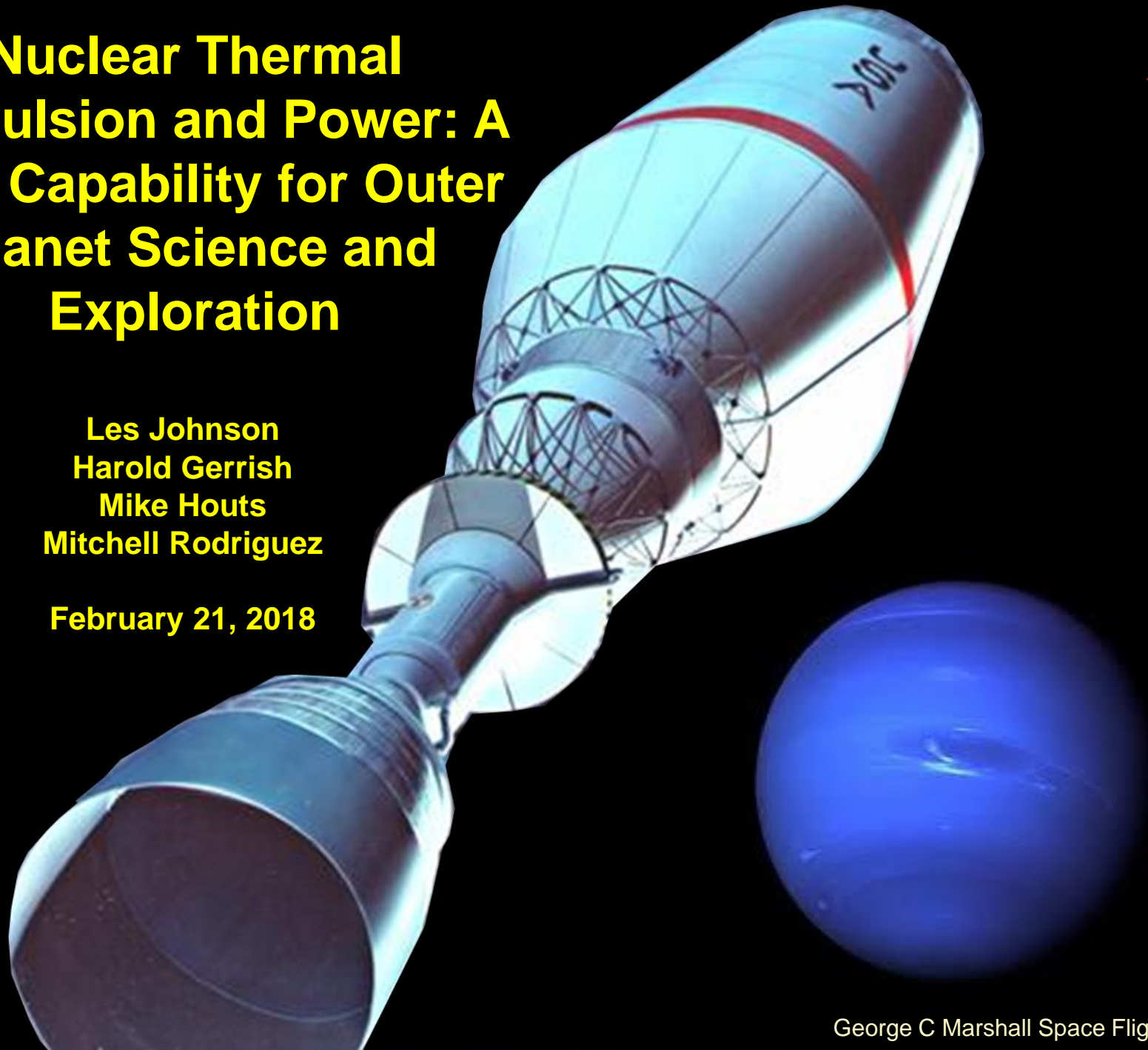


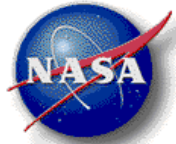


# Nuclear Thermal Propulsion and Power: A New Capability for Outer Planet Science and Exploration

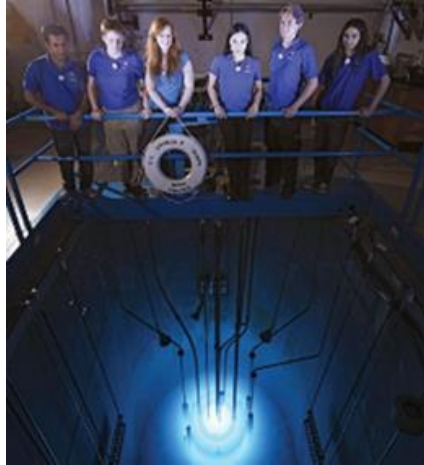
Les Johnson  
Harold Gerrish  
Mike Houts  
Mitchell Rodriguez

February 21, 2018

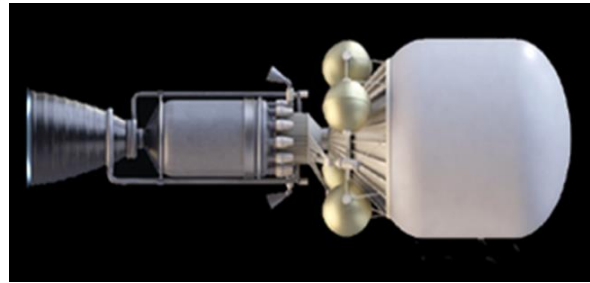




# Why Consider Nuclear Thermal Propulsion?




Using nuclear fuel comparable to what powers university class reactors across the USA




- **Metric tonnes** of usable payload **in orbit** around outer planets and moons
- Fast trip times
- Much lower cost than previously estimated from use of Low Enriched Uranium

Goal of on-going NTP project is to determine the feasibility and affordability of a Low Enriched Uranium (LEU)-based NTP engine with solid cost and schedule confidence.


FY16 | FY17 | FY18 | FY19



System Feasibility Analysis



Fuel Element Development and Testing



Exhaust Capture Analysis and Testing

## Possible Future Capabilities

- NTP reactor providing multiple kWe electric power for entire mission
- Using NTP for braking at mission destination using advancements in Cryogenic Fluid Management to increase usable payload mass at the destination
- Other potential users showing interest