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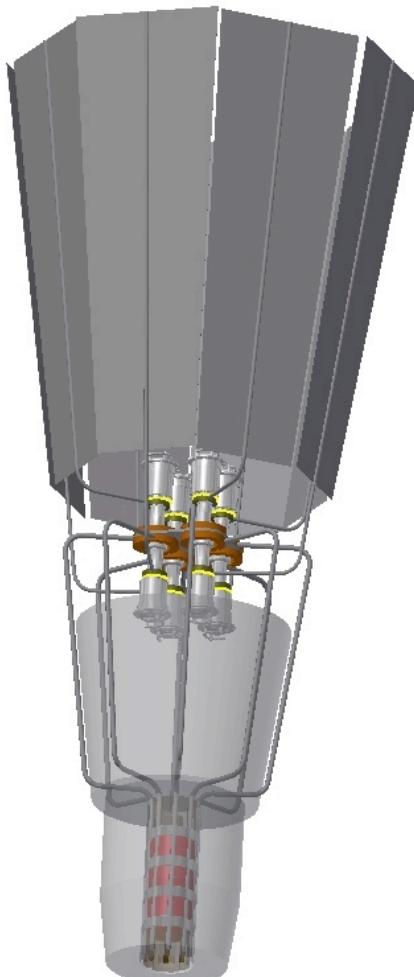
# KiloPower Program

Presented to Aerospace America,  
(A Magazine of the AIAA)

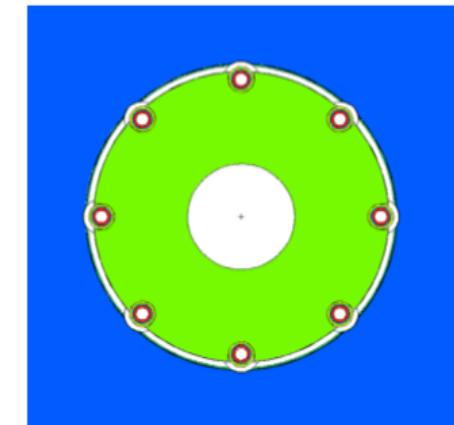
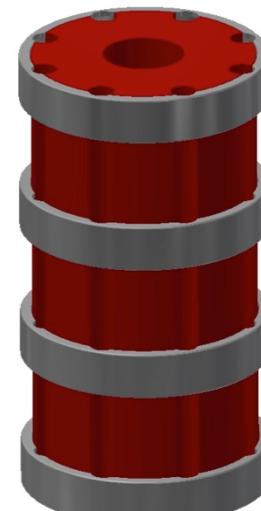
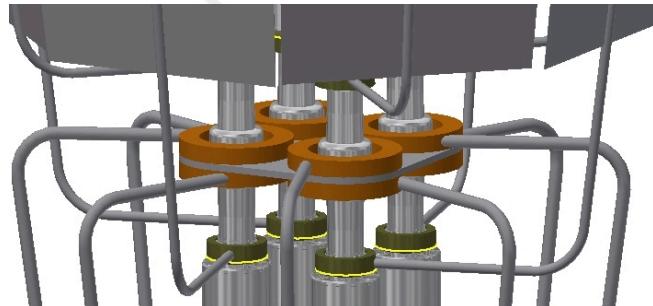
**Patrick McClure**  
**Los Alamos National Laboratory**

August, 2016

# 1 kWe Kilopower

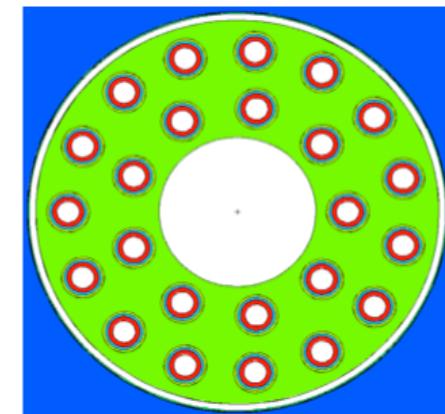
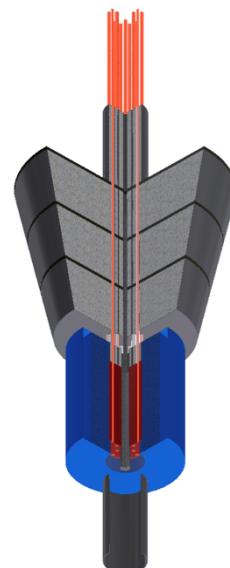
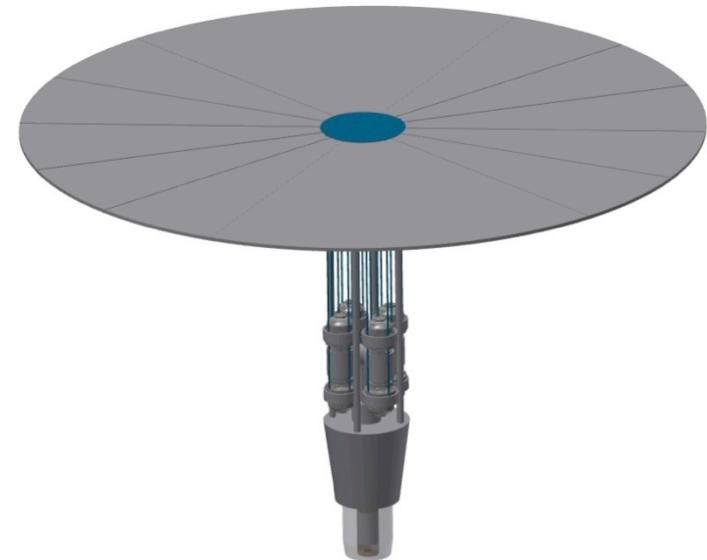
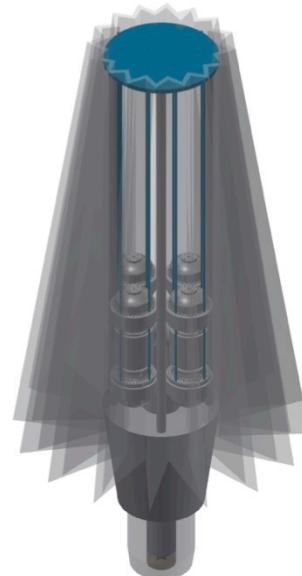


- 4 kWt UMo Core (25kg)
- BeO Reflector
- (8) 230/Sodium heat pipes
- (8) Modified ASC Converters
- (16) Ti/Water heat pipes
- Al Radiator
- 390 kg total mass
- 2.6 W/kg
- 28 VDC Bus
- 1 amp-hr startup
- 15+ year design life
- < 1% fuel burnup
- $1 \times 10^{11}$  neutrons/cm<sup>2</sup> , 100krad (16yr) @ 10m dose plane



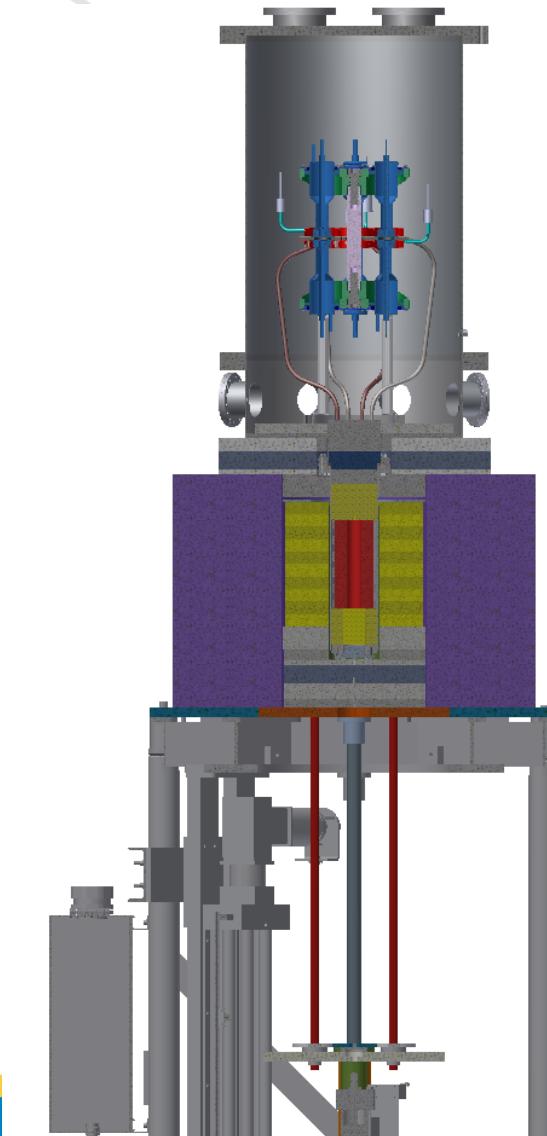
# 10kWe Kilopower

- 40 kWt UMo Core
- BeO Reflector
- (24) 230/Sodium heat pipes
- (8) 1.25 kWe Stirling Converters
- (32) Ti/Water heat pipes
- Al Deployable Radiator
- 1800 kg total mass
- 5.6 W/kg
- Mission Specific Bus Voltage
- 2 amp-hr startup
- 15+ year design life
- <1% Fuel Burnup
- $1 \times 10^{11}$  neutrons/cm<sup>2</sup> , 100krad (16yr) @ 10m dose plane

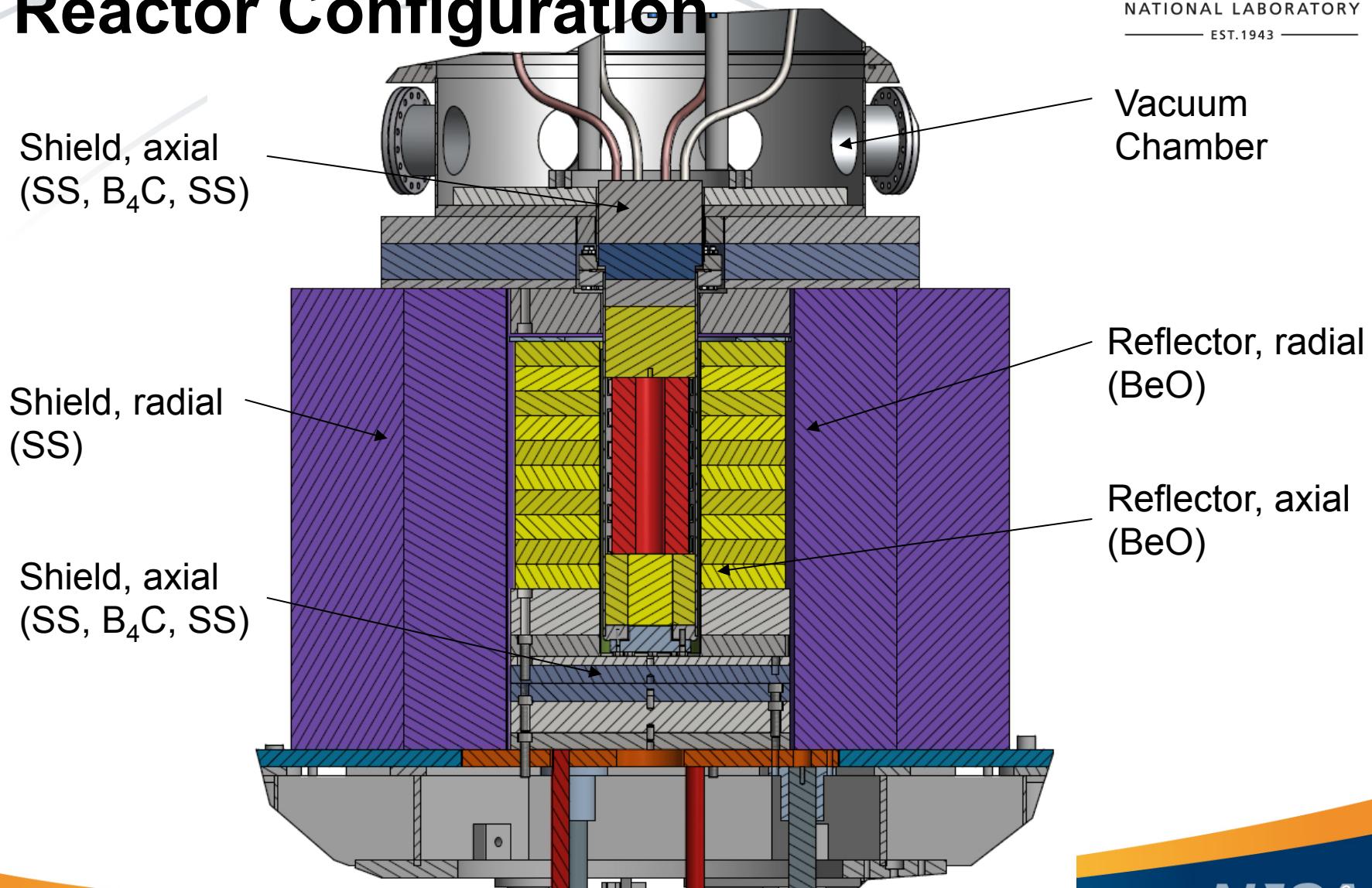


# KRUSTY Integration Test (DAF)

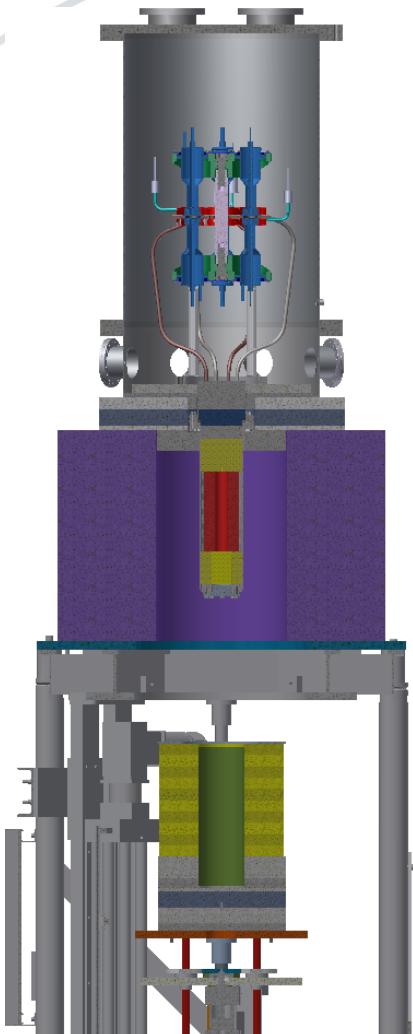
- Kilopower Reactor Using Stirling Technology
  - Comet criticality experiment at NNSA Device Assembly Facility
  - Same system configuration as DU thermal vacuum testing
  - HEU core
  - BeO reflector
  - Vacuum chamber addition
- Addresses
  1. Neutronics/Criticality
  2. Thermal power/feedback
  3. Reflector Performance
  4. Startup/Shutdown Operations
  5. Converted Electrical Power
  6. ATLO Safety processes



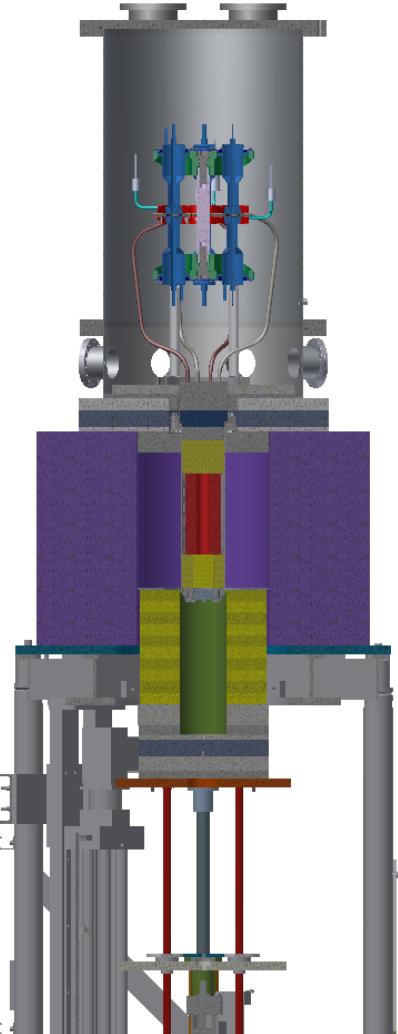
# Reactor Configuration



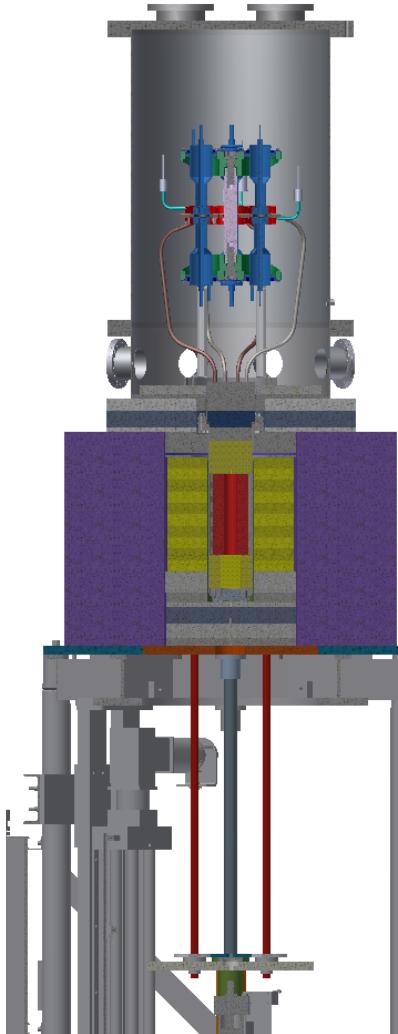
# Platen Positions



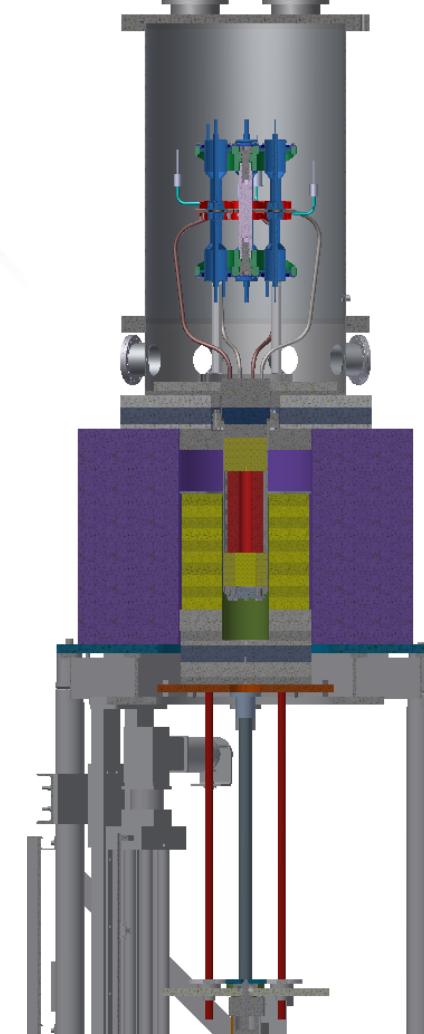
Fully Withdrawn



Neutronically withdrawn



Fully Inserted



Hydraulic scram  
from full insertion