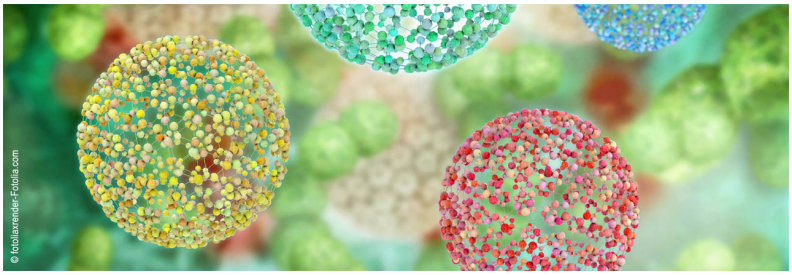

Contribution ID: **52** Type: **Poster**

H-BN to the Future: Growing High Quality 2D Hexagonal Boron Nitride on a Liquid Metal Catalyst

Two-dimensional materials (2DM) are one or few atom thick crystals with high stability whose physical properties governed by extreme quantum confinement. One such material is hexagonal boron nitride (h-BN) or "white Graphene" which is a wide-bandgap semiconductor that holds great promise for a wide range of applications, including batteries, supercapacitors, thermal management, drug delivery and even cosmetics. However, the large-scale synthesis of high-quality 2D h-BN remains a challenge.

In this work, we present the first in-situ monitoring of h-BN growth on a liquid metal catalyst via Chemical Vapor Deposition (CVD), using the state of the art LMCat reactor (see https://lmcat.eu). By optimising experimental conditions such as temperature and precursor flows, and employing in-situ, real-time monitoring via radiation-mode optical microscopy, we aim to gain insights into h-BN growth process and its influencing factors.

Our research focuses on understanding the growth dynamics of h-BN flakes during the CVD process, with the goal of achieving improvements in structural quality and size. Preliminary results indicate successful h-BN growth, and further analysis using synchrotron X-ray diffraction is planned to assess sample quality. This study contributes to the advancement of 2D h-BN synthesis techniques, with potential implications in the development of novel materials and applications. Future efforts will target optimising growth techniques to enable large-scale, high-quality 2D h-BN production.

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