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Extreme Thermal Stability of Carbon Nanotubes GAVI BEGTRUP, KEITH G. RAY, BRIAN M. KESSLER, THOMAS D. YUZVINSKY, HENRY GARCIA, ALEX ZETTL, University of California, Berkeley — The versatility of carbon-carbon bonding creates a wealth of extraordinary physical properties. Of the two common allotropes of carbon, diamond (sp-3 bonded) exhibits record thermal conductivity but is meta-stable and transitions to graphite at elevated temperatures. Graphite (sp-2) is electrically conducting but sublimes at temperatures as low as 2400K. Carbon nanotubes (also sp-2) capitalize on the extraordinary strength of the sp-2 hybridized carbon-carbon bond and exhibit high electrical and thermal conductivities as well as tremendous mechanical strength. Here we report a new technique to measure the thermal properties of nanosystems. We apply this technique to determine the extreme high temperature stability and thermal conductivity of multiwalled carbon nanotubes.

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