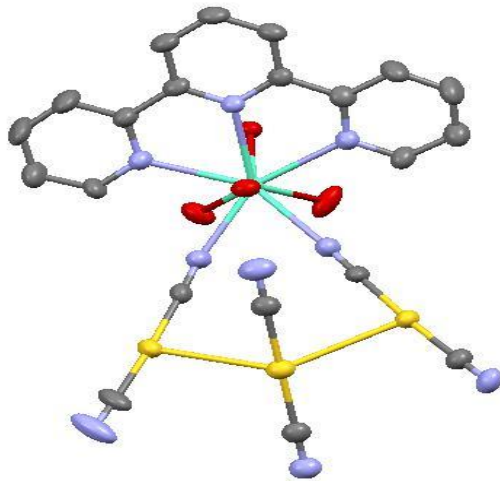


## *Kendra E. Whitehead*

*Program: Energy & Environmental Systems*

*Title: “Synthesis, Structural, and  
Spectroscopic Studies of Lanthanide  
Terpyridine Trigold Complexes”*

*Major Professor: Dr. Zerihun Assefa*



### RESEARCH QUESTIONS / PROBLEMS:

- Research avenues for increased efficiency of lanthanide emissions through interactions with Au that is simulated via dual donor sensitization; to enhance photophysical properties of solid-state materials.

### METHODS:

- Synthesis, single crystal x-ray diffraction, photoluminescence, vibrational IR and Raman spectroscopy

### RESULTS / FINDINGS:

- Photoluminescence studies displays enhanced luminescence emission via energy transfer from the donor ligands to the lanthanide acceptor ions.
- Studies show overlapping of energy levels of gold emission and excitation of the lanthanide in close proximity of adjacent aurophilic chains help facilitate the energy transfer displayed.

### SIGNIFICANCE / IMPLICATIONS:

- Use as chemical sensing application for rapid real time monitoring of volatile organic pollutants on-site and in-situ monitoring of environmental