Summary: Multi-Machine Determination Of SOL-To-Core Multi-Z Impurity Transport in Advanced Confinement Regimes (PD/1-1)

- **9 Datasets (3 US devices: Alcator C-Mod, DIII-D, NSTX/U) used to study core to edge impurity transport for US FY20 Joint Research Target (JRT)**

- **Neoclassical transport determines impurity transport in the deep core with turbulence dictating outside of mid-radius**
  - All databases/modeling show > mid radius impurity peaking correlated with electron density
  - Modest ECH reduced core neo accum., independent of Z and/or confinement regime

- **Clear deviations from turbulent modeling, particularly in the direction of imp. pinch in the core**
  - Modeling generally more pessimistic (inward pinch) compared with measurements
  - Rotodiffusion found not to play a significant role in impurity pinch
  - Turbulent modeling in the ST core, unable to explain impurity peaking

- **Neoclassical transport describes impurity dynamics in the pedestal**
  - ELM recovery and L-H time histories explained on DIII-D and NSTX by NC transport

- **3D modeling is able to qualitatively reproduce many features of SOL/ divertor impurity transport**
  - Evidence of near SOL W accumulation observed, only in unfavorable grad B direction, unlikely for reactor operation