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BurstCube, a CubeSat for Gravitational Wave Counterparts: Mission and Science JACOB R. SMITH, NASA GSFC / CRESST / UMBC, BURSTCUBE TEAM — A new era of multi-messenger astronomy broke ground after the first simultaneous detection of a short gamma-ray burst (SGRB) with a gravitational-wave (GW) signal. Coincident detections enable electromagnetic observations that probe many areas of astrophysics such as jet physics, neutron star equation of state, speed of gravity, and heavy element production. In order to increase the number of SGRB-GW simultaneous detections, the gamma-ray community needs broad-band sky coverage and continued sensitivity. BurstCube, a CubeSat for Gravitational Wave Counterparts, aims to expand sky coverage of the current suite of GRB monitors in order to detect and localize gamma-ray bursts (GRBs). BurstCube is designed with four Cesium Iodide scintillators coupled to arrays of silicon photo-multipliers (SiPMs) on a 6U CubeSat bus (a single U corresponds to cubic unit approx. 10 cm on each side) that are optimized for gamma-rays between 50 keV and 1 MeV, the ideal energy range for GRB prompt emission. BurstCube will compliment current gamma-ray observatories in the detection of GRBs as well as provide astronomical context to gravitational wave events detected by Advanced LIGO, Advanced Virgo, and KAGRA. We present the BurstCube scientific objectives and mission design.

Alyson Joens
George Washington Univ

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