511th ASRC Seminar

Date: 13:30 ～14:30, 18 April

Location: Meeting room 103, ASRC Building

Speaker: Dr. Leonid A. Chernozatonskii

(N.M.Emanuel Institute of Biochemical Physics,
Russian Academy of Sciences)

Title: Nanostructures and spintronics

Spintronics is an emerging technology, that exploits electron spin for information storage and processing, could potentially offer power savings, low variability and improved scalability. Utilization of nanoscale materials makes possible heterogeneous integration of dissimilar materials by accommodation of strain and minimizing defects. Due to their technological relevance, the most important effects on which commercial spintronic devices are based will be considered: giant magnetoresistance, tunneling magnetoresistance and spin torque and other peculiarities of semiconductor spintronics. In all these cases, physical systems and/or devices are authentic nanostructures, that is, artificial, nanosized structures characterized by carefully controlled geometries in spite of their reduced dimensions. The main attention in the talk will be paid for spintronics applications using carbon nanostructures: nitrogen-vacancy centers in diamond; metal-filled and decorated carbon nanotubes; graphene (Ni/graphene/Ni nanostructures, bilayer graphene pseudospin valve, magnetism of graphene quantum dots). Based on theoretical predictions, the methods to synthesize the nanostructures for some spintronic applications are proposed.

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