The CU Aerospace (CUA) Monopropellant Propulsion Unit for Cubesats (MPUC) system, is a compact monopropellant thruster using a high performance, non-detonable, low-toxicity (“green”) chemical monopropellant [CUA Monopropellant, formulation 10 (CMP-X)] MPUC has benign storage characteristics, uses an in-house CUA Catalyst, formulation 9, (CC-9) catalyst bed, and uses non-refractory construction materials thanks to a ~950°C flame temp. Propellant is driven by gaseous helium pressurant, providing constant fuel flow and thrust over the system lifetime. The system is readily adapted for a two-phase pressurant (self-pressurizing liquid) that can both provide constant primary fuel flow and also feed a four-nozzle cold gas ACS. High “volumetric impulse” (N-s/liter) performance levels of >1000 N-s/liter for the anticipated system and ~180 s specific impulse for the optimized thruster head will provide significant orbital maneuverability (a 6U 12 kg satellite with a 2U-sized MPUC system would see a total ΔV > 210 m/s) and also enable end of mission de-orbiting. The average power requirement is projected to be a moderate ~3 W based on previously-developed hardware. CMP-X thrusters have demonstrated 180 s specific impulse at 174 mN thrust during thrust stand testing and continuous firing times > 10 min.

An MPUC system equipped with CMT technology is an exceptionally compact, moderate thrust, lightweight system with very high volumetric impulse. This system offers affordable access to CubeSat propulsion and is easily scalable to larger sizes depending on mission requirements to meet needs of differing users in DOD, industry, and academia.