

# Overview of Sandia/NM Tritium Capabilities

**IMOG**

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# Overview of Sandia/NM Tritium Capabilities

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- All tritium operation is performed inside a “tritium envelope”.
- Equipment can be connected to both
  - Tritium Exhaust (smoke stack release).
  - Tritium Capture System



# Helium Release “Hedge”

- 40 automated sample ports
- RGA measures mass 2-4
- Calibrated by PSL
- UHV system,  $1 \times 10^{-9}$  Torr
- Measures Instantaneous Release Fraction (RF<sub>i</sub>)

$$RF_i = \frac{ARR}{G(t)}$$

- Samples build up He for one month
- Amount of He determined
- Average Release Rate determined
- Divided by generation rate



# X-Ray Diffraction Analysis

- **Bruker AXS D8 DISCOVER with GADDS**
  - Monochromatic and parallel x-ray beam
  - HI-STAR area detector – Peak to background close to theoretical limits
  - High temperature stage for in-situ XRD
  - Texture analysis
  - Reflectivity
  - Phase identification
  - Grazing incidence
  - Structure refinement



# Transmission Electron Microscopy

- **Philips CM20 200keV TEM**
  - EDAX EDS
  - TEM sample prep for tritided samples



# Thin Film Sciences and Surface Analysis

- **Dual chamber system**
  - **Deposition chamber**
    - 2 e-beam evaporation cells
    - 1 high temperature effusion cell
    - RHEED deposition monitor
    - RGA
    - Flux monitor
    - Substrate temp from 70-1000K
    - Can deposit 1-3 materials in single run
  - **Surface Analysis chamber**
    - Mono-chromatic XPS
    - Dual anode XPS
    - Auger
    - UPS
    - Secondary Electron Microscopy
    - 70K-1000K
    - Reaction Chamber



# Tritium Loader

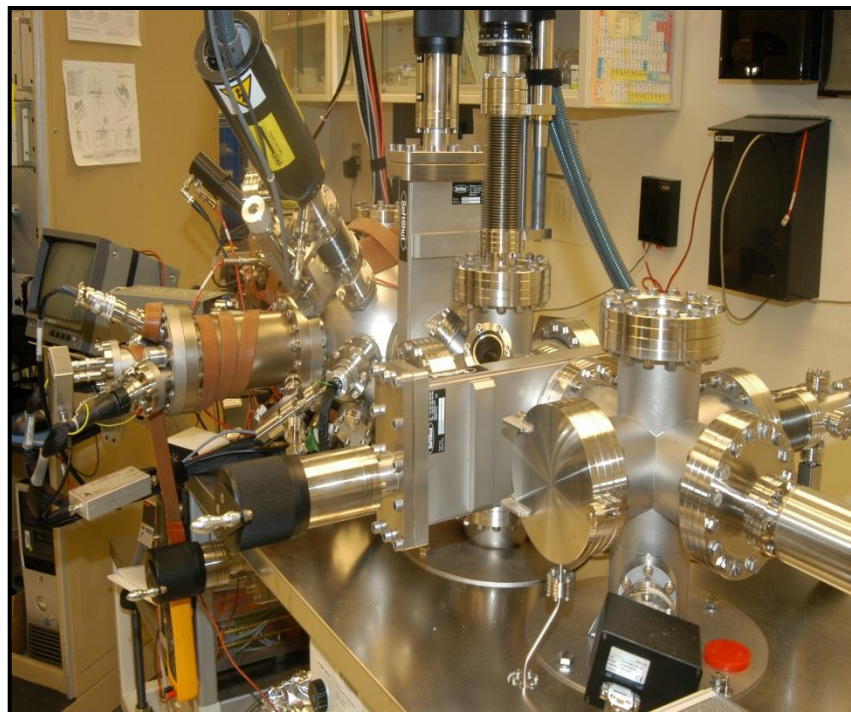
- **Seivert's type apparatus**
  - **0.1 – 1000Torr**  
pressure range
    - **Sensitivity 0.1 Torr**
  - **20 to 900C**  
temperature range
    - **Sensitivity of 0.25C**



# Thermal Desorption System (TDS)

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- RGA
- ~750C upper temperature limit





# Who to contact for more information

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- **Group Manager – Mike Eatough (505) 844-7761**
- **XRD/TPD – Dan Kammler (505) 845-0297**
- **Helium Release Measurements/ TEM – Clark Snow  
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