

Walking the Plank: Solar Cell Nanowire Arrays Probed *in situ* by Surface Potential Microscopy

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Nanostructured III-V semiconductors have brought third generation photovoltaic devices to the brink of mass application. InP nanowire arrays have already demonstrated excellent performance, offering high efficiency and low cost. Perfecting device fabrication and performance will require intimate knowledge and utmost control over the semiconductor nanosurfaces. We present an *in situ*, cross-sectional Kelvin probe AFM technique for measuring nanowires within the array along their axis. Whereas alternative methods involve destructively removing nanowires from their growth substrate, we keep the structures intact and on their original growth substrate. This ensures relevance and precision while probing *p-n* junction surfaces. Ambiently measuring arrays gives timely feedback for subsequent processing. Selectability allows comprehensive single-nanowires characterization when combined with other electronic/spectroscopic techniques (e.g. EBIC).

