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SmallSat Symposium 2020

PRIME LIGHT WORKS™

SATELLITE ELECTRIC PROPULSION

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Y Combinator
S16 Batch

GREENTOWN LABS
Member Company

CLEAN TECH OPEN
West 2018

STARBURST
Portfolio Company

CubeSat electric propulsion systems

Growth Opportunity:

- Rapid increase in number of small satellites launched annually
  - Constellations for planetary observation and communications

Technology Applications:

- Low-Earth Orbit (LEO) propulsion to counter decay
  - Increase CubeSat lifetime from 6-24 months to 10+ years
- Transfer Orbit or Deep Space maneuvering
  - Unlimited delta-velocity for renewable in-space propulsion

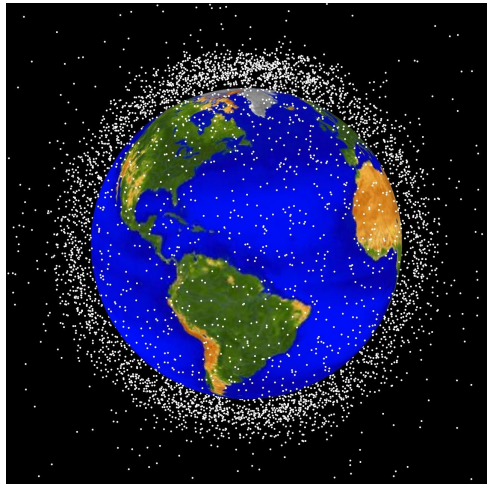

Image: NASA

RF resonant cavity thruster propulsion

- Thrust from concentrated electromagnetic (EM) radiation pressure
  - RF subsystem feeds power (co-ax) to closed microwave resonant cavity
- EM field analysis and RF software simulations (1U cavity, 8.5GHz RF)
  - Wolfram Mathematica, ANSYS HFSS EM Field Simulator
- Experimental test measurement to detect electromagnetic thrust
  - Eliminated false positive interference from magnetic torque

RF Dual Purpose:

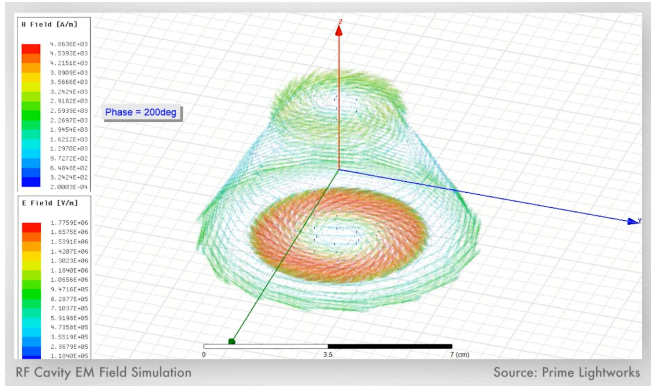

Image: Prime Lightworks

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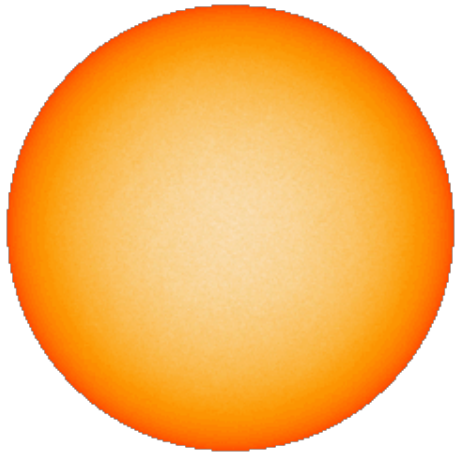
Image: NASA

Business Model Rationale

- Use RF subsystem for propulsion
  - In-situ resource utilization
  - Solar power for electric thruster
  - Reduced cost of manufacturing
- Eliminate satellite fuel
  - Unlimited delta-velocity
  - Fully renewable propulsion
  - Reduced cost/mass of launch



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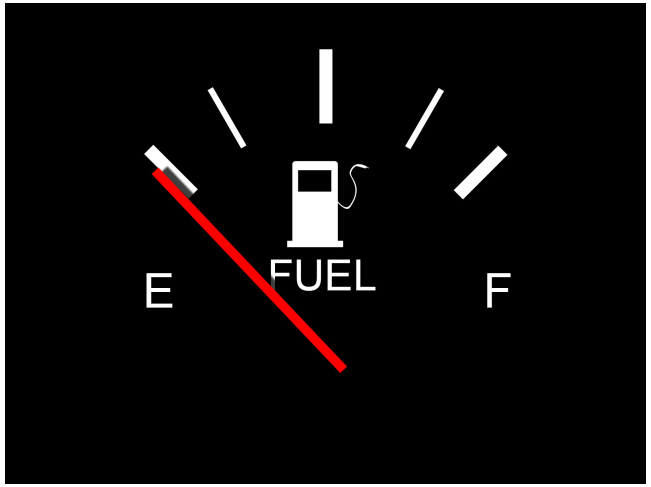

Goal: ISS National Laboratory (2021)

- Y Combinator (2016)
- Greentown Labs (2016)
- Cleantech Open West (2018)
- Starburst Accelerator (2019)
- StartEngine Reg CF (2020)

Critical Milestone: measure thrust in vacuum zero-g

SCAN ME

https://www.startengine.com/primelightworks