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The new nanoARPES at MAESTRO of the ALS ROLAND KOCH, SIMON MOSER, SOREN ULSTRUP, LUCA MORESCHINI, CHRIS JOZWIAK, AARON BOSTWICK, ELI ROTENBERG, Lawrence Berkeley National Laboratory
— In 2016, the new Microscopic and Electronic STRucture Observatory (MAESTRO) at the Advanced Light Source achieved first commissioning results. This unrivaled experimental system fuses a powerful sample preparation program (glovebox, MBE, PLD) with state of the art photoemission end stations (μARPES, PEEM, nanoARPES) – all of which are connected through an automated UHV transfer system. A particularly novel feature of MAESTRO is its nanoARPES setup. This technique mates the merits of state of the art angle resolved photoemission (ARPES) with spatial resolution presently less than 120 nm, with an eventual goal of less than 50 nm, bringing k- and energy resolved electronic contrast on the nano- and mesoscale within reach. In this talk, we will present the key features of this machine and demonstrate its operation in two experimental showcases: data obtained on graphene sheets grown from SiC reveal fascinating landscapes of "volcanos" spitting out rivers of "carbon magma" at unprecedented resolution. Data on dichalcogenide WS_2 nano-plates supported by TiO_2 exhibit a wealth of detailed information on its chemical composition and band structure, and directly correlate to the spatially-dependent photoluminescence signal.

Simon Moser
Lawrence Berkeley National Laboratory

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