

Investigation of Optical Properties of Silver Nanorod Films

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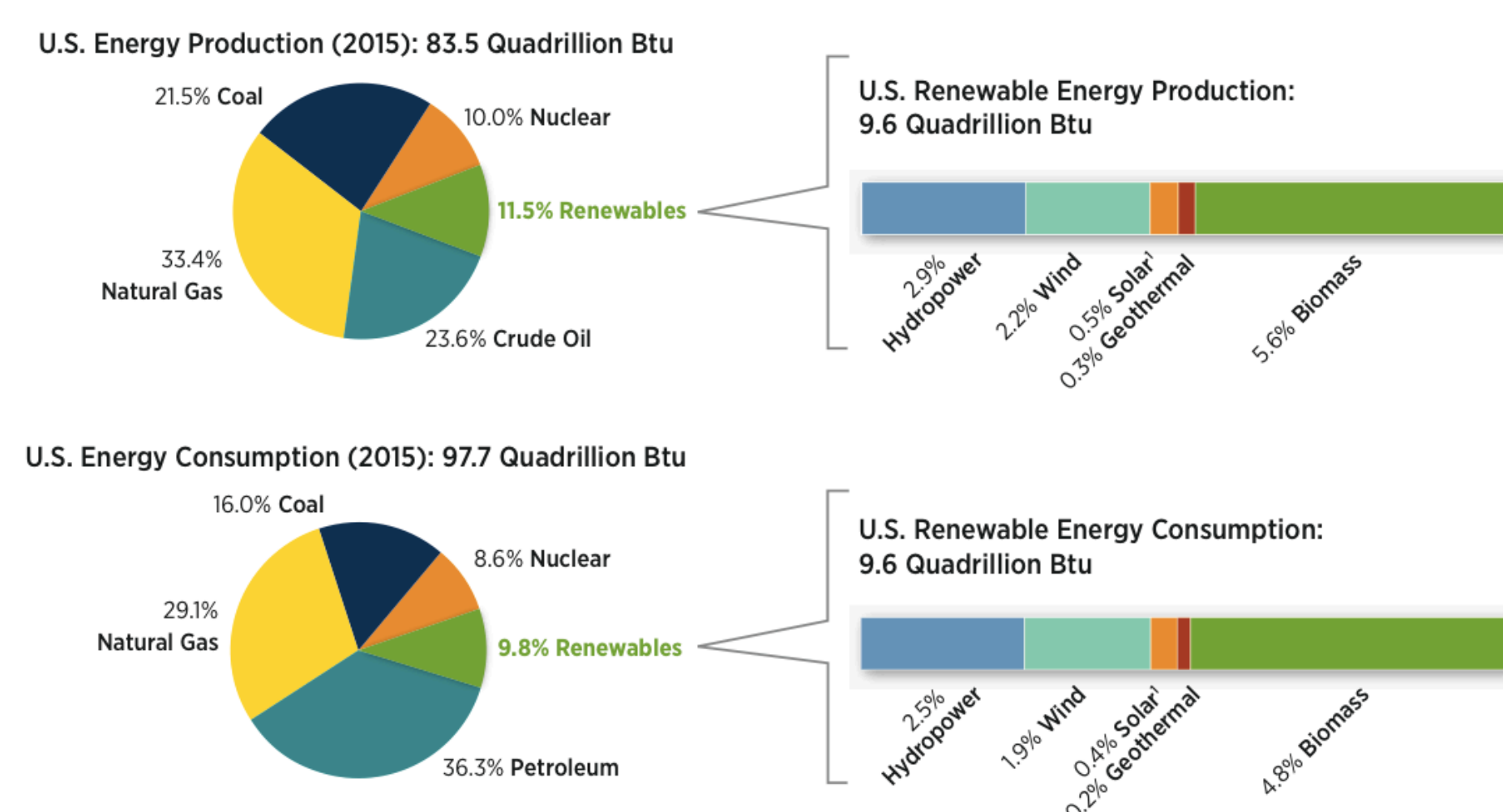
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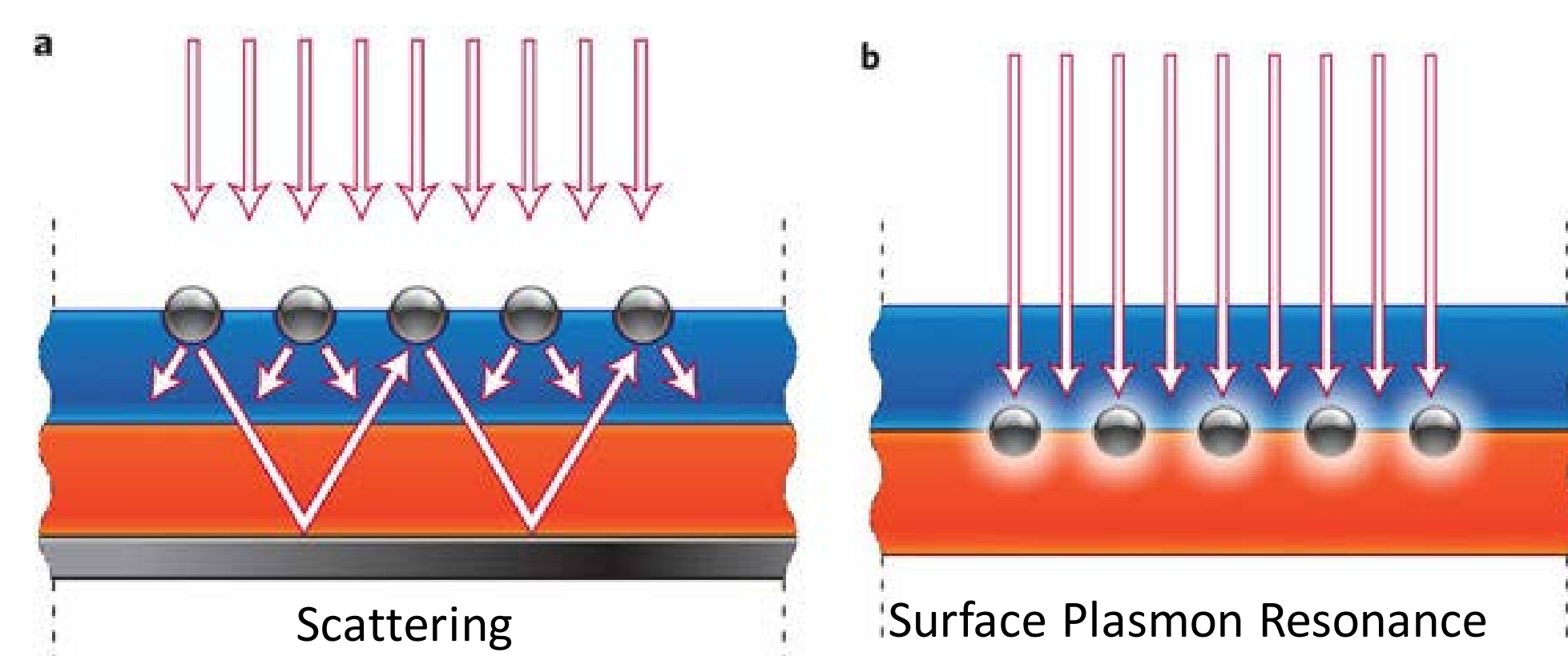
ABSTRACT

Given the global energy crisis, there is a need to increase our dependency on renewable energy sources. Although solar energy is abundant, current solar cell technology is not efficient enough to solve the crisis. The surface plasmon resonance enhancement effect and scattering properties of silver nanoparticles make them an ideal candidate to increase solar cell efficiencies. In this work, silver nanorods were synthesized by reducing silver ions and then adsorbed onto films. UV-Vis spectroscopy, integrating sphere, atomic force microscopy, and transmission electron microscopy were used to characterize the films.

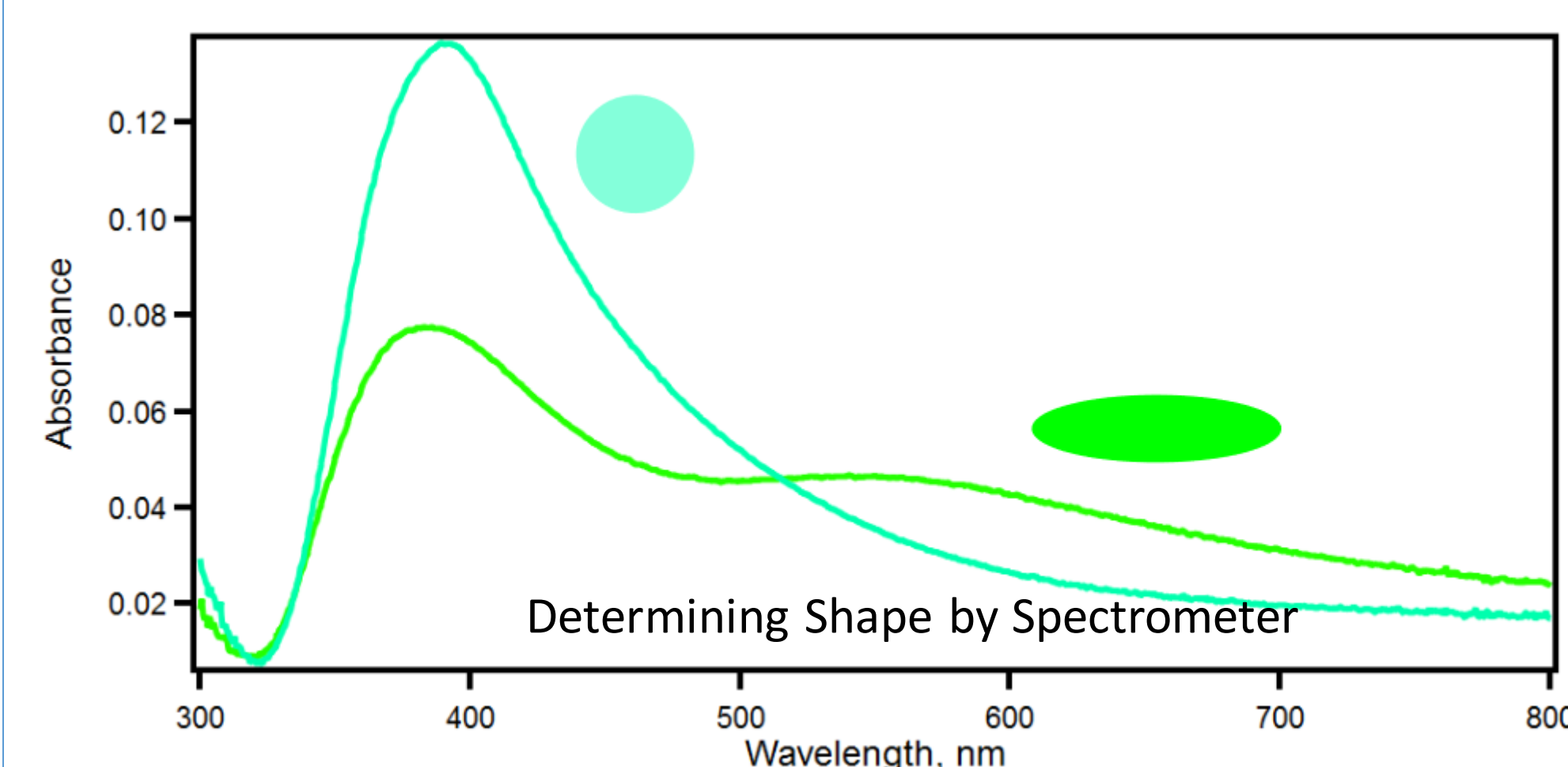
MOTIVATION



Ag NP's Increase Solar Efficiency by:



OBJECTIVES

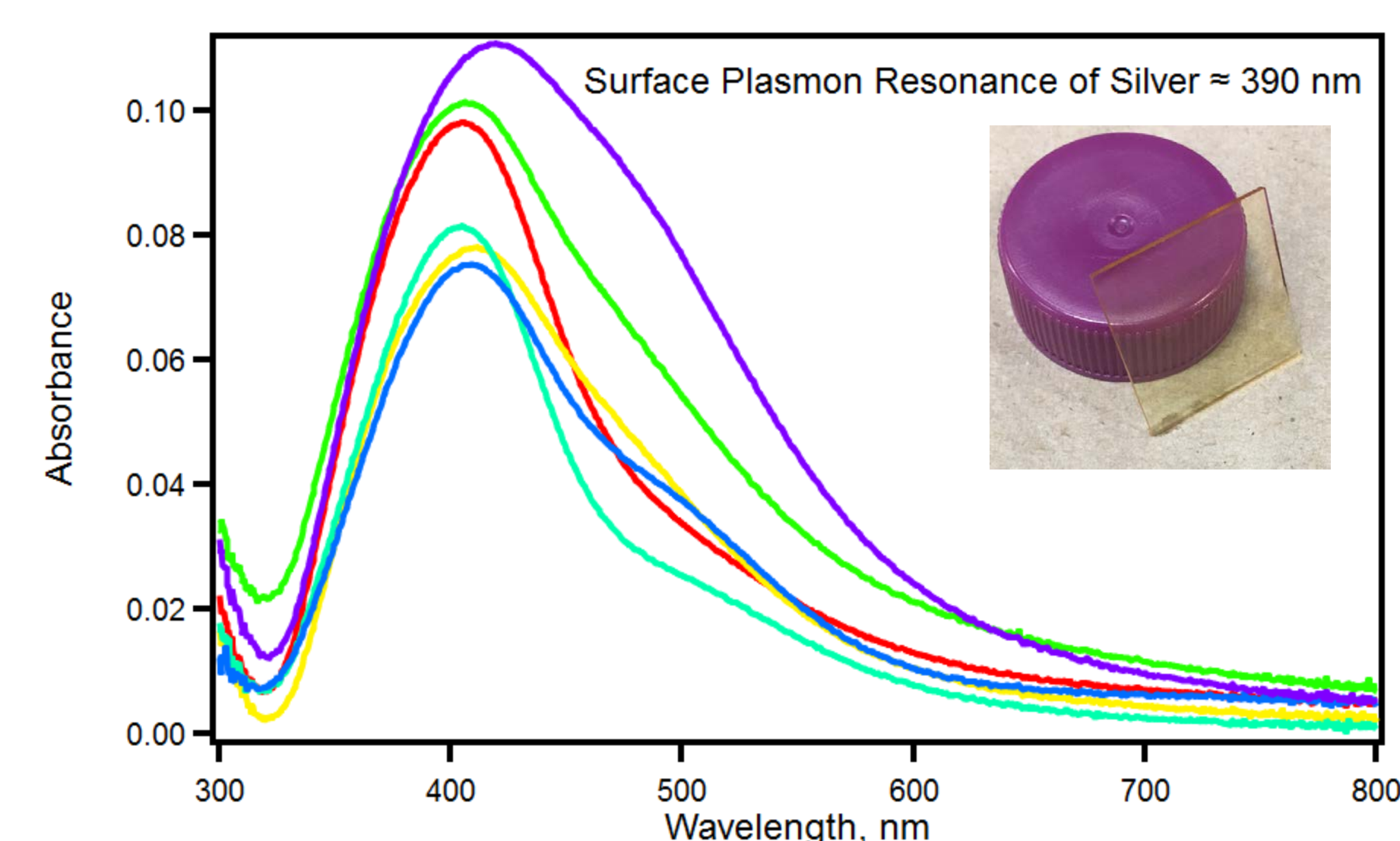
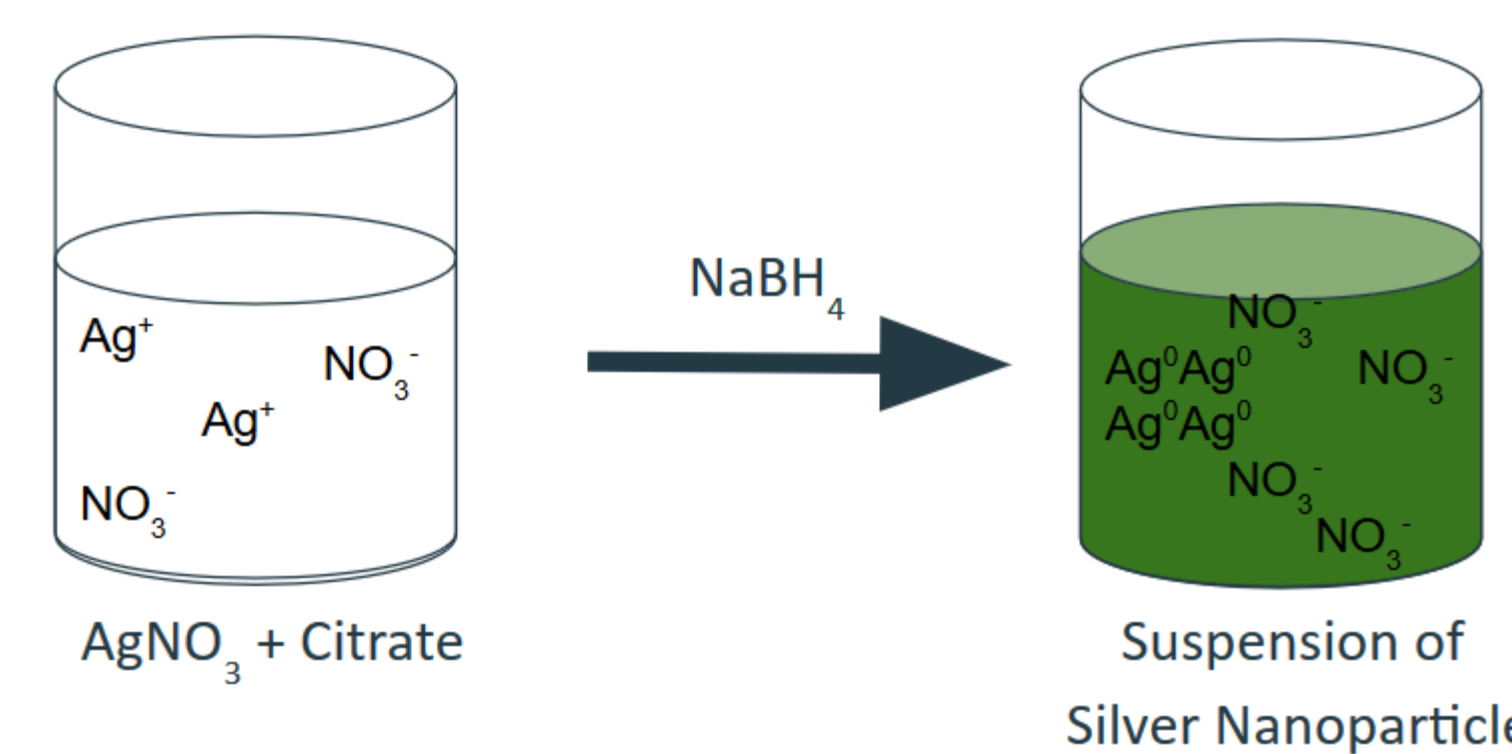
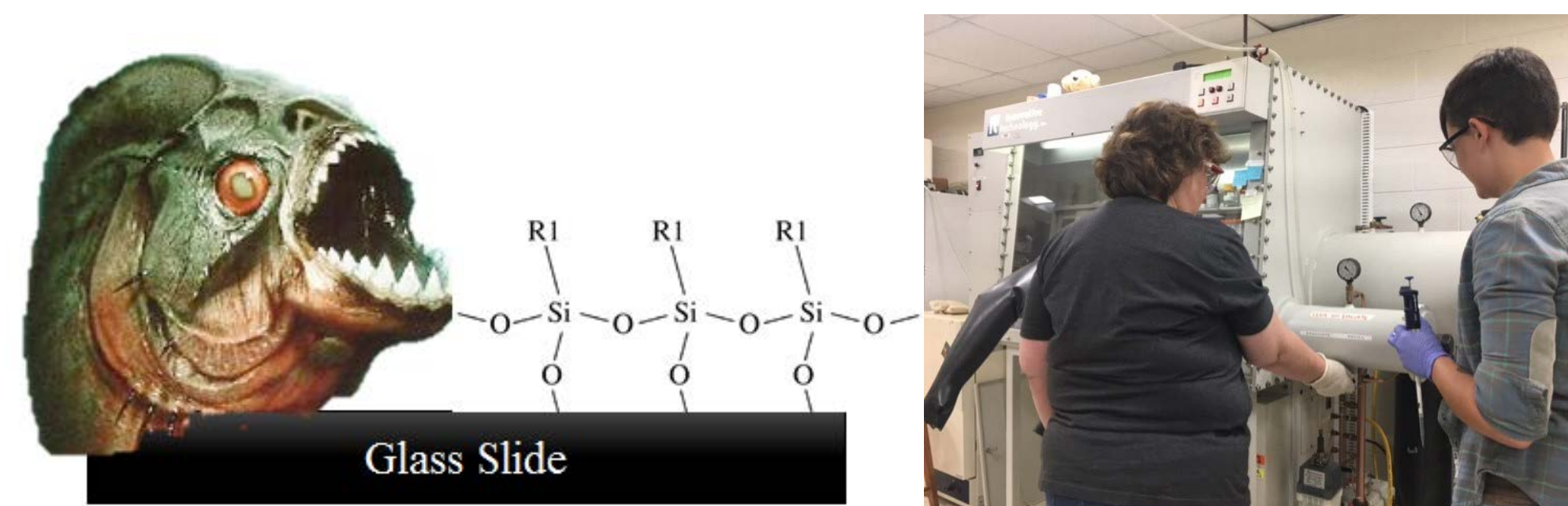


ACKNOWLEDGEMENTS

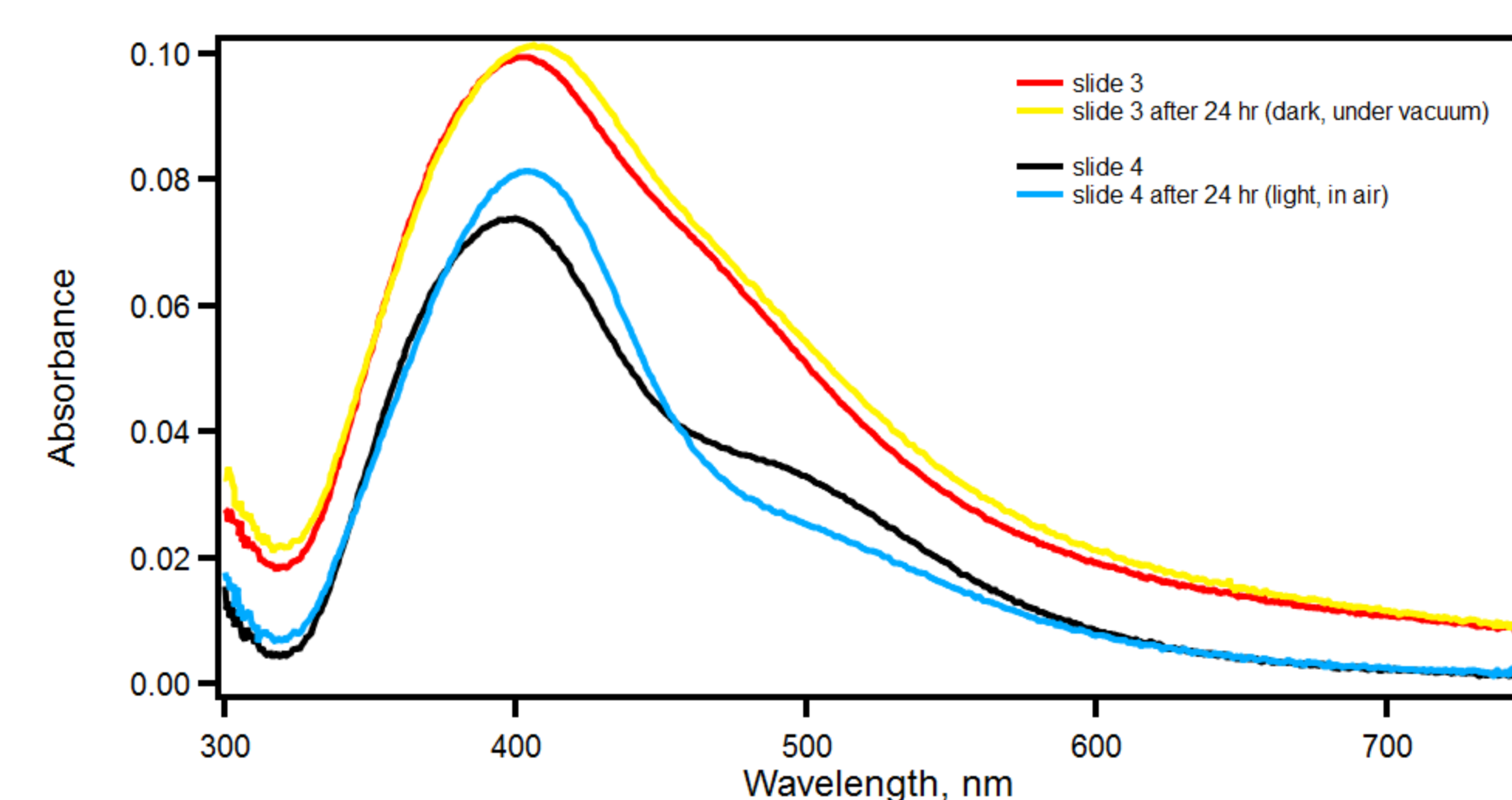


MATERIALS/METHODS

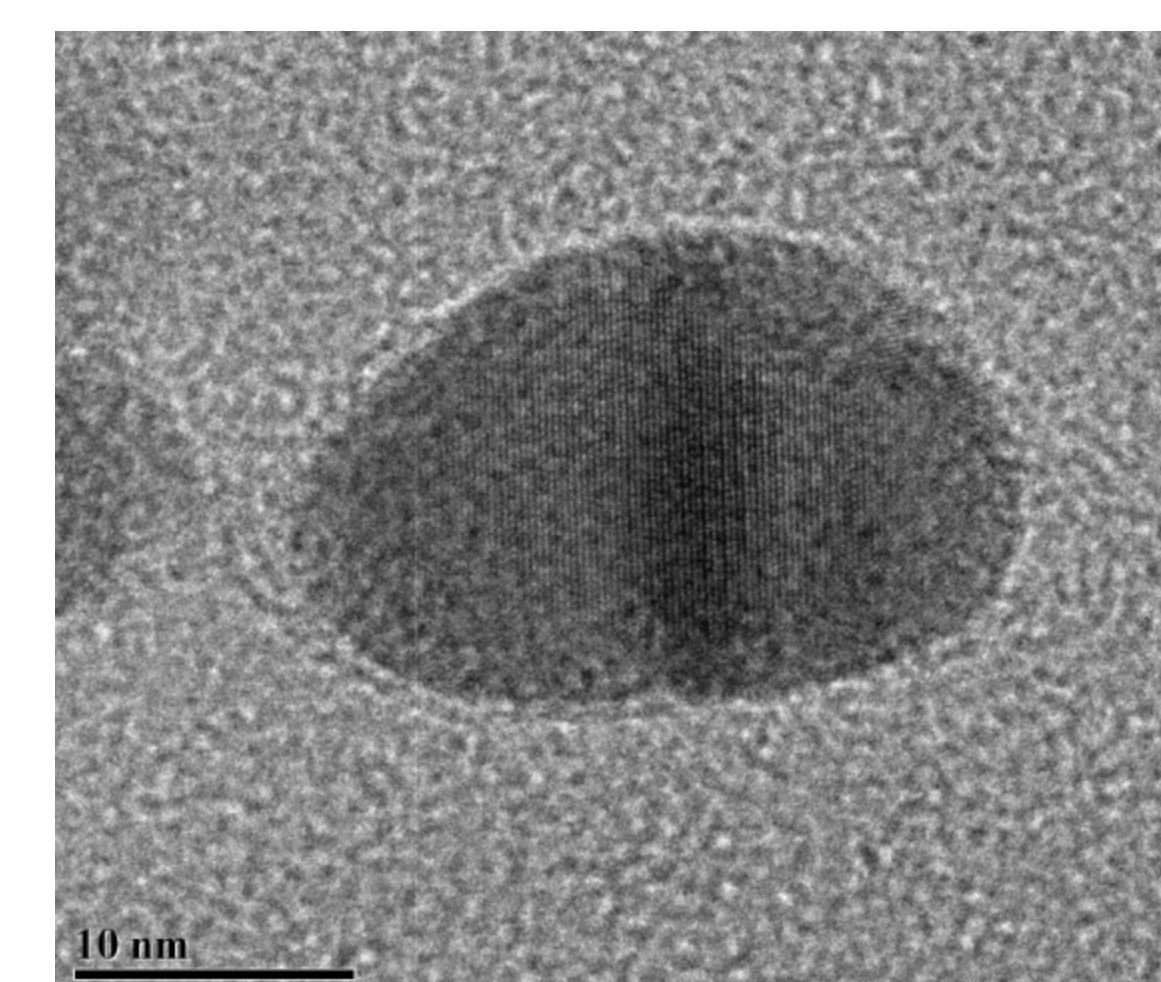
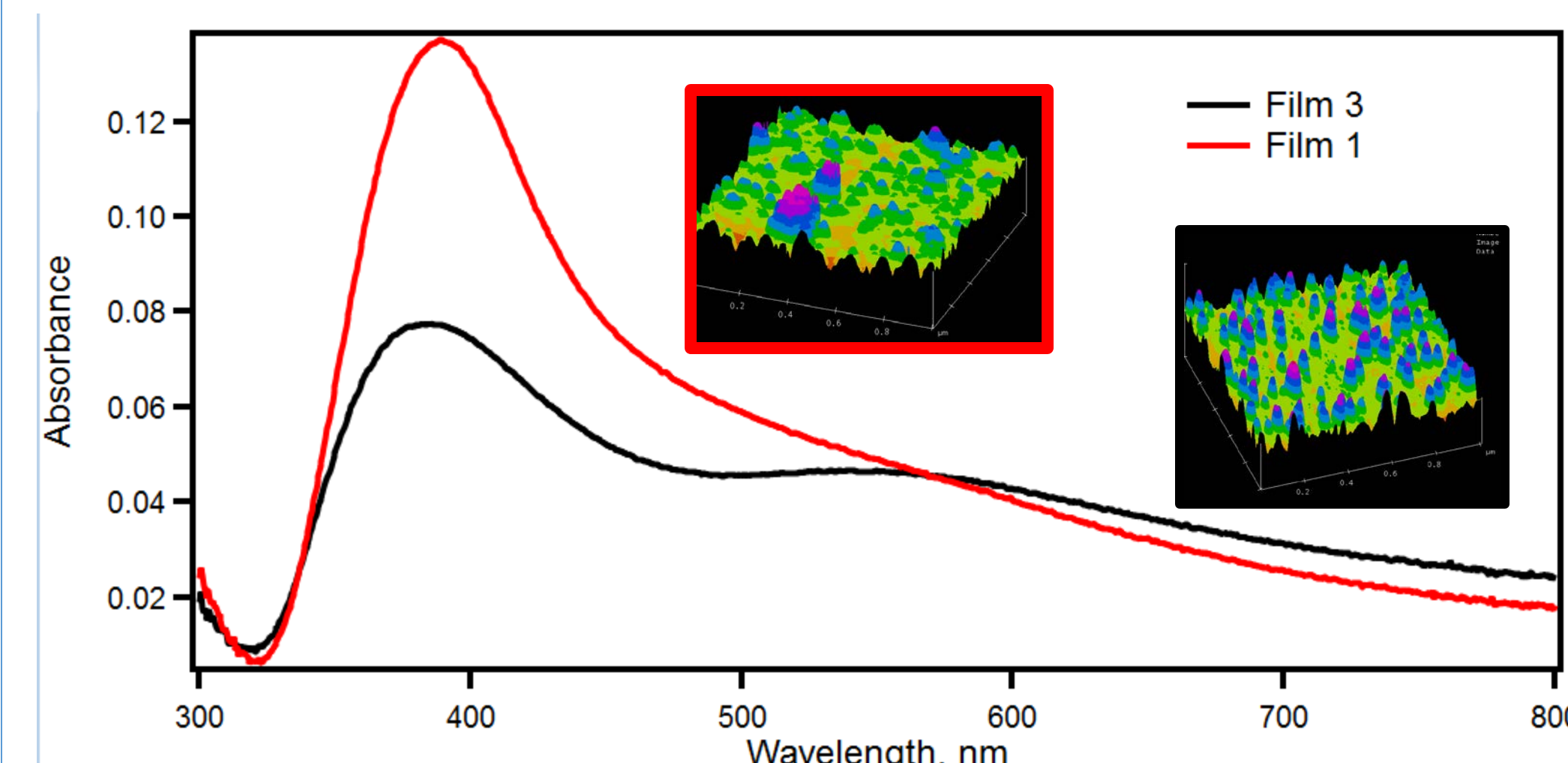
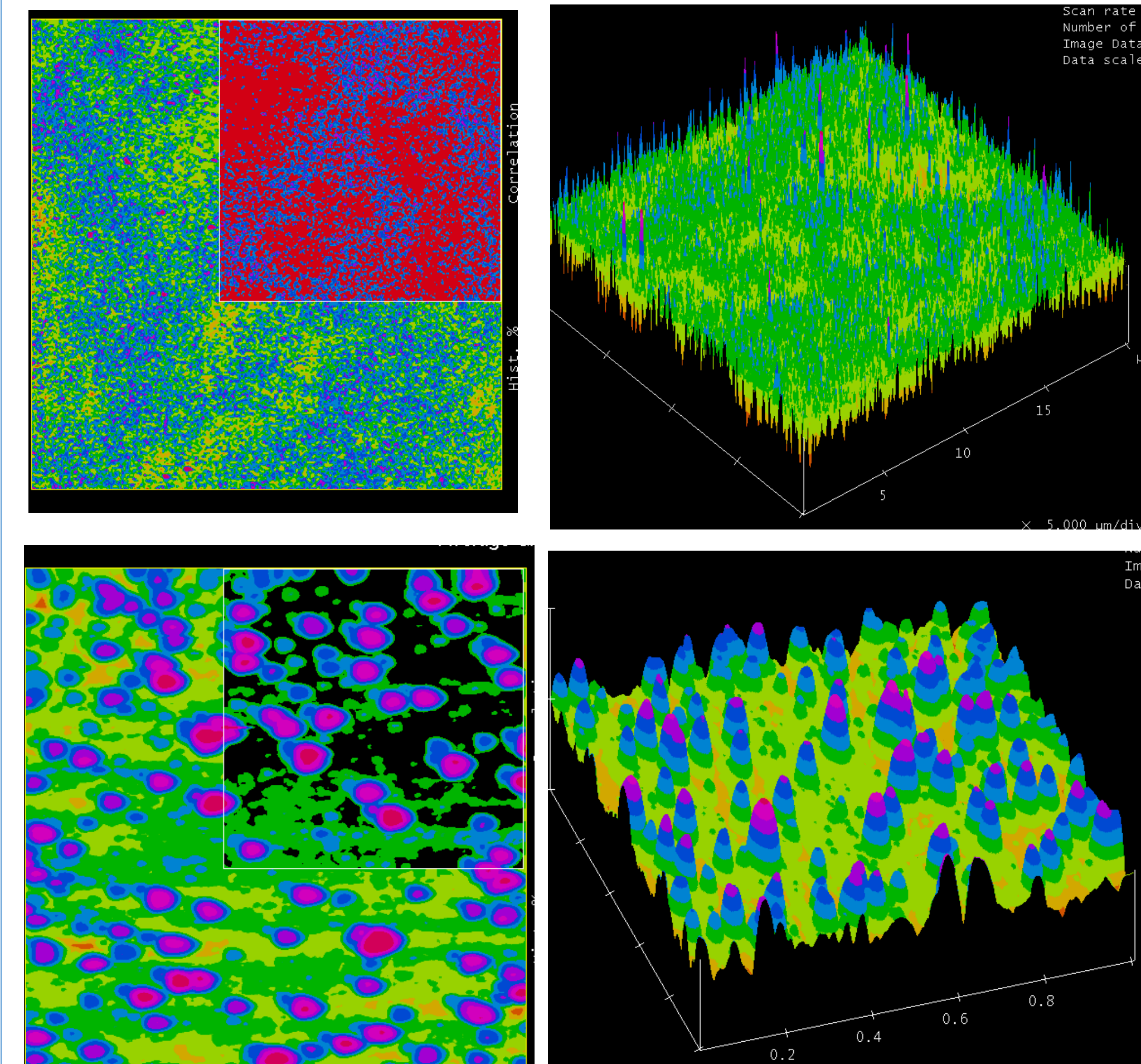
First we cleaned and silanized the films, then created a reaction to create silver nanorods, finally we soaked the films in AgNR solution.



RESULTS



Atomic Force Microscopy Results



FUTURE WORK

- Collect scattering data using integrating sphere
- Take TEM of nanoparticles
- Polymer layer on top of films
- Test other storage conditions

CLASSROOM CONNECTIONS

High School Forensic Science Classroom:

- Applying the Scientific Method to a Criminal Investigation
- Exploring applications of nanotechnology to forensic science including visualizing latent fingerprints and detecting drug metabolites and explosive residues in fingerprints

Third Grade Talent Development Classroom:

- Science as Inquiry including ability to do and understand scientific inquiry
- Utilizing the scientific method
- Physical Science including properties of objects and materials, position and motion of objects and light, heat and electricity
- Science and Technology including distinguishing between natural and man-made object, ability of technological design, and understanding about science and nanotechnology.

PHOTOS

