FY17-18 T&T Milestone ideas

- "Validate reduced transport models for electron thermal transport with NSTX and NSTX-U plasmas"
  - Focus on both low β L-modes (electrostatic) and high β H-modes (electromagnetic)
  - Test TGLF, MMM, Rafiq-MTM, RLW … with experimental plasmas
    - Lots of work already done, just not very systematic or unified
  - Compare models with gyrokinetic simulations, identify biggest discrepancies to motivate model upgrades
    - Some TGLF and Rafiq-MTM comparisons with GYRO already started

- "Assess importance of multi-scale effects in NSTX, NSTX-U plasmas"
  - ETG predicted important (using electron scale NL GK sims) in various NSTX L-mode, H-mode, and NSTX-U L-mode
  - Still don't have a great understanding of when & where ETG can be important contributor, and whether it can be considered in isolation from ion scale turbulence
  - Test TGLF with new saturation rule (based on multiscale sims) over many NSTX, NSTX-U cases to (in)validate and help guide when ETG/multiscale may be important
  - Use linear and nonlinear GK sims to test TGLF (started this in ~2014 using NSTX L-mode data), identify biggest discrepancies to motivate TGLF upgrades
  - Probably can't promise multi-scale runs, but we can motivate what cases are prime targets and begin scoping via the above work
    - Can compare large-box ETG sims + synthetic diagnostic with high-k data (J. Ruiz-Ruiz , MIT)

More T&T Milestone thoughts

- "Validate ion scale simulations with 2D BES data for NSTX-U L-modes"
  - Have core 2D BES data for first time (although some noise issues in 32 of 48 channels)
  - Signs of significant amplitude fluctuations and bimodal propagation
  - Use GK simulation + synthetic diagnostic to make prediction and comparison
  - May also be able to include UCLA reflectometer analysis (Crocker had initial look, will get back to it soon)
  - Have already started ion scale simulations (local GYRO, can try global GYRO, GTS, XGC1)

- "Assess importance of global/non-local transport effects in NSTX and NSTX-U plasmas"
  - Expecting finite-ρ_* effects to be important in STs
  - Number of GTS runs already done by Yang for various L and H-mode
  - Would initiate GTS and XGC benchmarking (w/ GYRO, and maybe GENE), which we're considering for L-modes (i.e. can do electrostatically)