



**Donnerstag, 26.06.2025, 15:30 Uhr**

Ort: Reichenhainer Str. 90;  
Zentrales Hörsaal- und Seminargebäude, Raum C10.013

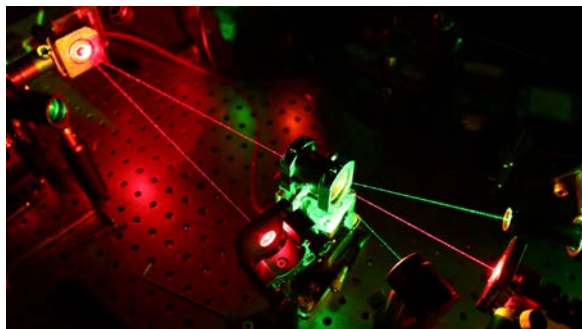
**Dr. Hermann Kahle**

Dept. of Physics & Astronomy, The University of New Mexico,  
Albuquerque, USA

## **Membrane External-Cavity Surface-Emitting Lasers: A Semiconductor Laser Technology for Every Wavelength**

Lasers are indispensable tools in science and industry, with specialized products tailored to an array of applications. Membrane external-cavity surface-emitting laser (MECSEL) as new class of semiconductor lasers are the latest evolution in a lineage that began with vertical-cavity surface-emitting lasers (VCSELs, or micro laser diodes), followed by the optically pumped vertical-external-cavity surface-emitting lasers (VECSELs), which bridge the gap between semiconductor lasers and solid-state thin-disk lasers. The defining feature of MECSELs is their simplicity: the laser consists solely of a few micrometer thin semiconductor gain membrane, sandwiched between transparent heat spreaders, and placed in a laser cavity. Unlike previous designs, MECSELs do not require monolithically integrated distributed Bragg reflectors (DBRs), which posed limitations by hampering heat dissipation and restricting design flexibility. Radical design simplification now enables several major advantages like broadband gain, scalable performance via multi-pass in-well pumping, and a new freedom in gain material selection and bandgap engineering. By eliminating monolithically integrated DBRs, MECSELs overcome critical barriers limiting their wavelength accessibility.

With the intrinsically high beam quality of vertical emitters, MECSELs open the door to unprecedented versatility in laser development. In terms of wavelength accessibility there are almost no more limits –if you can make an LED, there can also be a laser. Let's explore this groundbreaking new technology. Maybe there will soon be a laser for the wavelength you are looking for.



Alle Zuhörer sind ab 15:15 Uhr zum Kaffee vor dem Hörsaal eingeladen.