IBS Center for Multidimensional Carbon Materials

Special Guest Speaker

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High quality graphene/MX2 growth
Work towards a technology compatible 2D transfer
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The promising future of 2D materials in the semiconductor industry

Monday, Feb 15
1:30P.M.

Bldg. 101
Seminar room on the 1st floor

Since five decades, the scaling of the CMOS transistor has been revolutionizing our society. As we enter into the era of functional scaling where the crossroads of More-Moore and More-Than-Moore meet, the search for new devices and their enabling material comes to the forefront of technology research. 2D crystals provide very interesting form-factors with respect to traditional 3D crystals (bulk, Si, and III-V semiconductors). In this elegant 2D form, electronic structure, mechanical flexibility, defect formation, and electronic and optical sensitivity become dramatically different.

2D materials (e.g. graphene and MX2) represent interesting alternatives to traditional Si-based transistors. When introducing some MX2 materials in the channel of a MOSFET, the device could show superior immunity to short channel effects. These materials are also being considered for tunnel-FET (or TFET) applications, where carrier transport happens through band-to-band tunneling. These TFETs are considered promising candidates for low power electronics. In optoelectronics, the combination of broadband absorption and high carrier mobility of graphene turns out very beneficial in graphene modulators for optical interconnects. Researchers at Imec are also assessing the potential of doped multilayer graphene to replace copper wiring in back-end-of-line interconnects.

The talk will end with a dive into the world of high quality graphene growth and the associated transfer challenges. Today, a technology compatible graphene integration is still missing. One of the main reasons is the lack of a reliable and technology compatible transfer route.

You are cordially invited to attend!