



UiO : **Department of Technology Systems**  
University of Oslo

# Center for Space Sensors and Systems CENSSS



Image Credit NASA

# Center for Space Sensors and Systems - CENSSS

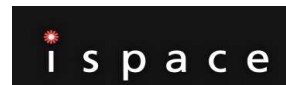
- A "center for research-driven innovation" (SFI)
- Collaborating with companies to enhance innovation through long-term research
  - 10 partner companies
  - Also collaboration with UCLA and FFI
- CENSSS works in two application areas:
  - Small, low-cost satellites ("new space")
  - Space exploration ("to the Moon and Mars")



AISSat microsatellite monitoring ship traffic.  
(image credit FFI)

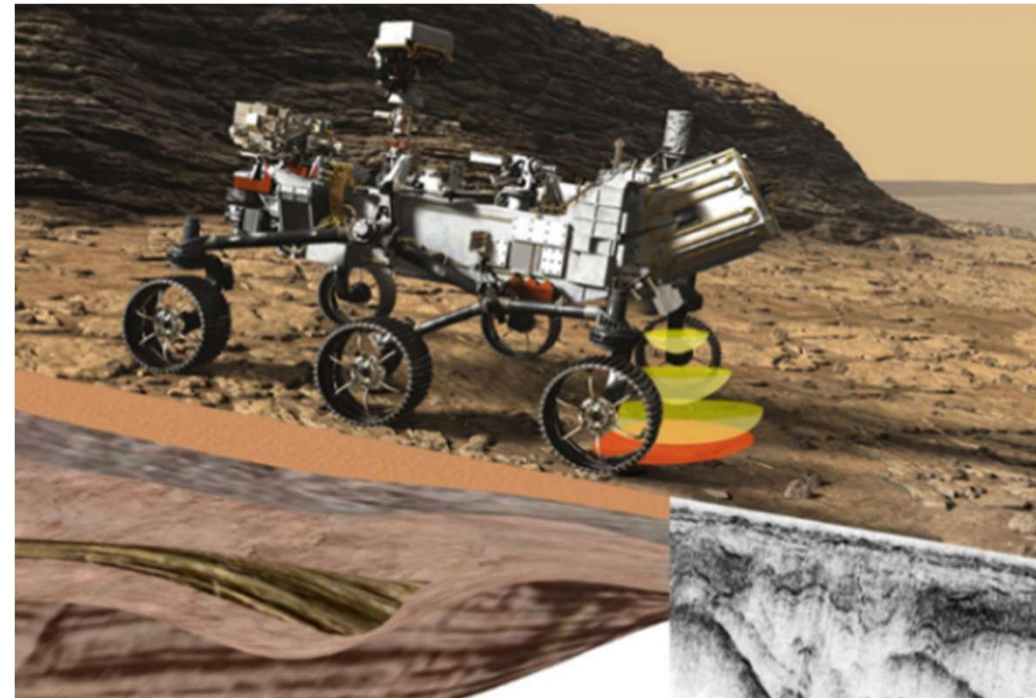


UiO : Department of Technology Systems  
University of Oslo



# CENSSS Research areas

- Sensors for extraterrestrial resource mapping
  - CENSSS will operate the RIMFAX ground penetrating radar on the NASA Perseverance rover on Mars
- Earth observation sensors
- Building satellites
- New space services

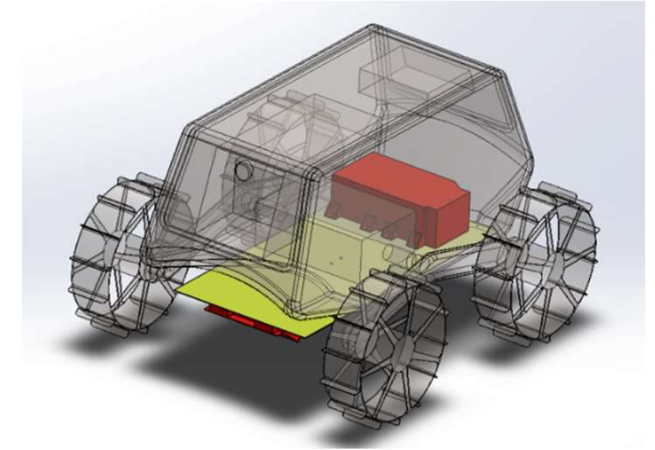


RIMFAX radar imaging the subsurface of Mars.  
(Background image credit NASA)

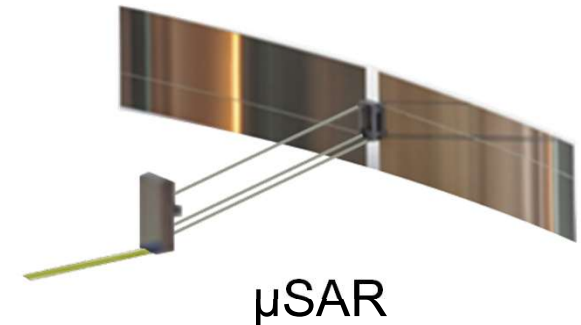


# Radar and electromagnetic sensor technology

- Ground penetrating radar
  - sensors for future space missions
- RF-sensor studies
  - SAR radar
  - passive radar, exploiting other emitters



ispace Lunar Rover



$\mu$ SAR

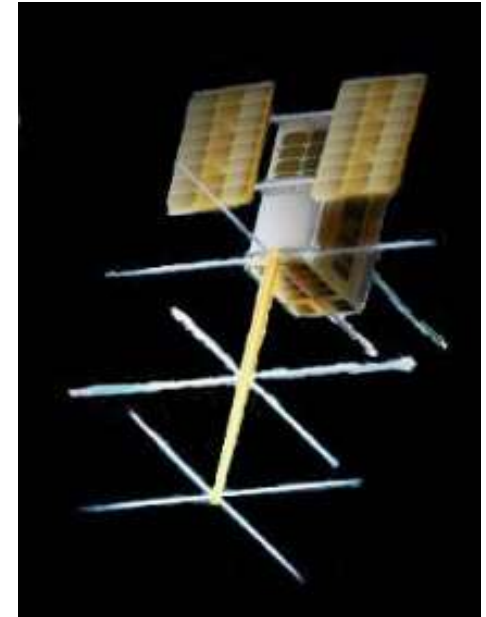
# Optical remote sensing

- Data processing for Norsat-4
  - satellite being built for FFI, launch 2023
  - data simulation/processing
- New cameras for small satellites
  - hyperspectral or multispectral
  - testing of new technologies
- New methods for camera testing
  - optical measurements

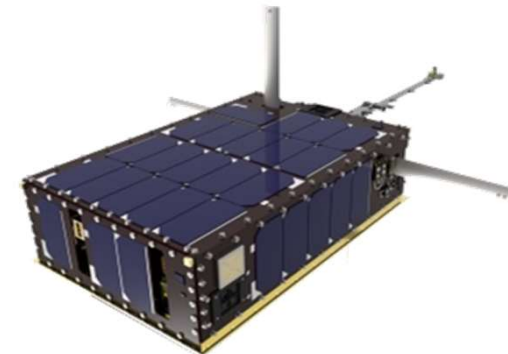


# Satellite communications

- Many new opportunities
- See separate presentation later



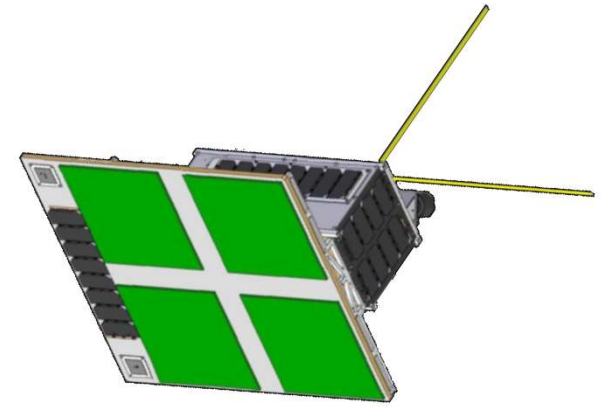
VHF Satcom  
& AIS NorSat-2



MicroTacSat

# New Space Services

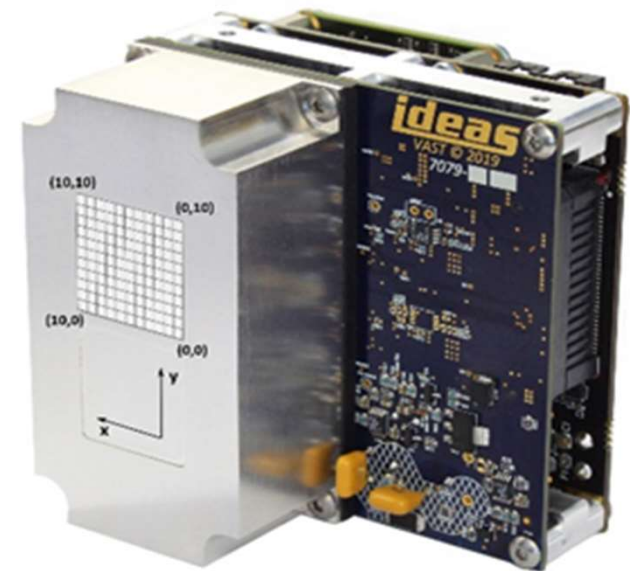
- Create new types of useful data and services
  - Existing satellites
  - "New space" earth observation satellites
- Concepts involving swarms of low-cost satellites
  - shorter re-visit times and new capabilities
  - high data volume requires onboard data processing



NRD & AIS  
NorSat-3

# Mapping Instruments for lunar/planetary resources

- Neutron Detector
  - Map hydrogen in the lunar surface
- Gamma ray spectrometer
- Electromagnetic Spectrometer
  - Map ice/hydrated minerals
  - Measure electromagnetic relaxation



IDEAS terrestrial precision gamma ray spectrometer.



# Interested? Get in touch!

- CENSSS director: prof. Svein Erik Hamran
- Optical sensors: prof. Torbjørn Skauli

