Title: Two-dimensional MXenes for Spintronics

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I. Abstract Body (up to 300 words)

Past two decades proved to be a wonderful era for two dimensional (2D) materials. From the discovery of graphene to MXene and other members, 2D materials have attained quite an outstanding interest owing to the potential of physical properties they offer for various applications. Out of many compelling applications of MXenes (Mn+1XnTx), there is a lack of study of its magnetic properties, superconductivity and their theoretical verifications. Recently, our group have reported the presence of unusual Meissner effect and signatures of type-II superconductivity in as-prepared Nb_2C-MXene powder. We unveiled the existence of superconductivity through the very basic phenomena of Meissner effect at different temperatures. The experimental as well as density functional theory proved the superconducting nature of the material. In another study, we reported that the conventional Ti_3C_2 MXene possess co-existence of magnetic phases that makes it a suitable candidate for use in spintronics devices. The potential of MXene towards magnetism and spintronics is huge that offers a new dimension of application towards magnetic data storage.

II. Biography:

Dr. Syed Rizwan is working as an Associate Professor at Department of Physics, School of Natural Sciences, National University of Sciences and Technology (NUST), Islamabad, Pakistan. His main research work includes micro/nano-fabrication, magnetism and spintronics, two-dimensional nanostructures, energy materials and energy storage devices. He received his PhD degree from Institute of Physics, University of Chinese Academy of Sciences, Beijing, China and worked as a Postdoctoral fellow at Peking University, Beijing, China for almost two years. The details of his research group can be found at: http://2denergymaterials.com and can be reached at: syedrizwan@sns.nust.edu.pk

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