• **Objective:**
  » Employ NEMO 5 for large-scale runs on supercomputers
  » Enable hero simulations
  » Prove scalability of code

• **Approach:**
  » Scalability is enabled by PETSc, SLEPc and home-grown multilevel MPI task distribution class
  » Participation in ORNL’s Joule project to test and improve scalability

• **Results / Impact:**
  » Strong scaling of a ballistic transport simulation in an ultrathin-body transistor up to 1e5 cores
  » Weak scaling of strain and eigenstates in a quantum dot involving ~1e9 degrees of freedom