



## Weekly Seminar

### Complex magnetic domain structures in oxides: physical origin and device application

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**Time: 3:00pm, Oct.12, 2022 (Wednesday)**

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**腾讯会议链接: <https://meeting.tencent.com/dm/GG3lqXUmSNpl>**

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#### Abstract

Physics of magnetic domains of conventional magnetic materials can be well described by minimization Landau-Lifshitz free energy. However, for magnetic oxides, competition between various types of exchange interactions has often led to complex magnetic domain structures that are far from being understood. One of the most typical example is the domain structure in colossal magnetoresistive manganites, which is featured by spatial coexistence of ferromagnetic, antiferromagnetic and even spin glass domains. These domains are not only in different magnetic states, but are also in different conducting states. By studying the effect of spatial ordering of the chemical dopants, we conclude that the dopants-induced disorder is the key reason for the formation of the complex domain structures in magnetic oxides. Based on the understanding of the physical origin of the complex magnetic domains in oxides, we have developed various methods to control the domain patterns in oxides and fabricated multi-bit memory device that can also carry out logic operations.

#### About the speaker

沈健, 国家千人计划特聘教授、复旦大学“浩清”讲席教授。2010-2020年任复旦大学物理系主任。现任复旦大学微纳电子器件与量子计算机研究院院长、应用表面物理国家重点实验室主任、微纳加工实验室主任, 中国物理学会磁学分委会主任。沈健长期从事低维磁性及自旋输运的实验研究, 因对二维磁性超薄膜中结构与磁性的关联效应的研究, 获得了1996年德国马普学会的Otto-Hahn奖章; 他在实验上系统地研究了维度对磁性的影响, 获得了包括美国总统青年科技奖(2003, 美国政府给予青年科学家的最高奖励)和美国能源部杰出青年科学家奖(2003)等多项奖励。2011年, 当选为美国物理学会会士(APS Fellow)。