



*NEW YORK CITY COLLEGE OF TECHNOLOGY*  
**Physics Department**  
**Seminar in Physics**

# **Electrodynamic Tethers for Spacecraft Propulsion and NASA Exploration Update**

*Presented by:*

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**Namm 823N**

## **Abstract**

NASA developed tether technology for space applications since the 1960's. Various types of tethers and systems can be used for space transportation. Short electrodynamic tethers can use solar power to 'push' against a planetary magnetic field to achieve propulsion without the expenditure of propellant. The Japanese Fortissimo experiment will demonstrate a new type of electrodynamic tether during its flight in late 2009. Utilizing completely different physical principles, long non-conducting tethers can exchange momentum between two masses in orbit to place one body into a higher orbit or a transfer orbit for lunar and planetary missions.

NASA is developing two new rockets to support the return of humans to the Moon for science and exploration. The Ares-I will carry people into space as a replacement for the Space Shuttle. The Ares-V will be an unmanned heavy-lift cargo vehicle to support travel to the Moon and beyond. NASA is also developing a lunar lander and various systems to be used on the Moon in support of its exploration.

Les Johnson is co-investigator on Fortissimo and manages engineers planning future manned lunar visits and various lunar surface systems.