

The Warsaw PhD School in Natural and Biomedical Sciences and the
Institute of High Pressure Physics PAS cordially invite you to
a **SPOTLIGHT TALK**

***Membrane external-cavity surface-emitting lasers
(MECSELS): State of the art and a glimpse
into the future***

given by

Dr. Hermann Kahle

University of New Mexico, Albuquerque, United States

on August 20th, 2024, 15:30

at the IHPP PAS New Technologies Building,
Al. Prymasa Tysiąclecia 98, seminar room, 2nd floor
Duration: 60+ min

and online via Zoom:

<https://us02web.zoom.us/j/8352053896?omn=87553102310>

All Warsaw-4-PhD students (and others) are very welcome!

Abstract

In recent years, membrane external-cavity surface-emitting lasers (MECSELS) have made rapid progress. A historical introduction will be given. The developments in this field are summarized and discussed, and an overview of the state of the art is given. Key advances, such as radical design simplification, double-side pumping and the ability to scale performance, play a major role. It also discusses the most important aspects of active region membrane design in terms of flexible pumping capabilities enabled by the absence of an integrated DBR and substrate.

Specifically, optical pumping of a relative thick membrane will be discussed and the latest results from newly designed broadband structures optimized for a very wide tuning range by employing two different kinds of quantum wells, will be given. The talk will be summarized by a short glimpse into the future about extending this technology to other material systems.

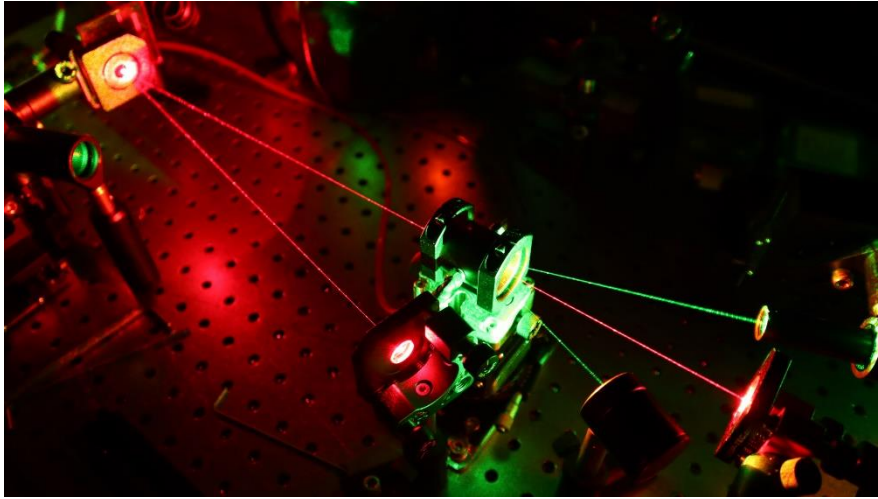


Fig. 1. Photo of the working MECSEL.



Dr. Hermann Kahle received his PhD in Physics at the University of Stuttgart, Germany, in 2016. The thesis was performed at the Institute for Semiconductor Optics and Functional Interfaces on the detailed investigation and optimization of red emitting semiconductor disk laser structures. He developed a novel concept - the membrane external-cavity surface-emitting laser (MECSEL) with first double-side diamond cooling implementation. After PhD graduation he moved to Tampere, Finland, where he joined the Optoelectronics Research Centre (ORC) at the Tampere University in 2017. He was granted an Academy of Finland Postdoctoral Researcher position in 2018 and was leading a research team further developing and investigating this novel category of heat spreader sandwiched membrane structures as laser gain elements with optimized cooling and broad tuning until 2022. After a short research stay in 2022 at Kassel University, Germany, he was with the Paderborn University, Institute for Photonic Quantum Systems (PhoQS) in 2023. Since April 2024 he is a Postdoctoral Research Fellow at University of New Mexico in the Department of Physics and Astronomy.