

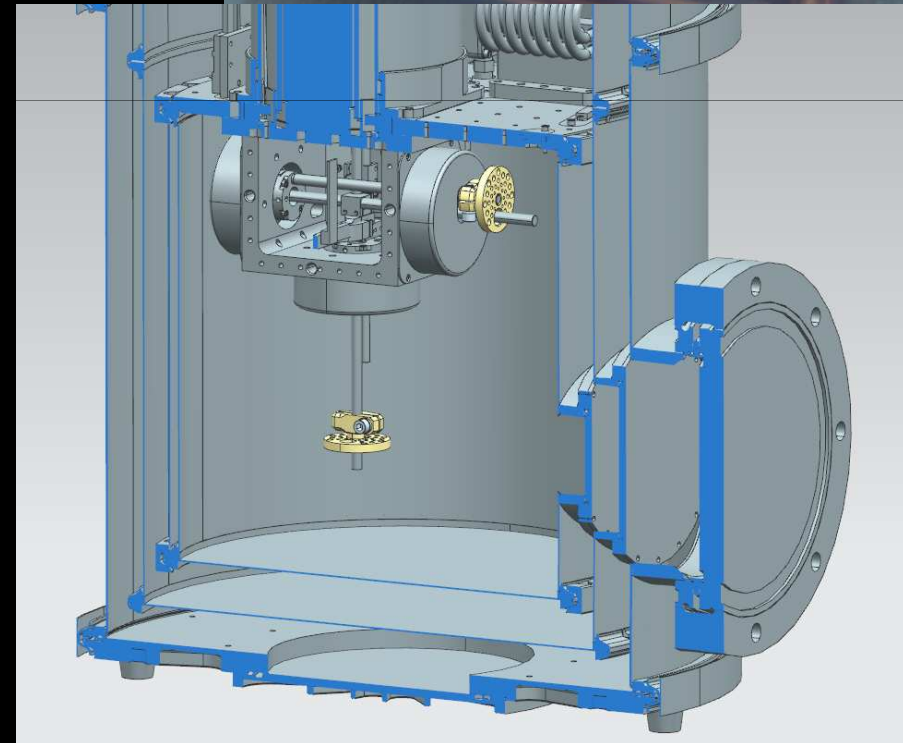
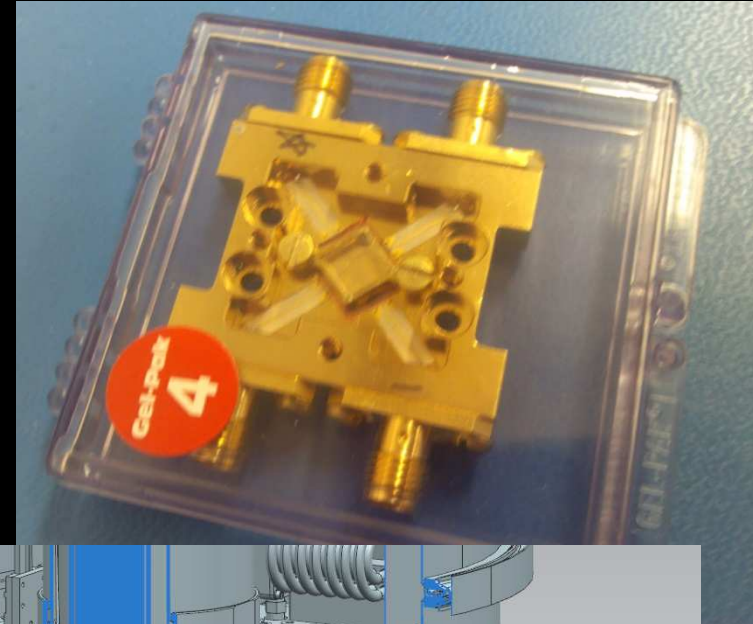
MKID Mechanical Development

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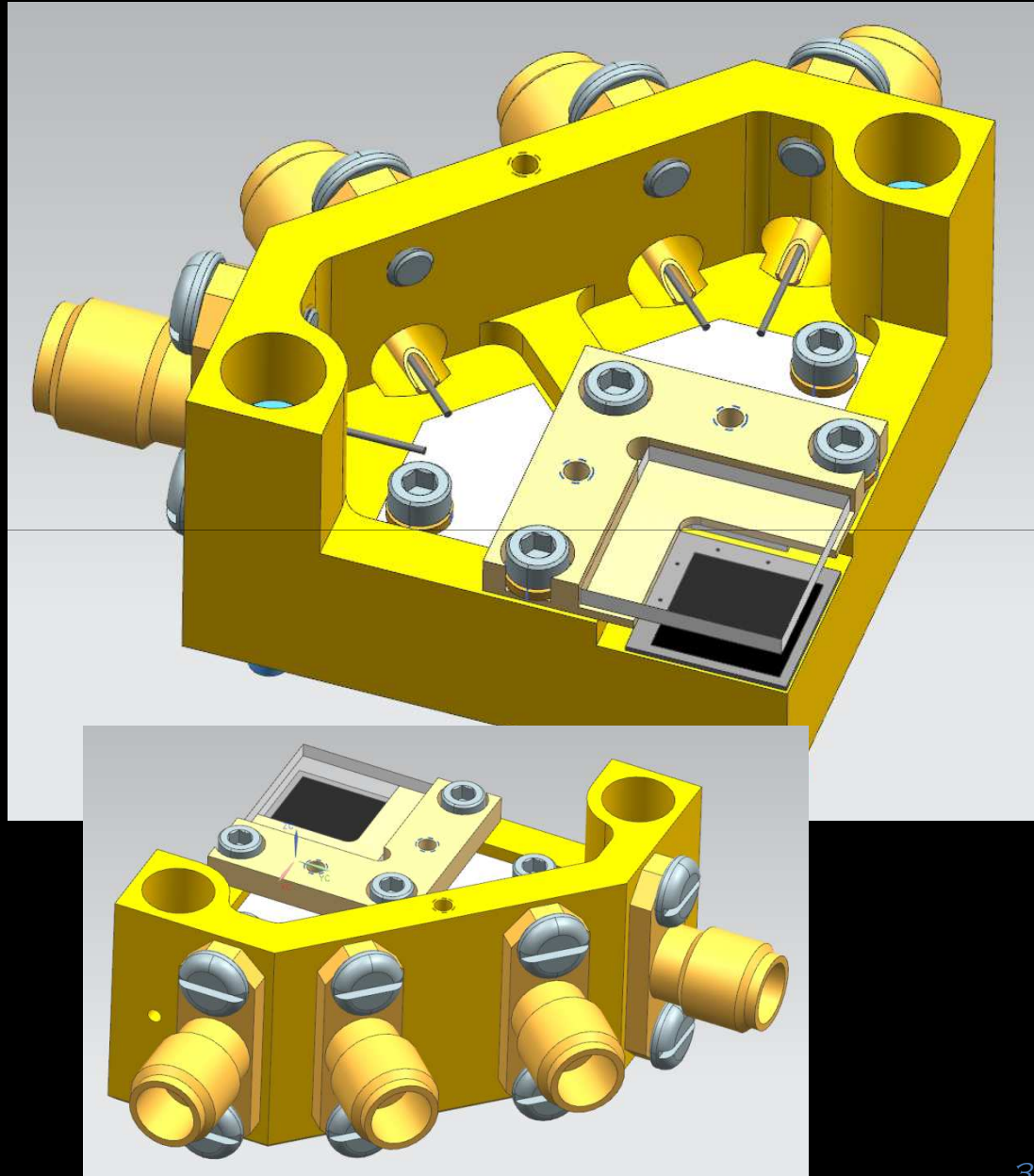
Phase 1

- Phase 1 project effort to utilize the single-chip packages developed at UCSB by Ben Mazin's group
- Mount package in ADR refrigerator
 - Thermal design
 - Mount alignment & stability issues
 - Magnetic issues?
- Develop window optics
 - Prescription
 - Filters
 - Alignment issues
 - Thermal issues
- Experience gained in Phase 1 system design & operation to aid Phase 2 effort

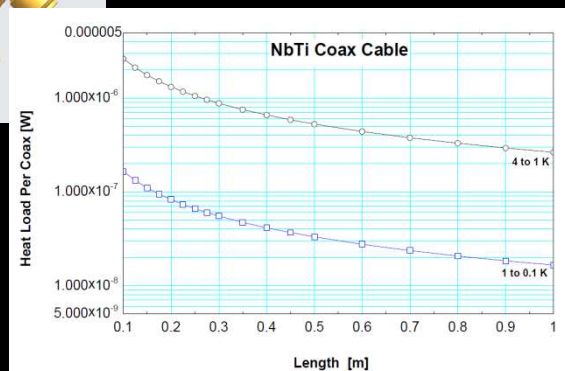
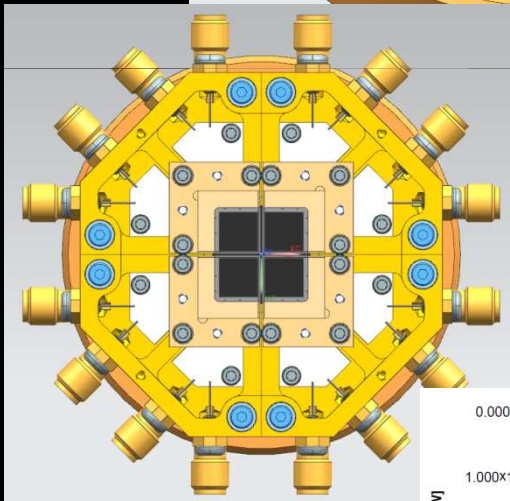
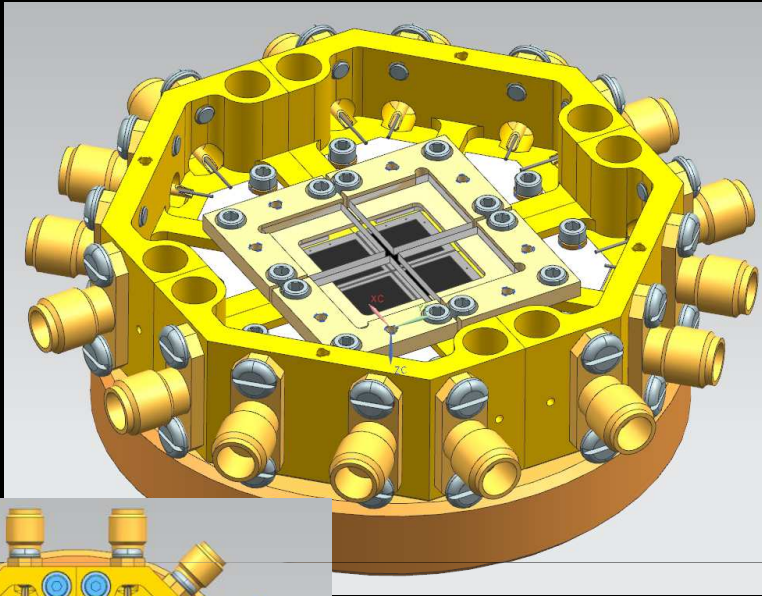


Phase 2 – Two-Side Buttable Design

- Two-side buttable array design allows grouping of four sensors on focal plane
 - Cartoon shown is all fantasy at this point, but the package here is 30x30x17mm
 - MKID sensor wirebonded along two edges only
 - Microlens array, glued to its holder, is to be precisely aligned to MKID
 - Adapter board connects sensor to SMA connectors – get input from RF experts
- Optical requirements for MKID / lens array need to be developed



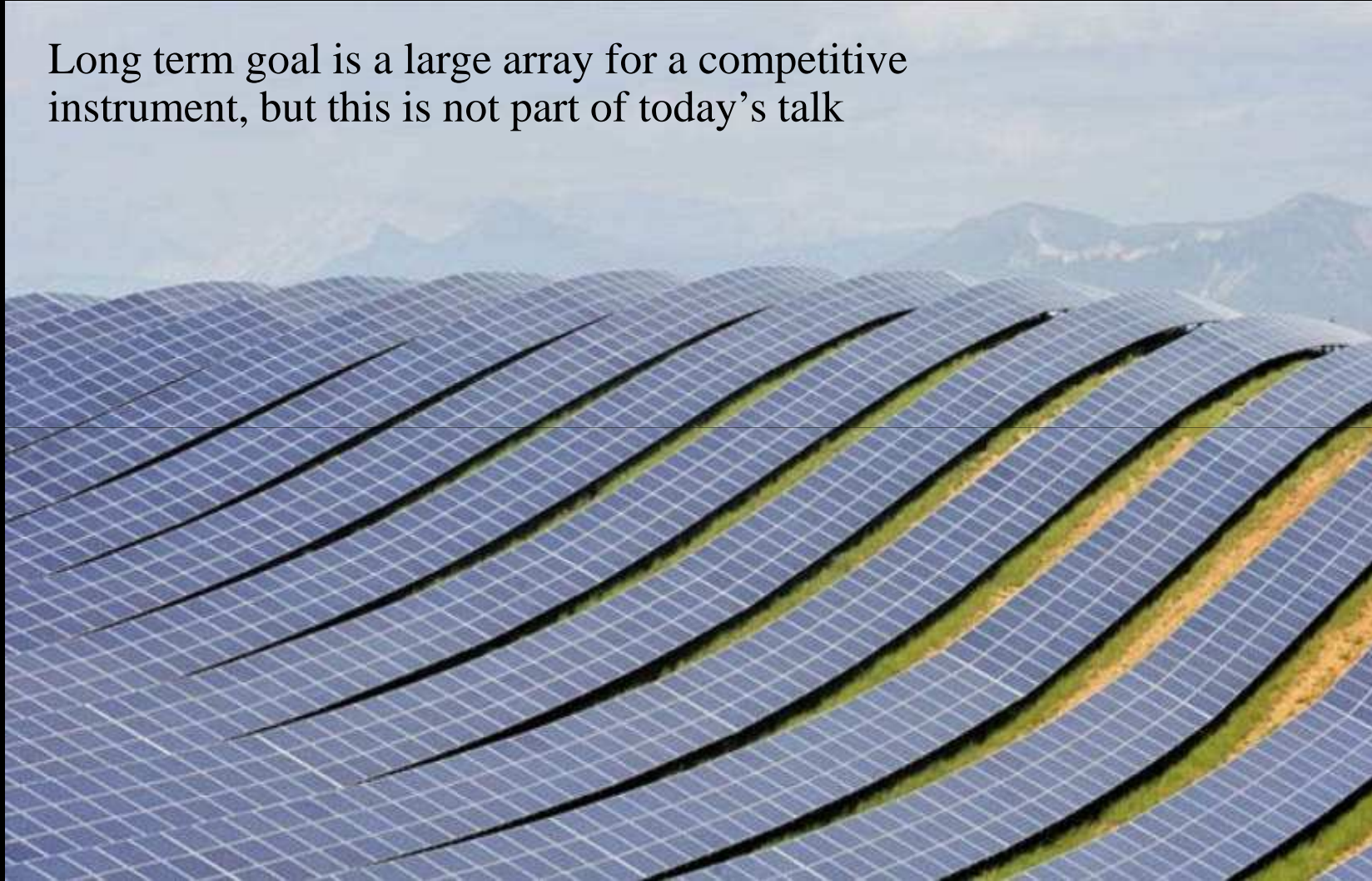
Phase 2 – Two-Side Buttable Design



- Modules have their edges butted together when mounted in the array
- Mounting for the focal plane array not yet conceptualized
 - Flatness & alignment requirement to optics?
 - Separate low-conductivity support from 4K plate (rather than support from ADR rods) required for stability?
- Optics design needed
 - Prescription / filter / alignment / thermal issues all still apply
- Large number of cables requires good understanding of thermal limits!
 - Need to ensure effective thermal grounding at 55, 4, & 1 K stages

Phase 3 – Large Four-Side Buttable Array

Long term goal is a large array for a competitive instrument, but this is not part of today's talk



Summary

- New ADR refrigerator allows us to explore this technology
- Several phases planned to
 - Increase our understanding of system design and operation
 - Help advance the technology
- Mechanical engineering resources are limited; to effectively use them we really need to understand our requirements at each stage of development

