

PRINCE WILLIAM COMPOSITE SQU

PLASMA PROPULSION

2<sup>ND</sup> LT TOM MARIANI

## EARLY WORK

- 1950's NASA LEWIS RESEARCH CENTER
- 1959 FIRST ION ENGINE TEST
- 1960's SUBORBITAL FLIGHT TESTS
- 1974 SATELLITE SERT II FLIGHT TEST

## CURRENT NASA WORK

- GLENN/LEWIS RESEARCH CENTER
- JET PROPULSION LABORATORY
- MARSHALL SPACE FLIGHT CENTER
- JOHNSON SPACE CENTER

# PLASMA PROPULSION TERMINOLOGY

- ION PROPULSION
- ELECTRIC PROPULSION
  - ELECTROSTATIC PROPULSION
    - SOLAR/PLASMA SAILS
  - SOLAR ELECTRIC PROPULSION
- MAGNETO PLASMA DYNAMIC(MPD) THRUSTERS
  - ARCJET PROPULSION

# THE PROCESS

- An electric power source ionizes fuel into a plasma
- Electric fields heat and accelerate the plasma in the proper direction as it is ejected from the engine creating thrust
- Ion propulsion is 10 times more fuel efficient than chemical counterparts