Gemini Gen4#3 Proposers Conference



UNIVERSAL CRYOGENICS
1815 West Gardener Lane
Tucson, Az. 85705
520-622-6277 (ph)
520-623-3167 (fx)

Our Facility



UNIVERSAL CRYOGENICS LOCATED OFF GARDNER LANE, TUCSON AZ
10,000 SQ-FT BUILDING

Universal Cryogenics

Capitol Investment / In-House Machining



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15 VERTICAL CNC MILLS
3 HORIZONTAL CNC LATHES

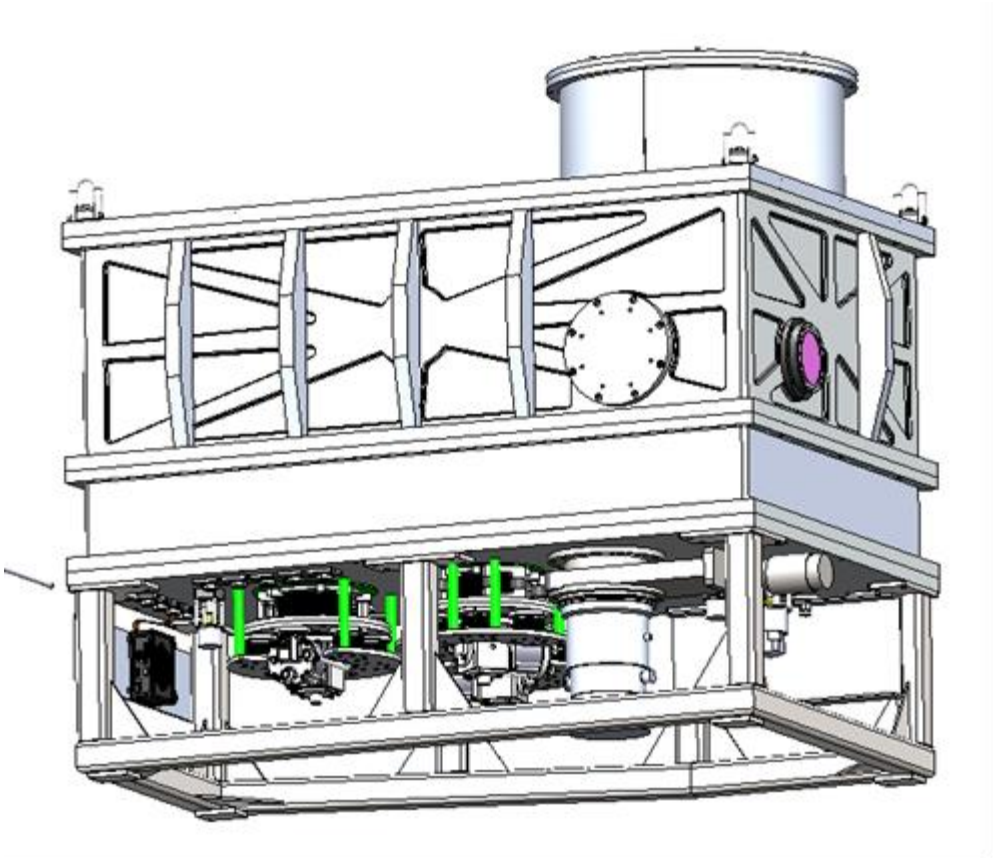


- 4 TIG / MIG WELDERS
- 1 AUTOMATED ROTARY POSITIONER

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CRYO-NIRSP



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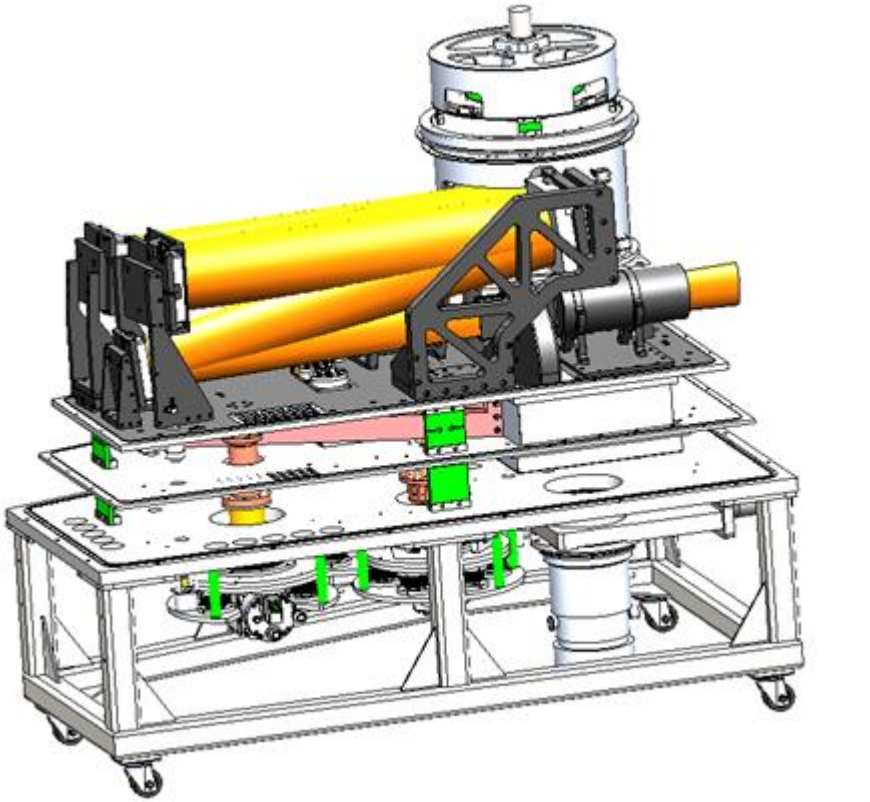
Science Driven Design Parameters

wavelength range	1000 - 5000 nm
spectral resolution	30,000 coronal observations 100,000 on-disk observations
total efficiency	$\geq$ 10 %
thermal emission	10 millionths of disk brightness at 3934 nm
polarimetric accuracy	better than $5 \cdot 10^{-4}$
temporal modulation	dual beam polarimeter with frame rate $\geq$ 10 Hz
spatial sampling	0.5 arcsec/pixel for coronal observations 0.15 arcsec/pixel for on-disk observations (diffraction limited at 4.7 μm)
spatial FOV	4 arcmin parallel to limb x 3 arcmin perpendicular to limb for coronal observations 1.5 x 1.5 arcmin for on-disk observations
context imaging	sample coronal FOV with $\leq$0.5 arcsec/pixel

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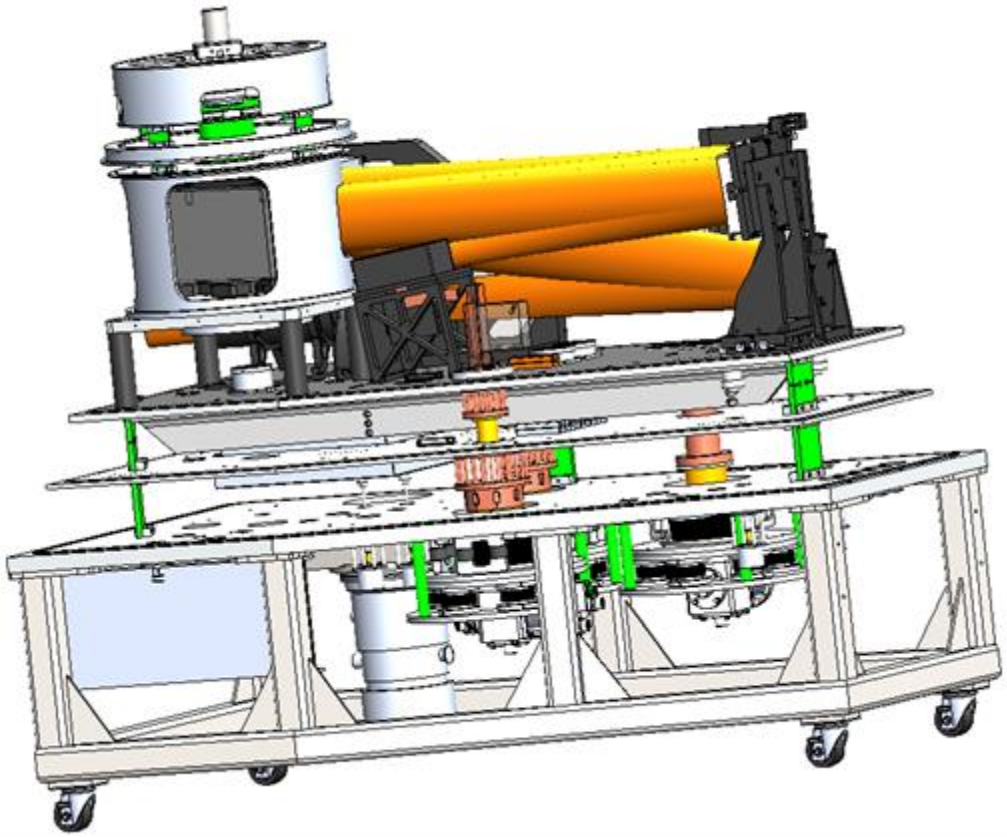
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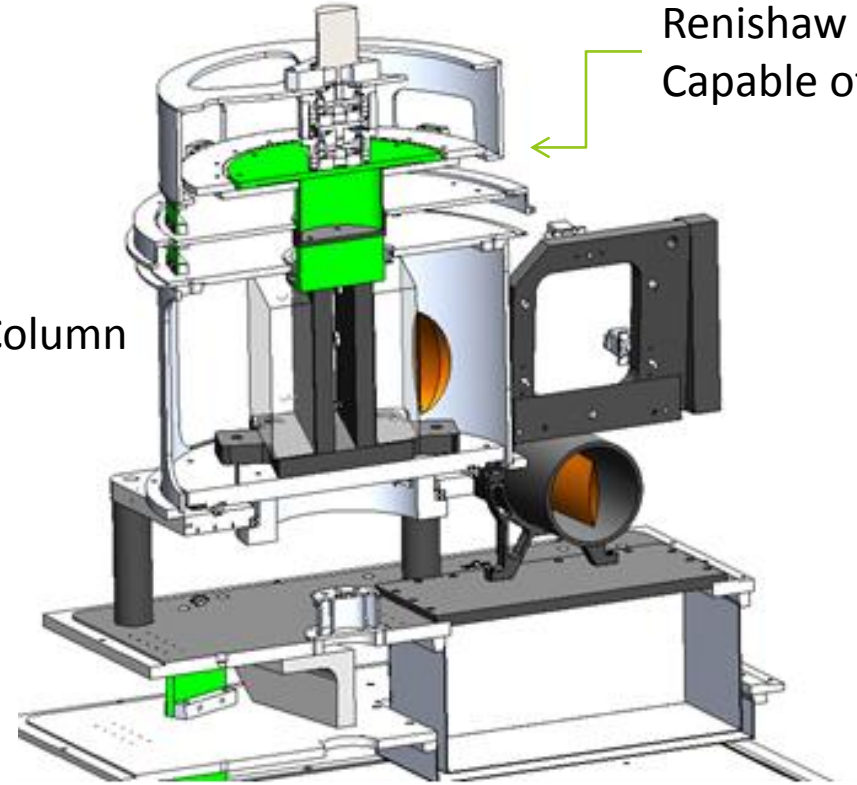
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Renishaw Rotary Encoder
Capable of ¼ arc-sec Resolution

Section View of Grating Column



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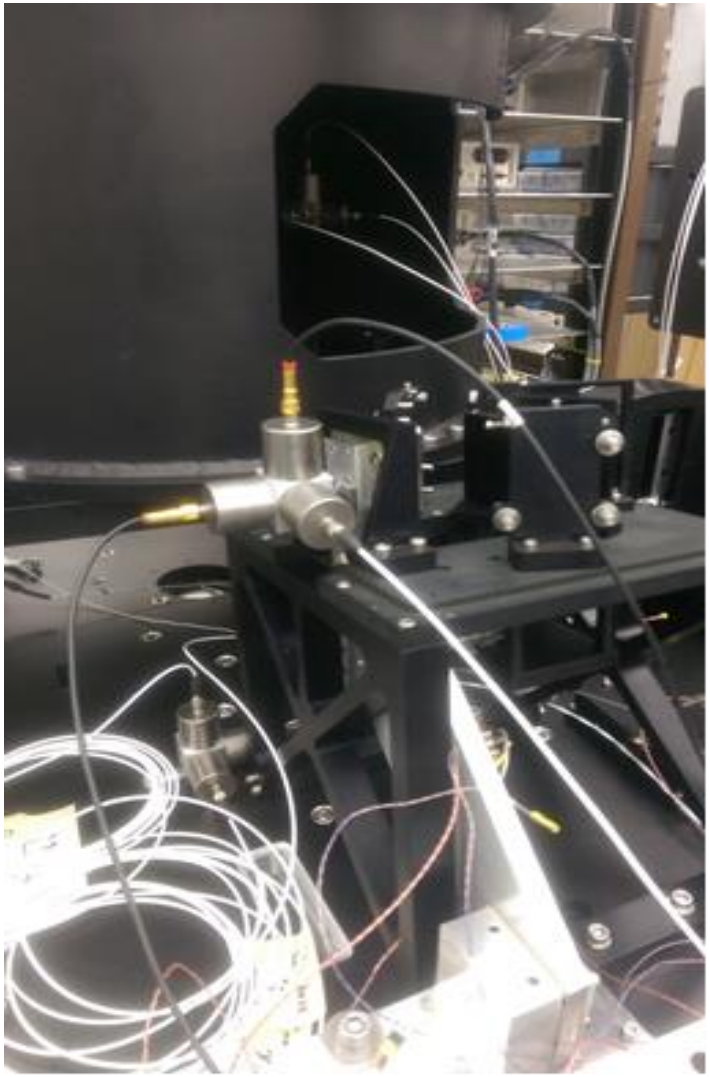
Design Challenges / Highlights

- Grating Column Rigidity
- Cold plate mounting – Kinimatic stand-off's
- Cryo-Cooler Vibration Isolation
- Cold Contraction Optics Compensation
- FPA Cable Signal Noise Reduction

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Accelerometer validation of FPA mount

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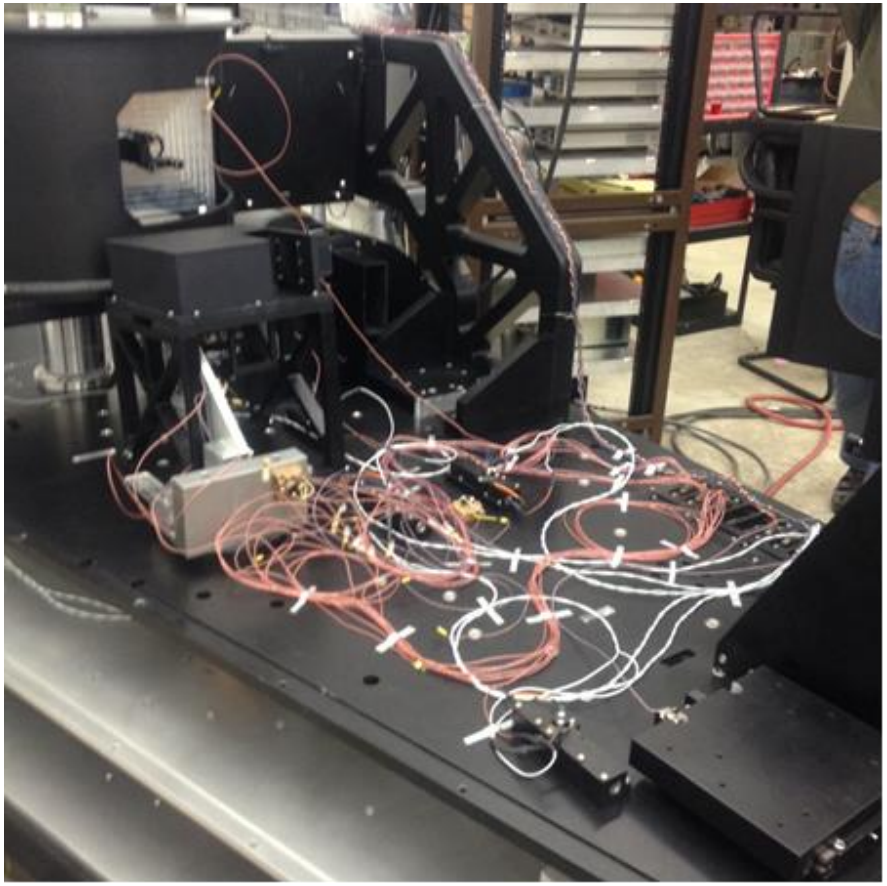


Accelerometer on cryo-cooler frame

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Wiring + Electrical

- Hermetic cable feed troughs
- Potted harnesses
- In-house PCB layout design
- Custom woven Cryo-Cables

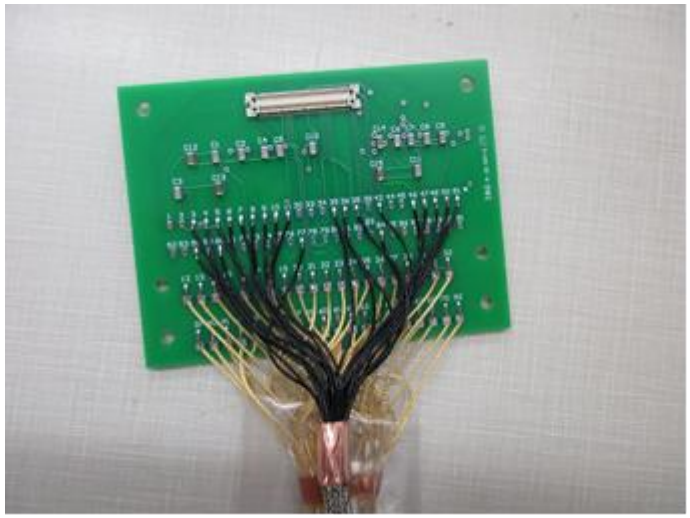


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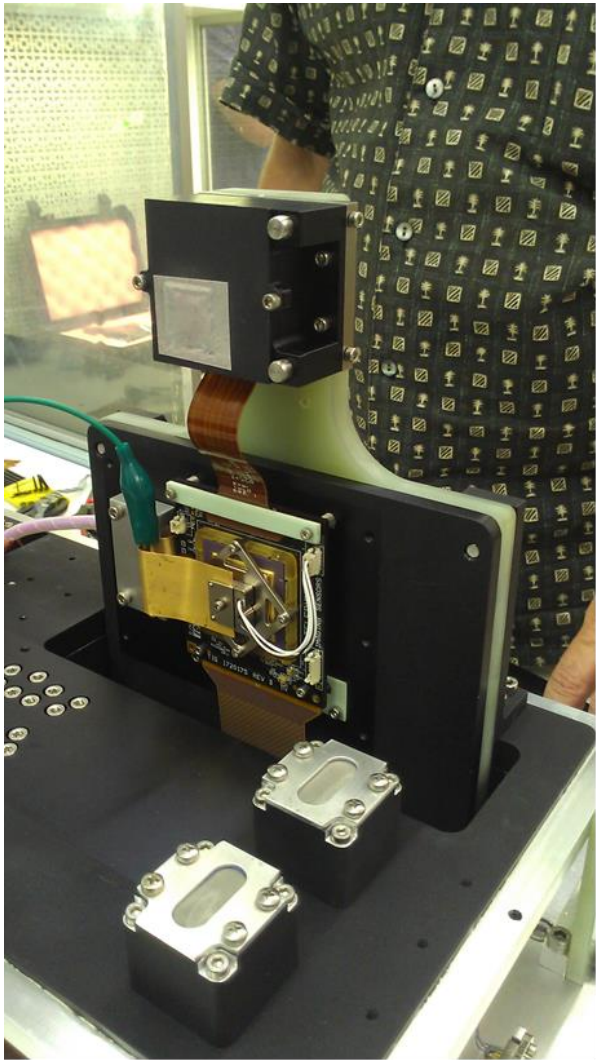


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Context Imager

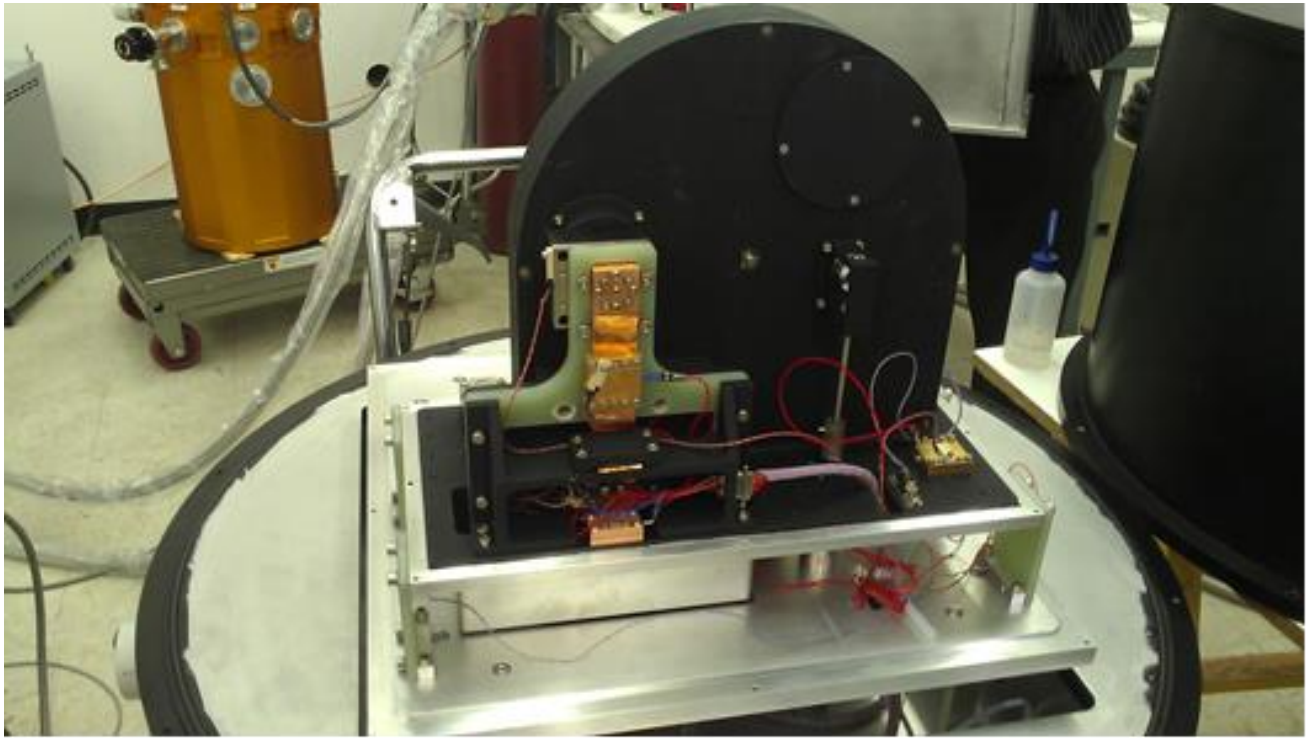


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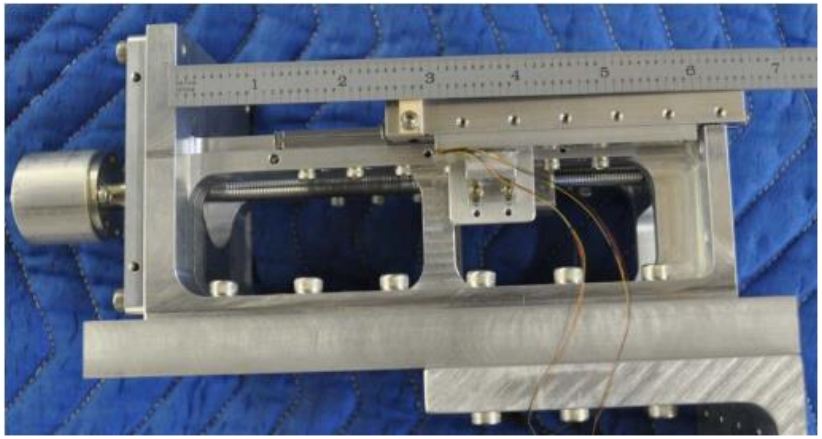
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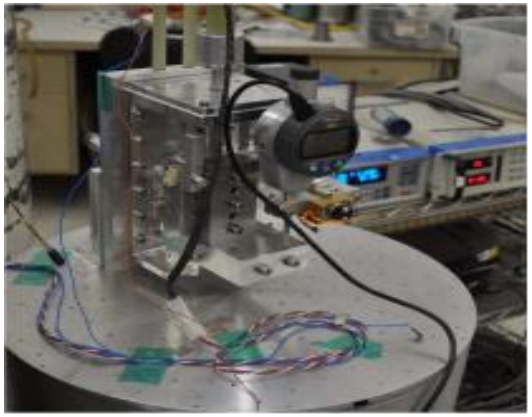
Context Imager



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SRON
SAFARI
BREADBOARD LINEAR STAGE REPORT

The modular stage performance was designed for the following requirements:

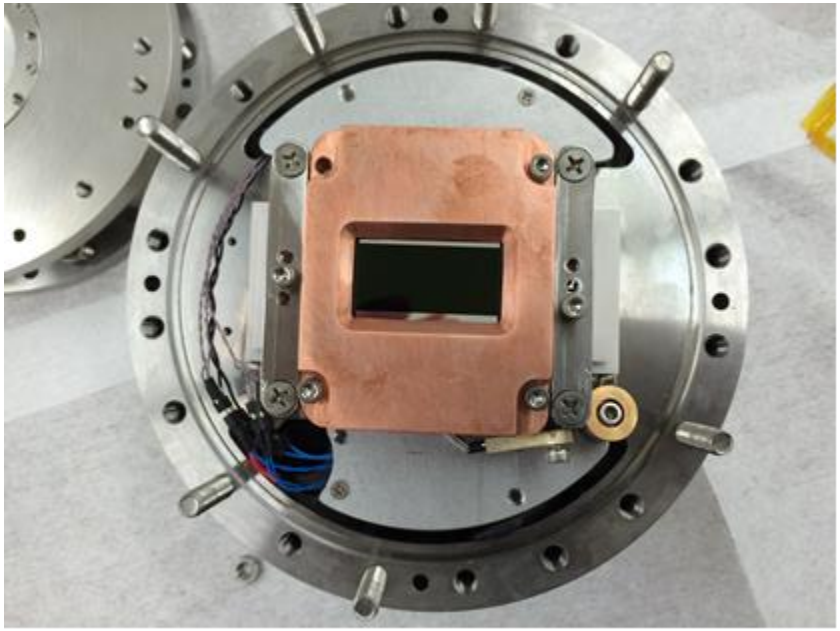
Travel:	>52 mm
Scan Speed:	30 µm/s
Slew Speed:	1 mm/s
Reproducibility:	<10 µm
Relative Position Accuracy:	<5 µm
Straightness:	±5 µm
Flatness:	±5 µm
Pitch:	±40 µrad
Yaw:	±40 µrad
Torque at 4K:	≤10 mNm
Torque at 4K Max:	≤100 mNm
System Mass:	2kg

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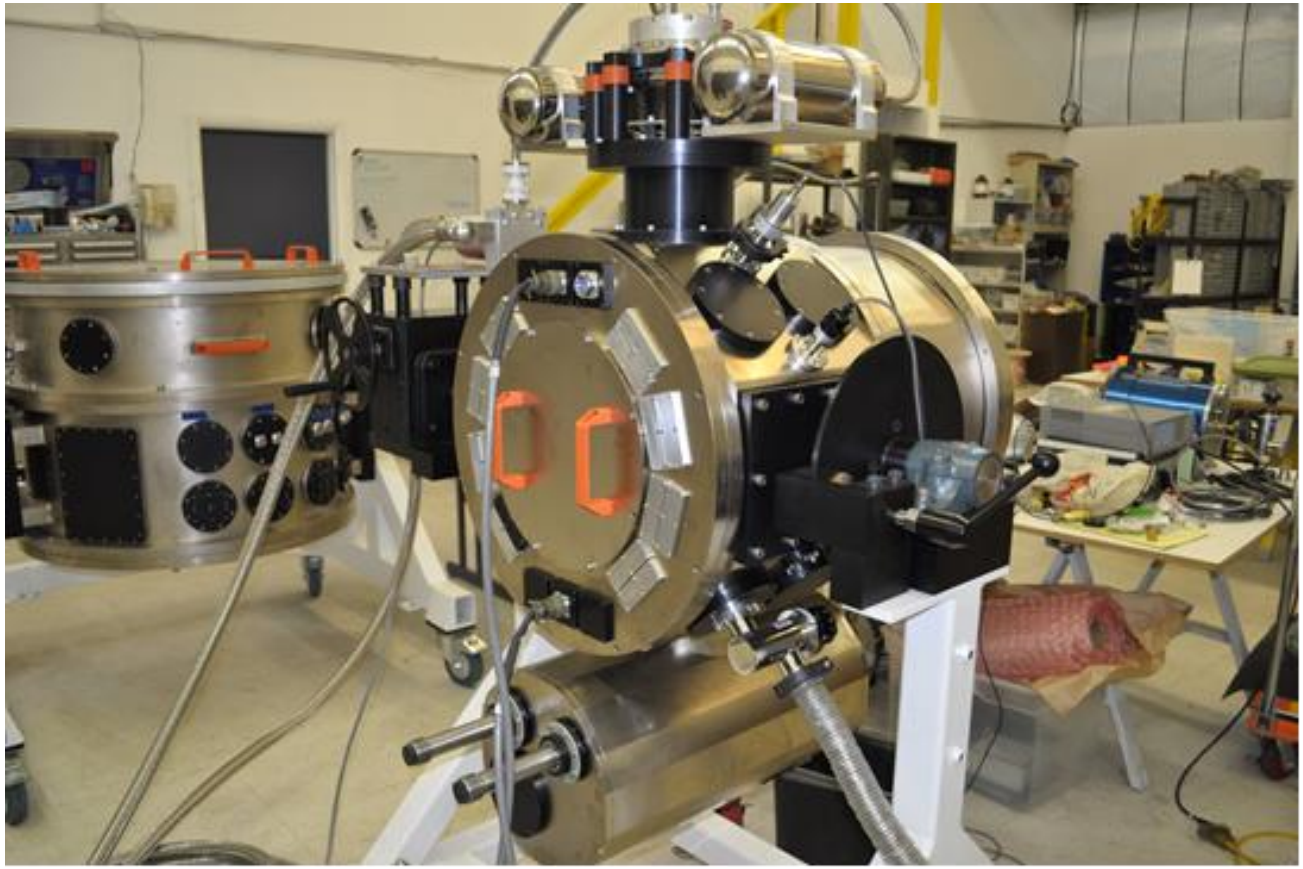
TEC cooled cryogen-free Cryostat
Temperature hold @ 180K with
750 mWatt Heat Load





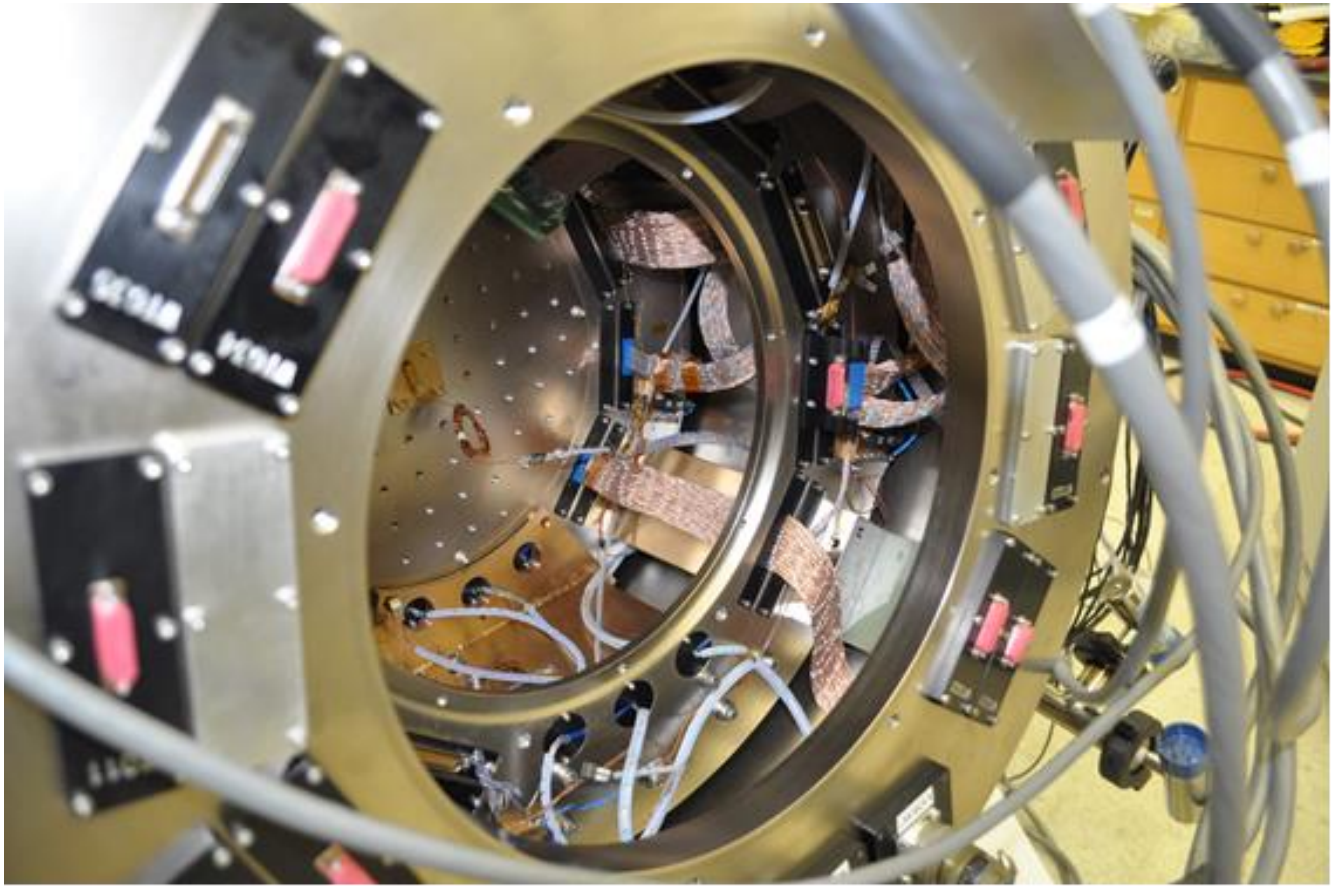
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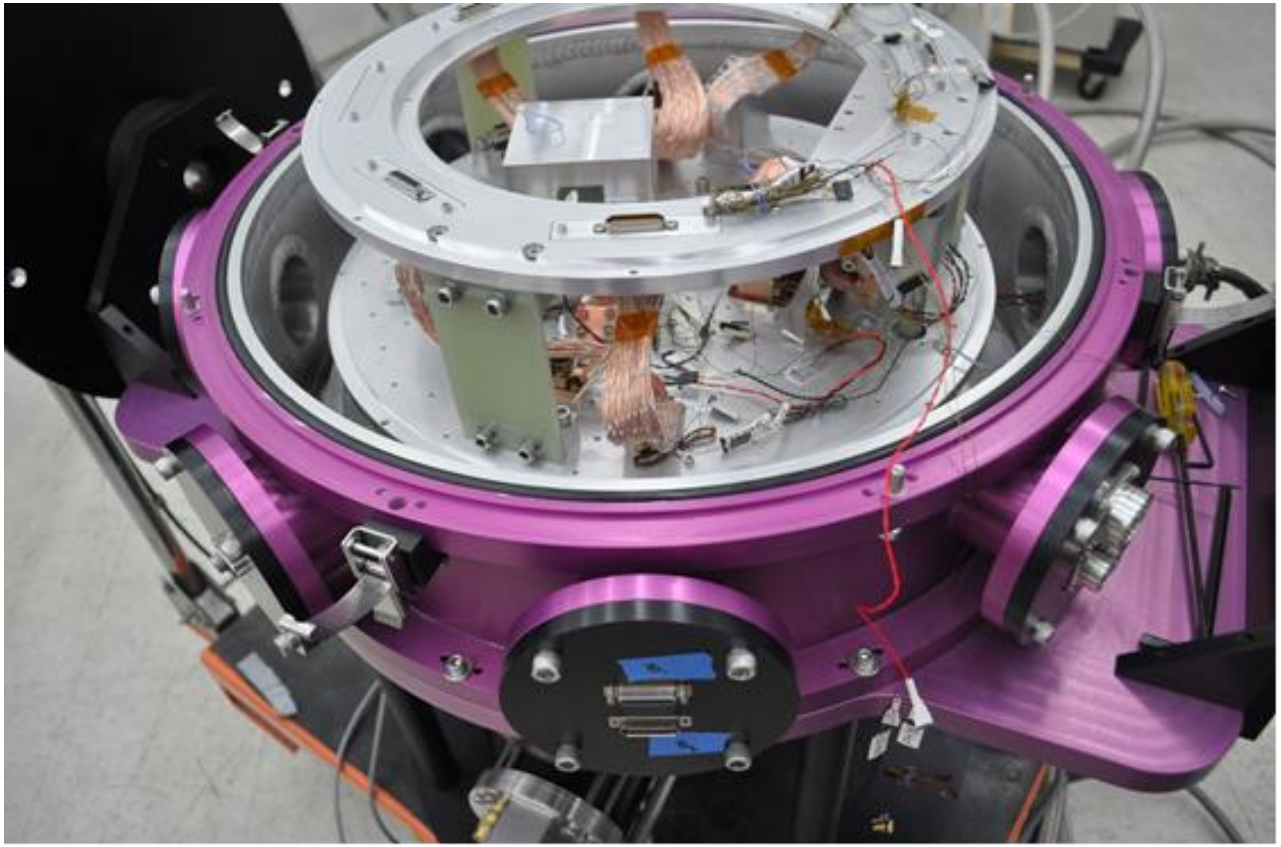
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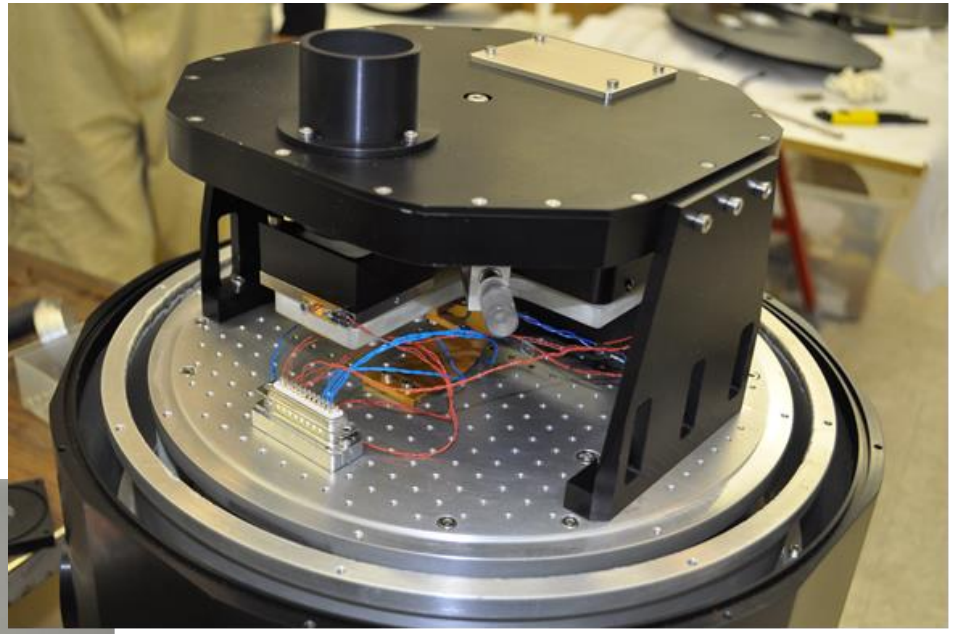
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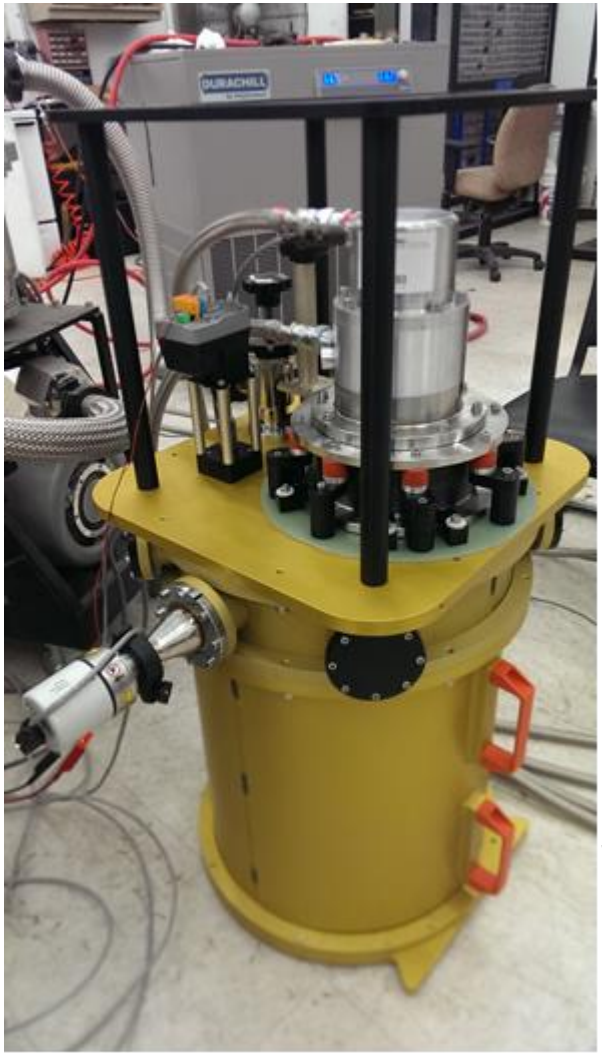




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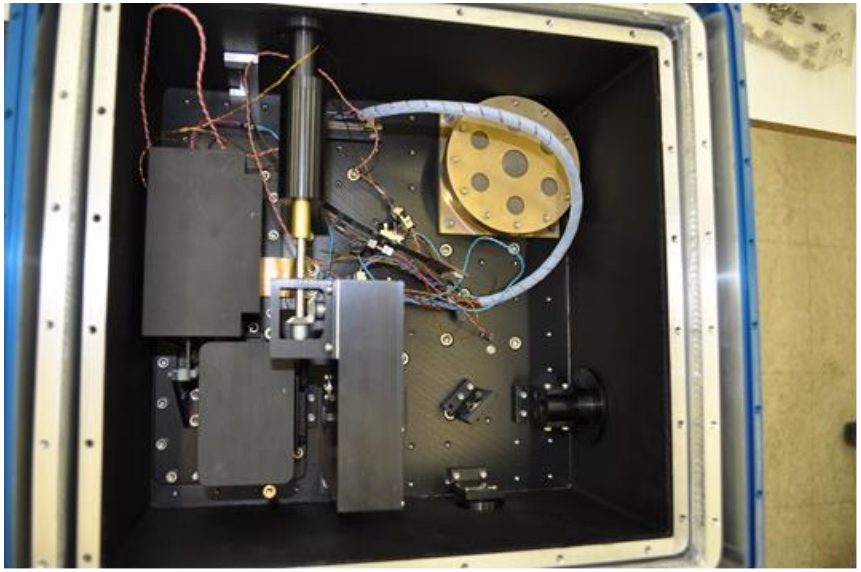
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