

**Thursday, March 22, 2012**  
**NUCLEAR THERMAL PROPULSION: MODELING**  
**3:30 p.m. Waterway Ballroom 2**

**Chairs:**     **Stan Borowski** (NASA Glenn Research Center)  
              **Jeramie Broadway** (NASA Marshall Space Flight Center)

3:30 p.m.     Litchford R. \* Luo W. Cassibry J.  
                  [\*Physics Based Modeling for Nuclear Rocket Fuel Development\*](#) [#3061]  
                  Physics based modeling for nuclear rocket fuel development.

3:50 p.m.     Appel B. C. \*  
                  [\*Combined Neutronics and Thermal-Hydraulics Simulation of the Argonne National Lab 10 klbf-Thrust Cermet Nuclear Thermal Rocket\*](#) [#3067]  
                  In the 1960s, the Argonne National Lab demonstrated the feasibility of tungsten-cermet fuel for a nuclear thermal rocket. This study evaluates a 10 klbf-thrust design developed at ANL by combining neutronics simulations with CFD models.

4:10 p.m.     Harrison T. J. \* Qualls A. L.  
                  [\*Analysis of Burnup Effects on Reactor Control Strategies\*](#) [#3057]  
                  Most proposed space applications use small, fast-spectrum cores. This paper describes calculational methods to include burnup effects to better optimize the control strategy.

4:30 p.m.     Shipley K. Sudderth L. \* Deason W. Casey D. Fischhaber L. Marquis J. Saleem R.  
                  [\*High Performance Bimodal Nuclear Thermal Rocket\*](#) [#3025]  
                  A high performance BNTR achieves 100 kWe using W-Re cermet fuel, with peak fuel temperature of 3000 K. A thrust to weight ratio of 1.3 is achieved with 6000 lbf thrust. The system mass is 3600 kg, including the reactor, shield, Brayton components, and radiators.