

**Task Force on Laboratory Astrophysics
Current Status
June 2023**

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Chair**

2020 Decadal Survey Recommendation concerning LAB ASTRO

NASA and the National Science Foundation should (1) convene a broad panel of experts to identify the needs for supporting laboratory data to interpret the results from the new generation of astronomical observatories, (2) identify the national resources that can be brought to bear to satisfy those needs, and (3) consider new approaches or programs for building the requisite databases. This panel should include experts in laboratory astrophysics as well as representative users of the data, who can best identify the highest-priority applications.

Led to the following **Charge:**

- **Survey the current state of laboratory astrophysics, drawing from the wide range of available materials (e.g., Decadal Survey reports, white papers, community workshop reports, etc.)**
- Assess resources that currently support laboratory astrophysics, including grant programs, databases, facilities, infrastructure.
- **Identify the needs for supporting laboratory data to interpret results from observatories and missions**
- Identify and prioritize the needs for interpretation of data from current and future observatories and missions.
- Identify the corresponding requirements for laboratory and theoretical research to support those needs.
- Identify workforce and infrastructure needs.
- **Identify the national resources that can be brought to bear to satisfy those needs**
- Identify national resources and interagency synergies (e.g., DOE, DOD, NIST, ...) that are not being exploited at present.
- Identify ways in which existing resources can be used more efficiently.
- Identify the specific areas that might benefit from targeted additional investments.
- Consider how resources for Lab Astro should be integrated into planning and operation phases of observatories & missions.
- **Consider new approaches or programs for building the requisite databases**
- Identify the database gaps, both nationally and internationally.
- Define database requirements that would enhance interpretation of astronomical observations.
- Identify new modalities of support (e.g., “Centers” for laboratory astrophysics and databases).

- Lab Astro Task Force formed

Current status:

- Kick-off Meeting March 24, 2023 to organize
- Created Three Subgroups
- **ISM**: group leader Kyle Crabtree (UC Davis)
- **Stellar, Nuclear, and Plasma** Astrophysics: group leader Stuart Loch (Auburn)
- **Planets and Exoplanets**: group leader Iouli Gordon (CfA)
- Started and are in midst of **Task 1: Survey Current State of Lab Astro**
- Template created (Flexible)

Task # 1. A. Collect relevant information about given areas. Start by assessing the current federal and university resources for laboratory astrophysics, e.g., grant programs, facilities, databases, infrastructure, and workforce. Compare with the international landscape.

Creation of Template

SUBGROUP TITLE (ISM / PIEx / SNP)							
	Grant Programs	Federal Facilities	University Facilities	Databases	Infrastructure	Workforce Development	Other
ADD Organization							
NSF	% Lab Astro funding	ALMA: No Lab Astro funding	-				
NASA	% Lab Astro funding	JWST:					
NASA JPL							
CfA							
etc.							

Note: If available, include information on international organizations for comparison.



Questionnaire

- What **resources at your institution support laboratory astrophysics** specifically? This could include financial support, facilities, or other programs.
- What **databases, software, or other publicly-accessible resources** are developed, hosted, and/or maintained at your institution that are related to laboratory astrophysics? (databases with data generated by experimental measurements or theoretical calculations, software or other data resources that generally benefit the broader LAD community.
- Over the past 5 years, approximately how many **undergraduates, graduate students, post-docs, and staff** has your research program supported in the area of laboratory astrophysics?
- Over the past 5 years, have you **applied for and/or received support from NSF , NASA, OTHER** specifically for laboratory astrophysics?

- If you have any **additional information or suggestions** about programs, facilities, or resources for laboratory astrophysics in your local area/region that we may not be aware of, please share relevant information (a short description, web link, etc).
- What types of **laboratory astrophysics needs** do you anticipate for the next 5-10 years?
(types of measurements or calculations, financial support, specific equipment, facilities, or other items)
- We may **have followup questions**. If you are willing to be contacted for followup, please include your name and email address below:

- Full Group Meetings in April, May
- Subgroup Meetings in April, May
- Questionnaire circulated to various groups (ACS Astrochemistry, others)
- Responses (May 26, 2023)

ISM: 16

Exoplanets: 12

Stellar: 7

- Questionnaire now posted on AAS LAD website (Stefanie Milam)
- AAS Meeting: Splinter Group Meeting on LAD to engage community, encourage responses to Questionnaire

242 AAS Splinter Group Meeting

AAAC Laboratory Astrophysics Taskforce Community Discussion

In this open splinter meeting, the chair of the LAT will discuss the goals of the taskforce and seek informal input from the scientific community, especially regarding the role of laboratory astrophysics in enhancing the scientific return of current and future astrophysics missions and observatories (e.g., ALMA, JWST, ngVLA, ELTs, etc.). Representatives from NSF and NASA will also be present to provide the programmatic context and participate in the discussion. All AAS attendees are encouraged to participate in the splinter meeting and learn about this important activity.

Future Activities

- Continue with Task 1
- Subgroups already formulating ideas for next Tasks
- Identifying needs, resources, new approaches
- Identifying writing tasks
- Full group meeting in person in September
- Write report in fall 2023

Previous Task Force organized through NASA (~ 15 yrs ago)

- Series of NASA Lab Astro Workshops
- White paper generated
- Lab Astro Working Group
- AAS Lab Astro Division

BIG PROBLEMS haven't changed

- Lack of funding, lack of faculty positions, lack of recognition in astronomy departments