Bowen Hall, Princeton University

New Frontiers in Quantum Science with Ultra-Pure GaAs

JUNE 22–24

2026

PROGRAM

ABOUT

Ultra-pure GaAs heterostructures provide the building block for semiconductor devices with vanishingly small impurities and/or fluctuations of compositions during crystal growth. Model experimental conditions then become accessible, enabling milestones for research in condensed-matter physics, for instance the fractional quantum Hall effect, Bose-Einstein condensation of excitons and polaritons, or the demonstration of anyonic quantum statistics. The Symposium brings together these ground-breaking research, spanning theoretical grounds to experimental research relying on transport or optical techniques. Hence, we aim at fostering a new synergy within the GaAs research community to design new frontiers of quantum science and technology.

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MONDAY, JUNE 22, 2026

WELCOME RECEPTION — Bowen Hall Atruim

17:30 - 19:30	Drinks, light refreshments and snacks for registered symposium attendees

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TUESDAY, JUNE 23, 2026

8:15 - 8:30	Registration/Badge Pickup
8:30 - 8:45	**Opening Remarks by organizers**

MBE Growth - 1
Chair: Michael Manfra
Bowen Hall Auditorium Room 222

8:45 - 9:15	**Loren Pfeiffer**, *Princeton University* **Achievement of Ultra-High Electron Mobilities in GaAs Quantum Wells**
9:15 - 9:45	**Zbig Wasilewski**, *University of Waterloo* **The Art and Hidden Pitfalls of Molecular Beam Epitaxy: From THz Lasers to Polariton Condensates**
9:45 - 10:00	Adbhut Gupta, *Princeton University* **High-Density, High-Mobility GaAs Quantum Wells Enabled by Doping-Well Engineering**
10:00 - 10:30	**Coffee Break** Bowen Hall Atrium

Optics –1
Chair: Ronen Rapaport
Bowen Hall Auditorium Room 222

10:30 - 11:00	**François Dubin,** *CNRS, CRHEA* **A Fate of Supersolid Phases: an Exciton Tribute to Ultra-High Purity GaAs**
11:00 - 11:30	**Ursula Wurstbauer**, *Muenster University* **Collective neutral excitations as sensitive probe for the quality of 2D charge carrier systems in ultra-pure GaAs quantum wells and in moiré systems**
11:30 - 12:00	**Daniele Sanvitto**, *CNR-NANOTEC* **Collective phenomena in non-equilibirum quantum fluids**

12:00 - 13:15	**Lunch Break**	Bowen Hall Atrium

Theory
Chair: David Snoke

Bowen Hall Auditorium
Room 222

13:15 - 13:45	**David Mross**, *Weizmann Institute* **Anyon braiding and bunching in chiral Mach-Zehnder interferometers**
13:45 - 14:15	**Sankar Das Sarma**, *University of Maryland* **High mobility 2D semiconductors**

Anyons-1
Chair: Sankar Das Sarma

Bowen Hall Auditorium
Room 222

14:15 - 14:45	**Michael Manfra**, *Purdue University* **Universal Anyon Tunneling in a Chiral Luttinger Liquid**
14:45 - 15:15	**Gwendel Fève**, *Ecole Normale Superieure* **Noise experiments for the characterization of anyons**
15:15 - 15:45	**Coffee Break** Bowen Hall Atrium

Electron Dynamics and Transport
Chair: Gabor Csáthy

Bowen Hall Auditorium
Room 222

15:45 - 16:15	**Guillaume Gervais**, *McGill University* **40+ Million $cm^2/(V\ s)$ Electron Mobility Field-Effect Electronic Devices**
16:15 - 16:30	Michael Hilke, *McGill University* **Current induced electron hydrodynamics and extreme phonon emission by supersonic electrons in 2DEGs**
16:30 - 17:00	**Jean Heremans**, *Virginia Tech* **Electron-electron interactions and nonequilibrium electron dynamics in ultrapure GaAs/AlGaAs**
17:00 - 17:15	Mani Chandra, *nOhm Devices, Inc.* **Low-noise amplification using hydrodynamic charge transport**

BANQUET	Mistral Restaurant
17:15 - 18:00	Walk to Mistral Restaurant
18:00 - 21:00	Symposium Banquet for Registered Attendees

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WEDNESDAY, JUNE 24, 2026

Anyons-2 *Chair: David Mross*	Bowen Hall Auditorium Room 222
8:30 - 9:00	**Robert Willett**, *Nokia Bell Labs* **Examining ultra-high mobility 2DES heterostructures for non-Abelian properties**
9:00 - 9:30	**Xiaodong Xu**, *University of Washington* **Observation of fractional charges via anyon-trions**
9:30 - 10:00	**Coffee Break** — Bowen Hall Atrium
Optics – 2 *Chair: Armando Rastelli*	Bowen Hall Auditorium Room 222
10:00 - 10:30	**David Snoke**, *University of Pittsburgh* **Canonical effects of Bose-Einstein condensation of polaritons in GaAs/AlGaAs structures**
10:30 - 10:45	Andrew Haky, *Laboratoire Kastler Brossel* **Towards Quantum Reservoir Computing with Polaritons**

10:45 - 11:15	**Hui Deng**, *University of Michigan* **Different Phases of Polariton Condensates**
11:15 - 11:30	Hassan Alnatah, *University of Maryland* **Room-Temperature Strong Coupling and Lower-to-Upper Polariton Condensation Switching in GaAs/AlGaAs Microcavities**
11:30 - 12:00	**Ronen Rapaport**, *Hebrew University* **GaAs adventures with Loren Pfeiffer: a 30 years perspective on our joint work on excitons and polaritons**
12:00 - 13:30	**Lunch Break** — Bowen Hall Atrium

MBE Growth – 2

Chair: Loren Pfeiffer

Bowen Hall Auditorium
Room 222

13:30 - 14:00	**Javad Shabani**, *New York University* **Hexagonal Synthetic Josephson Junction Lattices on epitaxial Al-InAs**
14:00 - 14:30	**Armando Rastelli**, *University of Linz* **MBE Growth, properties and applications of unstrained GaAs/AlGaAs quantum dots**

Fractional Quantum Hall Effect

Chair: Jim Eisenstein

Bowen Hall Auditorium
Room 222

14:30 - 15:00	**Chengyu Wang**, *Princeton University* **Strongly interacting composite fermions in ultra-high-quality GaAs 2D hole systems**
15:00 - 15:15	Leonid Rokhinson, *Purdue University* **Toward high-order nonabelions: formation of helical states in the fractional quantum Hall regime**
15:15 - 15:45	**Gabor Csáthy**, *Purdue University* **New Ground States with Complex Order in Ultra-High Mobility GaAs at Ultra-Low Temperatures**
15:45 - 16:00	Michael Zudov, *University of Minnesota* **Two-component fractional quantum Hall states in an ultrapure GaAs quantum well**

16:00 - 16:15	Daniel Suárez-Forero, *University of Maryland* **Chiral light-matter coupling in a 2D hole gas-microcavity system in the Quantum Hall regime**	
16:15 - 16:30	**Closing Remarks by Loren Pfeiffer**	
16:30 - 18:30	**MBE Lab tour** **Coffee & Snacks**	Engineering Quadrangle C431 Bowen Hall Atrium

THANK YOU

We extend our sincere gratitude to our organizing committee for their dedication and meticulous planning, which made this symposium possible. We also thank our esteemed speakers for sharing their expertise and insights, enriching our discussions over the past three days. Finally, we appreciate all participants for their active engagement and contributions. Your collective efforts have made this symposium a truly meaningful and successful event.

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