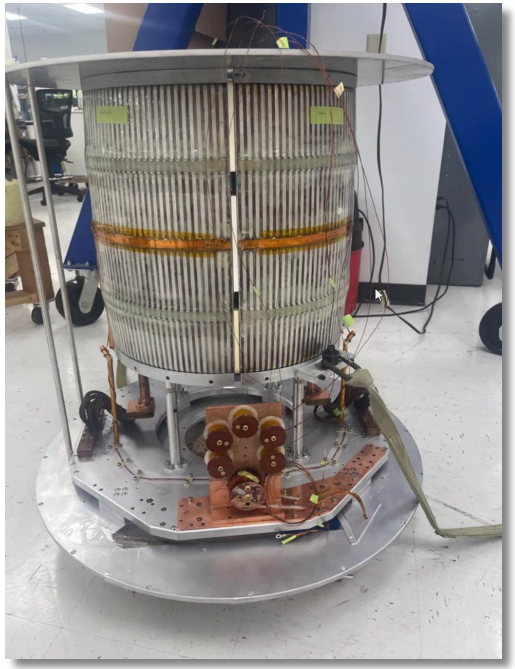
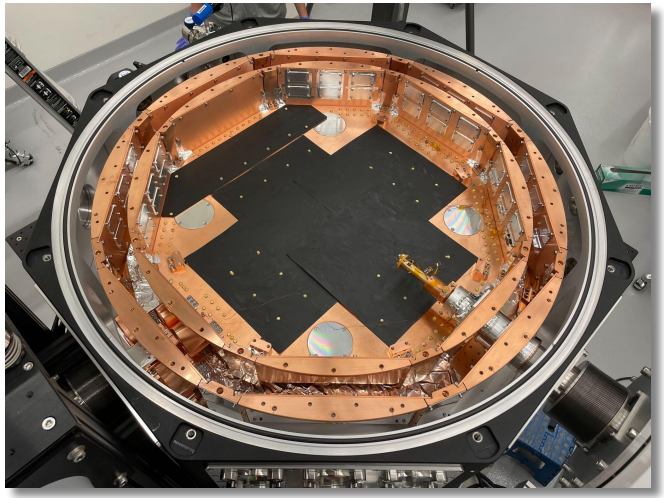
DMRadio-50L Introduction

Maria Simanovskaia
October 7, 2025





It’s an exciting time for DMRadio-50L!

Commissioning cryogenics: Snoopy, Woodstock, cold snout, 1 K space, 20 mK space

Finalizing and testing de-ceiver components: magnet, sheath, resonator, SQUID, tunable transformer

Finishing up facilities and room temp infrastructure: room temperature stand, lifting mechanism, crane system

From last collaboration meeting: cryogenics

DMRadio-50L cryogenics to-dos

Before 50L is assembled and operational, need to:

- Get Snoopy into prime operating shape — (Maria) scroll pump tip seal, extra still support
- Achieve target gradients with cold snout testing — (Aya) see Aya's talk 8/5
- Build 4 K flexible connection — (Princeton) design & build
- Build 40 K flexible connection — (Aya) design & build
- Build vacuum adapter plate to bellows — (Aya) design & build
- Build and validate Woodstock — (Four Nine Design) build & validate
- Design and make wiring for Woodstock — (Nicholas) SQUID wiring, other wiring?
- Design and build 4 K cryoperm shield — (Nicholas) roughly designed
- Design and build 1 K plate and shield — (Tori) see Tori's talk 8/5
- Design and build 20 mK plate and accessories — (Jessica and Maria Salatino) see Jessica's and Maria's talks 8/5

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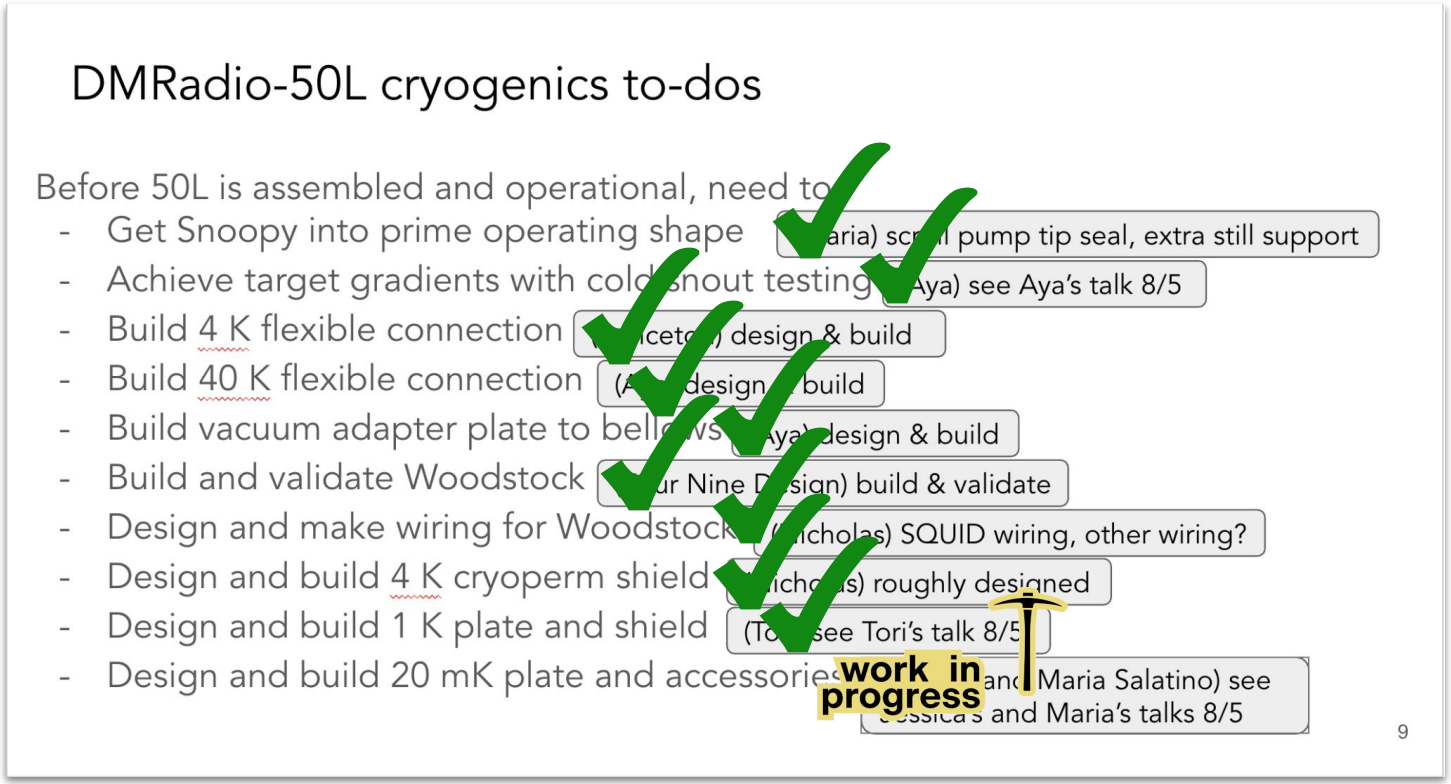
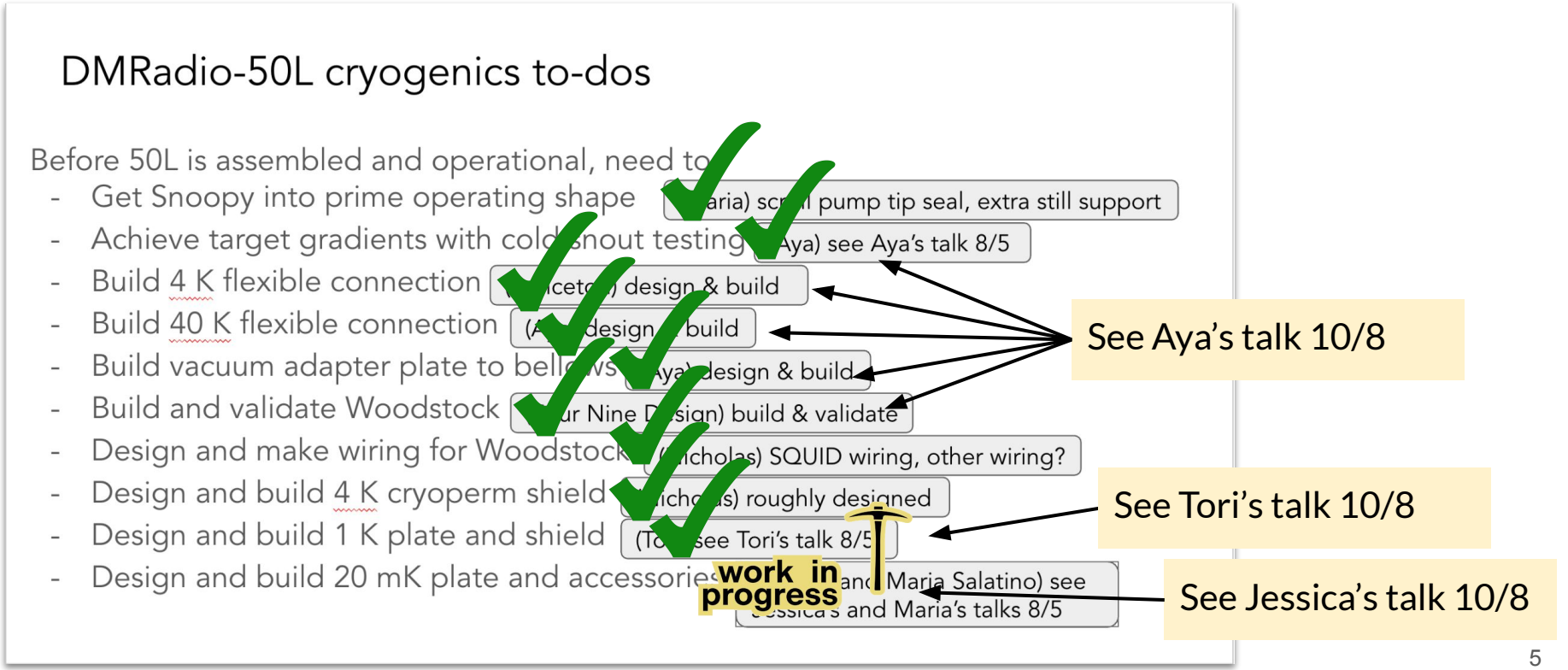
From last collaboration meeting: cryogenics



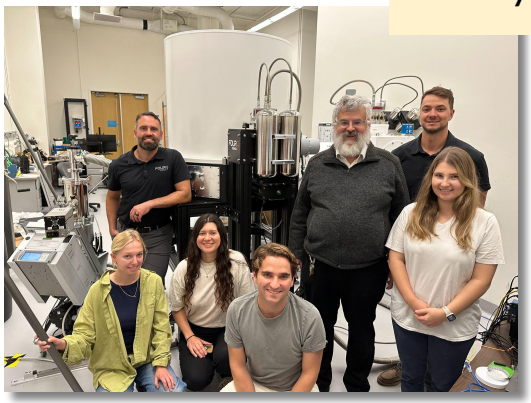
From last collaboration meeting: cryogenics



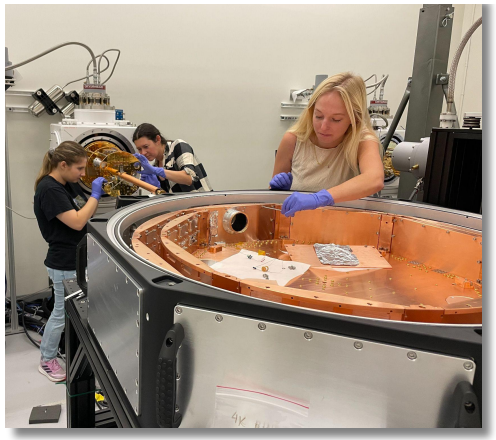
Now actively commissioning cryogenics at Stanford!

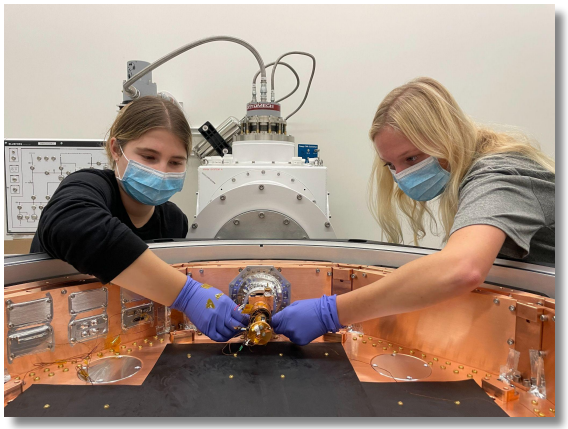
See Aya's talk 10/8

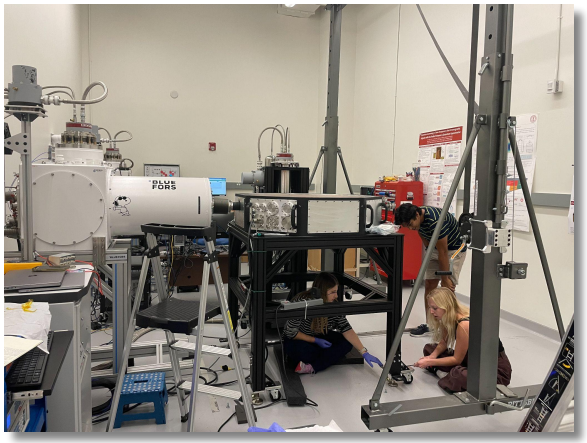
✅ Woodstock only



Current cooldown: Woodstock + Snoopy + cold snout







From last collaboration meeting: de-ceiver

DMRadio-50L "De-ceiver"

Before 50L is assembled and operational, need to:

- Build and validate toroidal magnet (SSI, Chelsea) see Chelsea's talk 8/6
- Finalize connector bracket design and build (Nicholas) see Nicholas talk 8/6
- Finalize / gather together the rest of the magnet components
- Design and build sheath (Nicholas) (Jessica, Johny, Alex, Nicholas, etc)
- Design and build tunable transformer (Joe) see Joe's talk 8/6
- Design and build SQUID board and wiring (Nicholas)
- Design and build resonator (Roman, Joe)
- Make sure de-ceiver is possible to assemble! (Chiara) see Chiara's talk 8/6

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From last collaboration meeting: de-ceiver

DMRadio-50L “De-ceiver”

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- Build and validate toroidal magnet
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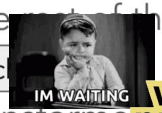
- Finalize / gather together the rest of the magnet components
- Design and build sheath
- Design and build tunable transformer
- Design and build SQUID board and wiring
- Design and build resonator
- Make sure de-ceiver is possible to assemble

work in progress

see Chelsea’s talk 8/6

(Nicholas) see Nicholas talk 8/6



(Jessica, Johny, Alex, Nicholas, etc)

work in progress

talk 8/6

(Nicholas)

work in progress

work in progress

see Chiara’s talk 8/6

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From last collaboration meeting: de-ceiver

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- Design and build sheath (Nic… (Jessica, Johny, Alex, Nicholas, etc)
- Design and build tunable transforme… see Tori's talk 8/6
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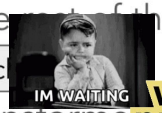

work in progress

work in progress

work in progress

work in progress

SSI is testing the magnet!

See Nicholas' talk 10/7

See Tori's talk 10/8

See Roman's talk 10/8

See Aya's talk 10/7

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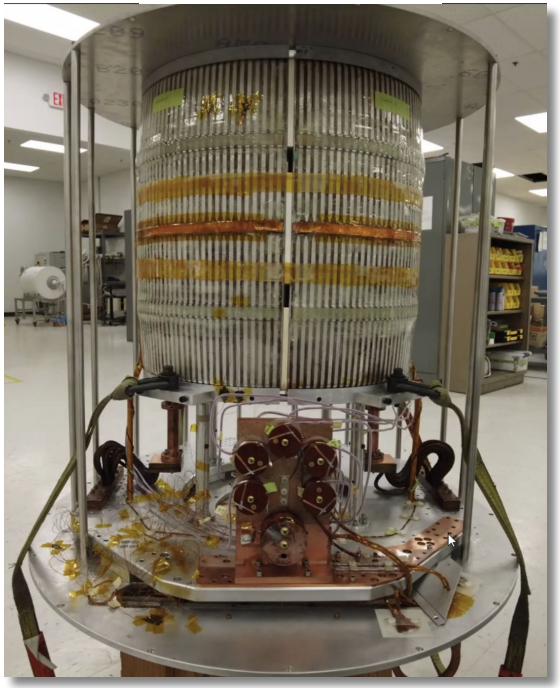
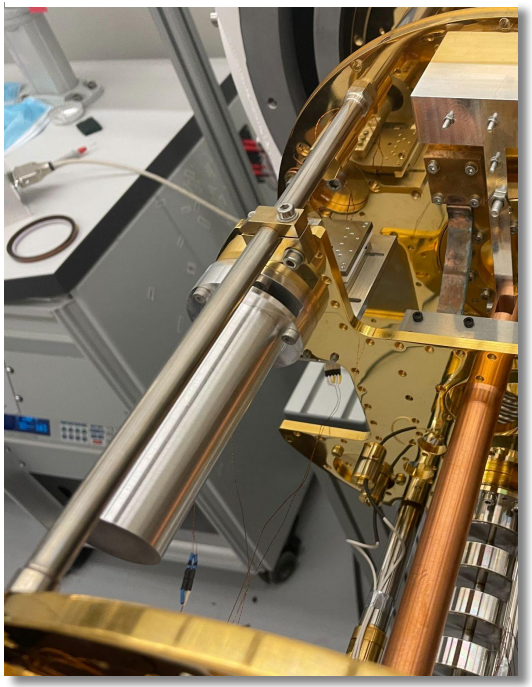
Active design, construction, and testing on components!

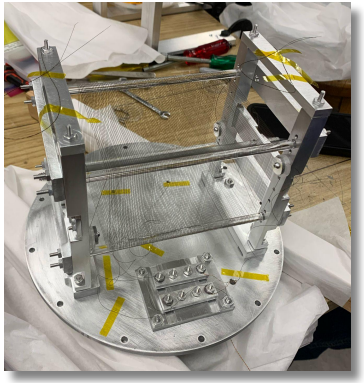
Magnet

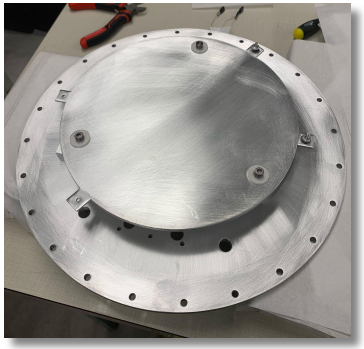


Tunable transformer



Prototype resonator, and 50L resonator is imminent!





From last collaboration meeting: facilities

DMRadio-50L location: Stanford PAB room B02

Before 50L is assembled and operational, need to:

- Install new 3-phase outlet in the dog house — (Maria) quote received, need to schedule work
- Tee-off cooling water in the dog house — (Maria) to-do
- Raise room lights — (Maria) to-do
- Design and build lifting and assembly structures (room temperature stand, cage, crane system)
  - (Johny) Room temp stand design and build
  - (??) De-ceiver cage is mostly designed, who should build?
  - (Four Nine Design) Crane system
  - (Maria) Certification of crane system

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From last collaboration meeting: facilities

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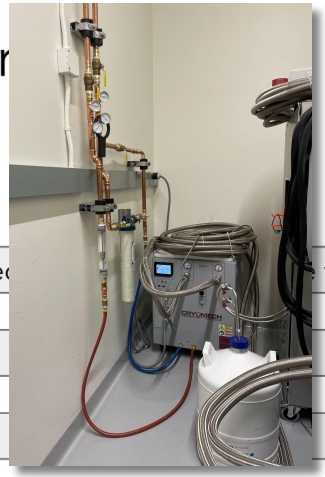

aria) quote re work

Maria) to-do

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work in progress

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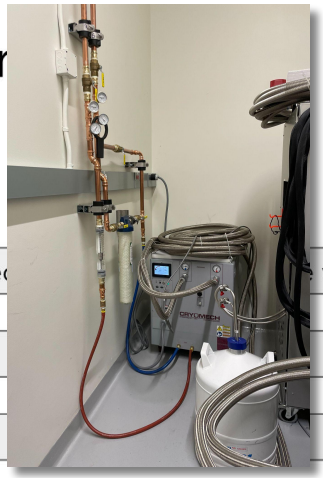

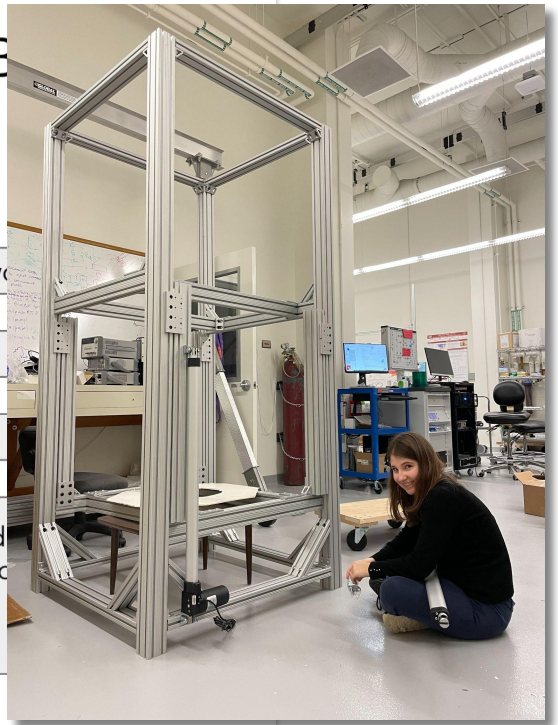

See my other talk :)

Thanks for listening!