

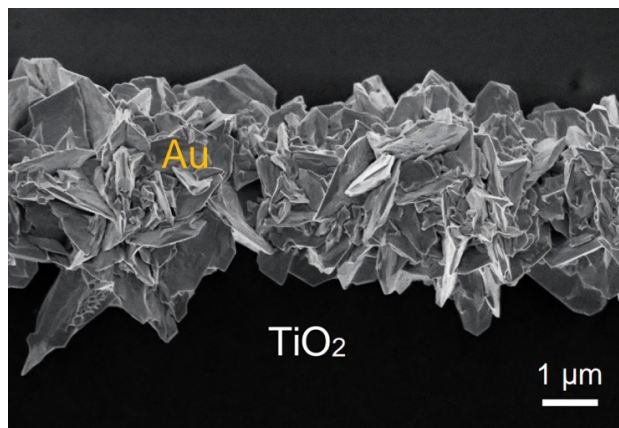
## **Photocatalytic Growth and Pruning of Gold Structures on TiO<sub>2</sub> for Adaptive Neuromorphic Systems**

***Dr. Fatemeh Abshari, Uni Kiel***

**CHyN, Rm.-301, 28. October 2025, 13.15h**

### **Abstract**

In this talk, Dr. Fatemeh Abshari presents her doctoral research on the photocatalytic growth and chemical dissolution of gold nanostructures on titanium dioxide (TiO<sub>2</sub>) substrates, targeting the development of adaptive material platforms for neuromorphic applications. The study investigates UV-induced photocatalytic reactions for spatially controlled deposition of conductive gold lines, enabling the formation of axon-like interconnections on patterned TiO<sub>2</sub> substrates. Complementary chemical dissolution allows selective pruning and reconfiguration of these metallic pathways, establishing a dynamic framework to emulate neural adaptability. Systematic studies revealed the influence of UV intensity, precursor concentration, and substrate design on the morphology and electrical conductivity of the resulting structures. Overall, this work demonstrates a novel materials-based approach to neuromorphic engineering, linking nanoscale growth and dissolution dynamics to the realization of reconfigurable and self-adaptive electronic networks.



### **Speaker**

Dr. Fatemeh Abshari was born in 1991 in Tehran, Iran. She received her Bachelor's and Master's degrees in Electronic Engineering in Iran. Her Master's thesis focused on developing novel luminophore layers for improved optical oxygen sensing. She completed her PhD in Nanoelectronics at Kiel University in March 2025. Her research focuses on the cleanroom fabrication and characterization of micro- and nanoscale devices.