

MAR17-2016-020008

Materials Talk

Abstract for an Invited Paper
for the MAR17 Meeting of
the American Physical Society

Synthesis as the heart of New Materials Physics¹

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Humanity needs to find the materials that will ease its growing needs for reliable, renewable, clean, energy and/or will allow for greater insight into the mysteries of collective and, in some cases, emergent states. The design, discovery and growth of novel materials is heart of the research effort that will, hopefully address these needs. In this talk I will present a broad overview of New Materials Physics and describe how a practitioner can go from staring at the periodic table to deciding what “the next growth will be”. I will present and discuss the three basic motivations for making a growth: wanting a specific compound; wanting a specific ground state; searching for known and unknown unknowns. Materials discussed will span superconductors, quasicrystals, heavy fermions, fragile magnets, topological electronic systems, local moment magnets and a few lost puppies. The goal of this talk is to inspire and entertain, any resemblance to persons living or dead is coincidental.

¹This work was supported by the U.S. Dept. of Energy, Basic Energy Science, Division of Materials Sciences and Engineering under Contract No. DE-AC02-07CH11358 as well as by the Gordon and Betty Moore Foundations EPiQS Initiative through Grant GBMF4411.