Arianne Saunders was working under the supervision of Dr. Gang Chen on creating mesoporous materials and using them as templates to grow nanowires by electro-deposition. Mesoporous materials have nanosized pores ranging from 2 to 50 nm in diameter. They are synthesized through a self-assembly approach in which nanosized polymers act as structural directing agents. Manipulation of the structures of mesoporous materials was done by controlling the synthesis conditions and doping the materials with ions such as iron, copper, and silver. By using a Small Angle X-ray Scattering (SAXS) instrument (Figure 1), nanoscale structures of the mesoporous materials can be analyzed.

The ultimate goal of studying electro-deposition was to determine the best way to fill semiconductors (e.g., Se) into the nanosized pores of the mesoporous materials, in order to produce semiconducting nanowires. This was done by establishing the correct procedure for the electro-deposition, finding the solution to plate poorly conducting mesoporous materials, and optimizing the deposition conditions to create high quality semiconducting nanowires.