Cation size effect and Conduction Mechanisms

- **Solution-Processed** amorphous thin-film In-X-O (X=Sc, Y, or La)
- Thin-film transistor (TFT) electron mobilities as a function of gate voltage
- Excellent agreement with **MD simulations** (local structure) and **DFT** (DOS)

\[ T_{\text{growth}} = 250 \, ^\circ \text{C} \]

Dominated by **trap limited conduction**: broadening of tail states in DOS **below** Fermi level with increased cation size

\[ T_{\text{growth}} = 300 \, ^\circ \text{C} \]

Dominated by **impurity percolation**: increased potential barrier in DOS **above** Fermi level with increased cation size