Cleanliness Protocol, Surface Contamination & Radon Plateout

- **Brief introduction of those present**

- **Recap of last AARM collaboration meeting, recalling prior motivation for this radon-related working group:**
  - Plate-out studies
  - Cleanliness protocols
  - Rn-impervious packaging

- **Ideas & progress:**
  - Direct implantation of Po-210 (rather than wait for ingrowth) via chemistry
  - Influence of electric fields on plate-out rate at SMU:
    - Make-shift pressure-cooker setup & with HV
    - Clear evidence for plate-out reduction, but study was limited by pressure cooker
    - Resulted in redesigned box for future measurements
  - Also, common interests between SuperCDMS & LZ:
    - Targeted plate-out studies
    - Diffusion through barriers
    - Local emanation of radon as a limitation to radon control & mitigation
    - Dust as a particle-borne source of U/Th/K and radon progeny

- **Ideas continued…**
  - Further e-field studies at SMU
  - Is it useful to test diffusion through Rn-impervious bags?
    - Yes, in order to identify *the* product to use for the G2 experiments
    - Probably most relevant to measure the effect of diffusion through the bag material together with plate-out onto the surface of a sample
  - Cross calibration between surface screeners
    - Also, test practical aspects of shipping & multi-site use of samples
    - For example, development of a protocol (cleaning, packaging & shipping)
      - What grade of chemical is needed for cleaning?
    - And checking with ICP-MS or other assay techniques?
  - Targeted tests of failure modes for radon mitigation (e.g., calibration of purge-cabinet failure … when the flow rates drops by 50%, what does the Rn level do?)
    - Purge cabinet witness plate (specifically to monitor purge-cabinet failure)
    - Also, load-lock mechanisms for purge cabinets
  - Use of etching to concentrate bulk contaminants for assay in commercial alpha counter
  - Dust:
    - Recap of problem: has relatively high U/Th and large surface area to volume ratio and thus emanates radon profusely
    - Potentially dominant background for LZ (SuperCDMS hasn't evaluated yet)
    - Combination of measuring bulk U/Th in dust via ICP-MS and radon emanation
      - Is ICP-MS sensitive enough to assay dust mass via U/Th? (if so, how?)
      - May be possible at PNNL using ~10 cm^2 collection surface?
    - Beginning of a measurement program at Mines has been started