

Scientific recognition for Dr. Leyla Majidi Fardvatan

Dr. Leyla Majidi Fardvatan, who is a postdoctoral researcher at the School of Nano Science and granted by the Iran Science Elites Federation, has received the "Young researcher award" of the 10th International Conference on Magnetic and Superconducting Materials (MSM17).

In recent years, there have been various breakthroughs in the science and technology of superconducting and magnetic materials. Despite the vast achievements made after these discoveries, further advances are required in the basic understanding and application of these very important and applicable materials.

She has been working on the transport properties of heterostructure systems including superconductivity and magnetic materials. Based on her studies the unusual features of the charge and spin transport characteristics are investigated in new two-dimensional crystalline materials such as thin films of topological insulators and monolayer phosphorene. The possibility of generating intraband specular Andreev reflection with unit efficiency is realized in a topological insulator thin film normal/superconducting junction in the presence of a gate electric field. Then, the magnetotransport characteristic of a monolayer phosphorene ferromagnetic/normal/ferromagnetic junction with noncollinear magnetization is investigated. The high in-plane structure anisotropy of puckered phosphorene results in anomalous properties of the charge conductance. The proposed structure exhibits giant magnetoresistance, which can be tuned to unity. Spin-transfer torque exerting on the magnetic order parameter of the right ferromagnetic region, penetrates into the ferromagnetic region and, unlike graphene structure, is very sensitive to the chemical potential of the normal region as well as the exchange field of the ferromagnetic region.

The 10th International Conference on Magnetic and Superconducting Materials (MSM17), with many eminent invited speakers including Nobel Laureates, was held at Sharif University of Technology in Tehran, Iran during 18-21 September 2017. The MSM17 has awarded the "Young Researcher Award" to Dr. Leyla Majidi Fardvatan, who presented her contributed talk entitled "Quantum transport in new two-dimensional heterostructures: thin films of topological insulators, phosphorene" in this activity.