

Cold Lightweight Imagers For Europa (C-LIFE)

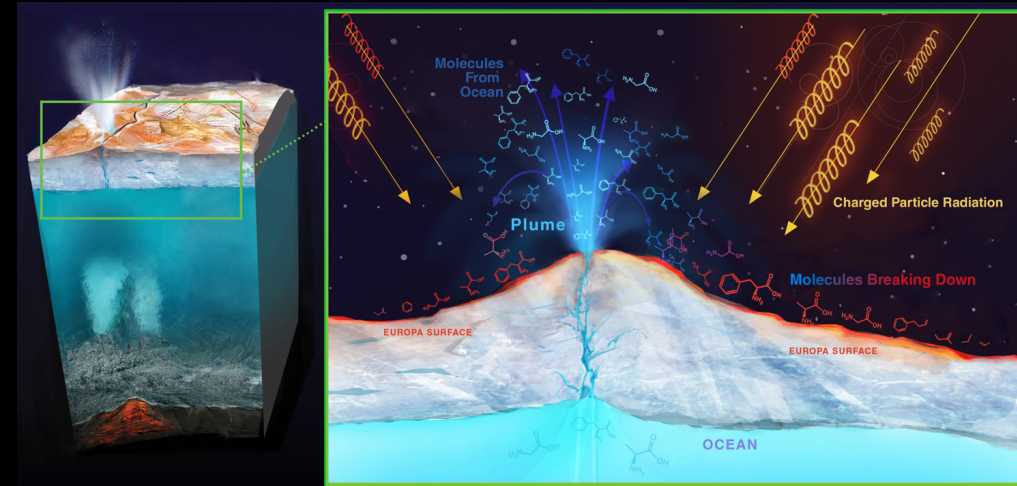


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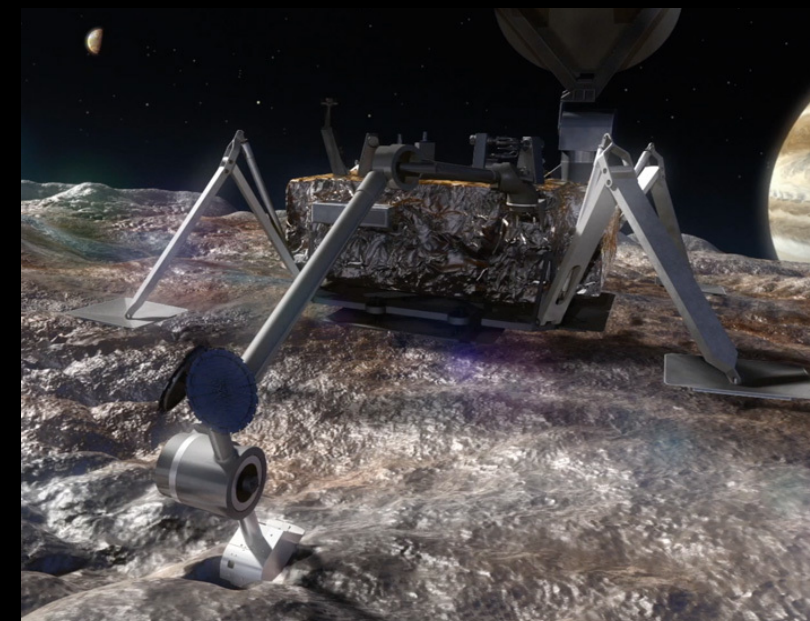
Due to observed plumes, the European surface is a means to investigate its ocean...

...but the European Surface is a hostile location



Our Camera Design Overcomes Five Major Challenges

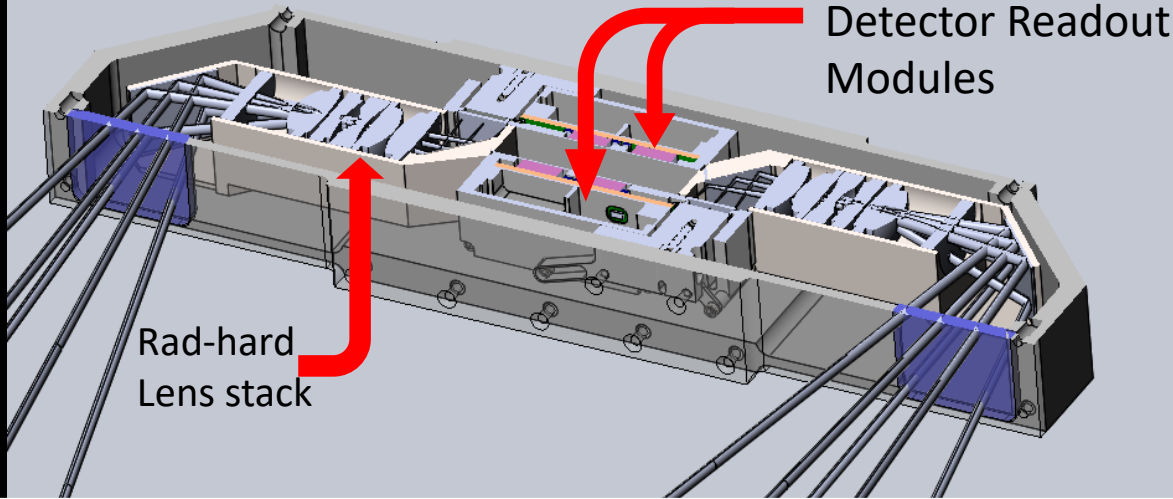
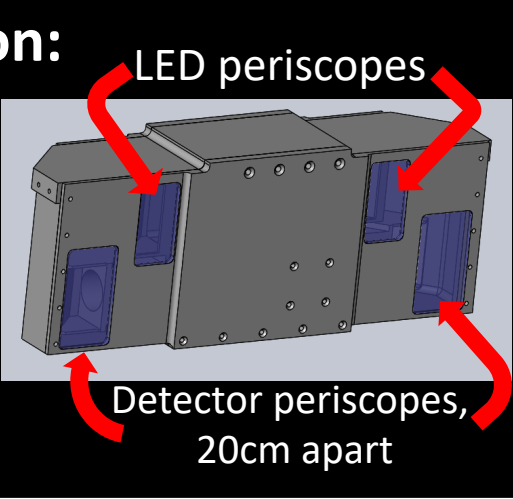
- Radiation
- Planetary Protection
- Low Ambient Temperature
- Low Available Energy
- Very Low Downlink



Radiation & Planetary Protection:

Dual-periscope design
maximizes self-shielding

Parts survive required thermal
sterilization and radiation doses



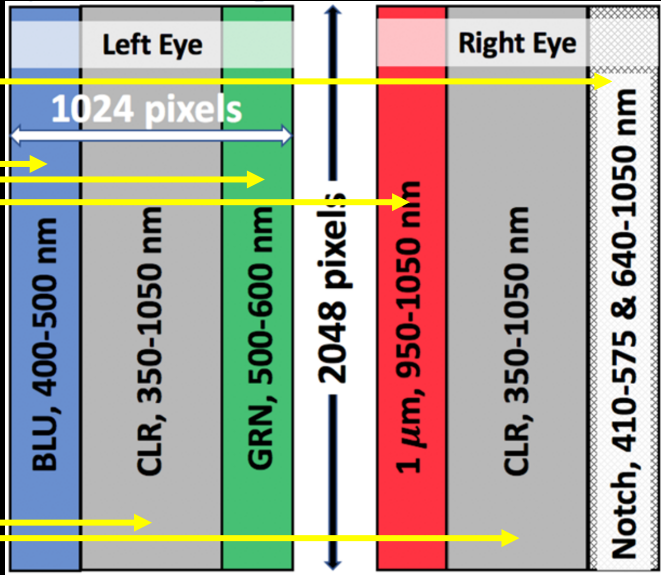
Low Temperatures & Energy:

No moving parts or deployable covers
with progressive focus and strip filters

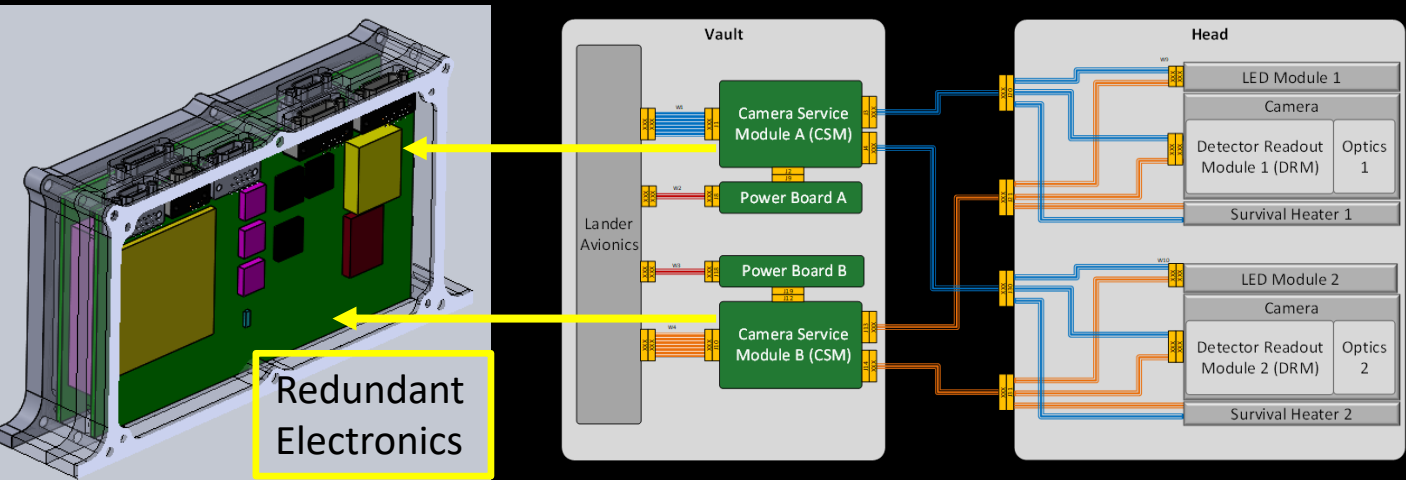
Cryogenic storage and no survival
heating between observing sessions

Fluorescence excited by three separate LEDs and detected by one notch filter

Color filters match the camera on Europa Clipper



Stereo in Pan



Low Downlink:

Multi-image median filtering and wavelet
compression. More-advanced tools in future
work.

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C-LIFE has high impact on mission success and European science.

- Color stereo panorama
- Fluorescence of organic materials in three bands
- Plume detection through forward scattered light near east/west horizon
- Change detection at excavation site and through tidal effects
- Autonomous operation, higher-level product generation and smart algorithms to prioritize downlink

