

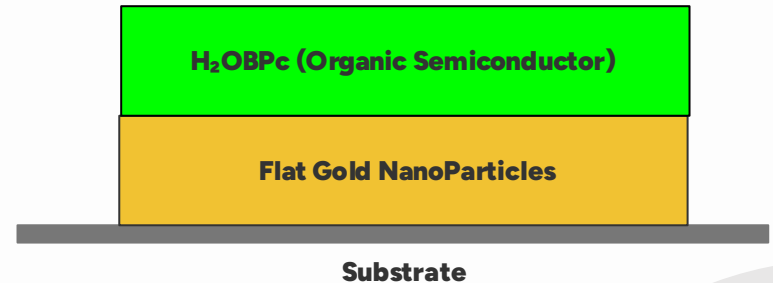
Creating Heterostructures of 2-D Materials

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Acknowledgements: Dr. Lloyd Bumm, Steven Raybould, Mikey Walkup,
Aiden Guild

Project Overview

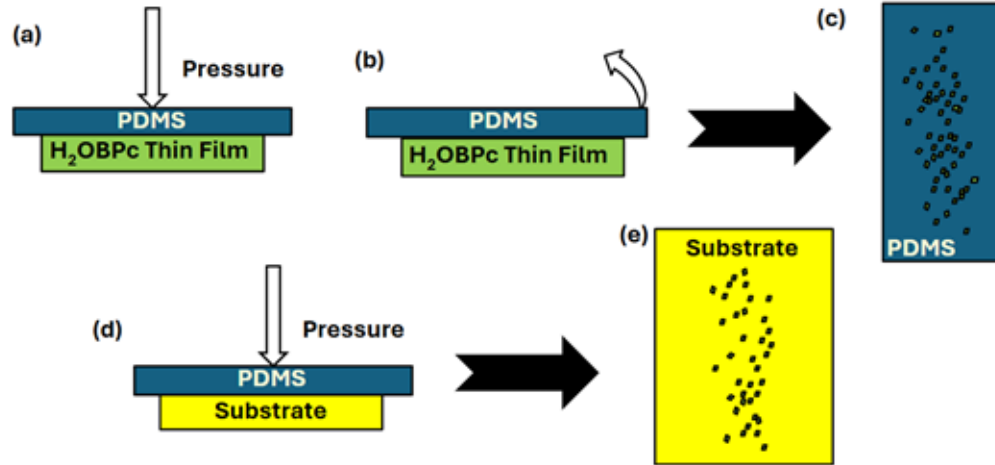
- Creating heterostructures made of Flat Gold Nanoparticles with mechanically exfoliated organic semiconductor crystals (H₂OBPc)
- Grow flat Gold Nanoparticles and deposit them
- Characterizing heterostructures with:
 - Atomic Force Microscopy
 - Optical Light Microscopy



Stacking Materials

Exfoliation

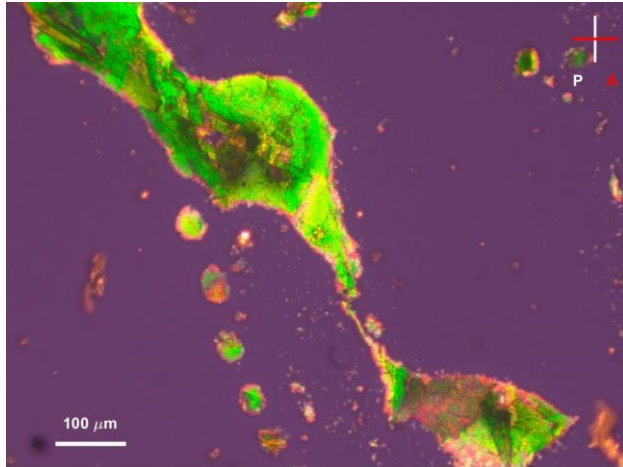
- Method to peel off thin layers from a bulk material
- Uses PDMS, then transfers it onto another surface.
- Useful for studying 2D materials and making tiny devices.



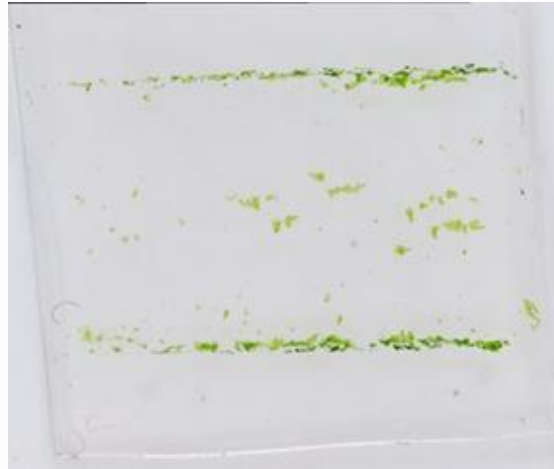
Exfoliation for Conventional materials

Optical Light Microscopy

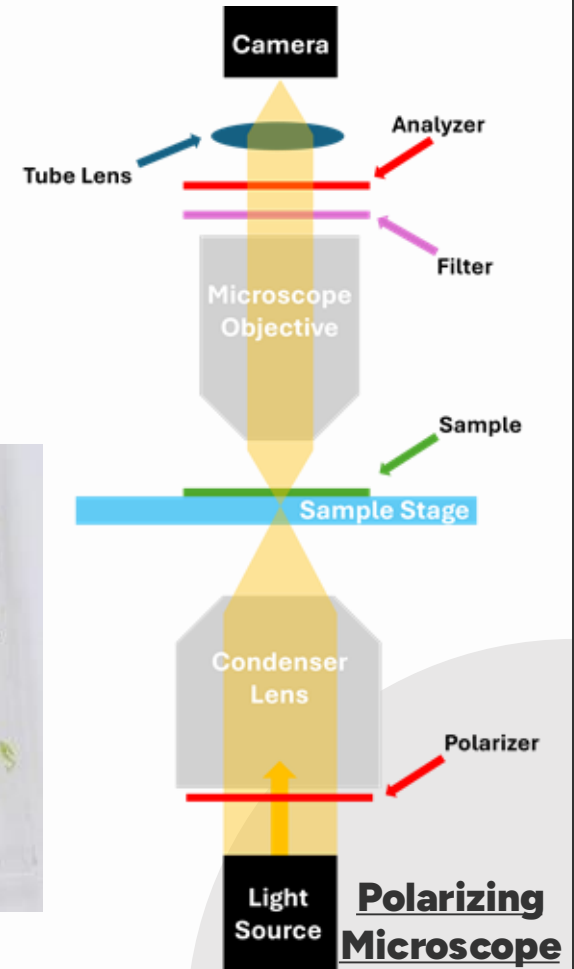
- Using microscopes to see the particles
- Helps in AFM imaging



General Birefringence

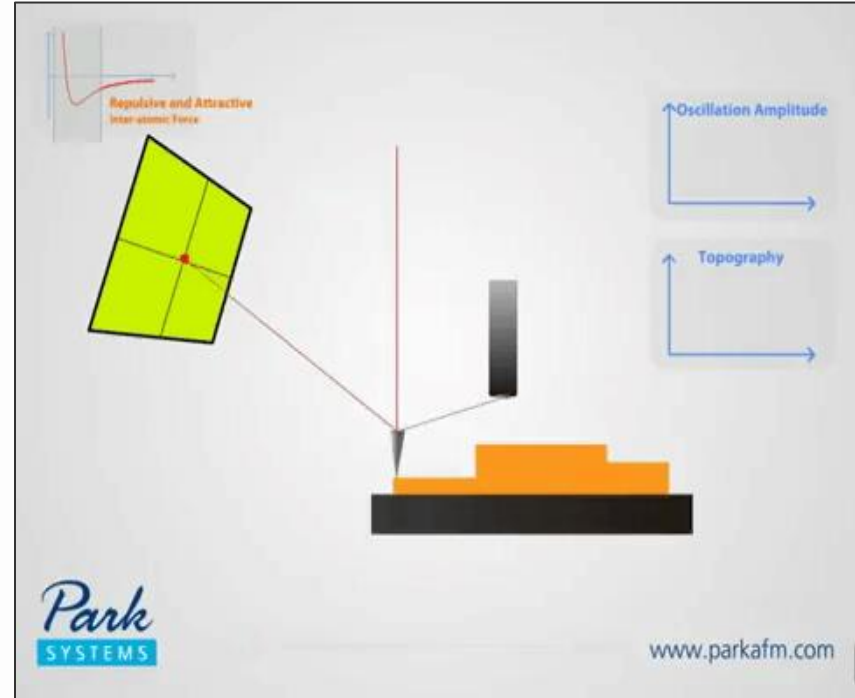


Exfoliated H₂OBPc



What is an AFM?

- Atomic Force Microscope
- Using to measure topography on the nanoscale
- Works by oscillations
- Has different modes
 - Contact
 - Non-contact
 - Tapping



Atomic Force Microscope

**Thank You
Questions?**



References

<https://web.physics.ucsb.edu/~hhansma/biomolecules.htm>