ExEP Resources Available to Strategic Astrophysics Technology (SAT)-2024 PIs

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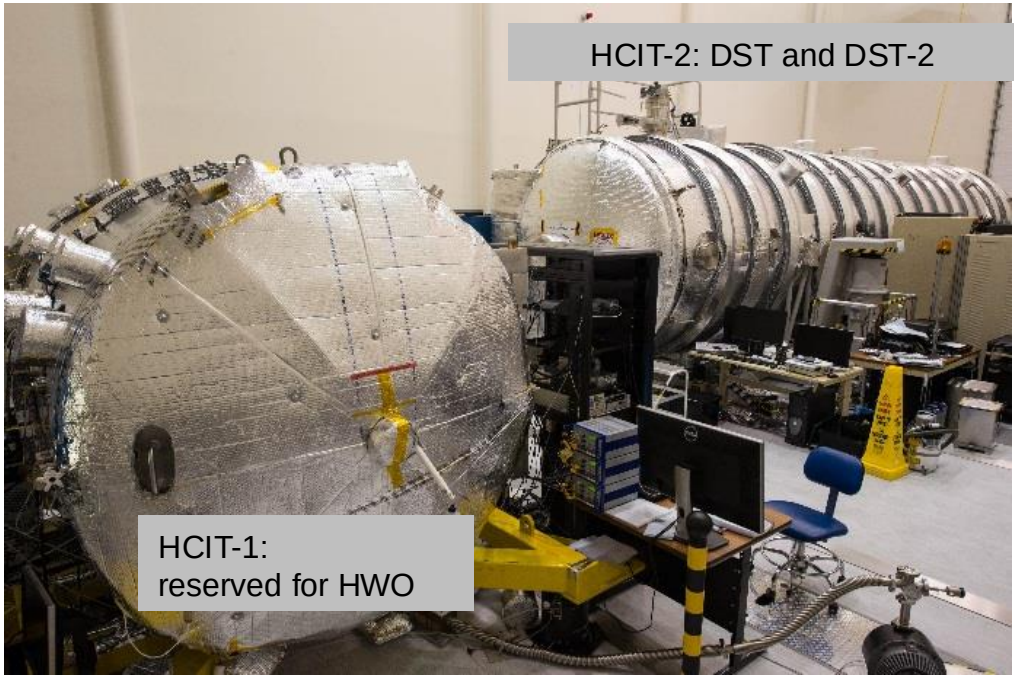
ExEP Resources for SAT PIs

- **This presentation provides an overview of the ExEP resources located at JPL available to support a Strategic Astrophysics Technology (SAT) proposal.**

- **The available resources, if appropriate for your needs, may help you more efficiently meet your milestone goals and reduce your proposal costs and schedule.**

Resources available on request:

- **High Contrast Imaging Testbed (HCIT) laboratory:**
  - Vacuum coronagraph testbeds:
    - **Decadal Survey Testbed (DST)-1**
    - **Decadal Survey Testbed (DST)-2**
    - **Vacuum Surface Gauge (for deformable mirror metrology)**
  - **In-air coronagraph testbed (IACT)**

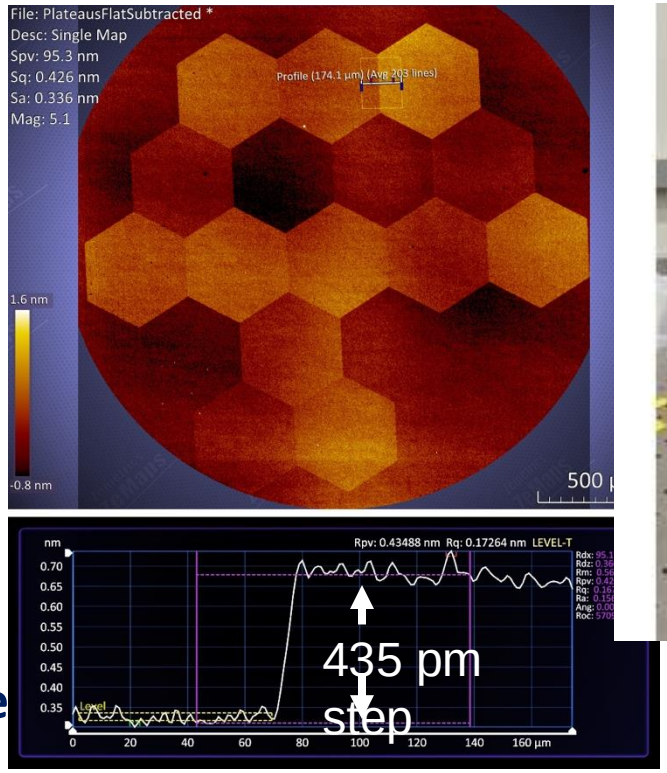


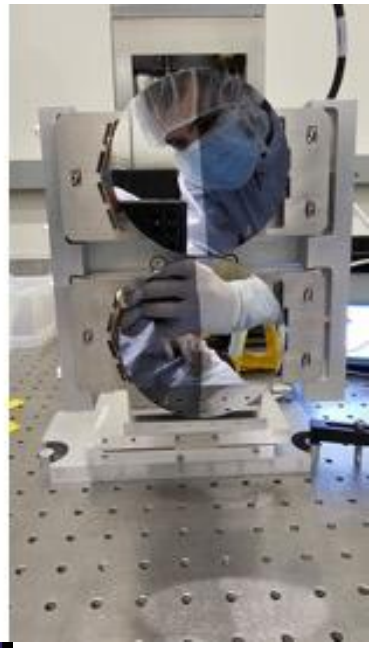
Static Segment Phase Errors

- **ExEP has developed a reflective optic to simulate static sub-nm phase errors introduced by a hex-segmented telescope mirror.**

- **While the optical path differences of the hexagons have been measured, the masks have not yet been commissioned in a coronagraph testbed. Their use is being made available to SAT PIs for coronagraph demonstrations in the HCIT but on a shared risk basis.**

- **Additional masks with a range of optical path differences can now be manufactured at JPL's Microdevices Laboaratory.**





Optical path difference error measured across two segmented hexagons from Prototype 1 (2.5 mm); Prototype 2 (50 mm) has just been fabricated and is being optically mounted. Step size differences are produced through multiple overlapping rounds of photolithography and e-beam deposition. (image credit: Dr Dan Shanks, JPL)

Gaining Access to the ExEP Resources at JPL

How to Request Use of ExEP Resources at JPL

- **Submit preliminary Statement of Work (SOW) for use of ExEP resources to Brendan Crill no later than January 6, 2025.**
  - Follow SOW questionnaire on next page.

- **Schedule telecon with Brendan Crill before Jan 10, 2025 to discuss use of the resources of interest and to obtain costing guidelines.**
  - We will evaluate with the PI workforce, labor, and infrastructure access required across all received SOWs.
  - Proposal due date is January 30, 2025

- **Brendan Crill will supply the proposal PI a Letter of Commitment for use of any ExEP resources.**
  - PIs are to include both the SOW and the Letter of Commitment in their proposal (due January 30, 2025).
  - HCIT will provide workforce cost to set up testbeds; additional labor and unique procurements must be costed within the proposal.

- **The Letter of Commitment does not assure selection of the proposal; lack of a SOW or Letter in a submitted proposal could adversely affect proposals intended to utilize ExEP resources.**

SOW Questionnaire for Use of ExEP Testbed Resources

1. **Brief description of the proposed SAT**
2. **What resources are requested?**
3. **Milestone(s) to be accomplished and performance goals**
4. **Brief description of how the work will be conducted**
5. **Period(s) and preferred dates, if any, over which the resource is requested, stating whether in vacuum or air for testbeds. Include any time required for preparatory work.**
6. **A list of the personnel, expertise, and level of effort (if any) who will assist in the use of the resource.**
7. **Any anticipated changes to the resource needed to accommodate your demonstrations.**
8. **List of items needed for all testbed modifications. Identify items you will be procuring within your proposal's budget and provide approximate cost of needed items.**
    a. Otherwise, state that no additional procurements will be necessary for the use of the infrastructure under consideration.
9. **Provide any other relevant information or constraints.**

Strategic Astrophysics Technology Timeline

- **The timeline for requesting access to ExEP resources is based on the dates specified in ROSES SAT-2024**

- **Notice of Intent (NOI) to propose to SAT-2024 is due on December 15, 2024**
  - Amended November 2024: ***NOI is no longer mandatory***

- **The proposal deadline is January 30, 2025**

ExEP Technology Resources POC

For questions concerning use of ExEP technology resources or requests for more detail contact:

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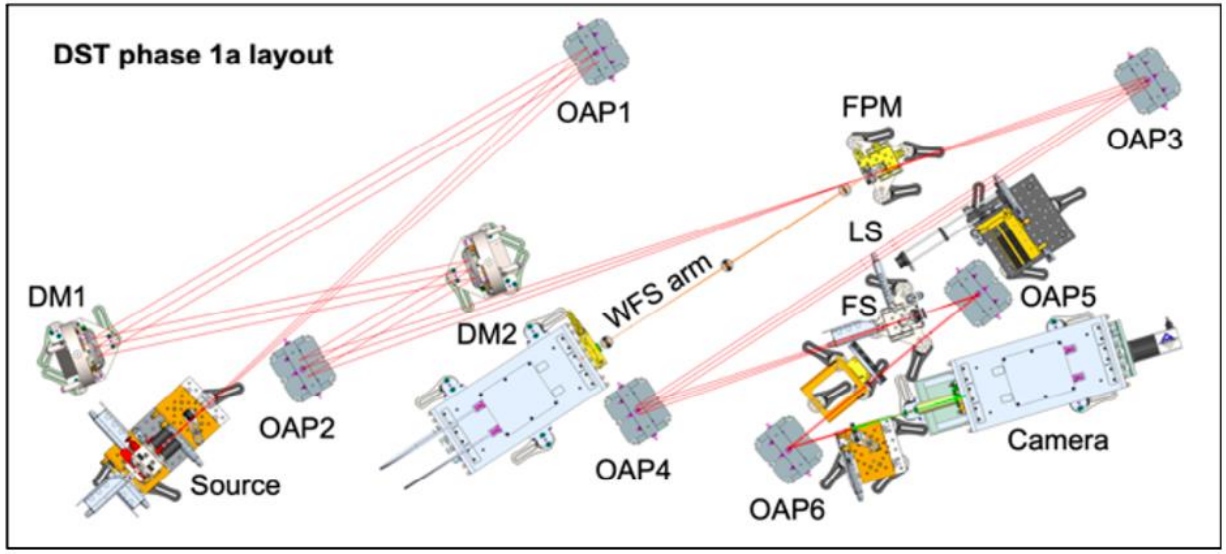
Additional Slides

Decadal Survey Testbed bench layout



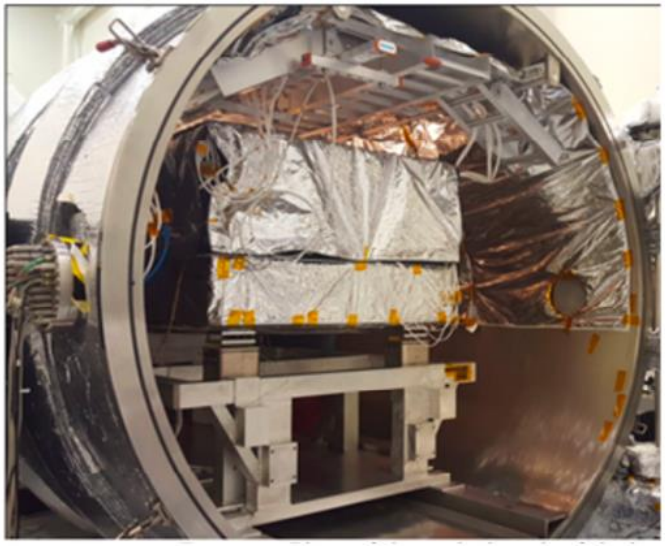


Figure 1: (Left) DST phase-1a commissioning layout. (Right) The DST bench in the HCIT2 vacuum chamber, covered in multi-layer insulation (MLI) and resting atop a support frame, Minus-K isolators, and Vespel platforms.

Patterson et al. 2019 SPIE proceedings

Decadal Survey Testbed 2 bench layout

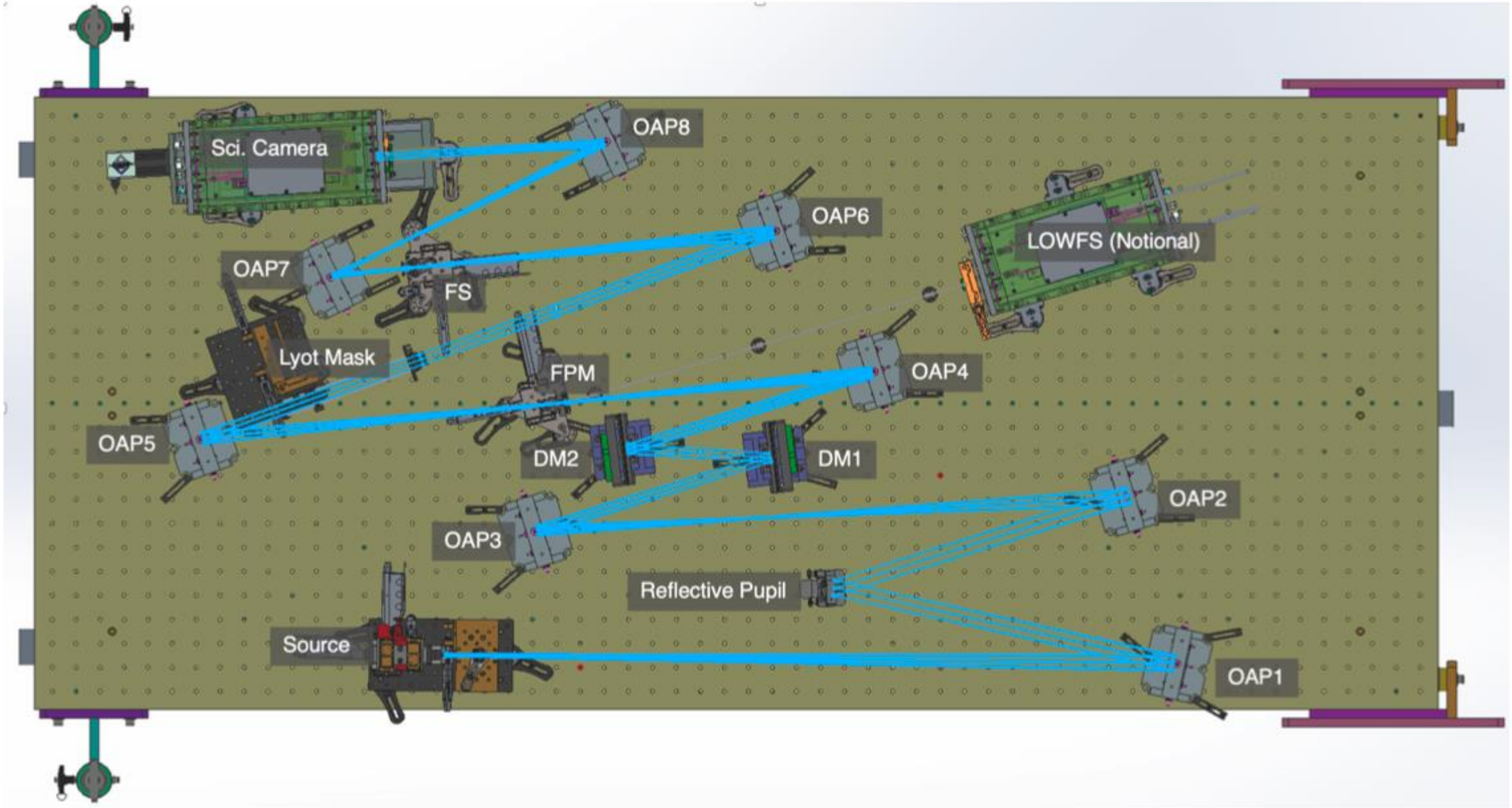


Figure 6: Top-down view of the DST2 bench CAD model with Zemax raytrace overlaid. Key elements are labeled.

Meeker et al. 2021 SPIE proceedings