Study of ferroelectrics: past, current and future

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Ferroelectric materials have been well developed for various applications ranging from sensors to capacitors, memory devices, transducers and actuators since the first ferroelectricity, rochelle salt was discovered in 1920s. The study of ferroelectrics has attracted considerable attentions from researchers in condensed matters physics and solid-state chemistry (including crystallography) because the relation between the structure and properties in such strongly correlated material systems is very complicated and fascinating. In this talk, I will discuss the importance of the structure and phase transition in the course of seeking and developing new ferroelectric materials. Through the case studies, I will address several critical issues in the study of ferroelectric and related materials, regarding (1) average and local structure; (2) defects and local chemistry; (3) surface and bulk effect; (4) low dimensional form, and (5) non-traditional metal oxides. In the end, I will share my vision and insight on the future research in ferroelectrics that may be beyond the traditionally well-defined ferroelectrics.

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