Title: Self-bound droplets of a dipolar Bose-Einstein condensate

Prof. Blair Blakie, University of Otago, New Zealand

Abstract:
Recent experiments with Bose-Einstein condensates of dysprosium [1] and erbium [2] atoms have observed the formation of droplets that can preserve their form, even in the absence of any external confinement [3]. These droplets occur when the long-ranged dipole-dipole interaction between the atoms dominates over the short-ranged contact interaction. In this regime meanfield theory predicts that the condensate is unstable to collapse, however the Lee-Huang-Yang corrections to the meanfield energy [3] can stabilize the system as one or many finite sized droplets. I will discuss our current understanding of these droplets, and introduce a new type of nonlinear Schrodinger equation used to describe their equilibrium and dynamical properties.

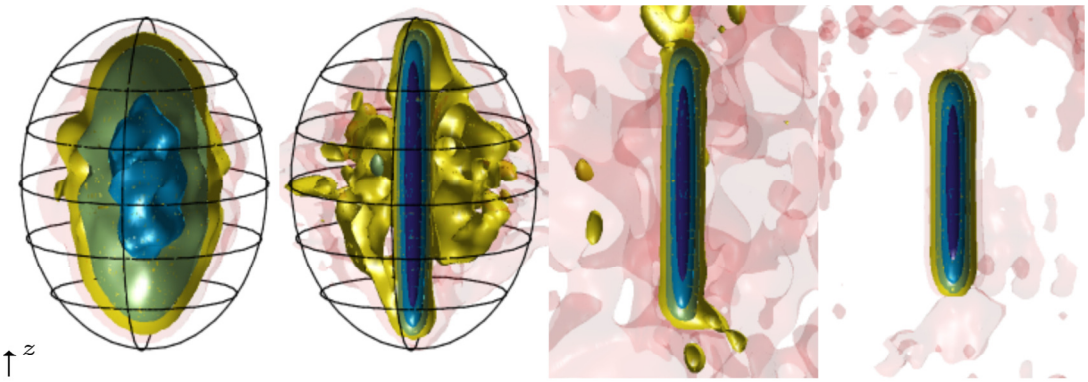

Figure: Simulation of the formation dynamics of a self-bound droplet from Ref. [4]

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[3] T. D. Lee, K. Huang, and C. N. Yang, Phys. Rev. **106**, 1135 (1957)
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