



# SFB1242

Nichtgleichgewichtsdynamik kondensierter  
Materie in der Zeitdomäne

UNIVERSITÄT  
DUISBURG  
ESSEN

Open-Minded

**29.04.2025 / 10 Uhr c.t., Raum MG 272  
Campus Duisburg**

## **KISS exfoliation of 2D materials for ARPES studies**

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Two-dimensional (2D) materials offer a rich platform for investigating novel quantum phenomena and designing nanostructures with tailored functionalities. However, key characterization techniques such as photoemission spectroscopy impose strict requirements on sample quality, size, and surface cleanliness — conditions that are often difficult to meet using standard mechanical exfoliation methods, even within a glove box environment. In this seminar, I will present a method for in situ exfoliation of 2D materials — the kinetic in situ single-layer synthesis (KISS) method — performed directly under ultra-high vacuum (UHV) conditions [1,2]. This technique enables the preparation of large-area, high-quality flakes with excellent crystallinity, and is particularly well-suited for air-sensitive materials, as it completely avoids exposure to ambient conditions. Using the KISS method, we successfully exfoliated various semiconducting and metallic transition metal dichalcogenides, as well as kagome materials, onto Au, Ag, and Ge substrates, demonstrating broad applicability of the KISS method. I will discuss the electronic structure of these materials, probed using angle-resolved photoemission spectroscopy, and discuss possible future applications.

[1] A. Grubišić-Čabo, M. Michiardi, C. E. Sanders, M. Bianchi, D. Curcio, D. Phuyal, M. H. Berntsen, Q. Guo, M. Dendzik. *Adv. Sci.*, **10** (2023) 2301243.

[2] Z. Dan, R. Sarmasti Emami, G. Feraco, M. Vavali, D. Gerlach, Y. Zhu, M. F. Sarott, P. Rudolf, A. Grubišić-Čabo. *Front. Nanotechnol.* **7** (2025); arXiv: 2501.00815

**Für diese Zeit steht eine Kinderbetreuung nach vorheriger Anmeldung zur Verfügung.**

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