

Abstract Submitted  
for the NWS10 Meeting of  
The American Physical Society

**Space Mission Concept for a Nuclear-Powered Airplane for Saturn's Moon Titan** JASON W. BARNES, University of Idaho, AVIATR TEAM — Saturn's large moon Titan is one of the most interesting places in the solar system. It's the only moon with a significant atmosphere. With a temperature of around 90K, the methane in that atmosphere plays the same role that water does in Earth's atmosphere. Titan has methane clouds, methane rainfall, methane rivers, and methane lakes and seas as seen by the Cassini spacecraft. Future Titan exploration will require a more aggressive vehicle in order to follow up on Cassini's discoveries. I will present the motivation and design for a robotic 'drone' aircraft mission to Titan: AVIATR, the Aerial Vehicle for In situ and Airborne Titan Reconnaissance. This platform makes sense because with  $4 \times$  Earth's air density and only  $\frac{1}{7}$  its gravity, flying at Titan is easier than any place else in the solar system. From AVIATR we could acquire images and near-infrared spectroscopy of the surface, search for waves in liquids, and measure winds and atmospheric properties directly, which would dramatically advance our understanding of this enigmatic, frigid moon.

Jason W. Barnes  
University of Idaho

Date submitted: 26 Aug 2010

Electronic form version 1.4