

# T<sub>C</sub>SUH Bi-Weekly Seminar

Texas Center for Superconductivity at the University of Houston

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Room 102, University of Houston Science Center

12:00 noon – 1:00 p.m.

## Are Complex Oxides “Simple”?

### ABSTRACT

We will present synthesis strategies to access model compounds for the study of certain structure-property relationships. A rare class of complex oxides are  $\text{Na}_5[\text{MO}_2][\text{X}]$  because they can be regarded as coordinative “unsaturated”. However, they adopt a simple structure type of an anti-perovskite.[1] Likewise, we have intensified our search for specific series of compounds that can be used as templates to study frustration effects in triangular antiferromagnets. Here, interesting aspects arise from the study of charge and pressure effects on the magnetic properties.[2-4] Also, upon doping with non-magnetic ions one can achieve the ordered formation of a honeycomb lattice. Recent examples for one-dimensional magnetic properties are complex oxide-halide intergrowths compounds. In summary, we will discuss selected examples for “simple” oxides with respect to their structures and physical properties. Furthermore, lattice dynamic studies by Raman spectroscopy and DFT methods, magnetic and specific heat measurements, as well as magnetic structures derived from neutron diffraction experiments will be presented.

### References:

- [1] D.E. Gheorghe, A.P. Litvinchuk, A. Möller, *Inorg. Chem.* **51**, 5822 (2012).
- [2] N.E. Amunke, D.E. Gheorghe, B. Lorenz, and A. Möller, *Inorg. Chem.* **50**, 2207 (2011).
- [3] A.A. Tsirlin, A. Möller, B. Lorenz, Y. Skourski, and H. Rosner, *Phys. Rev. B* **85**, 014401 (2012).
- [4] A. Möller, N.E. Amunke, P. Daniel, B. Lorenz, C. R. de la Cruz, M. Gooch, P. C. W. Chu, *Phys. Rev. B.*, **85**, 214422 (2012).

### BIO

Dr. Angela Möller, Associate Professor of Chemistry at UH, received her Ph.D. in Chemistry in 1993 (University Hannover, D), D. Sc. in Inorganic Chemistry (University of Cologne, D) in 2002, and joined UH in 2009. Her work is focused on oxides, synthesis, crystal structures and structure-property relationships. She thanks the Texas Center for Superconductivity, the R.A. Welch Foundation and the National Science Foundation for generous support.