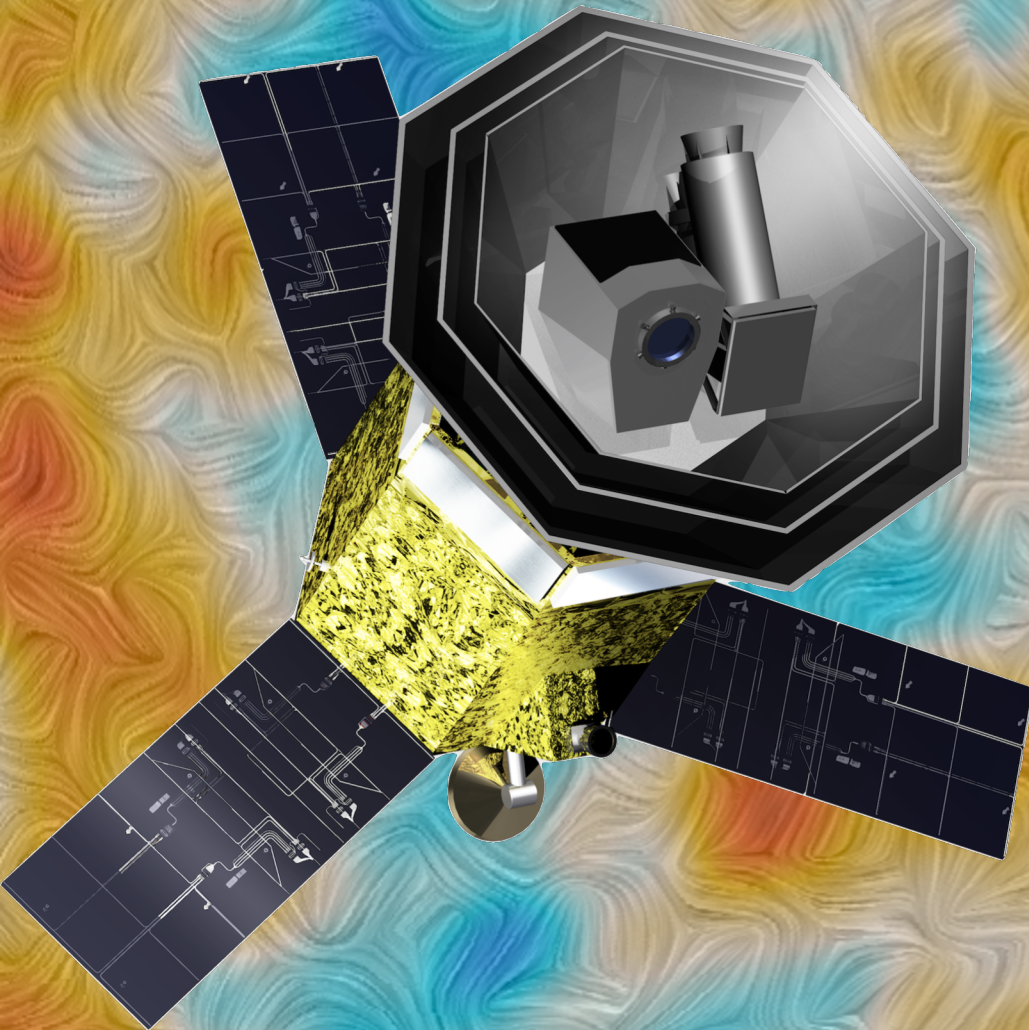


# LNf Thermo-Vacuum Facility and Contribution to LiteBIRD



Contributed by the INFN-LNF Group:  
L. Porcelli, S. Dabagov, G. Delle Monache,  
D. Hampai, G. Modestino.

24/05/2023



# FTE Sharing @ INFN-LNF

SEDE	NOMINATIVO	TIPO	CONTRATTO	QUALIFICA	RICERCATORI	TECNOLOGI		
LNF	Dabagov Sultan	DIP	Ricercatore	Dirigente di Ricerca	30			
	Delle Monache Giovanni Ottavio	DIP	Tecnologo	Primo Tecnologo		40		
	Hampai Dariush	DIP	Tecnologo	Primo Tecnologo		25		
	Modestino Giuseppina	DIP	Ricercatore	Ricercatore	75			
	Porcelli Luca	DIP	Ricercatore	Ricercatore	40			
<b>LNF (5 PERSONE - 2.1 FTE)</b>					<b>1.45 fte</b>	<b>3 pers.</b>	<b>0.65 fte</b>	<b>2 pers.</b>
					<b>2.10 fte / 5 pers. (media 0.42)</b>			

- 2 man-week of electronics support.
- 2 man-week of technical design support.



## Foreseeable activity as of today:

- Thermal balance test (and correlation to models) thanks to the 'pocket' cryostat which is at our disposal, and that is being instrumented in a dedicated space.
- (Non)destructive irradiation testing @ X-Lab (Dabagov and Hampai), with extrapolation at other wavelengths, and X-ray circuitry diagnostics on specifically dedicated and instrumented optical bench.
- ...

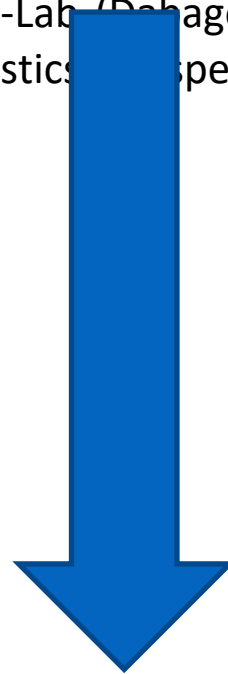




# Foreseeable Activity @ INFN-LNF

## Foreseeable activity as of today:

- Thermal balance test (and correlation to models) thanks to the 'pocket' cryostat which is at our disposal, and that is being instrumented in a dedicated space.
- (Non)destructive irradiation testing @ X-Lab (Debagov and Hampai), with extrapolation at other wavelengths, and X-ray circuitry diagnostics on a specifically dedicated and instrumented optical bench.
- ...



31-12-2023	<b>WP2000 (SCU): Completamento primo test termico rappresentativo e confronto con la simulazione &lt;br&gt; &lt;br&gt;</b>
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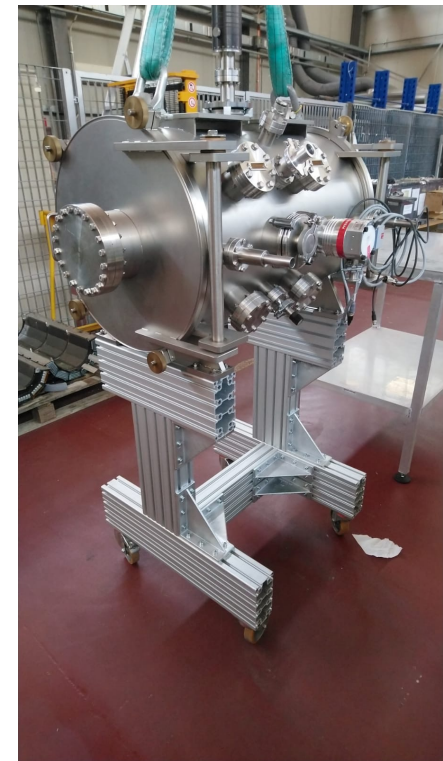
The 'pocket' cryostat is being instrumented in a dedicated space:

- LNF in-kind.
- Specifically designed for (lunar) thermo vacuum tests and thermal balance tests.
- $p < 10^{-6}$  mbar.
- $-200\text{ }^{\circ}\text{C} < T < 100\text{ }^{\circ}\text{C}$ .

# Activity @ INFN-LNF

The 'pocket' cryostat is being instrumented in a dedicated space:

- New, stronger, custom-made stand (LNF in-kind) with wheels.



The 'pocket' cryostat is being instrumented in a dedicated space:

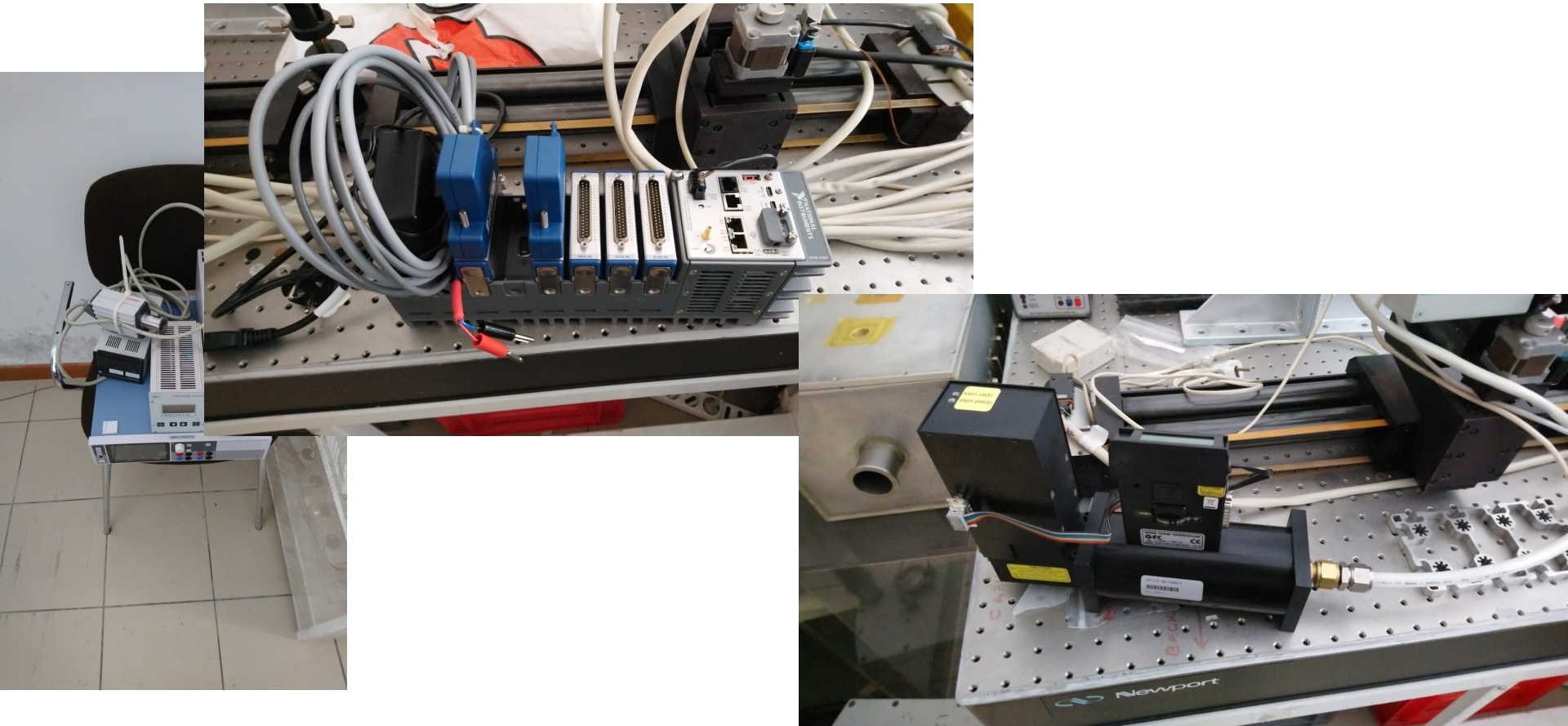
- Mass of the system (as of now) = 315 kg.
- Maximum allowed mass PER single wheel = 400 kg.





The 'pocket' cryostat is being instrumented in a dedicated space:

- Control electronics is being assembled (thanks to Bruno Ponzio).

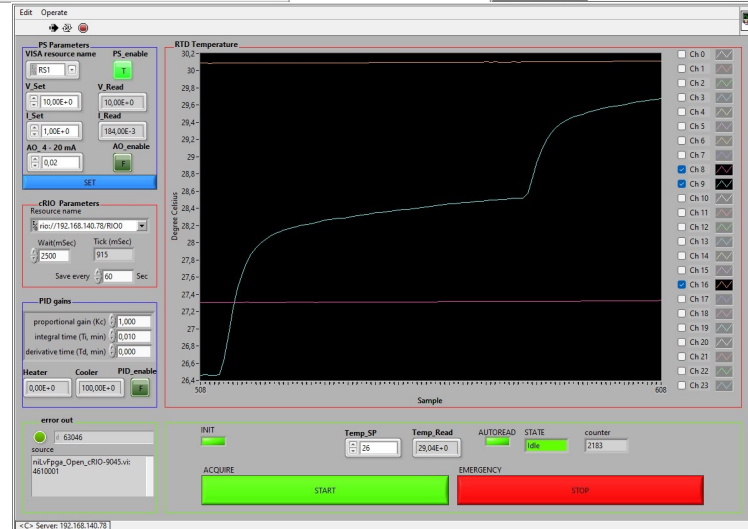
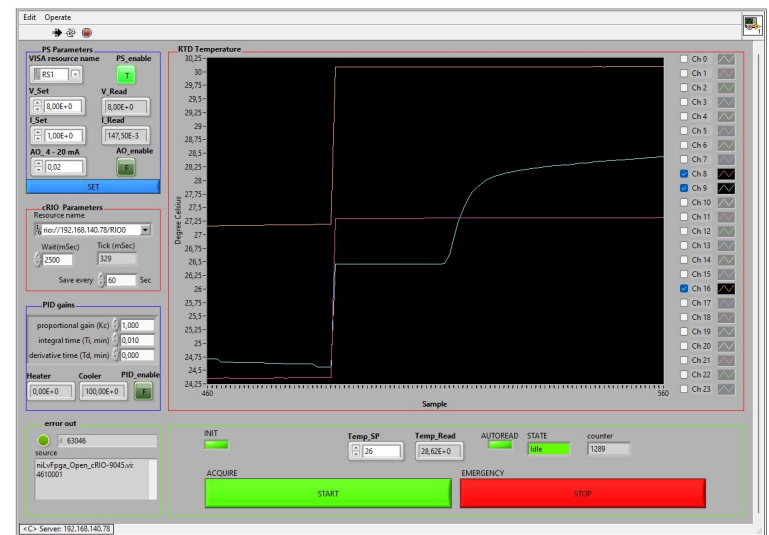
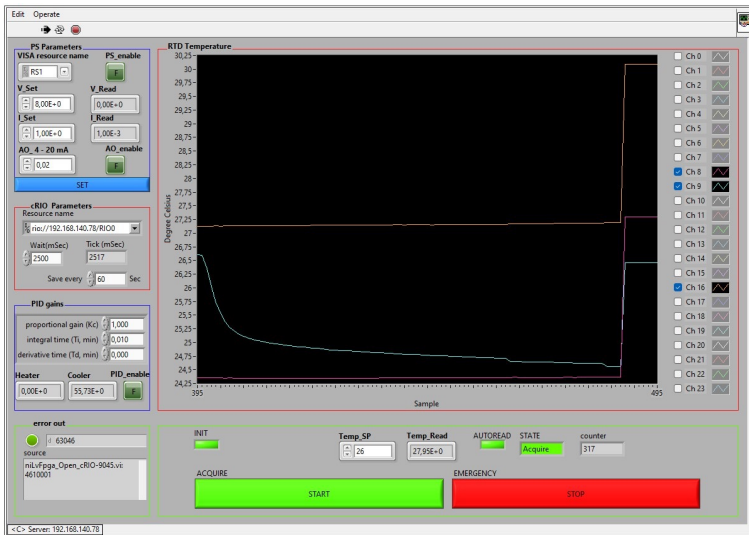




# Activity @ INFN-LNF

The 'pocket' cryostat is being instrumented in a dedicated space:

- Control electronics is being assembled (thanks to Bruno Ponzio).





## Next Steps

- The INFN-LNF Group is alive and well!
- ‘Pocket’ cryostat: in-kind endowment to the effort:
  - Mechanics and cryostat: almost ready.
  - NI Compact Rio and control system: almost ready.
  - Pumps and control system: almost ready.
  - ‘Cold chain’: MISSING (\$\$\$).
  - LabVIEW VI fine tuning: TBD.
- Define a strategy for (non)destructive irradiation testing and X-ray circuitry diagnostics.