

Last updated: August 1, 2025

Venue: James L. Sorenson Molecular Biotechnology Building (SMBB), University of Utah

Venue: James L. Sorenson Molecular Biotechnology Building (SMBB), University of Utah				
August 4 th 2025 (Monday)				
8:00 AM				
8:20 AM				
8:30 AM	Advances in Ga₂O₃ Crystal Growth and Device Applications (PLENARY TALK)	Kohei Sasaki	Novel Crystal Technology	
	Technical Session 1: Bulk Crystal Growth Session Chair: Michael Scarpulla			
9:15 AM	Bulk Growth of Offcut (100) Ga₂O₃ by EFG: Establishing a Domestic Source of Gallium Oxide Substrates (INVITED TALK)	Drew Haven	Luxium Solutions	
9:45 AM	Bulk Crystal Growth of β-Ga ₂ O ₃ Crystals from the Melt Without Precious-Metal Crucible Using Oxide Crystal Growth from a Cold Crucible Method	Akira Yoshikawa	Tohoku University	
10:00 AM	Optimization of Axial Vertical Temperature Distribution and Experimental Verification in 4-Inch β-Ga ₂ O ₃ Crystal Growth Using the Vertical Bridgman Method	Dae-Uk Kim	Dong Eui University	
10:15 AM	Thermal Field Engineering Using Ceramic Materials to Optimize β-Ga ₂ O ₃ Crystal Quality by EFG Method	Tae-Hun Gu	Pukyong National Uni.	
10:30 AM				
	Technical Session 2: Substrates & Epitaxial Gr Session Chair: Matthew McCluskey	owth		
11:00 AM	Development of a Manufacturing Process for Epi-Ready Miscut (100) β-Ga ₂ O ₃ Substrates	Daniel Erdely	Penn State, Applied Research Laboratory	
11:15 AM	Characterization of Miscut (100) β-Ga ₂ O ₃ Substrates to Enable Bulk Growth and Processing Improvements	Robert M Lavelle	Penn State, Applied Research Laboratory	
11:30 AM	Fabrication of (010) and (001) β- Ga ₂ O ₃ Thin Film Composite Wafers	Michael E Liao	Apex Microdevices	
11:45 AM	Evaluation of the Impact of Substrate Processing on (010) β -Ga ₂ O ₃ Epitaxial Growth	Robert M Lavelle	Penn State, Applied Research Laboratory	
12:00 PM	Nitrogen-Doped Ga₂O₃ Thin Films Grown by Molecular Beam Epitaxy (INVITED TALK)	Masataka Higashiwaki	Osaka Metropolitan University	
12:30 PM LUNCH BREAK (Lunch box will be provided) to 2:00 PM				



5:30 - 7:30

PM

GOX 2025: The 8th United States Gallium Oxide Workshop (August 4- 6, 2025, University of Utah, Salt Lake City) TECHNICAL PROGRAM

Venue: James L. Sorenson Molecular Biotechnology Building (SMBB), University of Utah

August 4th 2025 (Monday) Technical Session 3: Epitaxy, Material Characterization & Defects Session Chair: Masataka Higashiwaki

Illuminating Features in β-Ga₂O₃ with Photoluminescence and Raman **Matthew McCluskey Washington State Spectroscopy (INVITED TALK)** 2:00 PM University Mitigating Unintentional Carbon Incorporation and Characterizing Associated The Ohio State Hemant Ghadi **Deep Compensating Centers** 2:30 PM University Non-Equilibrium Defect Formation Energies-What Happens to Defect Isaac Thomas University of Utah 2:45 PM Concentrations in the Presence of Excess Carriers? Infrared-Active Phonon Modes, Band-to-Band Transitions, and Ultraviolet Preston R Sorensen University of Nebraska-Dielectric Functions of Unintentionally-Doped (X < 0.3) and Silicon Doped (X < Lincoln 3:00 PM 0.25) Single Crystal (100) β -(Al_xGa_{1-x})₂O₃ Si-Doped β-Ga₂O₃ Films Grown by LPCVD with Controlled Doping, Promising Saleh Ahmed Khan University of Mobility and High Growth Rates Massachusetts Lowell 3:15 PM

COFFEE BREAK 3:30 PM **Technical Session 4: Epitaxial Growth** Session Chair: Anhar Bhuiyan **University of** Synthesis of UWBG GeO₂ and GeSnO₂ semiconductors (INVITED TALK) Rebecca L (Becky) 4:00 PM **Peterson** Michigan Seed-Driven Stepwise Crystallization for Phase Control in Growing Rutile GeO₂ Imteaz Rahaman University of Utah 4:30 PM Films by MOCVD β-Ga₂O₃ Epitaxial Layer Grown by Liquid Phase Epitaxy Zhijin Chen Mitsubishi Gas 4:45 PM Chemical Company MOVPE Growth and Characterization of β -(Al_xGa_{1-x})₂O₃ Thin Films on β -Saud Bin Anooz Leibniz-Institut für 5:00 PM (Al_vGa_{1-v})₂O₃ Substrates Kristallzüchtung (IKZ) Epitaxial Stabilization of Monoclinic (Al, in, Ga)₂O₃/Ga₂O₃ Heterostructures Stephen Schaefer National Renewable 5:15 PM **Energy Laboratory GOX Welcome Reception**

Cleone Peterson Eccles Alumni House

155 SOUTH CENTRAL CAMPUS DRIVE SALT LAKE CITY, UT 84112



Venue: James L. Sorenson Molecular Biotechnology Building (SMBB), University of Utah				
August 5 th 2025 (Tuesday)				
8:00 AM	Registration			
	Advancements in the Epitaxial Growth of Ga ₂ O ₃ Thin	Hongping Zhao	The Ohio State	
8:30 AM	Films, Alloys, and Heterostructures (PLENARY TALK)		University	
	Technical Session 5: MOC			
	Session Chair: Hari			
9:30 AM	Growth of >50micron Thick, <1e16 Doped Ga ₂ O ₃ Layers on Sn-Doped (001) Substrates by Halide Vapor Phase Epitaxy	Jacob Leach	Kyma Technologies	
9:45 AM	Sub-Nanometer Surface Roughness of 20 μm Thick Homoepitaxial β-Ga ₂ O ₃ on ~3.8° (100) Substrates by MOCVD	Joshua T Buontempo	Cornell University	
10:00 AM	MOCVD Growth of (010) β - Ga ₂ O ₃ with Fast Growth Rates (> 4.3 μ m/H) and Superior Transport Properties	Dong Su Yu	The Ohio State University	
10:15 AM	MOCVD Epitaxy of (001) β- Ga ₂ O ₃ Films with Fast Growth Rates	Lingyu Meng	The Ohio State University	
10:30 AM	10:30 AM COFFEE BREAK			
	Technical Session 6: MOC Session Chair: Xiulii			
11:00 AM	MOCVD Synthesis and in Situ Etching of Ga ₂ O ₃ (INVITED TALK)	Hari Nair	Cornell University	
11:30 AM	Low-Background Carrier Density Intentionally and Unintentionally Doped (010) β- Ga ₂ O ₃ Drift Layers and Schottky Diodes	Carl Peterson	University of California, Santa Barbara	
11:45 AM	Novel Showerhead for Scalable β-Ga ₂ O ₃ MOCVD	William Timothy Brand	Agnitron Technology	
12:00 PM	Electrical Transport in δ-Doped β- Ga ₂ O ₃ Grown by MOCVD	Cameron A Gorsak	Cornell University	
12:00 PM	MOCVD-Grown Insulating Nitrogen-Doped (010) β- Ga ₂ O ₃ Buffer Layers for Silicon Peak Suppression	Rachel Kahler	University of California, Santa Barbara	
12:30 PM to 2:00 PM				



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August 5 th 2025 (Tuesday)						
	Technical Session 7: Dielectrics, Ion Implant	tation & Material Processing				
	Session Chair: Kai					
2:00 PM	2:00 PM Dielectric Integration for Ga ₂ O ₃ MOS Devices (INVITED TALK) Ahmad Ehteshamul Islam Air Force Research Lab					
0.00.014	Investigation of SiO ₂ : HfO ₂ Composition Effects on ALD HfSiO _x as	Xin Zhai	University of Michigan			
2:30 PM	Gate Dielectric on β Ga ₂ O ₃ (001)	Level O Development	Air Francisco			
2:45 PM	Characterization of Ion-Implanted Nitrogen as a Compensating Acceptor in β- Ga ₂ O ₃	Jacob S Breakfield	Air Force Research Lab			
3:00 PM	High-Density Si Doping into Ga ₂ O ₃ by Hot Implantation	Kotaro Yagi	Osaka Metropolitan University			
	Effect of NiOx Sputtering and ICP Dry Etching on (010) β- Ga ₂ O ₃	Chinmoy Nath Saha	University of California,			
3:15 PM	Films Grown by MOCVD		Santa Barbara			
3:30 PM	3:30 PM COFFEE BREAK					
	Technical Session 8: Heterojunctions, Session Chair: Ahmad	Islam				
	Atomic Structure of the Ga ₂ O ₃ -Based PN Junction Interface	Jinwoo Hwang	The Ohio State			
4:00 PM	(INVITED TALK)		University			
4:30 PM	MOCVD-Grown n-Ga ₂ O ₃ /p-GaN Heterojunction Diodes with Atomically Sharp Interfaces	Zhongjie Ren	The University of Texas at Austin			
4:45 PM	Thermal Degradation and Performance Enhancement of β-Ga2O3 Diodes Using CNT/ Ga ₂ O ₃ Heterojunctions	Hunter Ellis	University of Utah			
	Near-Vertical Non-Plasma HCl Gas Etching on (011) β- Ga ₂ O ₃	Takayoshi Oshima	National Institute for			
5:00 PM			Materials Science, Japan			
5:15 PM	Dry Etch Damage Mitigation in (001) β - Ga ₂ O ₃ Schottky Diodes Using Hot-H ₃ PO ₄	Steve Rebollo	University of California, Santa Barbara			
	Poster Session					
5:30 - 7:30 PM	Cleone Peterson Eco 155 SOUTH CENTRA					
	SALT LAKE CITY, UT 84112					

	B 4		
	Posters		
1	Crack Formation in Strained β-(Al _x Ga _{1-x}) ₂ O ₃ Films Grown on (010) β- Ga ₂ O ₃ Substrates	Dorian P Luccioni	University of California Los Angeles
2	Advanced MOCVD Growth and TEM Analysis of Rutile GeO ₂	Imteaz Rahaman	University of Utah
3	Distinction Between (001) and (-101) Plane Orientations of β -Ga ₂ O ₃ Crystals Grown by EFG Method	So-min Shin	Dong Eui University
4	Improving Thermal Management in β- Ga₂O₃ Power Devices Through Interface Engineering: a First-Principles Study	Sanjay Gopalan	North Carolina State University
5	Understanding Anisotropic Breakdown Behavior in β- Ga ₂ O ₃ Through TCAD and Experimental Analysis of JTE Structures	Mohamed Torky	University of Albany
6	Measurement Geometries and Depth Sensitivity for High Resolution X-Ray Diffraction Measurements: Homoepitaxial β - Ga ₂ O ₃	Mark Goorsky	University of California Los Angeles
7	Remote Hydrogen Plasma Interplay with Ga ₂ O ₃ Carbon, Oxygen, and Gallium Defects	Carlos R DeLeon	The Ohio State University
8	High-Frequency Electron Paramagnetic Resonance Generalized Spectroscopic Ellipsometry Characterization of Cr -Doped Gallium Oxide	Viktor Rindert	Lund University
9	Mitigating Interfacial Si Conductivity in β- Ga ₂ O ₃ Thin Films with Fe Compensation	Brenton A. Noesges	Air Force Research Lab
10	Nucleation and Evolution of GeO ₂ Grown on Sapphire Substrates by MOCVD	Botong Li	University of Utah
11	Low-Pressure CVD of Sn- and Ge-Doped β-Ga ₂ O ₃ : Tunable Doping, Promising Mobility, Schottky Diodes, and Insights from DFT	Ahmed Ibreljic	University of Massachusetts Lowell
12	Investigating the Epitaxial Growth of Hexagonal ε-(In _x Ga _{1-x}) ₂ O ₃ on AIN for High Power and Extreme Environment Applications	Maria Sultana	Texas State University
13	Effect of N ₂ Atmosphere Annealing on Impurity Distribution and Crystallinity of 4N β-Ga ₂ O ₃ Single Crystals Grown by EFG Method	A-Ran Shin	Pukyong National University
14	TEM Investigation of Point-Defect Formation in Beta-(Al _x Ga _{1-x}) ₂ O ₃ Single Crystals	Arub Akhtar	Leibniz-Institut für Kristallzüchtung (IKZ)
15	Machine Learning Guided Microscopy for Vacancy Detection in β-Ga ₂ O ₃	Shaon Das	University of Buffalo
16	Vertically Conducting β- Ga ₂ O ₃ Diodes on 4H-SiC Substrate as Short Wavelength (<245 Nm) Switches/Detectors	Tahir Hassan	University of South Carolina
17	Nanoscale Thermal Transport in Ion-Beam-Exfoliated β-Ga ₂ O ₃ Nanomembranes	Azat Abdullaev	Nazarbayev University
18	Defects in Atomic Layer Deposited Polycrystalline HfO2 on (¯201) β- Ga ₂ O ₃	Khushabu Agrawal	Tyndall National Institute Cork
19	Modulating Interface and Bulk Properties in ALD Al2O3 on β - Ga ₂ O ₃ with Spatially Selective Oxidants	Adam A Gruszecki	University of Texas at Dallas

20	In Situ Study of Crystal Quality and Phase Transition of Ga ₂ O ₃ and GeO ₂ at High Temperatures Up to 1000 °C by XRD	Botong Li	University of Utah
21	Defect Kinetics in β- Ga ₂ O ₃ : Sequential Quenching Simulations for Thin Films and Bulk Crystals	Khandakar Aaditta Arnab	University of Utah
22	Orientation Dependence of near Surface Open Volume Defects in Beta- Ga ₂ O ₃ Investigated with Positrons	Marc H Weber	Washington State University
23	High Quality Ga ₂ O ₃ on Sapphire to Achieve Fast Solar-Blind Photodetectors with High Detectivity	Chen He	University of Chinese Academy and Science
24	Numerical Simulation and Optimisation of Hot-Zone Configurations for β - Ga ₂ O ₃ Crystal Growth via the Vertical Bridgman Method	Seora Son	AXEL Co, Ltd., Korea (South)
25	Generative Co-Design of Ga ₂ O ₃ Devices for Coupled Electrical, Thermal, and Mechanical Performance	Miguel Aguilo	Morphorm LLC
26	The Study on Surface Properties of Various Crystal Planes Obtained from Bulk β- Ga ₂ O ₃ Single Crystals Grown by the EFG Method	Yunjin Kim	DongEui University
27	A Surface Potential Based Analytical C-V Model of a Double-Gate Vertical Fin-Shaped Ga ₂ O ₃ Power Transistor	Twisha Titirsha	University of Missouri- Columbia
28	Simulation and Performance Evaluation of AlN/β-Ga ₂ O ₃ HEMTs for Next-Generation Ultrawide Bandgap Power Devices	Md Maruf Hossain	University of Missouri- Columbia
29	Crystallographic HCl Gas Etching for Fabrication of β- Ga ₂ O ₃ /Air-Gap Structures on (100) Substrates	Takayoshi Oshima	National Institute for Materials Science, Japan

Sponsor posters

- Novel Crystal Technology Inc. Taiyo Nippon Sanso Klar Scientific

- Kyma Technologies
- Agnitron Technology



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	Venue: James L. Sorenson Molecular Biotechnology Building	(SMBB), University of	Utah
	August 6 th 2025 (Wednesda	y)	
8:00 AM Registration			
8:30 AM	The Roadmap Towards Ga₂O₃ Technology Insertion (PLENARY TALK)	Andrew Green	Air Force Research Lab
	Technical Session 9: Transistors Session Chair: Nolan Hendricks		
9:30 AM	1.8 kV Multi-Fin β- Ga ₂ O ₃ Vertical FinFET with Field Oxide Exhibiting a PFOM of 1 GW/cm ²	Saurav Roy	University of California, Santa Barbara
9:45 AM	Enhancement-Mode Vertical β- Ga ₂ O ₃ U-Trench MOSFETs Featuring in-Situ Mg-Doped Current Blocking Layers	Walid Amir	University at Buffalo
10:00 AM	β-Ga ₂ O ₃ Sub-Micron FinFETs Modulating > 3 x 1E13 cm ⁻² Charge Density and 10 ⁹ on/off Ratio	Nabasindhu Das	Arizona State University
10:15 AM	High-Voltage β- Ga ₂ O ₃ MOSFET with Staircase Field Plate Design and 400 V Dynamic Switching	Shivam Sharma	University of Buffalo
10:30 AM	COFFEE BBEAK		
	Technical Session 10: Diodes & Thermal Mar Session Chair: Nidhin Kurian Kalarick		
11:00 AM	Near-Ideal 1D Thermionic Field Emission Current in Vertical β- Ga ₂ O ₃ Schottky Diodes via Ultra-High-κ Sputtered BaTiO ₃ Field Management	Kyle Liddy	Air Force Research Lab
11:15 AM	Orientation-Dependent β- Ga ₂ O ₃ Heterojunction Diode with Atomic Layer Deposition (ALD) Grown NiO	Yizheng Liu	University of California, Santa Barbara
11:30 AM	An Aerosol Jet Printed Heat Spreader Material for Thermal Management of Gallium Oxide Devices	Laura C Davidson	KBR
11:45 AM	Improved Thermal Performance of Gallium Oxide Devices Through the Metal-Embedded Chip Assembly Process	Judit K Beagle	Air Force Research Lab
	A Field Plate Study on Large-Area β- Ga ₂ O ₃ Transistors for Field Management in Power Switching Devices	Nicholas P Sepelak	KBR & Air Force Research Laboratory
12:00 PM			

Expert panel: Lessons learned from incumbent technologies and applications for Ga ₂ O ₃ Venue: Catmul Gallery, Warnock Engineering Building (WEB), University of Utah Moderator: Nolan Hendricks, Air Force Research Lab Panelists: 12:30 PM to 2:00 PM (Working Lunch- Lunch will be provided) Expert panel: Lessons learned from incumbent technologies and applications for Ga ₂ O ₃ Venue: Catmul Gallery, Warnock Engineering Building (WEB), University of Utah Moderator: Nolan Hendricks, Air Force Research Lab Panelists: Victor Veliadis, Executive Director & CTO, Power America, Professor, North Carolina State University SiC Power Semiconductor Commercialization: Overcoming Key Barriers and Lessons Learned for Novel Material Systems Sudip Mazumder, University of Illinois, Chicago Photoconductive Power Semiconductor Devices and Potential for Gallium Oxide Alan Mantooth, University of Arkansas Beyond the Die: Key Elements for Successful Adoption					
	Technical Session 11: Sapphire & Devices for extreme environment applications Venue: James L. Sorenson Molecular Biotechnology Building (SMBB), University of Utah Session Chair: Uttam Singisetti				
2:00 PM	Reaching beyond Diamond to Sapphire a 7 eV Semiconductor (INVITED TALK)	Darrell Schlom	Cornell University		
2:30 PM	Electrothermal Co-design of Vertical β- Ga ₂ O ₃ Schottky Diodes with High Permittivity Dielectric Field Plate for High-field and Thermal Management	Emerson J. Hollar	Iowa State University		
2:45 PM	Heavy Ion Single Event Effects (SEE) Testing of kV-Class Lateral Gallium Oxide MOSFETs	Shivam Sharma	University of Buffalo		
3:00 PM	Influence of Doping Concentration and E-Field on Radiation Response in MOCVD β- Ga ₂ O ₃ Schottky Diodes	Joe McGlone	The Ohio State University		
3:15 PM	COFFEE BREAK				
	Technical Session 12: Novel devices & dynamic Session Chair: Esmat Farzana	performance			
3:45 PM	Recent advancements in Gallium Oxide based power electronics (INVITED TALK)	Faisal Khan	National Renewable Energy Laboratory		
4:15 PM	Effects of Spatially Resolved Heavy Ion Irradiation on Ga ₂ O ₃ MOSFETs	Daram N Ramdin	Air Force Research Lab		
4:30 PM	Evaluation of a β- Ga ₂ O ₃ MSM Detectors for Proton Therapy	Hunter Ellis	University of Utah		
4:45 PM	Binary Phase-Only Gallium Oxide Diffractive Optical Element for Beam Shaping	Wei Jia	University of Utah		
5:00 PM	Application of α- Ga ₂ O ₃ -Based Schottky Barrier Diode to Microwave Rectenna	Takeru Wakamatsu	Kyoto University		
5:15 PM	Dynamic Breakdown Voltage and Overvoltage Margin Under Pulsed Conditions in β- Ga ₂ O ₃ Based Devices	Harsh Raj	Indian Institute of Science		
5:30 PM	5:30 PM Closing remarks (Michael Scarpulla, Sriram Krishnamoorthy)				

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	Best Paper Award (Oral Presentation) Nominees			
1	1.8 kV multi-Fin β- Ga ₂ O ₃ Vertical FinFET with Field Oxide Exhibiting a PFOM of 1 GW/cm ²	Saurav Roy	University of California, Santa Barbara	
2	β-Ga ₂ O ₃ Sub-Micron FinFETs Modulating > 3 x 1E13 cm ⁻² Charge Density and 10 ⁹ on/off Ratio	Nabasindhu Das	Arizona State University	
3	Orientation-Dependent β- Ga ₂ O ₃ Heterojunction Diode with Atomic Layer Deposition (ALD) Grown NiO	Yizheng Liu	University of California, Santa Barbara	
4	Sub-Nanometer Surface Roughness of 20 μ m Thick Homoepitaxial β -Ga ₂ O ₃ on ~3.8° (100) Substrates by MOCVD	Joshua T Buontempo	Cornell University	
5	A Field Plate Study on Large-Area β- Ga ₂ O ₃ Transistors for Field Management in Power Switching Devices	Nicholas P Sepelak	KBR & Air Force Research Laboratory	
6	Electrical Transport in δ-Doped β- Ga ₂ O ₃ Grown by MOCVD	Cameron A Gorsak	Cornell University	
7	Enhancement-Mode Vertical β- Ga ₂ O ₃ U-Trench MOSFETs Featuring in-Situ Mg- Doped Current Blocking Layers	Walid Amir	University at Buffalo	
8	Epitaxial Stabilization of Monoclinic (Al, in, Ga) ₂ O ₃ /Ga ₂ O ₃ Heterostructures	Stephen Schaefer	National Renewable Energy Laboratory	
9	Thermal Degradation and Performance Enhancement of β-Ga2O3 Diodes Using CNT/ Ga ₂ O ₃ Heterojunctions	Hunter Ellis	University of Utah	
10	Binary Phase-Only Gallium Oxide Diffractive Optical Element for Beam Shaping	Wei Jia	University of Utah	
11	An Aerosol Jet Printed Heat Spreader Material for Thermal Management of Gallium Oxide Devices	Laura C Davidson	KBR	
Pos #	Best Poster Award Nom	ninees		
1	Crack Formation in Strained β-(AlxGa1-x)2O3 Films Grown on (010) β- Ga2O3 Substrates	Michael Liao	Apex Microdevices	
2	Advanced MOCVD Growth and TEM Analysis of Rutile GeO ₂	Imteaz Rahaman	University of Utah	
3	Distinction Between (001) and (-101) Plane Orientations of β-Ga ₂ O ₃ Crystals Grown by EFG Method	So-min Shin	Dong Eui University	
4	Improving Thermal Management in β- Ga ₂ O ₃ Power Devices Through Interface Engineering: a First-Principles Study	Sanjay Gopalan	North Carolina State University	
5	Understanding Anisotropic Breakdown Behavior in β- Ga ₂ O ₃ Through TCAD and Experimental Analysis of JTE Structures	Mohamed Torky	State University of New York at Albany	
7	Remote Hydrogen Plasma Interplay with Ga ₂ O ₃ Carbon, Oxygen, and Gallium Defects	Carlos R DeLeon	The Ohio State University	
8	High-Frequency Electron Paramagnetic Resonance Generalized Spectroscopic Ellipsometry Characterization of Cr -Doped Gallium Oxide	Viktor Rindert	Lund University	

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