

# Quantifying Magnetic Interactions – linking images from TEM Observations with First Order Reversal Curves (FORCs)

A.P. Chen, R. Egli, and B. Moskowitz (PI), Institute for Rock Magnetism,  
Newton Horace Winchell School of Earth Sciences

## ◆ Sample

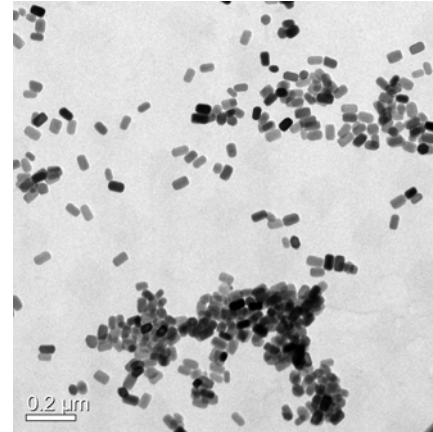
Biologically-controlled magnetite particles (~50nm) produced by magnetotactic bacteria

## ◆ Methods:

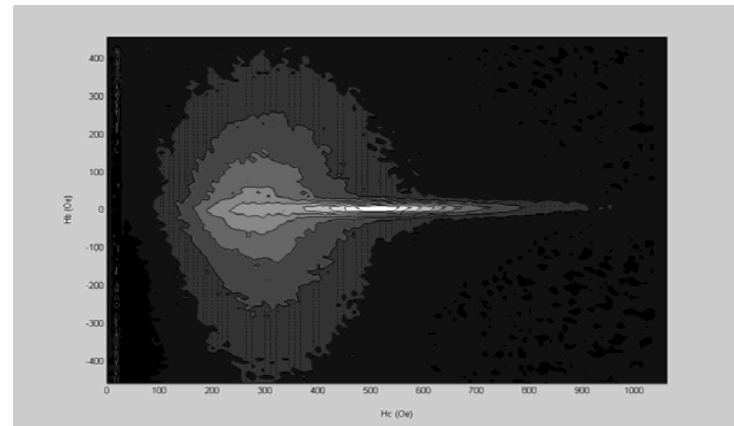
- Use TEM observations to obtain a statistical distribution of particle cluster dimensions.
- Use first order reversal curves (FORCs) (Pike *et al.* 1999) to characterize magnetic interactions in the sample.

## ◆ Goal:

Model the connection between FORCs diagrams and statistical distribution of particle clusters.



A TEM image of biogenic magnetite particles.



FORCs diagram of magnetite particles produced by magnetotactic bacteria. H<sub>c</sub> axis denotes the magnetic coercivity and the H<sub>b</sub> axis denotes the magnetic interaction field.

C. Pike, A. Roberts, and K. Verosub, *J. Appl. Phys.* **85**, 6660 (1999).