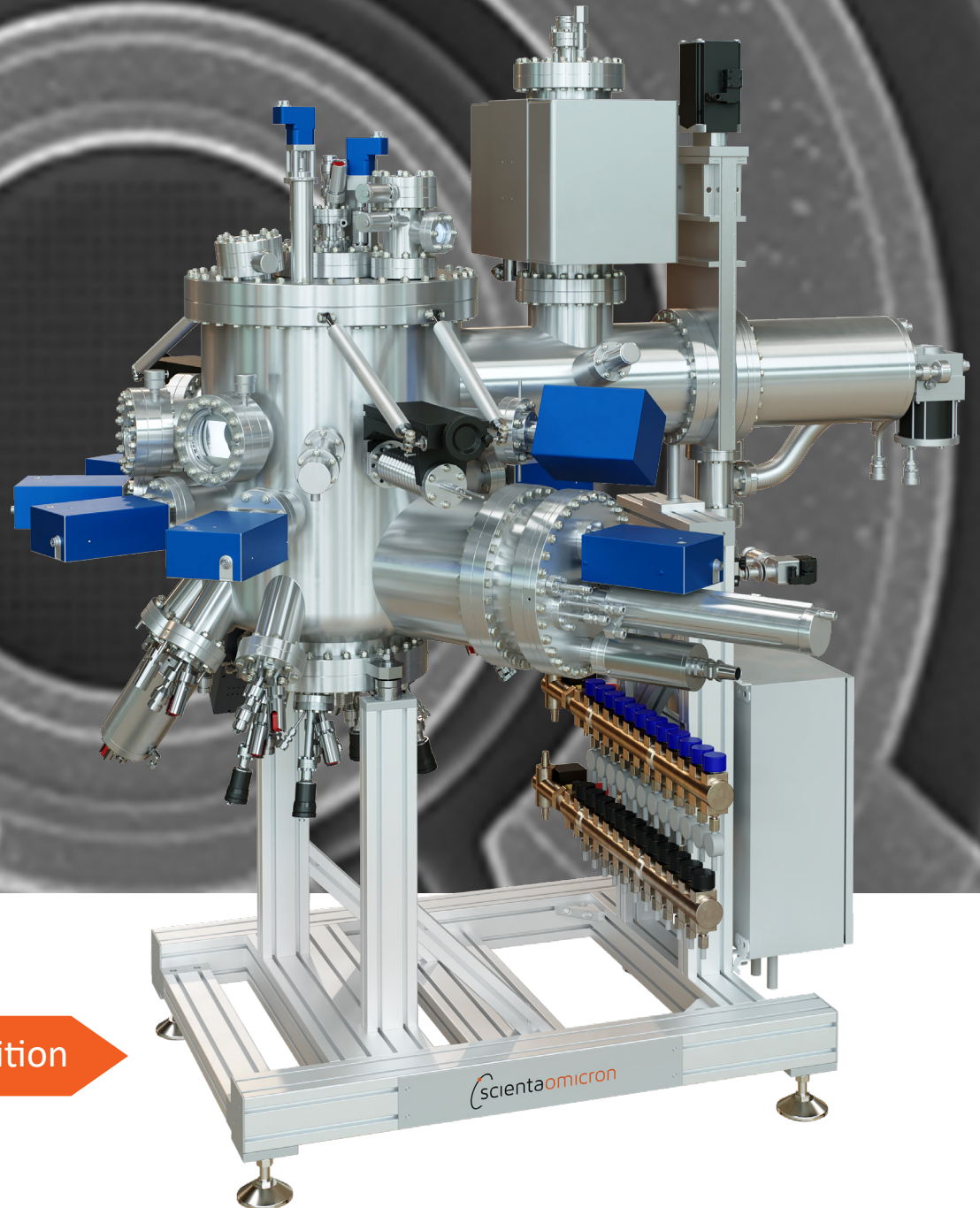




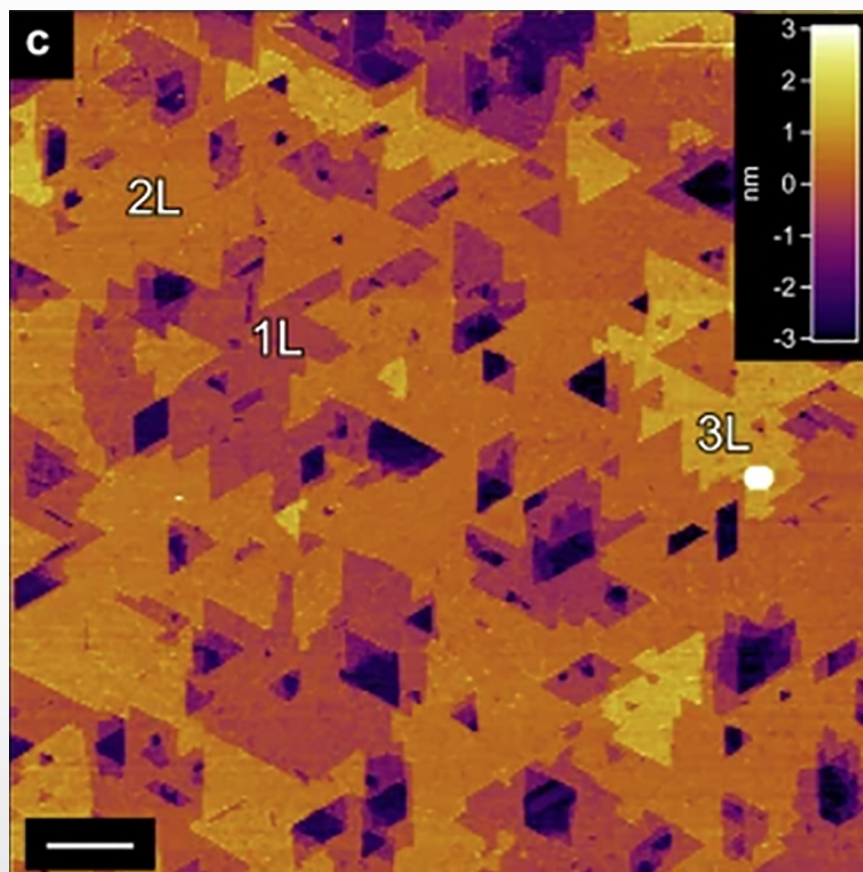
Thin Film Deposition

EVO 50 Molecular Beam Epitaxy System

Your pathway to innovation

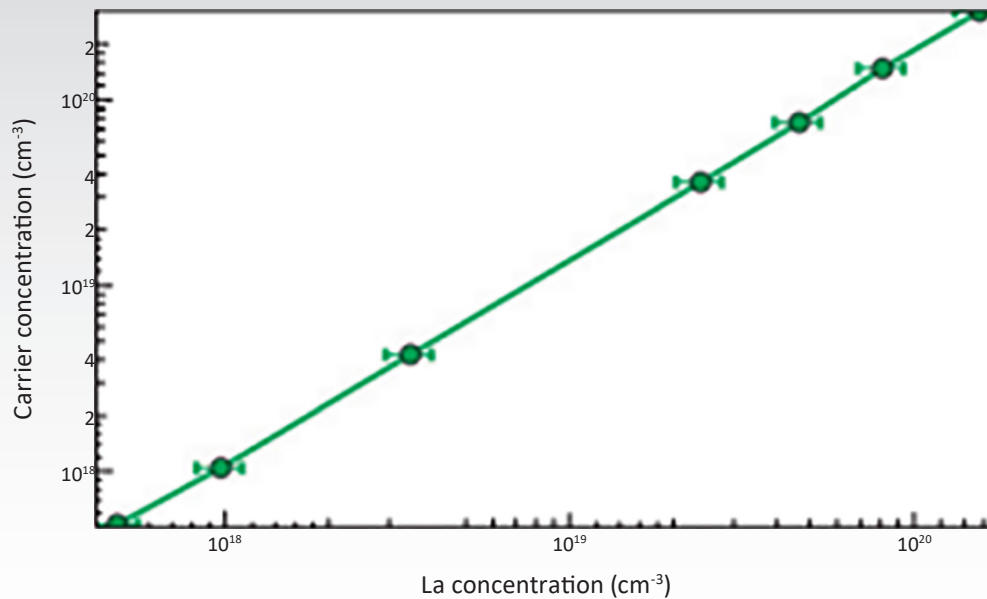
What will you discover?

The EVO 50 MBE System provides an advanced platform for high-purity thin-film deposition, tailored for a wide range of applications including optoelectronics, quantum computing, and high-speed electronics. Its optimized design enables the precise growth of ultrathin materials with outstanding reproducibility, making it an indispensable tool for cutting-edge research in materials science.



AFM image of ultrathin GaSe grown on the surface of GaAs using MBE. The scale bar is 500 nm long. Labels 1L, 2L, and 3L refer to monolayer, bilayer, and trilayer regions of the film

Son, J., Moetafeg, P., Jalan, B. et al. Epitaxial SrTiO₃ films with electron mobilities exceeding 30,000 cm² V⁻¹ s⁻¹. Nature Mater 9, 482–484 (2010)

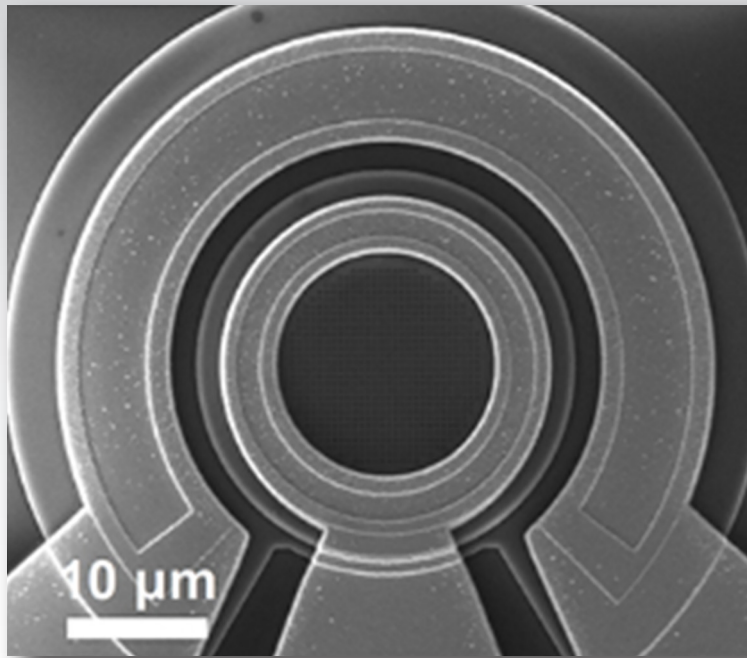


Carrier concentrations of SrTiO_3 films as a function of La-dopant concentration. Films were grown on $(\text{LaAlO}_3)_{0.3}(\text{SrAlTaO}_6)_{0.7}$.

Son, J., Moetakef, P., Jalan, B. et al. Epitaxial SrTiO_3 films with electron mobilities exceeding $30,000 \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$. Nature Mater 9, 482–484 (2010)

Innovation at Your Fingertips

The EVO 50 offers a highly flexible and customizable system that caters to the most stringent requirements of modern thin film deposition. Designed to provide exceptional control and efficiency, the system is optimized for growing ultra-high purity semiconductors and other advanced materials.



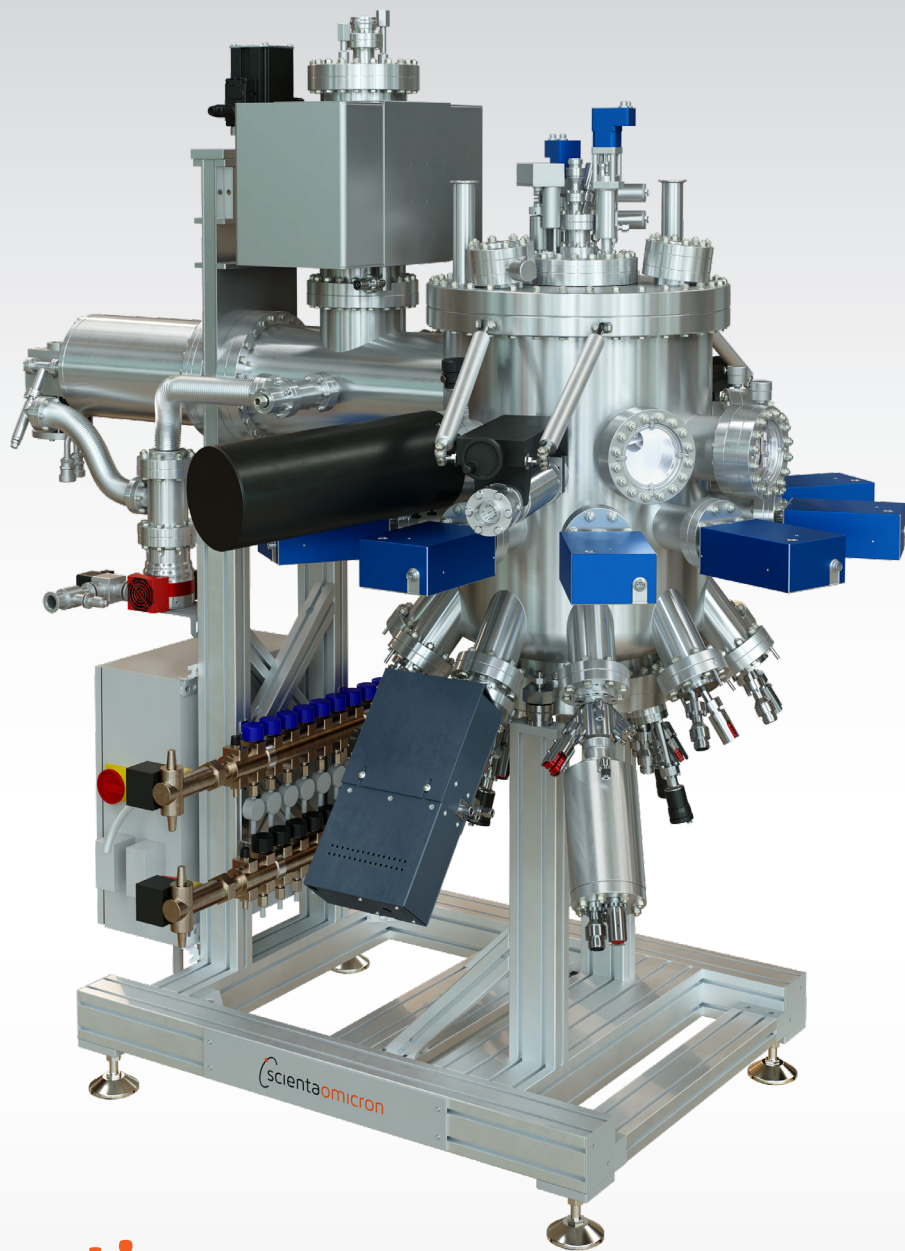
Scanning-electron-microscope (SEM) image of a 30-μm-diameter Ge PD with PhC. (c) Enlarged image of the resonant PhC integrated in the photodetectors.

Song J, Yuan S, Cui C, Wang Y, Li Z, Wang A, Zeng C, Xia J. High-efficiency and high-speed germanium photodetector enabled by multiresonant photonic crystal. Nanophotonics. 2021;10(3): 1081-1087.

Designed for Precision and Efficiency

The EVO 50 MBE system is engineered with state-of-the-art features to ensure superior deposition performance and ease of use.

- Advanced Control Software – Integrated Recipe Builder technology and automated flux calibrations.
- *In-Situ* Growth Monitoring – Enables real-time tracking and adjustment of film deposition.
- Energy-Efficient Design – Wake-up and sleep functions reduce energy consumption by up to 33 %.
- Magnetic Probe Sample Transfer – Facilitates rapid and precise substrate handling.
- Effusion Cell Fill Percentage Tracking – Allows real-time monitoring of material usage.
- AI/ML Integration – Compatible with AtomCloud and FairMAT, or configurable for custom AI models.
- Lowest liquid nitrogen consumption of its class (< 200 L/day)



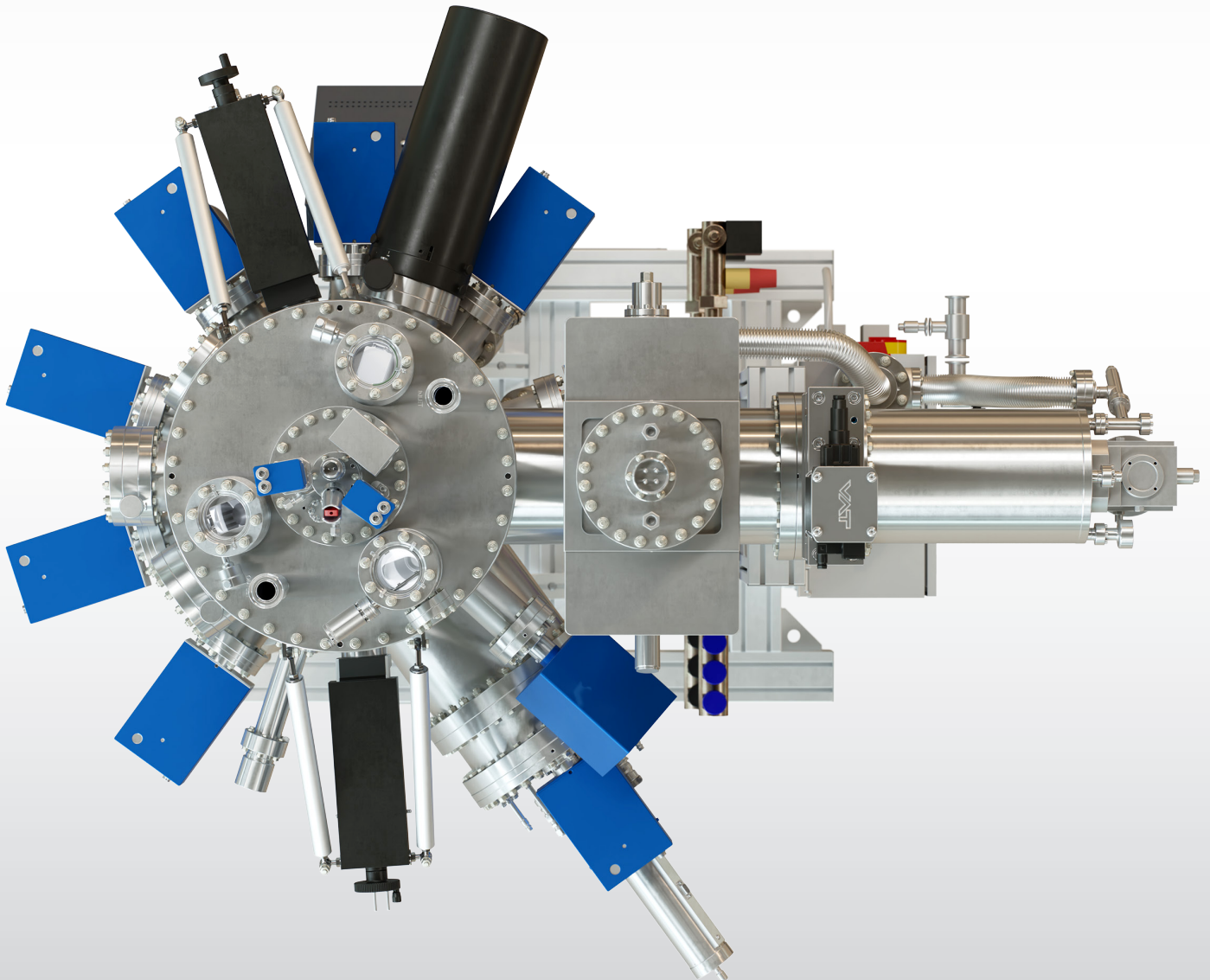
Applications

- **Optoelectronics** – Enables the growth of high-quality GaSe films with van der Waals epitaxy, paving the way for future thermoelectric materials.
- **Quantum Computing** – Achieves record electron mobilities exceeding $30,000 \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$ in oxide MBE systems, facilitating advancements in superconductivity research.
- **High-Speed Electronics** – Supports the fabrication of high-efficiency photodetectors for optical communication with bit rates up to 56 Gbps.

Flexible Configuration Options

The EVO 50 system is designed with versatility in mind, offering multiple configurations to meet research and industrial needs.

- Standalone System – A compact, efficient design for standard MBE applications.
- Integrated with Radial Distribution Chamber – Optimized for uniform material distribution.
- Integrated with Linear Transfer Line – Enables seamless integration with multi-chamber research setups.



Technical Highlights

Sample

Substrate minimum temperature	< 15 K
Substrate maximum temperature	1400 °C
Substrate manipulator options	15 K to 400 °C
	77 K to 1400 °C
	RT to 1400 °C
Sample sizes	1", 2" or 3" substrates

Chamber

Chamber material	Stainless steel
Base pressure	< 1 x 10 ⁻¹⁰ mBar
Pressure sensor	Ion gauge
Cryopanel	Double walled LN2 cryopanel
Bakeout temperature	Up to 150 °C

Analytics

RHEED
Film thickness monitor / Quartz crystal microbalance,
Beam flux monitor,
Residual gas analyser Pyrometer,
Optical flux measurement Spectroscopy,
Reflectivity and Curvature

Sources

10 sources as standard:
Low, mid and high temperature effusion cells,
E-beam evaporators, Gas and Plasma source,
Sputtering sources and organic sources



Get in touch with us at www.scientaomicron.com/contactus



Scientia Omicron Worldwide MBE install base

