Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Optical excitation of carbon nanotubes drives stoichiometric reaction with diazonium salts LYNDSEY POWELL, University of Maryland, YANMEI PIAO, NIST, YUHUANG WANG, University of Maryland, YUHUANG WANG RESEARCH GROUP TEAM — Covalent chemistry is known to lack the precision required to tailor the physical properties of carbon nanostructures. Here we show that, for the first time, light can be used to drive a typically inefficient reaction with single-walled carbon nanotubes in a more stoichiometric fashion. Specifically, our experimental results suggest that light can enhance the reaction rate of diazonium salt with carbon nanotubes by as much as 35-fold, making possible stoichiometric control of the covalent bonding of a functional group to the sp^2 carbon lattice. This light-controlled reaction paves the way for the possibility of highly selective and precise chemistry on single-walled carbon nanotubes and other graphitic nanostructures.

Lyndsey Powell
University of Maryland

Date submitted: 25 Nov 2015 Electronic form version 1.4