Beyond consumer batteries: Challenges of cell venting physics in lithium ion battery e-Aero applications

As lithium ion battery technology grows beyond cell phones, tablets, and other consumer products into electrification of aerospace systems such as drones, e-aircraft and electronic subsystems in larger aircraft, failure modes such as battery thermal runaway must be considered in design. With a push for high energy density and larger format systems, the phenomenon of cell venting and thermal runaway must be considered in design.

While thermal runaway is rare, the outcome of cell venting can be significant to aircraft safety, as cells can release an ionized plasma composed of flammable and hazardous gases mixed with water vapor and particulates at temperatures that can exceed 1000 degrees C at the point of venting. While prevention of failure is a focus of many aerospace engineers, safe designs must consider the complex multiphysics problems that evolve if these systems fail, including consideration of long latency of events.

Attendees will be provided information on cell venting failure physics, the effect on cells within the pack, current field issues and =latest efforts to provide countermeasures against propagation if a cell fails.