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The Molecular Foundry: a nanoscience user facility[1]

J.B. NEATON, The Molecular Foundry, Materials Sciences Division, Lawrence Berkeley National Laboratory

In this talk, I will describe current and planned activities at the Molecular Foundry, a new national nanoscience center at Lawrence Berkeley National Laboratory funded by the Department of Energy. The Foundry's mission is to provide scientists in academia, the national labs, and industry with resources–materials, instrumentation, and access to scientific staff–for synthesis, characterization, and assembly of nanostructures. User support and in-house research will be carried out by staff and postdoctoral fellows in six closely coupled facilities: the Inorganic, Organic, and Biological Nanostructures Facilities for synthesis, preparation, and assembly; the Nanofabrication Facility for processing and integration; the Imaging and Manipulation Facility; and the Theory Facility for understanding and modeling. The diversity across these facilities reflects the multidisciplinary nature of nanoscience and will provide a unique environment for discovery and development. After summarizing the Foundry program, I will present some examples of Foundry research during its initial ramp-up phase. In particular, recent results from several on-going user and internal projects of the Theory Facility highlighting complex physical phenomena at the nanoscale will be discussed. These projects include investigation of fluorescence shifts in nanostructures, level alignment at the metal-organic interfaces, and electron transport through single molecules at finite bias.

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