



## ~~Special Polymer Physics Seminar ~~

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**10:00 AM Tuesday**  
**August 16<sup>th</sup>, 2011**  
**301 Steidle Bldg.**

### **Morphologies in Precise Acid- and Ion-Containing Polymers**

For over a decade we have endeavored to quantify the morphologies in ion-containing polymers using a combination of X-ray scattering and electron microscopy methods. We are motivated by the promise that when we know the connections between chemical structure, nanoscale morphology, and physical properties, new strategies for improving polymer properties will be evident. Recently, we have been exploring the morphologies in precise acid copolymers and ionomers made neutralizing these precise copolymers. The precise copolymers are synthesized by Prof. K. Wagener's group at the University of Florida using acyclic diene metathesis and have functional groups attached to every 9th, 15th or 21st carbon along a linear polyethylene molecule. The precision of these molecules gives rise to well-defined hierarchical structures including acid-decorated lamellae and acid or ionic aggregates arranged on cubic lattices. The temperature dependence of these polyethylene-based copolymers is dominated by the crystallization of the polymer. Complimentary molecular dynamics simulations and NMR studies will be presented in addition to our morphology results.