

Abstract Submitted  
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**Spectral Rayleigh Imaging of Carbon Nanotubes Using Dark-field Microscopy with Index-Matching Media** LIHONG HERMAN, DANIEL JOH, JIWOONG PARK, Cornell University — We present a novel technique for investigating the elastic scattering of carbon nanotubes (CNTs) with high signal-to-noise ratio by using a modified darkfield microscope. Our method allows for high-throughput imaging of CNTs directly on a solid substrate with diffraction-limited optical and spectral resolution, enabling us to determine key resonance parameters such as resonance wavelength, intensity, and peak widths for their respective Rayleigh spectra. In conjunction with AFM measurements, this technique permits us to assign specific sub-band transitions, and even identify structural  $(n, m)$  values. By characterizing many CNTs in parallel, we can furthermore determine metallic to semiconducting ratios and the density of chirality-changing events for a given sample.

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