

VSS HTV and Engineering Services

Removal of these orbit objects and debris is an on-going public debate of strategies. Hyper Transfer Vehicle (HTV) extends the debate with a reusable and high-cadence approach for an in-space orbit vehicle disposal solution. VSS is excited to address the looming problem of orbital debris by introducing a revolutionary means of solar electric propulsion, called HTV. HTV performance impact provides an orbit debris removal market with a \$555/kg disposal service cost. NASA currently estimates of orbit debris remediation at \$7464/kg with chemical fueled rockets, or \$8.2M for comparable orbit debris disposal mission. The HTV cost allows service-based solutions and disposal of 1100kg Sun Synchronous/Polar Orbit (SSO) satellite, or spent rocket, estimated at \$610k.

Dennis Lee's Background

Dennis Lee has over 45 years of experience with NASA and DoD launch vehicles and spacecraft design, development, and operations. Currently, he is providing engineering services to NASA's Lunar Gateway space weather instrument suite called HERMES. Dennis Lee is the National Science Foundation (NSF) Phase I Principal Investigator (PI), currently manages and operates VSS. He is an honorably discharged veteran of the US Air Force. He has a Bachelor of Science degree in aeronautical/astronautical engineering (Washington,'77). Mr. Lee is the Lifting System Machine patent owner, inventor, and is knowledgeable in angular momentum for system of particles in rotating fluid flows. Photo of the lifting system machine test setup is shown below.

Investments for NSF Phase II activities

Upon successful completion of the recently awarded NSF Phase I grant, VSS will be writing a Phase II proposal, which will include CAM Drive investment opportunities, see graphic images below. Once a small business like VSS is awarded a Phase I grant, it becomes eligible to apply for Phase II NSF funding and supplemental investments totaling up to \$2 million. Erwin Gianchandani, NSF Assistant Director for Technology, Innovation and Partnerships, states "NSF accelerates the translation of emerging technologies into transformative new products and services. We take great pride in funding deep-technology startups and small businesses that will shape science and engineering results into meaningful solutions for today and tomorrow."