

Charter for the Science and Technology Definition Team (STDT) for the Extended Study Exoplanet Direct Imaging Mission Concepts

Background

In preparation for the 2020 Decadal Survey, the Astrophysics Division, through its Exoplanet Exploration (ExEP) Program Office, initiated two Science and Technology Definition Teams (STDTs) to study two probe-class exoplanet direct imaging missions. The final reports for these studies will be released in March 2015 and, upon release, will serve as benchmark starshade and coronagraph mission concepts providing valuable design information to the exoplanet research community as the community begins evaluating future possible missions ahead of the Decadal Survey. While the STDTs remain intact, an opportunity exists to expand on the study work beyond the two probe-class concepts and add to the current design information available to exoplanet researchers.

The next Decadal Survey will prioritize large space missions to follow JWST and WFIRST. As part of the Astrophysics Division plan for supporting the next Decadal Survey, a series of large mission concept studies will start in FY16 and possibly probe-class mission studies starting at a later date. With STDTs already in place for the probe-class studies, the Astrophysics Division has an opportunity to begin some early related design trades that will expand on the probe work done to date, or begin trades that will feed these later large exoplanet mission studies.

Since the start of the Decadal Survey large mission studies are less than a year away, time does not allow for the solicitation and formation of a new STDT; the reassignment of the probe-class STDT members is necessary to expand on the work done to date. These “Extended Study” STDTs will be chaired by the current probe-class STDT chairs, Sara Seager (MIT) and Karl Stapelfeldt (GSFC). Membership will be made up of current STDT members who are willing and able to continue in present their role. In consideration of the available schedule, the product of the STDT will be a presentation to be given by the STDT chairs to the Astrophysics Division. The presentation will be made public at the conclusion of this study.

Specific Charge to the STDT

The STDTs are charged with performing high-level assessments of the performance, cost and technical risk of direct imaging architectures building from the work already completed in the probe-class studies.

In particular,

1. The Coronagraph STDT (Exo-C-ES) will utilize what has been learned in the probe-class study to assess possible architectures for a large exoplanet direct imaging mission ready to be launched before 2030. The study will focus on telescopes with higher technical maturity (generally telescopes with primary mirror diameters of 2.4m or less). The concept can examine companion general astrophysics payloads but the concept’s driving design requirements must come from exoplanet direct imaging science.

2. The Starshade STDT (Exo-S-ES) will utilize what has been learned in the probe-class study to assess possible improvements on the WFIRST follow-on concept architecture presented in the probe-class report. New options will be examined, including reduced cost versions of the probe-class report's case study option.
3. The STDTs may choose to have one or more face-to-face meetings in developing its report. Meetings will be called by the STDT chairs, and the agendas will be set by the chairs in coordination with ExEP and the Study Office to ensure that planned activities are aligned with programmatic needs and expectations.
4. The STDTs shall produce a briefing package and deliver a briefing to the NASA Astrophysics Division as the final product of this task.
5. The STDT will deliver the study briefing to NASA HQ in November 2015. No CATE estimate will be required as part of this study effort. The STDT chairs will brief the final concepts to the Astrophysics Division at NASA Headquarters
6. Any public release or discussion of the STDT or Study Office status, or results of findings, studies and concepts, shall be coordinated directly with NASA HQ beforehand. Reports and other output of the STDT studies that are made publicly available will be in compliance with Federal export regulations (e.g., ITAR and EAR).

Organization

As with the probe-class studies, the STDTs will be assisted by the ExEP Study Office located at JPL. The Study Office will provide limited engineering and programmatic support to both STDTs. Each STDT is independent of the Study Office yet is expected to work in close coordination. Each STDT and the Study Office will iterate on science requirements and the mission concepts that flow from these and will share results with each other in a two-way exchange.

Termination

The STDTs will be disbanded after the delivery of the Mission Concept Presentations to NASA and prior to the start of the Decadal Survey large mission concept studies.

Point of Contact

The NASA HQ point-of-contact is John Gagosian (John.Gagosian@nasa.gov). The ExEP point-of-contact is Keith Warfield (Keith.R.Warfield@jpl.nasa.gov).



5/21/15

Paul Hertz
Director
Astrophysics Division
Science Mission Directorate
NASA Headquarters