

## **The Condensing Universe**

Prof. Michael Ramsey-Musolf

*Department of Physics, University of Massachusetts, Amherst*

While the phenomenon of cosmic expansion is well-established, it is also possible that this expansion could engender a process of cosmic condensation. Indeed, in the presence of new physics beyond the Standard Model, the early universe could have undergone a change of state in a manner analogous to the condensation of water vapor into liquid. Such a first order phase transition, associated with the breaking of one or more symmetries, could hold the keys to explaining the cosmic matter-antimatter asymmetry, abundance of dark matter, and/or non-vanishing neutrino masses. I discuss recent theoretical progress in analyzing the possibilities for this condensing universe and their possible signatures in terrestrial and astrophysical experiments.