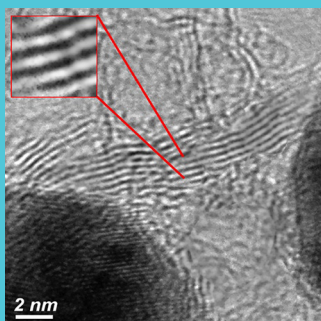


**COMPUTATIONAL MATERIALS
SCIENCE SEMINAR****LINEAR CARBON CHAINS:
ULTIMATE 1D CRYSTALS****Speaker:****Dr. Stella
Kutrovskaya****International
Center
for Polaritonics,
Westlake University,
China****ABSTRACT**

Carbynes are ultimate monoatomic one-dimensional crystals that are expected to possess a variety of unique physical properties. The synthesis of free standing linear carbon chains would have an impact on the material science community comparable with the impact of the fabrication of fullerenes, graphene and carbon nanotubes. Till now, all experimental attempts to synthesize unstable carbon allotrope met with significant difficulties. Our approach is in stabilization of linear monoatomic carbon chains due to the effect of a liquid medium and by metal nanoparticles attached at the ends of a chain. We characterize the crystal structure of stabilized polyyne chains using the X-ray diffraction method and high resolution TEM. The features corresponding to single and triple electronic bonds have been also clearly seen in the Raman spectra. These chains are bound by Van-der-Waals force and form a characteristic hexagonal lattice on a metallic surface. The optical spectra show resonances characteristic of straight linear carbon chains containing from 8 to 24 atoms. Synthesised carbyne is a direct-gap semiconductor sustaining excitons and trions.

BIOGRAPHY

Master degree in laser technics and laser technologies with honor, Vladimir state university
PhD in Physical and Mathematical Sciences, Moscow State University
Associate professor in laser physics, Vladimir state university

Feb 2007 – Aug 2012 – Administrative positions: an engineer, head of laboratories of department Physics and applied mathematics, vice director of the Innovative education center at Vladimir State university, Russia. Sept 2012 – Dec 2015 – Teaching experience included Senior lecturer and Associate professor positions, Vladimir state university, Russia. Jan 2016 – Sept 2018 – Leading researcher at International Center for Quantum Optics & Quantum Technologies Limited Liability Company (RQC), Nation University of Science and technology (MISIS), Moscow. Sept 2018 – present – Senior research scientist at International Center for Polaritonics, Westlake University, China.

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