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Aligned Single-Walled Carbon Nanotube Cantilevers ALEXANDER RUYACK, Materials Science and Engineering, Cornell University, Ithaca NY, SAMANTHA ROBERTS, Department of Physics, Cornell University, Ithaca NY, IVE SILVESTRE, Department of Physics, Universidade Federal de Minas Gerais, Brazil, ARTHUR BARNARD, School of Applied and Engineering Physics, Cornell University, Ithaca NY, RODRIGO LACERDA, Department of Physics, Universidade Federal de Minas Gerais, Brazil, PAUL MCEUEN, Department of Physics, Kavli Institute at Cornell for Nanoscale Science, Cornell University, Ithaca NY — Researchers are striving to make smaller cantilever sensors with higher resonant frequencies in an effort to enhance force, position and mass detection sensitivity. With its minimal mass and high Young's modulus, a single wall carbon nanotube (SWNT) cantilever is suggested to represent the ultimate limit of this trend. We will present a novel nanolithography method that has been developed utilizing highly aligned SWNT's grown via chemical vapor deposition which are then transferred to a silicon/silicon dioxide substrate planarized with chemical mechanical polishing. This method allows us to create arrays of $\sim$ 1 nanometer diameter aligned SWNT cantilevers of tunable length (typically 75 to 700 nanometers) with densities on the order of one cantilever per micrometer. Details about the nanofabrication process analyzed via imaging techniques such as scanning electron microscopy and atomic force microscopy will be discussed. Our future work will include characterization of the mechanical properties of these cantilevers and possible applications in biological sensing.

Alexander Ruyack
Materials Science and Engineering, Cornell University, Ithaca NY

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