

Atom Probe Tomography - 3D Subnanometer chemical imaging extended to Photovoltaic and Geological Materials.

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Atom probe tomography (APT) has been used for over 45 years, “to determine the composition of small volumes of metals, semiconductors, and some ceramics” [1]. Although this statement is still true some 12 years after it was written, it does not adequately capture the recent expansion and maturation of APT into non-metallurgical applications. Historically, the low analysis success rate in non-metallurgical applications limited the utility of the technique for such materials, but the recent introduction of laser-mode atom probe has been truly revolutionary in its impact. It is now routine for analyses to be conducted on non-conducting materials systems and there are a wide variety of studies now in the literature. These include analyses of semiconductor materials [2], LEDs, photovoltaics and even ceramics. Several novel examples will be presented in the current work including LEDs [3, 4], solar cells [5, 6] geology [7] and cosmology [8].

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