

3-D atom-by-atom dissection of materials

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After a long gestation period, atom-probe tomography (APT) is finally coming of age. The availability of reliable and well-engineered commercial instruments and data analysis software has meant that APT is now being applied to a broad range of materials, including oxides, organic/inorganic interfaces, and biological materials, as well as metals and semiconductors. In this presentation, I will describe the underlying physics of laser-assisted field evaporation which is the cornerstone of APT analysis. I will also describe the science and practice of its use to achieve 3-D atom-by-atom maps of different materials including nanoscale metal-semiconductor interfaces and isotopically engineered quantum materials.