

Special Issue

BSW2016

Fifth Bozok Science Workshop: Nano Carbon Materials and
Their Applications

Bozok Science Workshop 2016, Yozgat, April 28-29, 2016.

**ISING SYSTEMS FROM MAGNETIC PHASE TRANSITIONS TO
MAGNETIC NANOSTRUCTURES**

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Abstract: Ising systems are the one most actively studied problems in statistical physics and condensed matter physics, and they have been used to explain many important cooperative physical systems. In this talk, first I will briefly introduce Ising systems and then emphasis their importance in statistical physics and condensed matter physics with two subjects. The first one, I will elucidate how to obtain metastable and unstable phases or states that are very important in many experimental and theoretical works. The second one, I will demonstrate that Ising models play important role in very interesting subject of the dynamic phase transition and dynamic phase diagrams. Next, I will provide an overview of recent and important works on properties of magnetic nanostructures studied by Ising systems. In particular, I will present the hysteresis, coercivity and compensation behavior of Ising nanostructures and compared with some experimental works. Finally, I will briefly review and discuss the dynamic magnetic properties of the Ising nanostructures.

Keywords: *Ising Models; Phase Transitions; Dynamic Phase Diagram; Core-shell Spin Structure; Hysteresis; Coercivity; Compensation.*

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