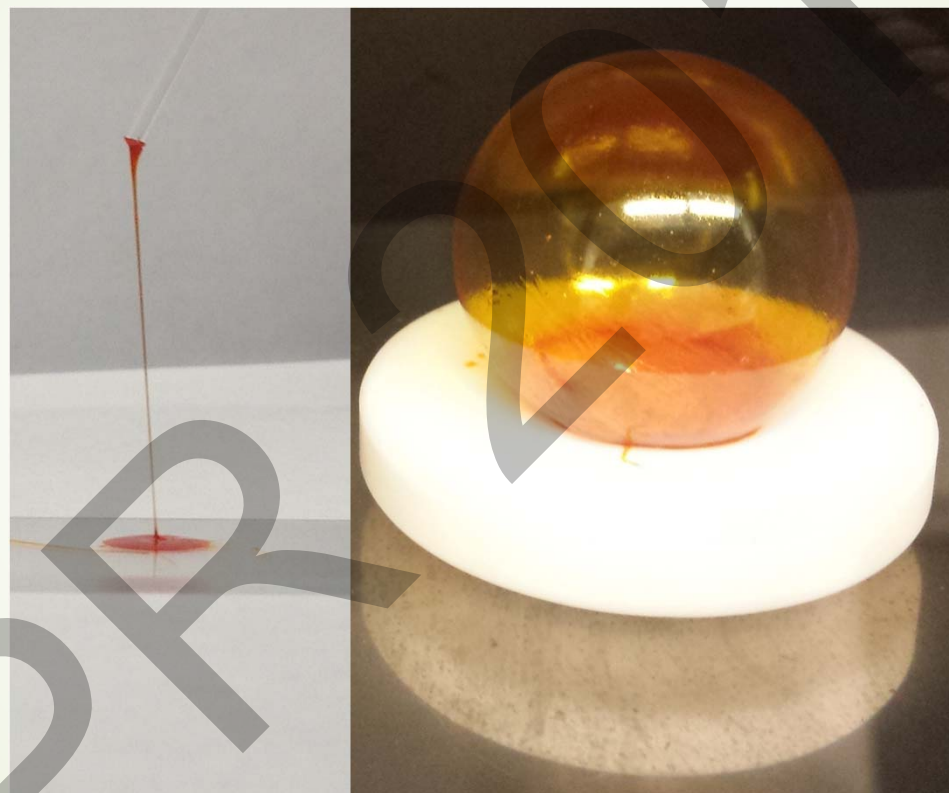


# A Novel Metal-Containing Supramolecular Polymer

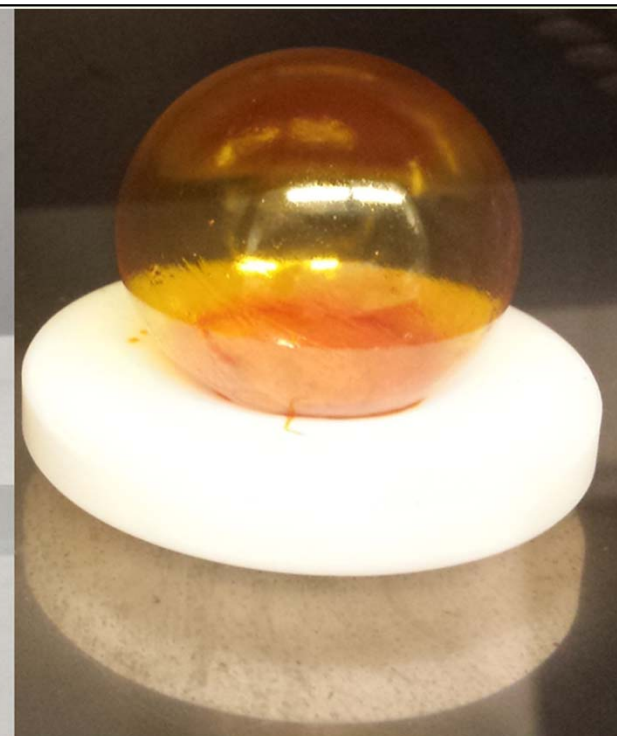
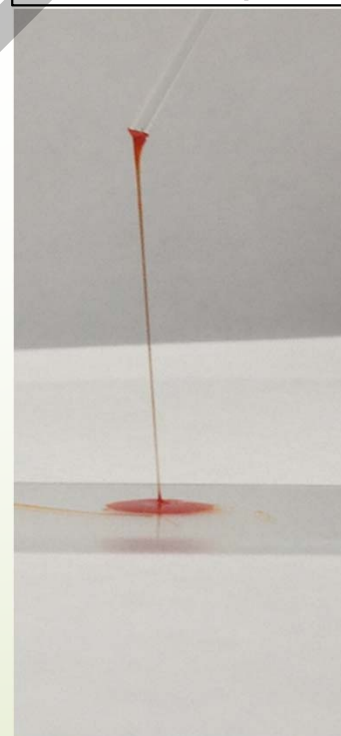
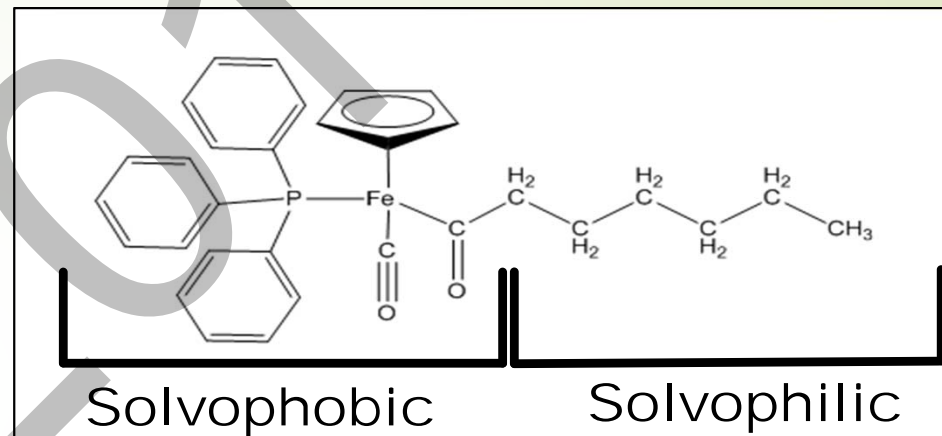


Nicholas Lanigan  
Ph.D. Candidate

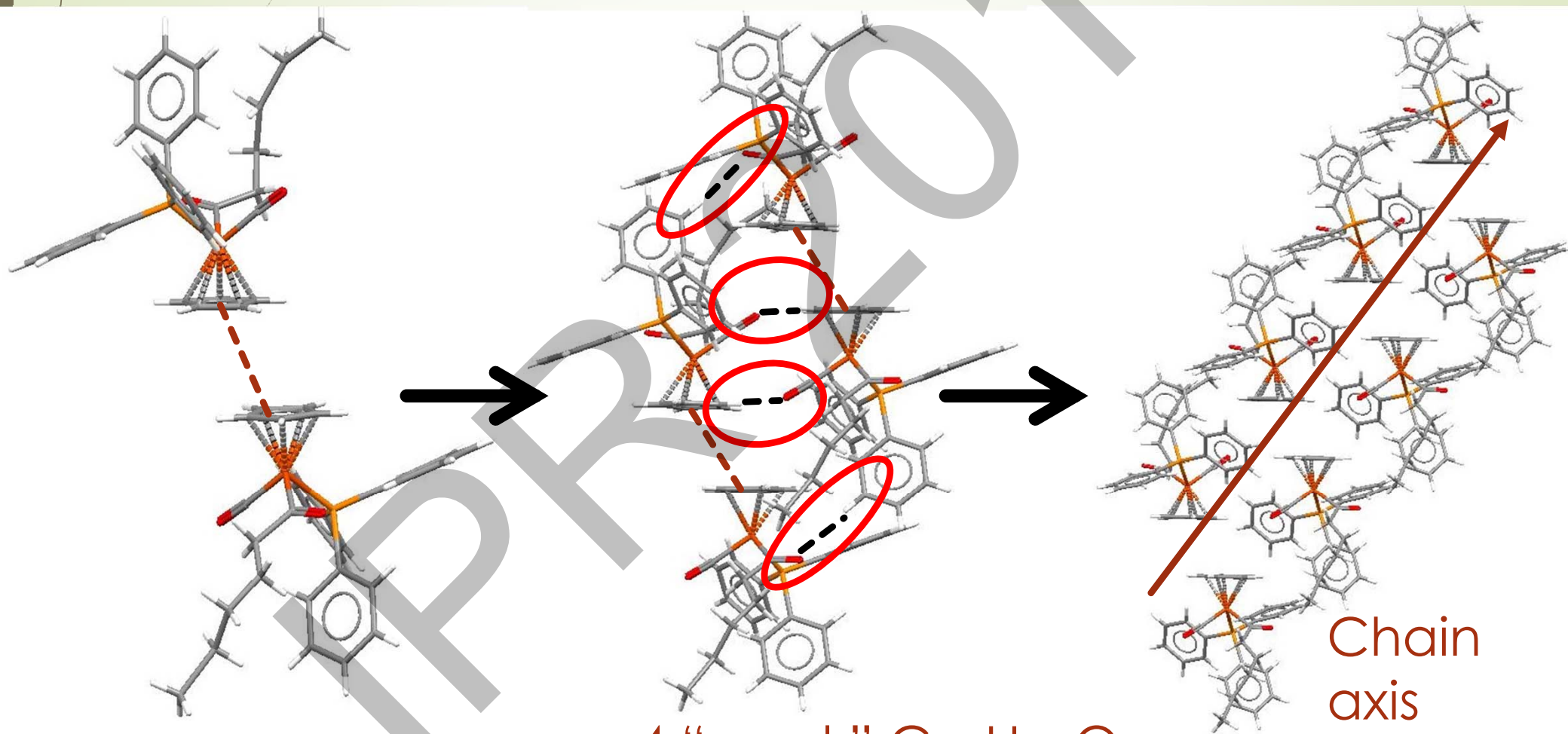
Supervisor: Xiaosong Wang

# My Research: Organometallic Supramolecular Polymers

- Started as an investigation of a metal containing amphiphile: Carbonylcyclopentadienylheptanoyltriphenylphosphineiron ( $\text{FpC}_6$ )
- Instead of behaving like a small molecule,  $\text{FpC}_6$  demonstrated polymeric behaviour.



# Single Crystal Chain Structure of FpC<sub>6</sub>



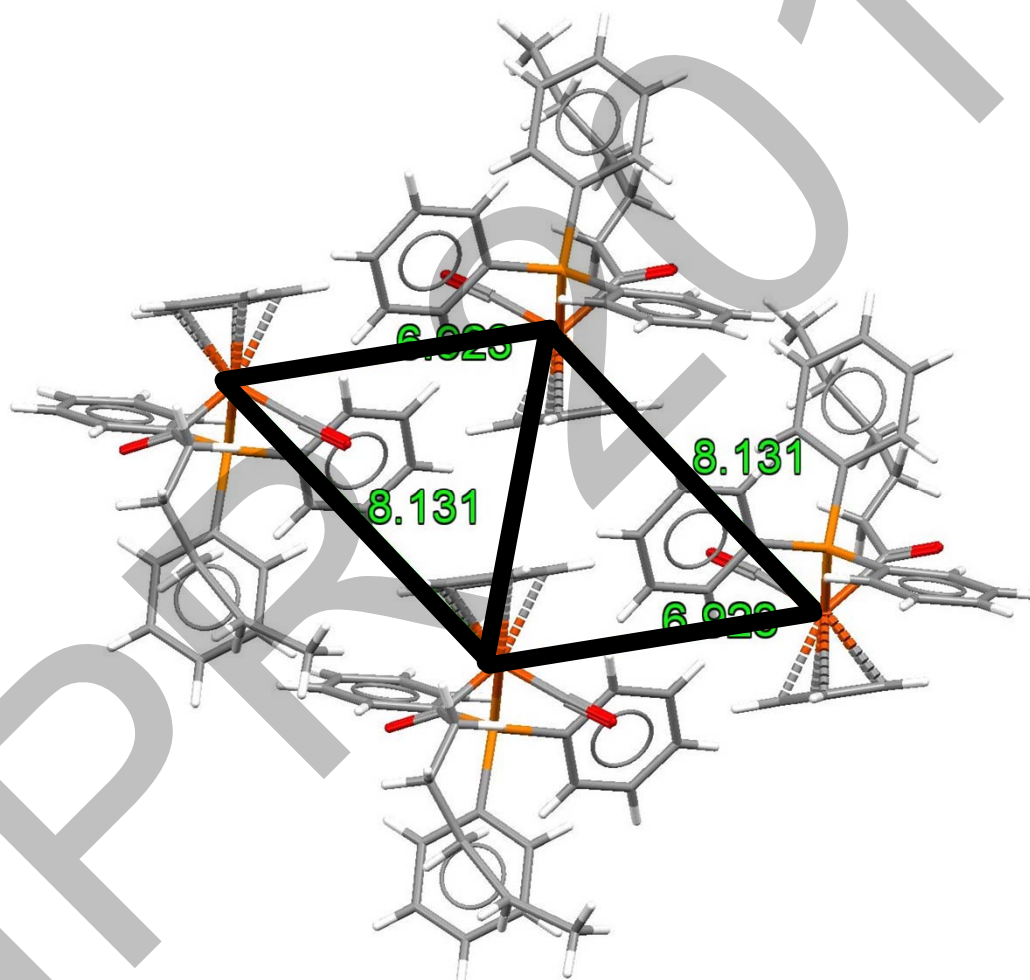
Parallel displaced  $\pi$ - $\pi$  interaction: 3.94Å

4 "weak" C—H...O hydrogen bonds

Chain axis



# PXRD Analysis of FpC<sub>6</sub>



Organometallic Supramolecular "TRUSS" Polymer

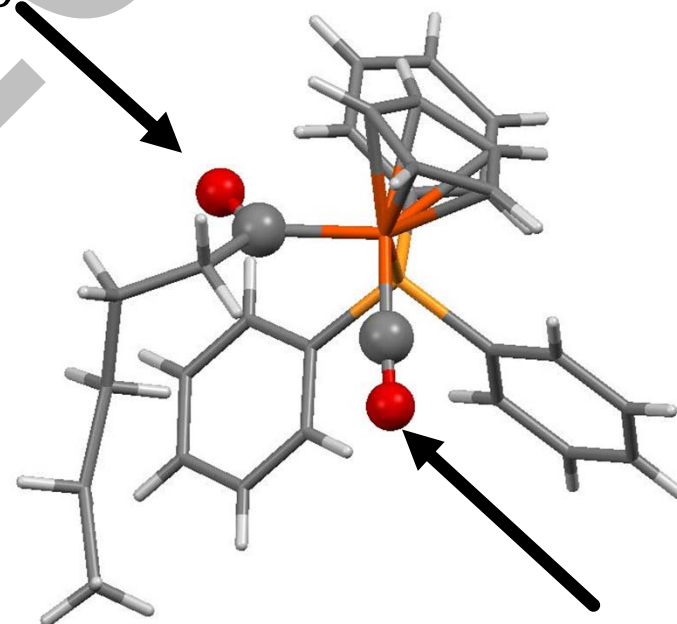
# FTIR Analysis of $FpC_6$

## Hydrogen Bonding

There is a gradually shift towards lower wavenumbers as the hydrogen bonding increases.

FTIR Carbonyl Peak Position		
Sample	Terminal $C\equiv O$ ( $cm^{-1}$ )	Acyl $C=O$ ( $cm^{-1}$ )
Solution (50 mg/mL BZN)	1911.5	1618.1
Amorphous (FTIR)	1909.6	1609.1
Crystalline (FTIR)	1900.8/ 1894.5	1605.1

Acyl  $C=O$



Terminal  $C\equiv O$

# THANK YOU!

Polymer and Supramolecular Functional  
Nanomaterials Group



From Left: Kai Cao, Abdelrahman El-Temtamy, Nicholas Lanigan, Nimer Murshid, Jin Liu, Professor Wang.