



---

## A Molten Salt Training and Research Loop for Advanced Nuclear Reactors

**PI:** Alexander Bataller, North  
Carolina State University

**Collaborators:** N/A

**Program:** FY23 NEUP  
Infrastructure – General  
Scientific Infrastructure  
Support for Universities

---

### **ABSTRACT:**

A future that features advanced nuclear reactors and their accompanying fuel cycles will require a work force familiar and skilled with high temperature, and likely non-aqueous, coolants. To meet this new demand, universities should offer students experiences related to high temperature coolants through coursework, hands-on laboratory training, and opportunities for fundamental research. Among these coolants are molten salts, whose high temperature operation (~700 °C) and relevance in advanced nuclear reactors (i.e., molten salt reactors, MSR) can provide new research and educational opportunities. The overarching goal of this infrastructure proposal is to establish a molten salt pumped loop and argon glovebox for facilitating fundamental research and incorporating advanced nuclear energy coolants into our nuclear engineering undergraduate curriculum. Future users of the salt loop will investigate a diversity of research topics that include fluid characterization, material corrosion, thermal-hydraulics, sensor development, and more. The proposed infrastructure equipment will enable rapid molten salt experiments while bypassing long development time of building a salt loop. The new capability will support the Office of Nuclear Energy's ongoing molten salt research efforts for developing advanced fuel cycles and MSR by providing an experimental platform for a variety of topics.