Pitt Research

Western Pennsylvania Quantum Information Core
AJA Three Chamber Deposition System

It is a three-chamber, high-vacuum deposition system designed for superconducting thin-film growth. It integrates multiple deposition and preparation techniques within a compact system, with full sample *in situ* transfer capability to/from all three chambers.

- **Left Chamber:** Electron-beam evaporation
- **Middle Chamber:** Sample surface cleaning and analysis
- **Right Chamber:** Sputter deposition and electron-beam evaporation

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Technical Specifications (left chamber, electron-beam evaporator)

- Power supply: 10 kV telemark
- Source: 6 pocket temescal (15 cc pockets)
- Material supported: Sn, Al, Ti, Ta, Pd
- Substrate size: up to 6" in diameter
- Substrate tilt: -45° to 45°
- Cooling: liquid nitrogen
- In situ oxygen oxidation
- Base vacuum: $<2 \times 10^{-9}$ Torr

Technical Specifications (middle chamber, preparation chamber)

- RHEED (Reflection High-Energy Electron Diffraction)
- Auger Electron Spectroscopy (AES)
- Atomic Hydrogen cleaning
- Substrate rotation for uniform deposition

- Substrate size: up to 6" in diameter
- Substrate heating: up to 850 °C
- Adjustable source-substrate distance:17"- 20"
- Base vacuum: <1 x 10^{-8} Torr

Technical Specifications (right chamber, sputter chamber)

- Electron beam source: 4 pockets
- Sputtering gun: One 3" diameter and four 2" diameter guns
- Power supplies: RF, Pulse, DC
- Argon plasma cleaning
- Material supported (electron beam): Al, Pd, V
- Material supported (sputter): NbTiN, Ta, Al_2O_3, Nb, Pt
- Substrate rotation for uniform deposition
- Substrate size: up to 6" in diameter
- Substrate heating: up to 850 °C
- Adjustable source-substrate distance:17"- 20"
- Base vacuum: <2 x 10^{-9} Torr