The Space Survivability Test Chamber (SST) provides an extensive, versatile, and cost-effective system for pre-launch verification and assessment of small satellites, system components, and spacecraft materials. A UNSGC Faculty Research Infrastructure Grant was awarded for the purpose of making improvements to enhance and extend the capabilities of the SST. Since the SST was brought online in August 2016, several externally funded projects have been completed and collaborative projects with The University of Tsukuba (Japan) and Logan High School (Utah). Many more projects are forthcoming and the capabilities of the SST continue to be improved and developed for the future.

### Space Environment Effects

The harsh space environment can modify materials and cause detrimental effects to satellites. To predict and mitigate these deleterious effects, ideally a full spacecraft would be tested in all applicable space environments [1]. Because this is not practical, the ability to accurately simulate space environment effects through long-duration, well-characterized testing in an accelerated, versatile laboratory environment becomes key.

### Simulated Space Environments

The SST chamber simulates several critical characteristics of the space environment: electron flux, ionizing radiation, photon flux, temperature and neutral gas environment. Fig. 3 show representative electron spectral fluxes for several common environments and the solar UV/Vis/NIR. The energy range of electron, ionizing radiation, and photon sources are shown above these graphs.

### Projects On The Horizon

Future proposed projects cover a wide array of scientific fields; these include:

- **Communications Satellite Component Testing**
  - VUV degradation of antennas and thermal control coatings. Proprietary funding.

- **Spacecraft Materials Testing**
  - Radiation induced conductivity (RIC) of perovskite dielectric materials by total ionizing dose (TID). Funding pending from Sandia National Labs.
  - Effects of radiation on conductivity and permeability of space polymers for NASA Europa Mission. Funding pending from NASA Jet Propulsion Lab.

- **Radiation Damage of Spaceflight Electronic Components**
  - Evaluation of TID effects on electronic components. Funding pending from NASA Space Dynamics Lab & Space Flight Industries.

- **Testing of New Spacecraft Propulsion Technologies**
  - Equipment to be flown on a Terrier Malamute rocket to test hybrid thruster designs. Proposed by USU Engineering Department in conjunction with a NASA Graduate Student Instrument Project (USGIP).