Wafer-Scale Integration of 2D Materials for Back-End-of-Line Processing

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Layered materials with atomic-scale thicknesses (2D materials) have the potential to transform electronics and photonics. Yet their industrial adoption remains limited by the lack of a viable integration technology that can exploit the well-established silicon semiconductor manufacturing infrastructure at scale.

In this talk, we present recent advances in 2D material integration enabled by an innovative wafer-scale transfer technique developed by In2great Materials AB, a spin-off from KTH Royal Institute of Technology in Stockholm (Sweden). In2great's foundry-ready platform brings atomically thin materials into conventional semiconductor manufacturing and is compatible with back-end-of-line processes, enabling 2D-material-based sensors and photonic components and supporting a scalable path toward next-generation electronics and photonics.

The approach is based on wafer bonding and uses equipment, processes, and materials already available in large-scale semiconductor production lines. It is compatible with fully automated tools and largely independent of recipient wafer topography and surface properties, allowing large-area 2D materials to be integrated onto a broad range of processed device substrates. Together, these advantages help lower the barriers to industrial adoption.

References

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