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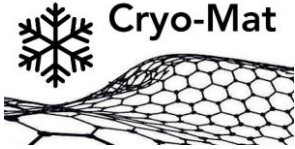
# Flash presentation

*Biennale APC 2024*

**Gwendal DENIEL — Design engineer CNRS**  
**Arrival December 2023**

Experimental techniques department - Cryogenics division

# Activities within the APC



Project leader : APC

Objective : creation of a sub-Kelvin measurement platform (electrical, thermal, mechanical)

My contribution : Study of instruments and cryostats



Project leader : APC

Objective : development of refrigeration and instrumentation systems

My contribution : Instruments testing



Project leader : Berkeley Lab

Objective : provide measurements of the CMB at unprecedented precision

My contribution : Instrumentation of a dilution cryostat for testing the readout module cold electronics



Project leader : JAXA / CNES

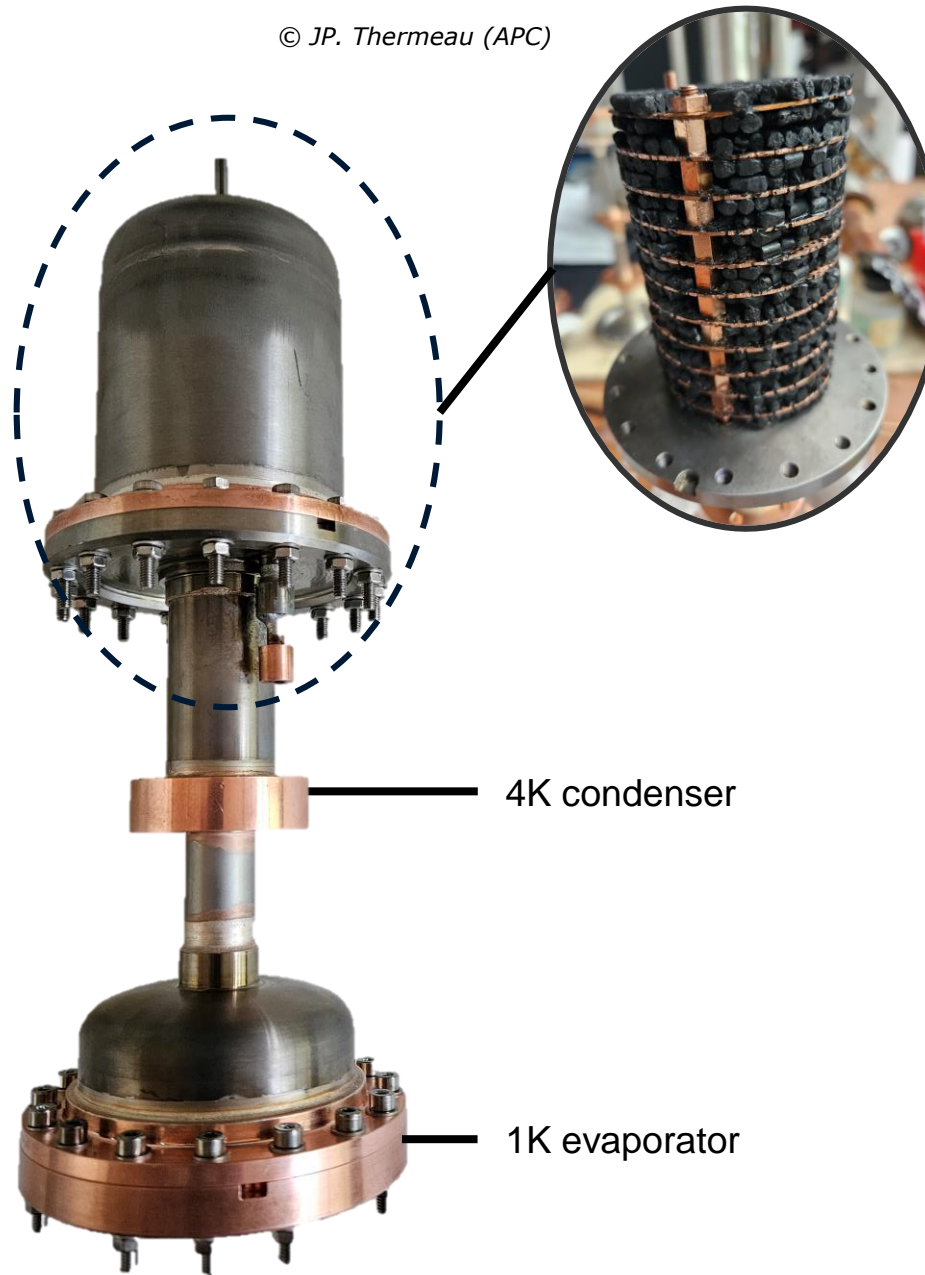
Objective : study of the cosmic microwave background B modes from space

My contribution : Thermal calculations on MHFT

# NGCryo

- **Development of helium 4 adsorption refrigerators**

- 4K condenser refrigerated by pulse-tube
- Using activated carbon
- Aimed to go under 700mK



Helium 4 adsorption refrigerator

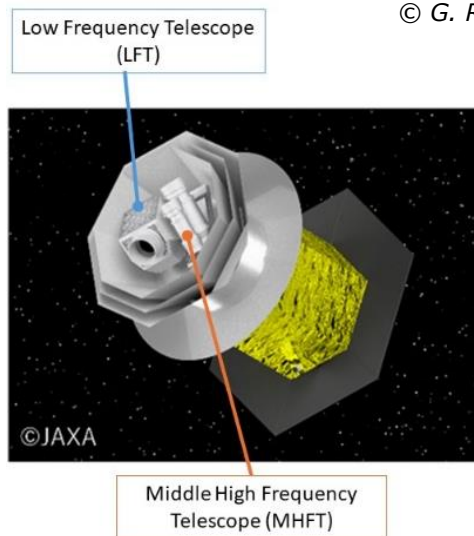


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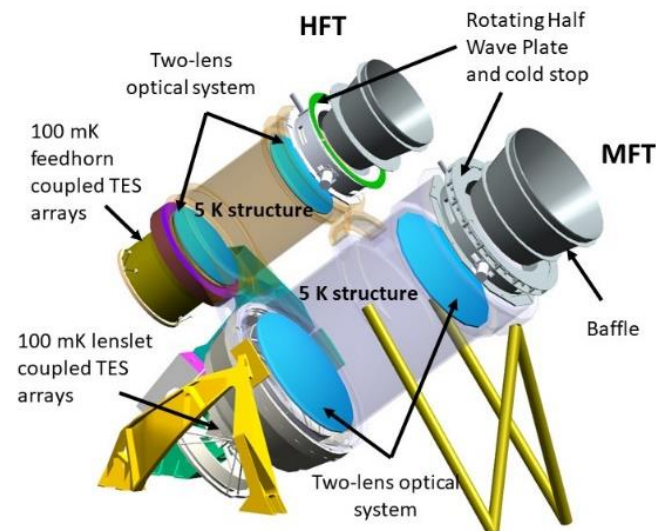
# Thank you for your attention

Do you have any questions ?

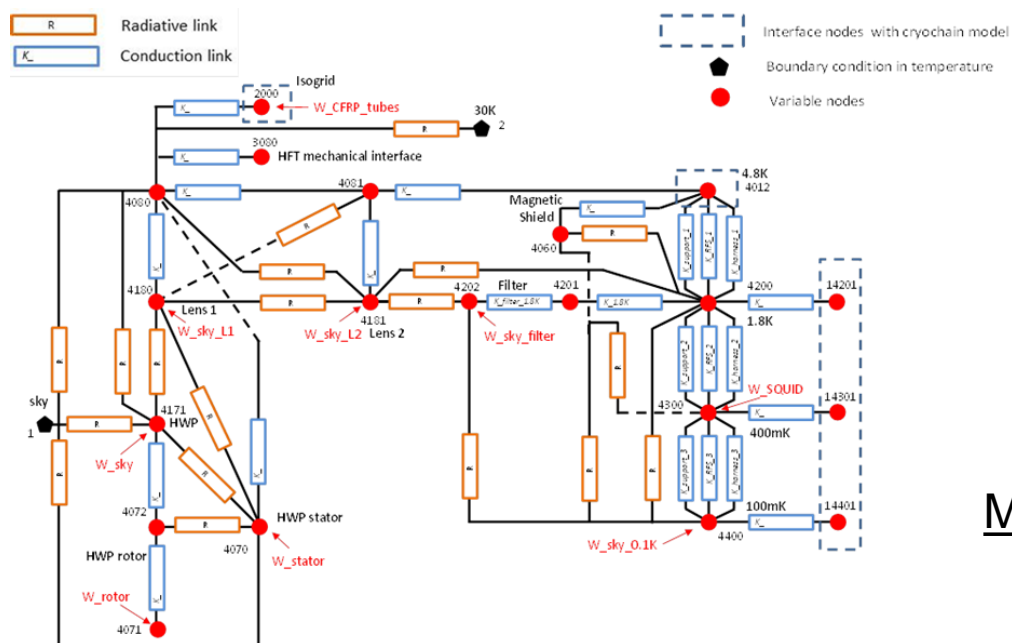




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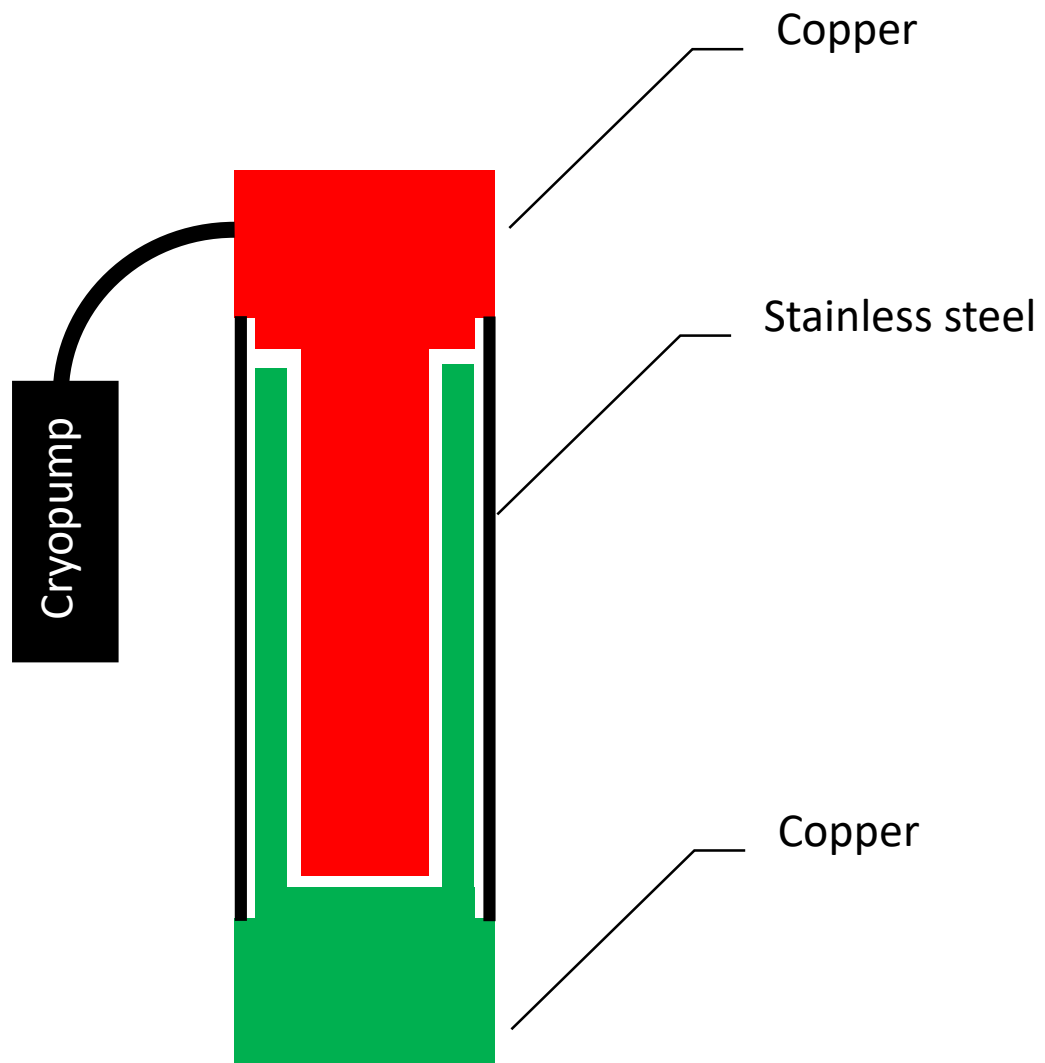


## LiteBIRD spacecraft, Low Frequency Telescope (LFT) and the Medium and High Frequency Telescopes (MHFT)



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## MHFT nodal thermal model



Schematic of a conductive thermal switch



Photograph of a conductive thermal switch