



Intro to Satellite

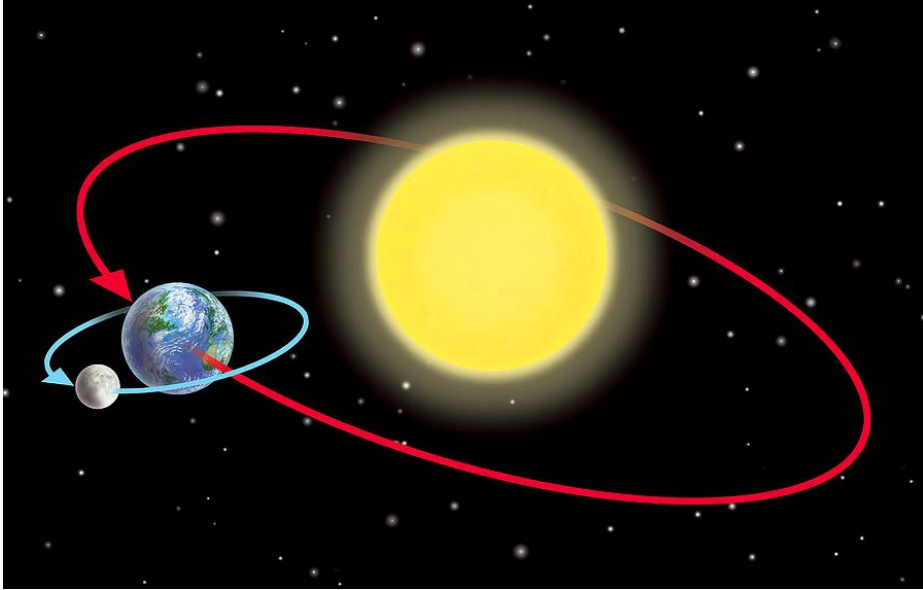
Avakas Lab

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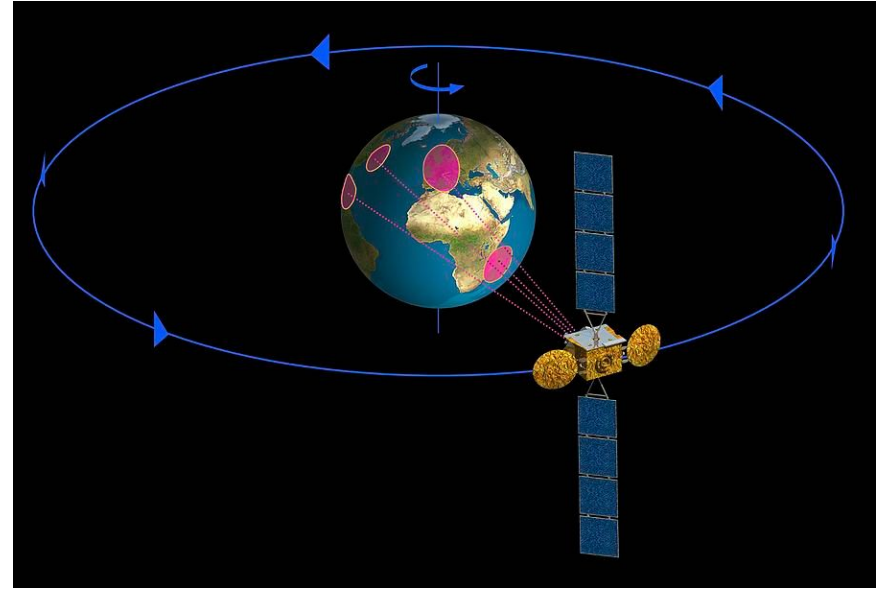
1. What is satellite?
2. History: world first satellite
3. Classification of satellite
4. Satellite development
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What is satellite?

Definition: an object with small mass orbiting a large object



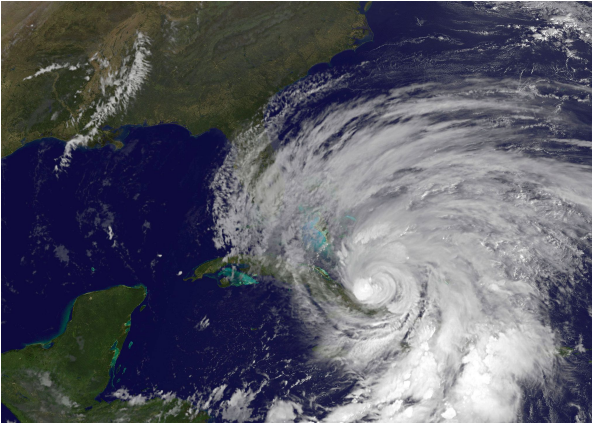
Natural satellites



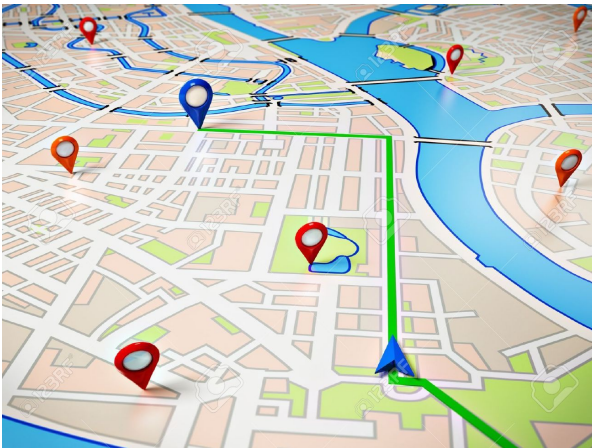
Artificial satellites

What is satellite?

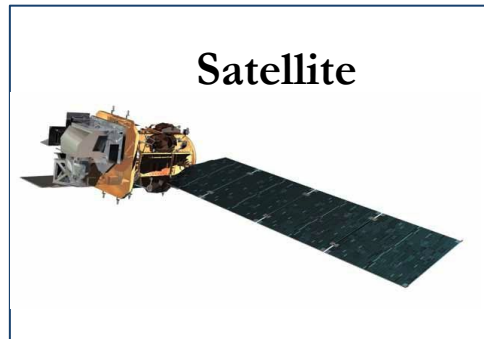
Purpose: satellite plays an important role in our daily life



Weather forecasting



Navigation



Satellite



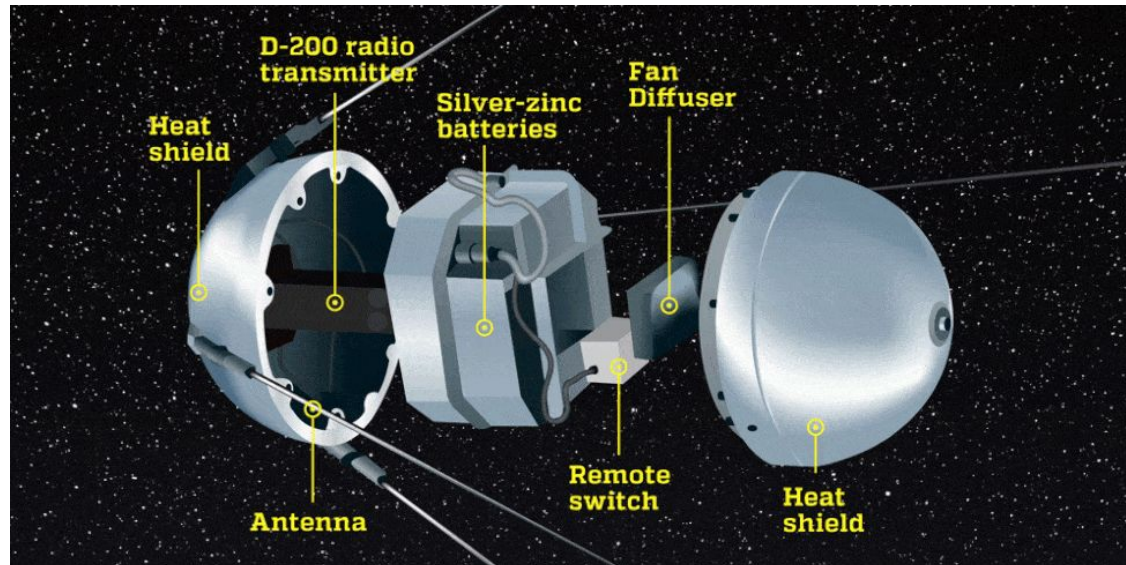
Broadcasting



Disaster management

World first satellite: Sputnik-1

- Launched in 1957 by Soviet Union (Now Russia)
- Size of basketball
- Equipped with a transmitter that gave off beeping signal



Classification of satellite by altitude



Communication satellite

Broadcasting satellite

Climate satellite

36,000 km



Navigation satellite

2000 km



Earth observation satellite

600 ~

800 km



International space station

400 km

Classification of satellite by mission



Navstar-2

GPS satellite



MEASAT

Communication satellite



Landsat-8

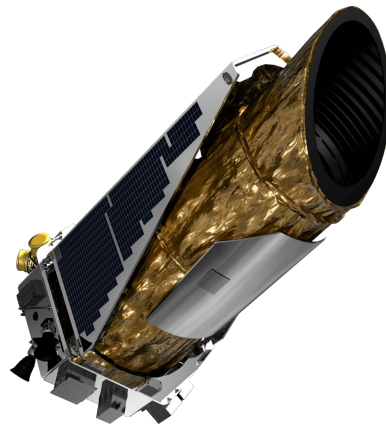
Earth observation satellite



Calipso

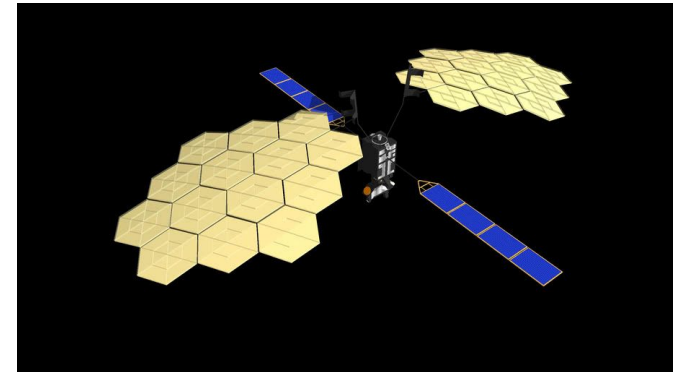
Or use Grace?

Climate satellite



Kepler

Astronomy satellite



ETS-VII

Engineering satellite

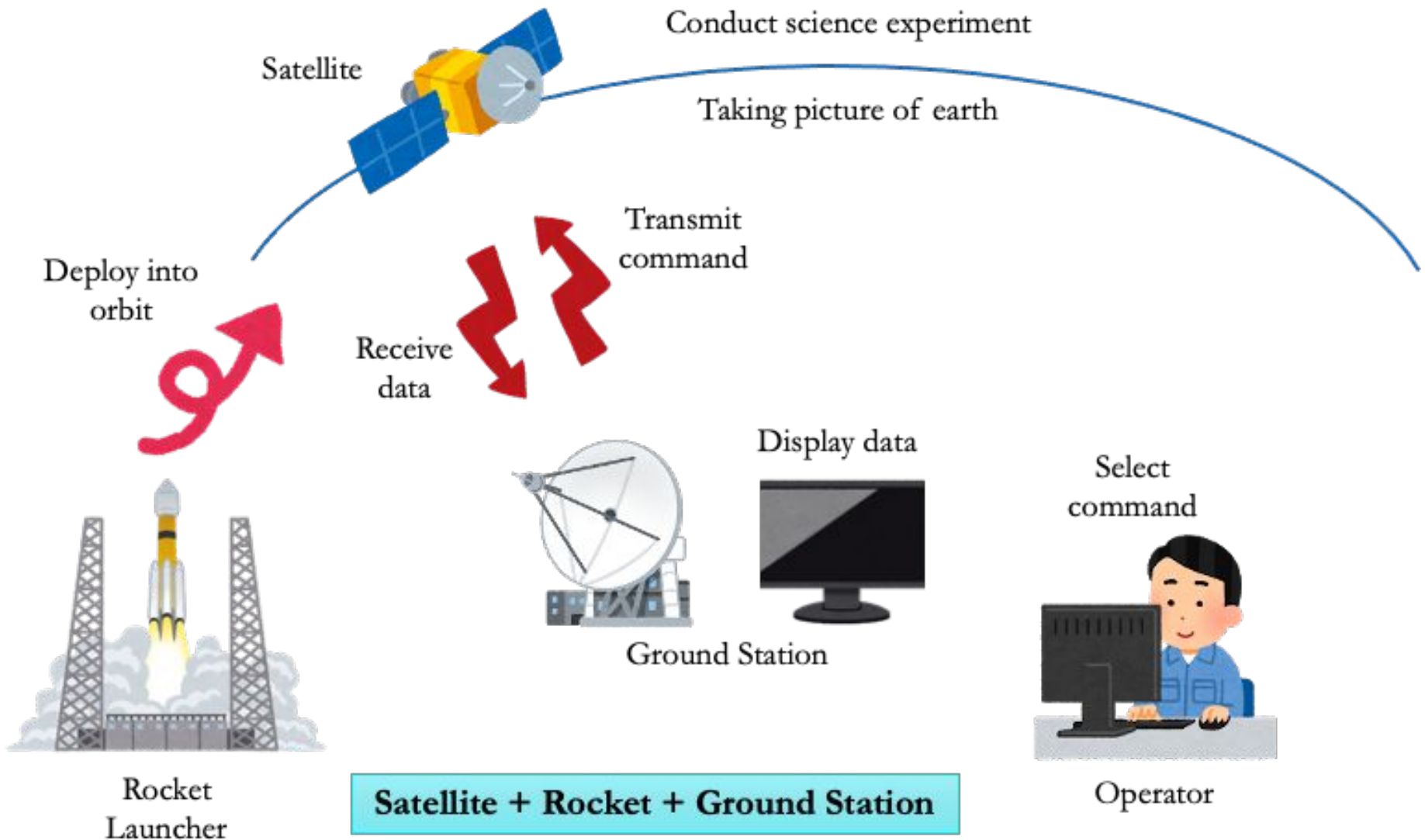
Classification of satellite by size

LARGE SATELLITE	 RADARSAT-2	 >1000 kg	 RHINO
MEDIUM SATELLITE	 CASSIOPE	 500-1000 kg	 BUFFALO
MINI SATELLITE	 SCISAT	 100-350 kg	 LION
MICRO SATELLITE	 M3MSat	 10-100 kg	 WOLF
NANO SATELLITE including CUBESAT	 Ex-Alt 1	 1-10 kg 1 kg per unit	 RACCOON  DUCK

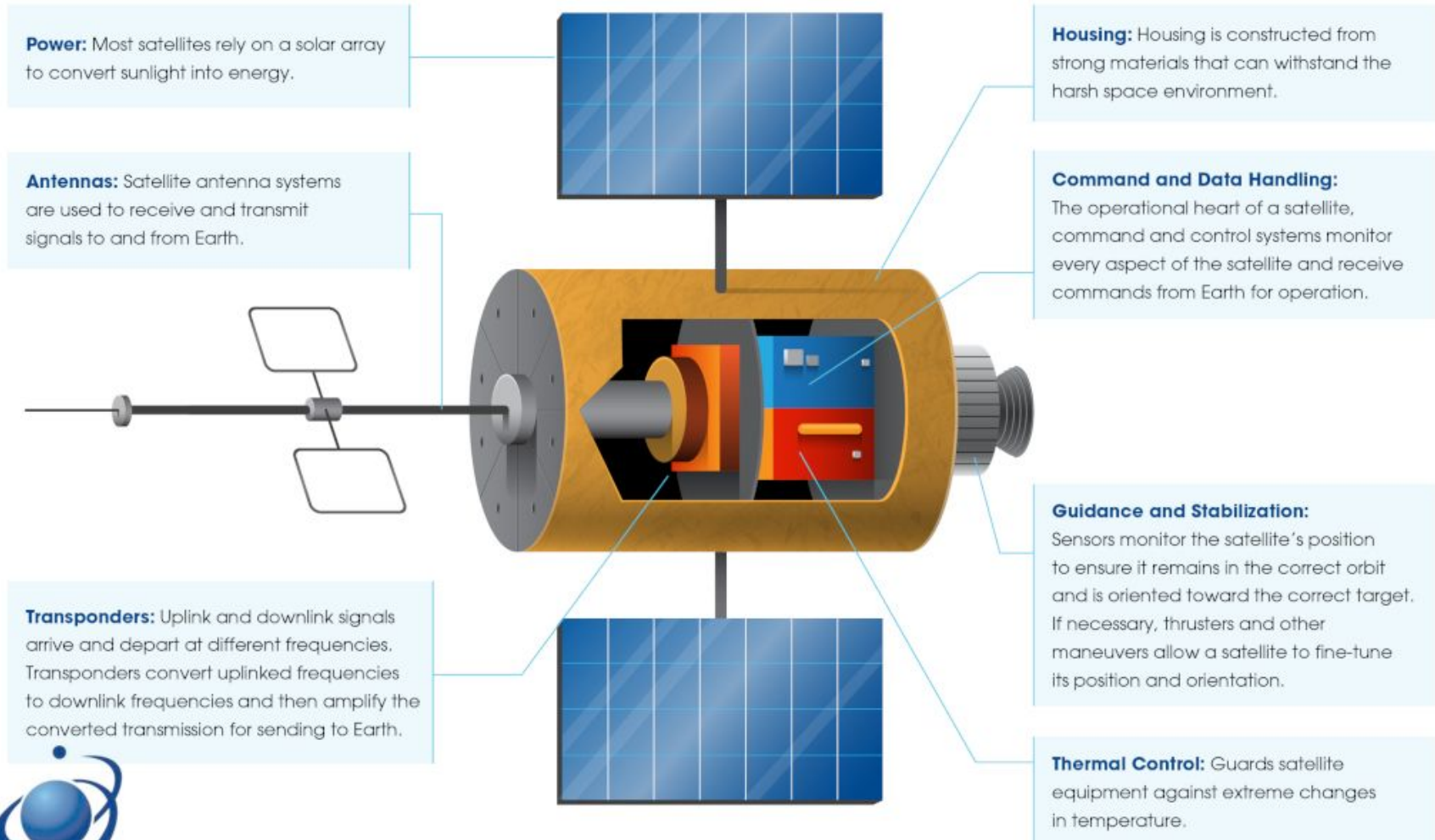
Note: These weights are approximations.

Canada

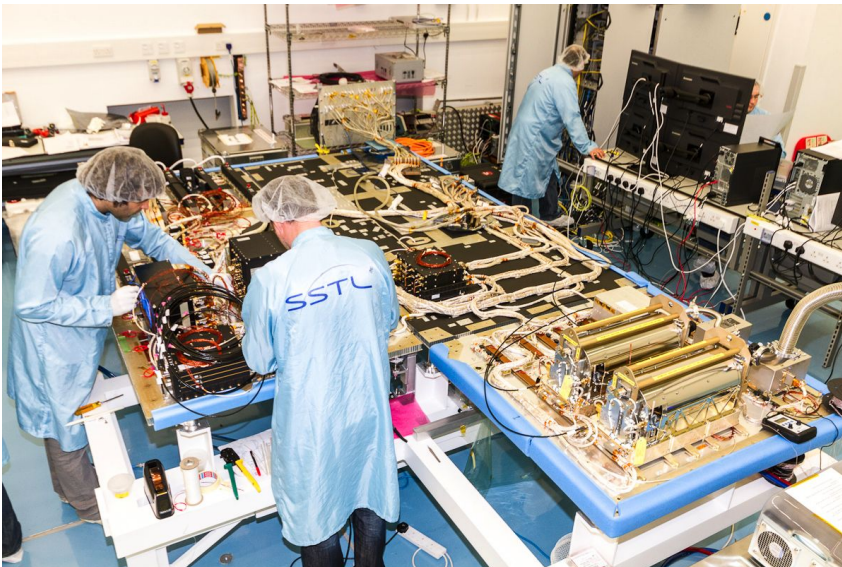
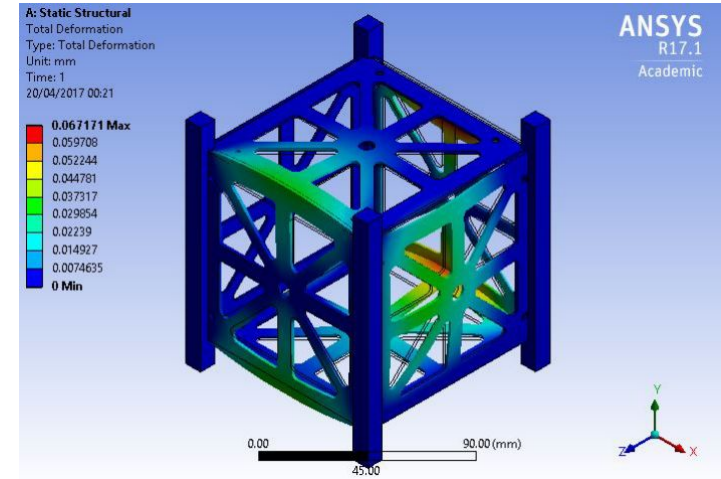
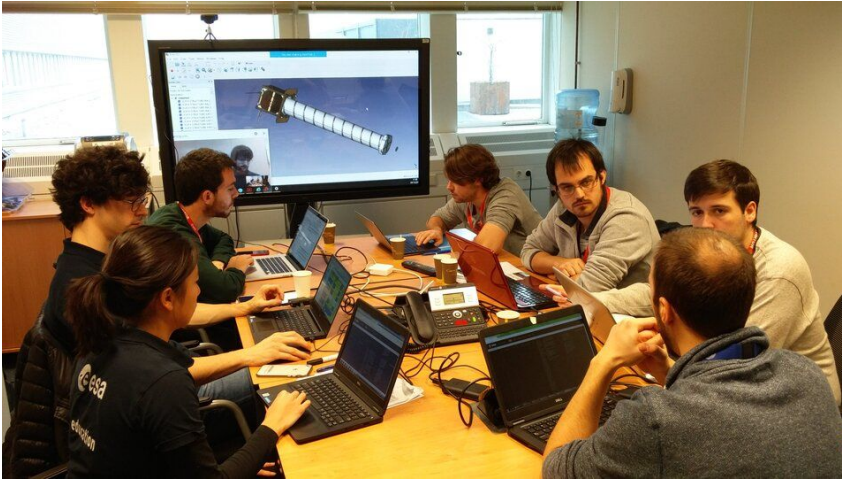
Satellite system overview



Six Major Components of a Satellite

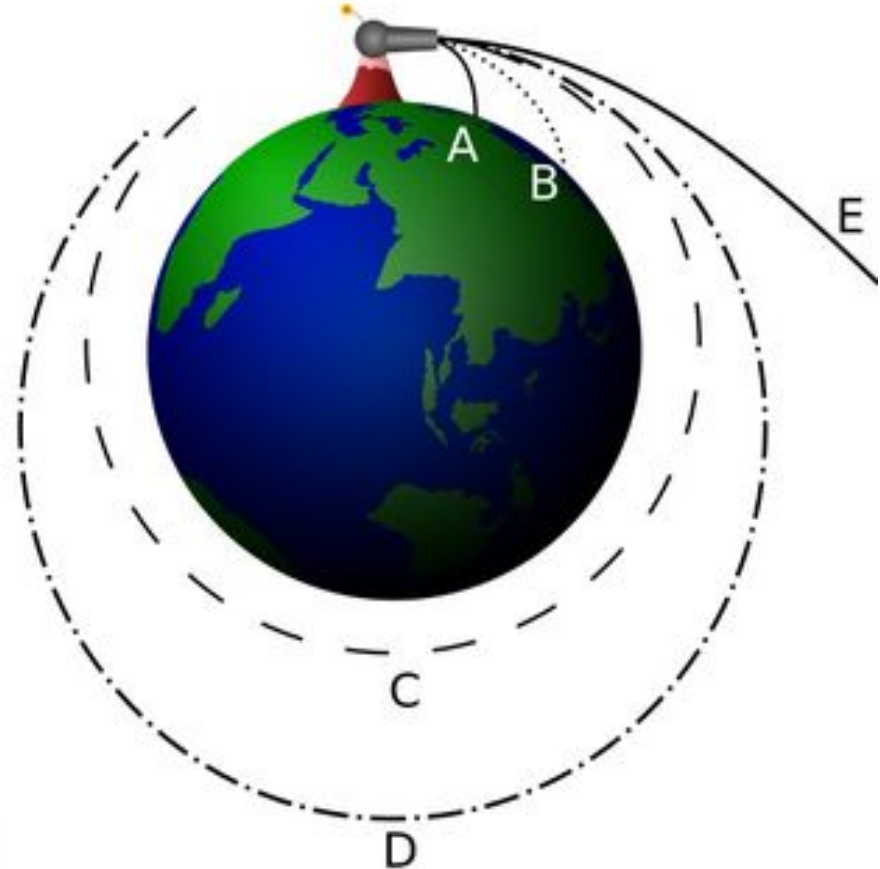


Satellite development



Putting satellite in orbit

- A suborbital - elliptical orbit intersecting Earth
- B suborbital - elliptical orbit intersecting Earth
- C circular orbit
- D elliptical orbit
- E hyperbolic orbit, leaving Earth



Putting satellite in orbit

INNOVATIVE Satellites 1

革新的衛星技術実証1号機/イプシロン4号機



Satellite operation



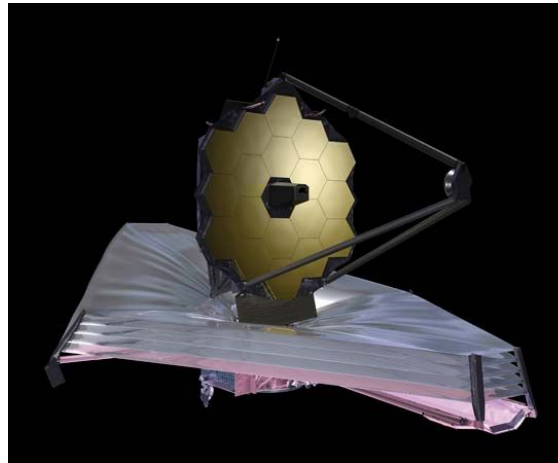
Future of satellite



On-orbit service satellite



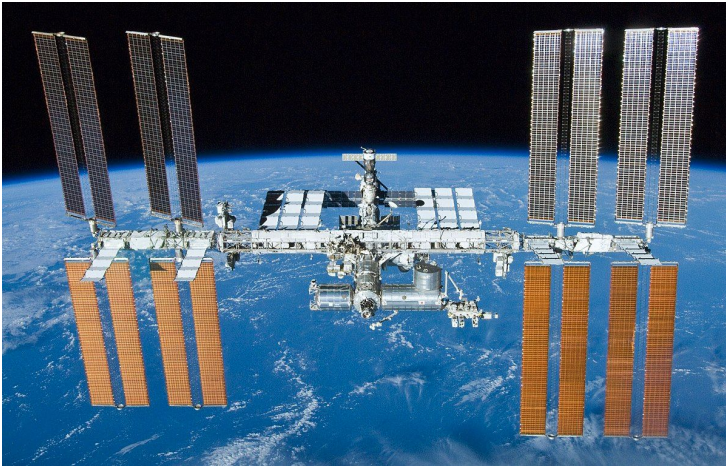
Artificial shooting star satellite



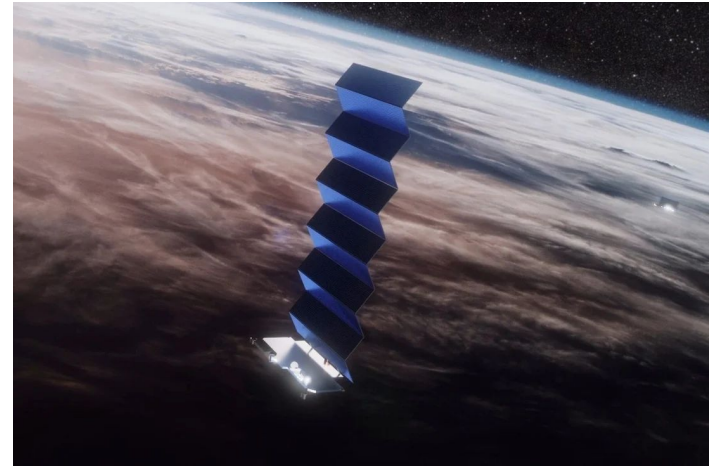
Jame webb telescope satellite

Group Discussion:

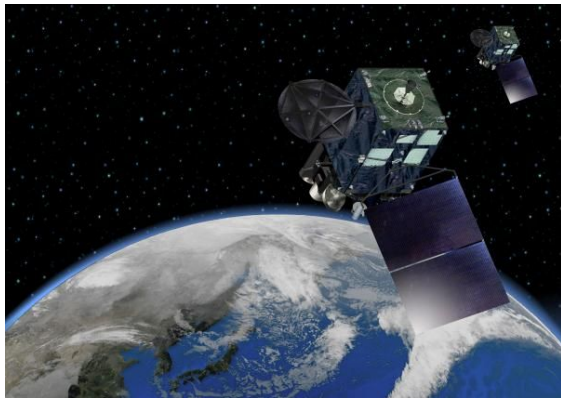
Please research about the following satellites:



International Space Station (ISS)



Starlink



Himawari



Navstar



Hope Orbiter

What to include?

- Purpose of the satellite
- Type: Communication, Navigation, Climate, ... etc
- Orbit
- Interesting features

References

Thank you for your attention.

Web Browser Interactive Tools

NASA Eye

SATNOGS

Starlink Coverage

Awesome space tools

Mikata-

Deep space network

Key Takeaway



Satellite

Small satellite (CubeSat)

CanSat