Project Title: Cooling, Pointing, Annealing Satellite (CAPSat)

Advisors: Dr. Alexander Ghosh, Prof. James Allison, Prof. Paul Kwiat

Project Description:

The Cooling, Pointing, Annealing Satellite (CAPSat) is a CubeSat proposed by the University of Illinois and Bradley University. The mission encompasses three technology demonstrations, each advancing the technology readiness level of NASA roadmap technologies. The experiments are: strain-actuated deployable panels for improved pointing control and jitter reduction, an active thermal control system, and single-photon avalanche detectors (SPAD) to test methods of mitigating space radiation damage. A 3U IlliniSat-2 CubeSat bus, as shown in Figure 1 is at TRL 7 and supports the three experiments.

Student Background and expected research activities:

The student should have a strong interest in space hardware development, and previous experience working with and designing spacecraft hardware is desired. The student will work in an interdisciplinary team, and assist with the design of a spacecraft bus. The student will further have the opportunity to work on one of the three payloads (cooling system, jitter reduction system or SPAD) based on their skills and interests. A diverse range of skillsets are sought, and being any of the following would put a student in consideration: programmer, electrical engineer, mechanical or aerospace engineer, physicist. The student may assist with the design and update to a system appropriate for their skillset such as the structure, the power system, the payload interface, the communication system and the command and data handling system.

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Funding: NASA USIP Program. Two positions can be funded, in different satellite subsystem areas of expertise.