NEWSLETTER AUTUMN 2024

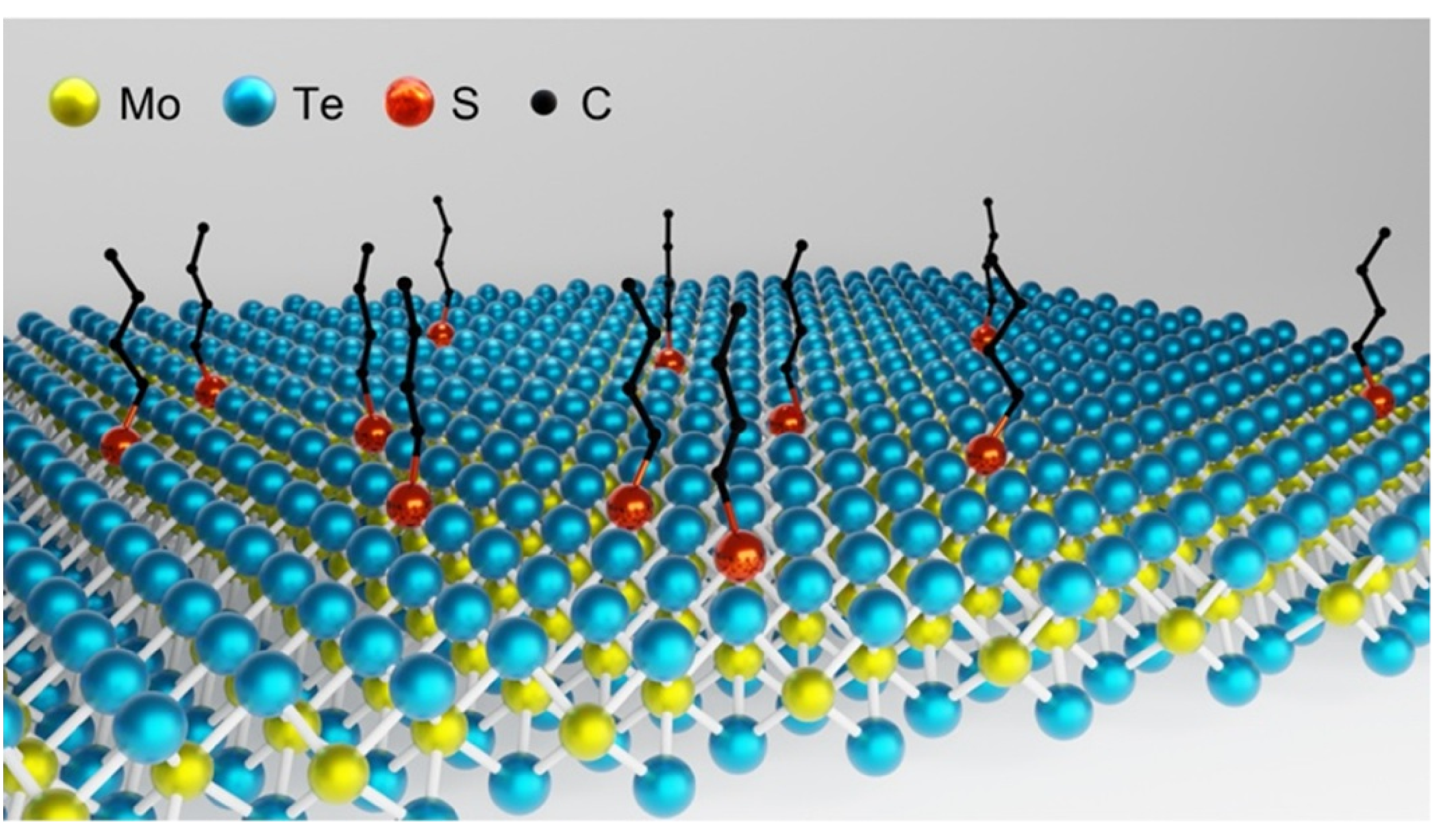
Dear reader,

Welcome to the second edition of our 2D-PRINTABLE newsletter! We are excited to bring you the latest news on the 2D-PRINTABLE project, and its developments in novel 2D materials and heterostructures for Printed Digital Devices using sustainable liquid exfoliation and deposition methods. In this edition, we highlight significant advancements and key milestones achieved by our partners across Europe. Want to stay up-to-date with the latest breakthroughs in 2D materials?
Click on this link to learn more about 2D-PRINTABLE and subscribe to our newsletter.

Project results

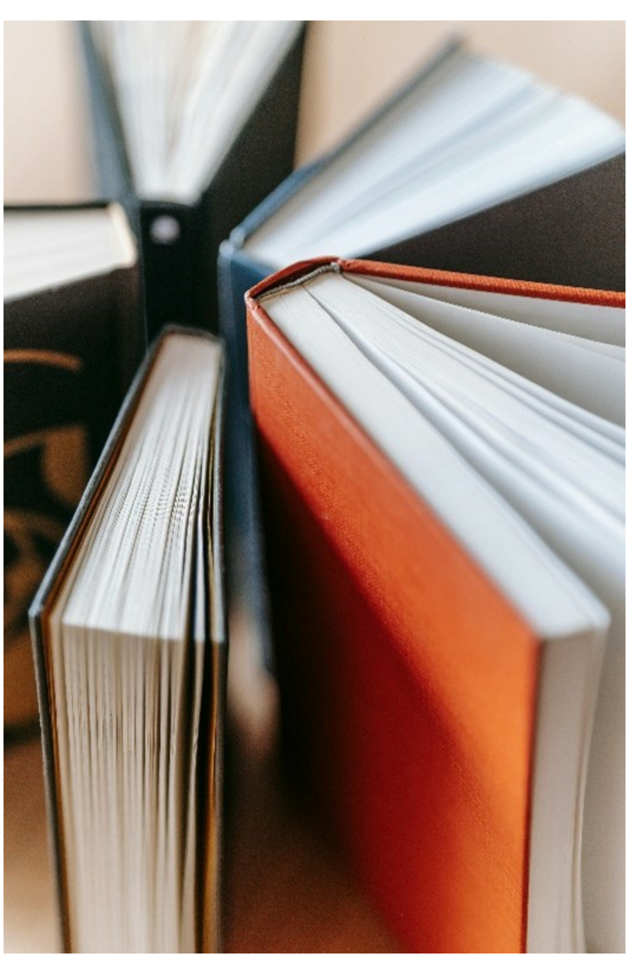
We're excited to share the latest results from our recent project efforts! This section highlights key milestones and impactful outcomes achieved by the team.

- Recent advancements in the defect and covalent functionalization of two-dimensional (2D) materials have been achieved, using transition metal dichalcogenides (TMDs) as the model substance. Read more about this achievement on our website here.
- The novel 3D synthetized crystals were subjected to liquid-phase exfoliation (LPE), resulting in new 2D materials displaying outstanding properties. These materials were subsequently exfoliated by sonication-assisted liquid-phase exfoliation in different solvents and by electrochemical exfoliation. Explore additional insights on our website here.
- A series of novel 2D materials have been produced from layered crystals using sonication assisted liquid phase exfoliation (LPE), electrochemical exfoliation (EE), chemical exfoliation (CE) and wet-jet milling (WJM). Our 2D-PRINTABLE partners have demonstrated that different LPE approaches can yield nanosheets in quantities that enable the practical exploitation of these novel materials for device applications, read more about this achievement on our website.
- 2D-PRINTABLE achieved significant progress by developing cutting-edge 2D materials for next-generation printed electronics by focusing on improving the quality and performance of materials. Discover more about our findings here.



The 2D-PRINTABLE publications are out!

The latest publications of several groundbreaking studies of 2D-PRINTABLE partners are now available



- "*Understanding How Junction Resistances Impact the Conduction Mechanism in Nano-Networks*", published by TCD in Nature Communications, presents a model for electrical conduction in networks of 1D or 2D nanomaterials, enabling the extraction of junction and nanoparticle resistances from particle-size-dependent DC network resistivity data.
- "*High-κ Wide-Gap Layered Dielectric for Two-Dimensional van der Waals Heterostructures*", by VSCHT in ACS Nano. The research demonstrated that LaOBr can be used as a high-κ dielectric in van der Waals field-effect transistors with high performance and low interface defect concentrations.
- "Defect-engineering of liquid-phase exfoliated 2D semiconductors: stepwise covalent growth of electronic lateral hetero-networks" by UNISTRA and TCD, featured in Materials Horizons. This study presents a novel method for synthesizing two-dimensional (2D) in-plane heterostructures with enhanced optical and electrical properties, surpassing traditional methods that rely on labor-intensive and energy-consuming growth processes.

For a full list of our publications, visit our website here.

Get to know 2D-PRINTABLE partners

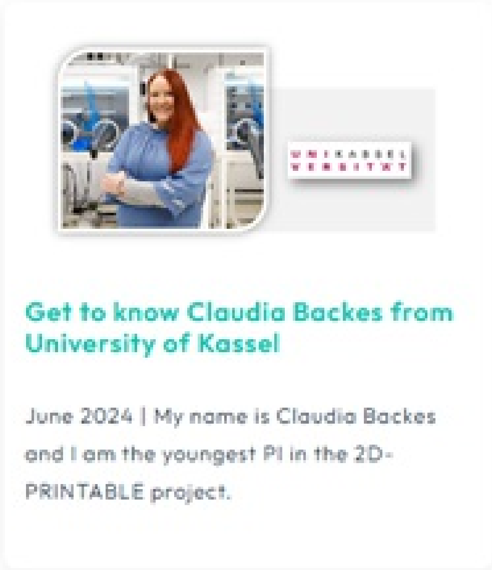
Get ready to read about our 2D-PRINTABLE team. Read exclusive interviews where they share their expertise, challenges, and visions for the future. In our second newsletter, we introduce the project coordinator Jonathan Coleman (TCD), Paolo Samori (UNISTRA), Claudia Backes (UKa), Zdenek Sofer (VSCHT) and Joka Buha (BeD)

Get to know Joka Buha from BeDimensional

October 2024 | My name is Joka Buha from BeDimensional.

Get to know Zdenek Sofer from University of Chemistry and Technology Prague

September 2024 | My name is Zdenek Sofer, i am one of the Principal Investigators (PI) in the......



Get to know Claudia Backes from University of Kassel

June 2024 | My name is Claudia Backes and I am the youngest PI in the 2D-PRINTABLE project.

Get to know Paolo Samori from the University of Strasbourg

May 2024 | I was simply very curious about what was happening around me

Get to know Jonathan Coleman from Trinity College Dublin

May 2024 | He is the coordinator of the 2D-PRINTABLE project

Graphene Week 2024 in Prague

Our team had a strong presence at **Graphene Week 2024** in Prague, Europe's leading event dedicated to 2D materials, where we actively contributed to the program's organization and shared our latest project achievements. Supported by the European Commission, this leading conference gathered over 400 experts from academia and industry. We showcased our advancements, exchanged insights, and connected with top minds across the field, driving forward the innovation and collaboration at the heart of our work.

Project Partners

2D-PRINTABLE joins a multi-disciplinary consortium with 7 Universities and 2 SMEs, located in 7 European countries including Ireland, France, Italy, Germany, Czechia, Switzerland and the Netherlands, to advance the field of 2D materials and unlock the full technology's potential to play a significant role in the future of European digital electronics manufacturing.

Facts & Figures

Acronym: 2D-PRINTABLE
Duration: 36 months
Start date: 1st October 2023
Total budget: 4,092,496.25€
EC Funding: 3,999,996.00€

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