Expanding space exploration efforts to include long-term missions and habitation will expose astronauts and their equipment to many hazards including numerous types of radiation exposure, static charge build-up, micrometeoroid impact, and thermal extremes. Due to their low density and compatibility with numerous existing manufacturing techniques, polymers present a promising class of materials to address many of these needs. A major limiting factor in using most polymers in space applications is the fact that most are electronic insulators and can therefore statically charge during flight. In our work, chemically modified reduced graphene oxide (rGO) nanoparticles are used as reinforcement materials in polymer blends and laminated structures to overcome many of the hazards in space. We are investigating polymer matrices/substrates such as high density polyethylene which is well known to block specific types of radiation encountered in space expeditions and poly(ether ether ketone) which is an aerospace grade polymer due to its mechanical properties but it is an inefficient radiation attenuator. With best configurations achieving sheet resistances as low as $R_s \approx 10 \, \Omega/sq$, we demonstrate composites capable of not only dissipating static charge, but also enabling other advantageous capabilities such as ohmic heating. The fabrication and characterization of these composites is discussed and lab-scale prototypes are used to demonstrate the advantages these materials provide in the space environment.