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Abstract for an Invited Paper
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Electrical, Mechanical, and Optical Studies of Carbon Nanotubes of Known Chiral Index.

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Because small changes in the crystal structure (chirality) of carbon nanotubes can produce large changes in their electrical properties, it is important to understand the relationship between structure and transport properties, both for basic science and for applications. We have developed a unique set of tools for characterizing and manipulating nanotubes that allow for detailed studies of the properties of known-chirality nanotubes. Completed and ongoing studies include: structure-correlated optical properties; tube-tube interactions; variable electron-phonon coupling; electromechanical properties; structure-correlated electrical transport; nanotube intermolecular heterojunctions; and mechanical stiffness and strength.