30 – 4:00 Stephan Hruszkewycz (Argonne National Laboratory)  
*Characterization of Nanoscale Structural Heterogeneity in Wide Bandgap Semiconductors with Synchrotron X-ray Methods*
- 4:00 – 4:10 Break
- Session 4      Towards Commercialization of Diamond-based Electronics (Chair: Anirudha Sumant)**
- 4:10 – 4:25 Keith Evans (Great Lakes Crystal Technologies)  
*High Performance Crystalline Diamond Materials for High Technology Applications*
- 4:25 – 4:40 Manpuneet Benipal (Advent Diamond, Inc.)  
*The Future of Semiconducting Diamond for Electronic Components*
- 4:40 – 4:55 Victor Tabelaing (Applied Diamond, Inc.)  
*Providing Solutions for Diamond Fabrication Across Diverse Industries*
- 4:55 – 5:10 Anirudha Sumant (Argonne National Laboratory)  
*Closing Remarks*
- 5:10            Adjourn