

# DRC 2022 | THE OHIO STATE UNIVERSITY

All session times are listed in Eastern Daylight Time (EDT)

**SUNDAY - 6/26**

All Coffee Breaks will take place in the Performance Hall

Poster Session will take place in the Performance Hall

U.S. BANK CONFERENCE THEATER
Short Course: Cryogenic Computing Devices 1:00-5:00 pm
PERFORMANCE HALL
Welcome Reception 6:00-8:00 pm

**MONDAY - 6/27**

Intro and Awards 9:00-9:20 am	
Plenary: Rediscovering Semiconductor Materials for Quantum Photonic Devices, Hu (invited) 9:20-10:20 am, U.S. Bank Conference Theater	
COFFEE BREAK 10:20-10:40 AM	
Plenary: Unleashing the Potential of Integrated Ferroelectric Devices with Hafnium Oxide, Mikolajick (invited) 10:40-11:40 am, U.S. Bank Conference Theater	
LUNCH 11:40 am-12:40 pm (Not provided by Conference)	
Session 1: Wide Bandgap I - Lateral Ga2O3 Devices U.S. Bank Conference Theater	Session 2: Cryogenic Devices Great Hall Meeting Room 1 & 2
High Performance Homoepitaxial Gallium Oxide Power Devices on Bulk and Composite Substrates, Krishnamoorthy (invited) 1:00-1:40 pm	Design Space Analysis of Superconducting Nanowire-based Cryogenic Oscillators, Islam 1:00-1:20 pm
Low dispersion MOCVD $\beta$ -Ga2O3 $\delta$ -doped MESFET with a Mg-doped Buffer, McGlone 1:40-2:00 pm	Scalable Cryogenic InGaAs Quantum Well Switches for Signal Routing, Ferraris 1:20-1:40 pm
Thermal stability of ALD-grown SiO2 and Al2O3 on (010) $\beta$ -Ga2O3 substrates, Islam 2:00-2:20 pm	Enhanced Drain Current in Transient Mode due to Long Ionization Time of Shallow Impurities at 4 K in 65-nm bulk Cryo CMOS Transistors, Miyao 1:40-2:00 pm
High-temperature operation of $\beta$ -Ga2O3 MOSFET with TiW refractory metal gate, Sepelak 2:20-2:40 pm	Interface Engineering for Steep Slope Cryogenic MOSFETs, Richstein 2:00-2:20 pm
Comparison of lateral field-plated MOSFETs with and without Mg-doped buffer layer in MOCVD grown $\beta$ -Ga2O3, Sharma 2:40-3:00 pm	Cryogenic Device Requirements for Qubit Control and Readout, Subramanian (invited) 2:20-3:00 pm
COFFEE BREAK 3:00-3:20 PM	
Session 3: RF Devices U.S. Bank Conference Theater	Session 4: Memory I Great Hall Meeting Room 1 & 2
Polarization-Engineering of III-N mm-Wave Transistors for High Efficiency and Linearity, Fay (invited) 3:20-4:00 pm	Sub-Nanosecond Switching of Si:HfO2 Ferroelectric Field-Effect Transistor, Dahan 3:20-3:40 pm
D-band frequency memristor switch based on monolayer boron nitride, Yang 4:00-4:20 pm	Buried-Channel Ferroelectric FET as Energy Efficient and Reliable 1T-NVM, Chakraborty 3:40-4:00 pm
Free-Standing High Power GaN Multi-Fin Camel Diode Varactors, Chen 4:20-4:40 pm	Improved Endurance with Electron-Only Switching in Ferroelectric Devices, Wang 4:00-4:20 pm
Record RF Performance of Ultra-thin Indium Oxide Transistors with Buried-gate Structure, Charnas 4:40-5:00 pm	Interface-Controlled Ultralow Resistance Drift and Its Origin in Superlattice Phase Change Memory, Wu 4:20-4:40 pm
LATE NEWS: N-polar GaN-on-Sapphire MIS HEMTs with high power and record >40% efficiency at 94GHz, Li 5:00 pm	Statistical Analysis of 2T1R Gain-Cell RRAM Bitcell for Area Efficient, High-Performance, and Reliable Multi-level Cell Operation, Mehra 4:40-5:00 pm
BREAK 5:00-6:00 PM	
POSTER SESSION 6:00-9:00 PM	

**TUESDAY - 6/28**

Plenary: The Path Towards Realistic ASIC Electronics Deployment Into Previously Impractical Extreme Application Environments, Neudeck (invited) 9:00-10:00 am, U.S. Bank Conference Theater	
COFFEE BREAK 10:00-10:20 AM	
Session 5: Wide Bandgap II - Vertical Devices U.S. Bank Conference Theater	Session 6: Memory II Great Hall Meeting Room 1 & 2
Ga2O3 Trench Schottky Diodes by Novel Low-Damage Ga-Flux Etching, Dhara 10:20-10:40 am	Nanoscale HfO2-based memristive devices for neuromorphic computing, Hoffmann-Eifert (invited) 10:20-11:00 am
Movement of Current Filaments and its Impact on Avalanche Robustness in Vertical GaN P-N diode Under UIS stress, Shankar 10:40-11:00 am	Ambient Effects on Reprogrammable Read-only Selector-free Memory for the Embedded NVM Applications, Chen 11:00-11:20 am
A Composite TE-TFE-FE Model for Schottky Barrier Reverse Current over the Entire Electric-Field Range, Li, Wenshen 11:00-11:20 am	An Experimentally Validated, Universal Memristor Model Enabling Temporal Neuromorphic Computation, Zivasatienraj 11:20-11:40 am
$\beta$ -Ga2O3 FinFETs by MacEtch: high aspect ratio and ultra-low hysteresis, Li, Xiuling (invited) 11:20-12:00 pm	Robust Reconfigurable Field Effect Transistors Process Route Enabling Multi-VT Devices Fabrication for Hardware Security Applications, Galderisi 11:40-12:00 pm
LUNCH 12:00-1:00 pm (Not provided by Conference)	
Session 7: Thin Film Transistors U.S. Bank Conference Theater	Session 8: Quantum I - Spin Great Hall Meeting Room 1 & 2
First Demonstration of Top-Gated ITO Transistors: Effect of Channel Passivation, Wahid 1:20-1:40 pm	Quantum-Ready Germanium and Silicon, Scappucci (invited) 1:20-2:00 pm
Vertically Stacked Multilayer Atomic-Layer-Deposited Sub-1-Nanometer In2O3 Field-Effect Transistors with BEOL Compatibility, Zhang 1:40-2:00 pm	Controlling the Spin and Valley Hall Effect in Monolayer WSe2 at Elevated Temperatures, Li 2:00-2:20 pm
N:Cu2O S/D for low contact resistance p-type Cu2O thin film transistor, Jo 2:00-2:20 pm	Electrically Triggered Spin-State Phase Transition in LaCoO3, Islam 2:20-2:40 pm
Photonic Curing: Rapid Thermal Processing of Oxide Thin-film Transistors on Plastic, Chatterjee 2:20-2:40 pm	LATE NEWS: High Voltage $\beta$ -Ga2O3 Lateral Schottky barrier diode with High Permittivity Dielectric RESURF demonstrating > 1 GW/cm2 Power Figure of Merit, Roy 2:40-3:00 pm
Atomically-thin atomic-layer-deposited InZnO transistors with BEOL compatibility, Zheng 2:40-3:00 pm	
COFFEE BREAK 3:00-3:20 PM	
Session 9: 2-D Devices U.S. Bank Conference Theater	Session 10: Quantum II - Photonics Great Hall Meeting Room 1 & 2
Nanoscale Devices Based on Two-dimensional and Ferroelectric Materials, Zhu (invited) 3:20-4:00 pm	SiGeSn Technology for All-Group-IV Photonics, Yu (invited) 3:20-4:00 pm
Mobility Enhancement of Monolayer MoS2 Transistors using Tensile-Stressed Silicon Nitride Capping Layers, Jaikissoon 4:00-4:20 pm	Ge-based Mid-infrared integrated photonics platform for Sensing, Kim (invited) 4:00-4:40 pm
Gate-Tunable Resonant Tunneling in a Dual-Gated Twist-Controlled Double Monolayer Graphene-hBN Heterostructure, Lin 4:20-4:40 pm	LATE NEWS: Monolithic integration of III-nitride LED with NbN superconductor on a single epitaxial platform, Chlipala 4:40-5:00 pm
Analysis of BTI in 300 mm integrated dual-gate WS2 FETs, Panarella 4:40-5:00 pm	
LATE NEWS: A Gate-All-Around Single-Channel In2O3 Nanoribbon FET with Near 20 mA/ $\mu$ m Drain Current, Zhang 5:00 pm	
BREAK 5:00-6:00 PM	
Conference Dinner Reception 6:00-8:00 pm, Faculty Club	
Rump Session I Great Hall Meeting Room 1 & 2	Rump Session II Great Hall Meeting Room 3
What is the role of computational physics and modeling in emerging devices? Panelists: Miller, Winslow, Low, Roy 8:30-10:30 pm	The Intersection of Industry and Academia: Training Future Researchers, Panelists: Shahedipour-Sandvik, Younkin, Buck, Rajan 8:30-10:30 pm

**WEDNESDAY - 6/29**

EMC Plenary New Materials for Three Dimensional Ferroelectric Microelectronics 8:20-9:20 am, Archie M. Griffin West Ballroom <i>*EMC Plenary is open to DRC attendees who agree on-site to the EMC COVID Duty of Care statement. Please see EMC website for details.</i>
COFFEE BREAK 9:20-10:00 AM
Session 11: Heterogeneous Integration U.S. Bank Conference Theater
Hybrid 2D/CMOS Microchips, Lanza (invited) 10:00-10:40 am
Large-Scale Heterogeneous Device Integration, Radosavljevic (invited) 10:40-11:20 am
Monolithic and Heterogeneous Integration of Atomically Thin Semiconductors for non-von Neumann CMOS, Pendurthi 11:20-11:40 am
LATE NEWS 11:40-12:00 pm
LUNCH 12:00-1:00 pm (Not provided by Conference)
Session 12: Wide Bandgap III - III-N HEMTs U.S. Bank Conference Theater
Ultra-Wide Bandgap Semiconductor Transistors for mm-wave Applications, Rajan (invited) 1:20-2:00 pm
Modeling of the Charge-Voltage Characteristics of AlScN/AlN/GaN Heterostructures, Wu 2:00-2:20 pm
Improved On/Off Current Ratio of TiO2/AlGaIn/GaN MIS-HEMTs with N2O Surface Treatment on TiO2 Layer, Zhama 2:20-2:40 pm
First demonstration of N-polar GaN/AlGaIn/AlN HEMT on Single Crystal AlN Substrates, Kim 2:40-3:00 pm