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| **Student** | **Advisor** | **Poster Title, Abstract & Student Bio** |
| Emily Oreste  | Dr. Erik Sapper | Title: Emulsion Atom Transfer Radical Polymerization for Controlled Latex Particle SynthesisAbstract: Standard emulsion and solution polymerization are common methods for creating polymers, but the polydispersity index is often large since the molecular weights cannot be adequately controlled during conventional free radical polymerization methods. Using atom transfer radical polymerization (ATRP), homopolymers and copolymers using common monomers were synthesized which resulted in various latex dispersions comprised of polymers having well-defined architectures and narrow molecular weight distributions. The latex dispersions were characterized using gel permeation chromatography (GPC), nuclear magnetic resonance spectroscopy (NMR), Fourier transform infrared spectroscopy (FTIR), and dynamic light scattering (DLS). A synthetic design space was investigated, which considered simultaneously traditional emulsion polymerization conditions (such as surfactant to monomer ratio, agitation rate, addition rates of monomer and initiator, batch and semi-batch methods, and monomer reactivity ratios), as well as reaction conditions relevant to state-of-the-art ATRP (multifunctional initiator selection, ligand choice, and desired polymer architecture). Results from the design space analysis provided a set of best practices for emulsion ATRP, and have also provided insight into the relationship between polymer architecture and waterborne latex film-forming properties.Bio: Emily Oreste is a junior studying materials engineering.She graduated from Tampalpais High School in Mill Valley with the class of 2015. A major accomplishment in her academic career was getting an undergraduate research position in the Cal Poly Department of Chemistry. One of the most interesting things Emily has done was hiking the Eyjafjallajökull volcano in Iceland. |