

# Cold Lightweight Imagers For Europa (C-LIFE)

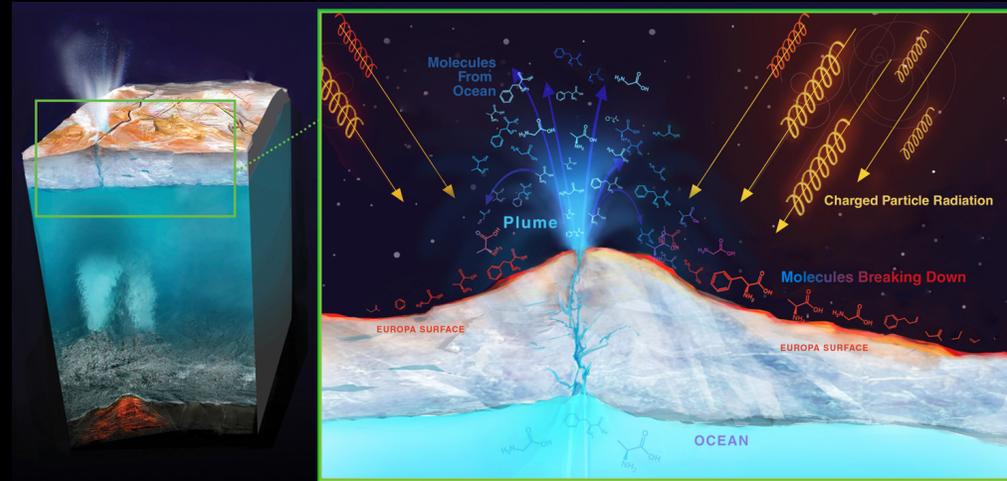


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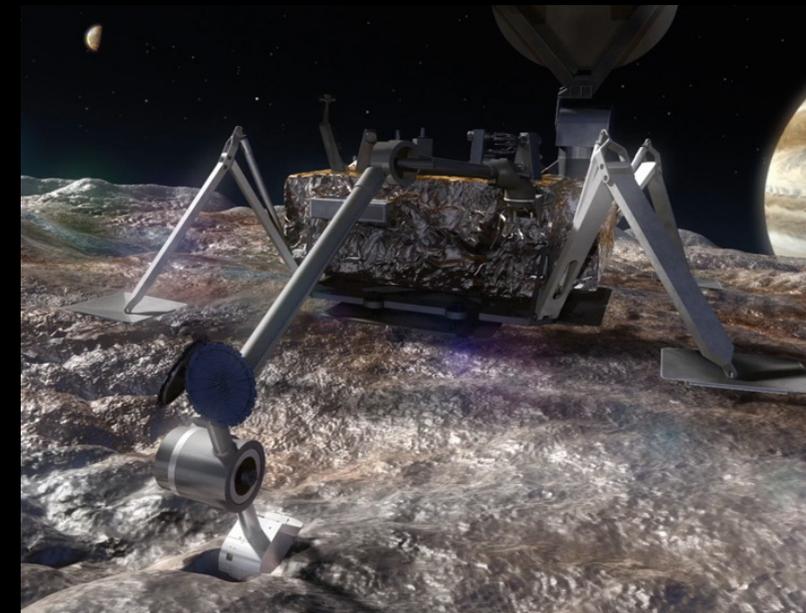
Due to observed plumes, the European surface is a means to investigate its ocean...

...but the European Surface is a hostile location



## Our Camera Design Overcomes Five Major Challenges

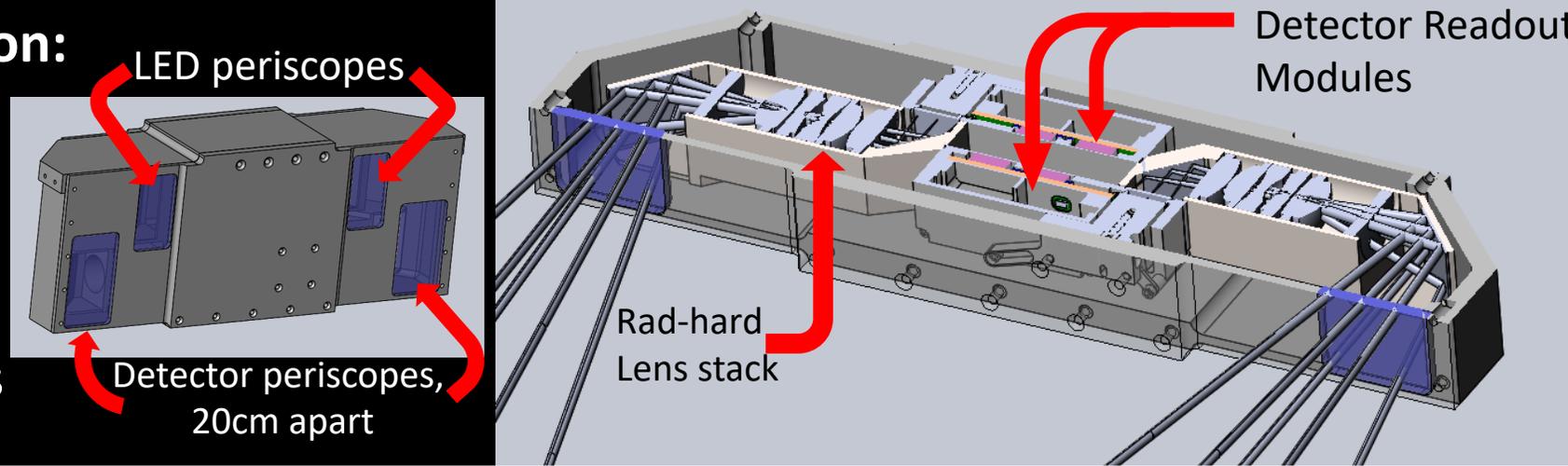
- Radiation
- Planetary Protection
- Low Ambient Temperature
- Low Available Energy
- Very Low Downlink



# Radiation & Planetary Protection:

Dual-periscope design maximizes self-shielding

Parts survive required thermal sterilization and radiation doses



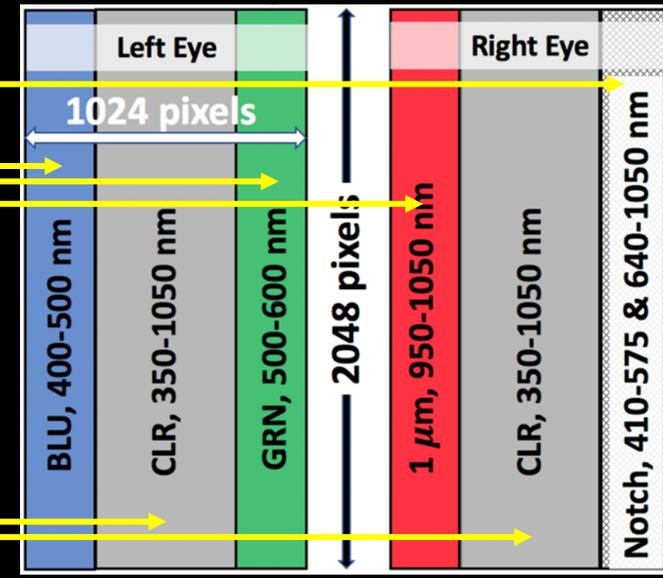
# Low Temperatures & Energy:

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

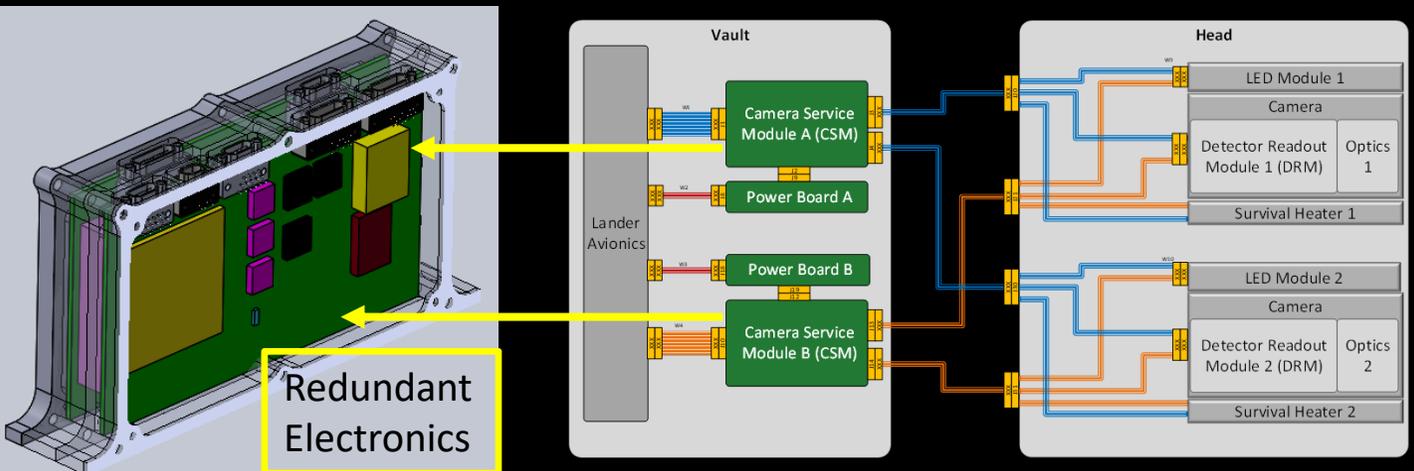
Cryogenic storage and no survival heating between observing sessions

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.**

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- 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

