UNICEX Facility and UCLA Capability

Existing operating facilities for immediate needs of collaboration

- Paratherm High Temperature Organic Oil Coolant Loop
- Helium Purge Gas Stream System
- Data Acquisition with Remote Viewing and Control
- Beryllium and Flibe Handling and Experimental Facilities
- Thermomechanical Test Stand
- Water Vapor Bake-out and Vacuum Pump Systems
- Ceramic breeder and Beryllium pebbles

Human Resources and Experience

- Fusion group: Many years of experience in thermomechanics experiments and modeling
- Mechanical Eng. Dept. : A large group of Faculty in solid mechanics, materials, and material interactions
- Proven record of accomplishments and collaborations (e.g. with JAERI and FZK)
Existing Steel Test Article for Ceramic Breeder Packed Bed Effective Thermal Conductivity and Interface Conductance Study

Modeling and measurements on the effective thermal conductivity and interface conductance under different loading conditions
Experimental Li$_4$SiO$_4$ pebble bed under bake-out

The vapor bake-out system includes:

- cryogenic sorption pump
- turbomolecular pump
- a high resolution Residual Gas Analyzer
Solid Breeder Material Systems Thermomechanics and Interactions

- Advanced 3-D modelling capabilities and conducted experiments on thermomechanics, deformation, and fundamental properties for pebble bed ceramics and Be

- 3-D Numerical simulation results reproduce the effects of the external loads on the beryllium packed bed thermal conductivity.

- Effective thermal conductivity increases as a result of an increase in contact area

- Glove box and enclosure facilities approved for large scale Be handling (for thermomechanics experiments)

- Approval underway for Flibe (solid and molten forms) handling
Data Acquisition System with Internet Access Remote Viewing and Control Capability Allows Effective and Cost Saving Collaboration

JAERI scientists observing and discussing real-time experimental data in Japan

JAERI scientist Yasuo Kosaku pouring the Li$_2$O particulates into the test article at UCLA

Professor Mohamed Abdou with Yasuo Kosaku