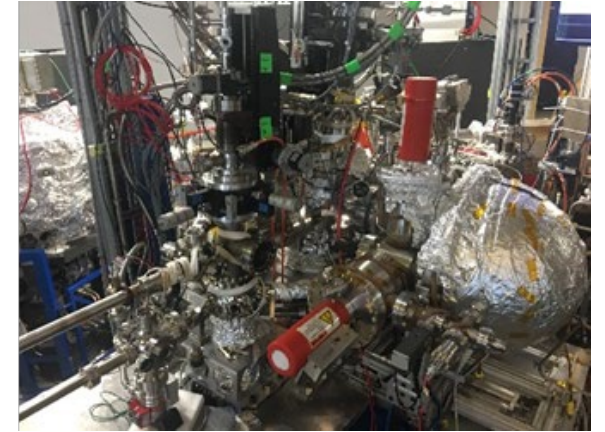
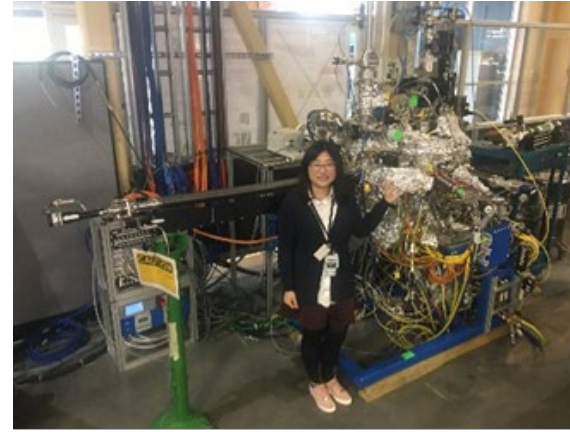


Yale MBE on the NSLS II floor

Develop molecular beam epitaxy (MBE) thin film deposition capabilities at the National Synchrotron Light Source II to fabricate synthetic quantum materials.



Yale-fabricated instrument requiring:

- *Machine shops to fabricate specialized parts, UHV welding.*
- *Materials characterization of grown materials: aberration corrected TEM, AFM, XRD.*
- *Software development for controls.*
- *Software training for students.*
- *Vacuum chamber pumping simulation.*

Yale MBE on the NSLS II floor at BNL

PI/Group

Charles Ahn and Fred Walker, Applied Physics

<https://ahnlab.yale.edu/>

Current Approach

PI design of chamber to achieve performance metrics, match NSLS II constraints on instrument footprint, and comply with BNL safety protocols.

Advanced Instrumentation Development Center needed for the following:

- 1) Vacuum chamber design tools (software) and expertise (vacuum engineers).*
- 2) Machine shop fabrication expertise to fabricate specialized parts for holding and manipulating samples, UHV welding expertise for making custom vacuum parts.*
- 3) Training for students in the use of simulation programs such as COMSOL for vacuum chamber simulation.*
- 4) Expertise in industrial laboratory safety to anticipate and address National Laboratory safety requirements.*
- 5) Knowledgeable experts in computer control of instrumentation to develop custom control software and adapt commercial software to existing hardware.*