

A cosmic background featuring a large planet on the left and a spiral galaxy in the upper right. The text is overlaid on a dark horizontal band.

Strategic Exoplanet Initiatives with HST and JWST

Town Hall 1 - July 12, 2023

The Charter

STScI formed a working group to provide guidance on optimal strategies for maximizing the scientific return from *HST* and *JWST* spectroscopic and imaging observations of planetary systems



Read the initial charter here!

The Goals

Working Group is charged with:

1. **Collecting** community input.
2. **Presenting** the broad science themes that should be prioritized with *JWST+HST* GO observations and the resulting archive, including multi-cycle programming.
3. **Advising** on timing of observations and mechanisms to enable observations.
4. **Discussing** appropriate scale of resources to support these efforts.
5. **Developing** specific concept for DDT observations to start as early as *JWST* Cycle 3.

The End Results

The Working Group will produce a report based on community input. Those recommendations will be also be directly communicated to the JWST and HST Users Committees and STScI Director.

1. Our role is to provide advice to the STScI Director on potential DDT program(s) and science priorities.
2. The Director will make their selection and identify an implementation team, including external science advisors that may or may not include members of the current Working Group.

The Working Group

Seth Redfield (Wesleyan University; Chair)

Natasha Batalha (NASA Ames)

Bjorn Benneke (University of Montreal)

Beth Biller (University of Edinburgh; STUC Chair)

Néstor Espinoza (STScI)

Kevin France (University of Colorado)

Quinn Konopacky (UCSD)

Laura Kreidberg (MPIA)

Emily Rauscher (University of Michigan)

David Sing (Johns Hopkins University)

Selection Process: appointed by STScI

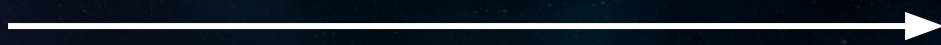
Community Feedback

Success of this process relies on community feedback!

How can you provide feedback to the working group?

1. Survey
2. White paper call

How can you communicate with the working group?

3. Town Halls (Slido Q&A)
4. Submit questions to our email wg-exoplanets@stsci.edu
5. FAQ page 

Due Date: September 8, 2023



Community Feedback: Survey Option

The goal of the survey is to make sure that all ideas from the community are heard.

Key Features of the Survey:

1. **Lower bar** than writing a full white paper:
 - a. Word-limited responses
 - b. Quick open-ended responses to specific prompts
2. **Fully anonymized** survey responses.
3. **Fully anonymized** demographic details:
 - a. Holds the WG accountable to ensure voices from across community are represented

Community Feedback: Survey Option

Survey
available [here](#)



Community Survey on the Strategic Exoplanet Initiatives with HST and JWST

Context:

Exoplanet science was highlighted as a key science area for the 2020s in the Astro2020 Decadal Survey. HST and JWST provide unique technical capabilities that enable precision investigations of planet formation, structure and evolution. These investigations will lay the foundations for the future flagship missions highlighted by the 2020 Decadal Survey, particularly the Habitable Worlds Observatory. As such, the Director of STScI has formed a working group charged with providing guidance on optimal strategies for maximizing the scientific return from HST and JWST spectroscopic and imaging observations of planetary systems (see [charter](#)). This includes general strategic advice, but also the opportunity for a large Director's Discretionary Time program of ~500 hours.

Information on the activities of the working group, including links to the survey and white paper submission can be found [here](#). The site includes a list of FAQs and an email to submit your own questions to the working group. We will also be holding three Town Hall meetings in July to advertise our community engagement opportunities, with one reserved for early career researchers.

Community Feedback: Survey Option

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Survey, pt. 1: Demographics Questions

Approx time to complete: < 5 min

Why it exists: Accountability to ensure that voices representing the full breadth and diversity of the astronomical community are heard.

What it addresses: career stage, institutional type, geography, race, gender identity

Logistics: Optional and fully anonymized.

Section 1 - Demographic Information

What type of institution are you primarily affiliated with? *

- Doctoral degree granting university
- Other four-year university or college
- Two-year college or community college
- Observatory, Laboratory, or National Facility
- Research institution
- Other: _____

Please check all that apply. *

- My primary affiliation is an R1 or equivalent institution
- My primary affiliation is primarily an undergraduate institution
- My primary affiliation is a Minority Serving Institution in the US (MSI; <https://msiexchange.nasa.gov>).
- My primary affiliation is a government or research institution,
- Other: _____

What geographic region is your primary institution located in? *

Survey, pt. 2: Word-Limited Responses

Approx time to complete: 10-15 min

Why it exists: To provide *quick* feedback on all topics. *For more in-depth feedback consider writing a white paper.*

What it addresses:

- 1) Key Science Themes
- 2) Optimal Timing
- 3) Scale of Resources
- 4) Director's Discretionary Time

Section 2 - Using HST and JWST to study planetary systems:

Key Science Themes:

Please respond to one or more of the following questions (1750 character limit):

- How can HST and JWST be used to maximize exoplanet science?
- What science topics or questions should be prioritized for observations?
- What science areas need to be prioritized for HST and JWST to lay the foundation for future flagships?
- What science could best be enabled by joint, coordinated observations from both HST and JWST?

Your answer

Optimal Timing

Please respond to one or more of the following questions (1750 character limit):

- What timing considerations affect the highest priority science areas for HST and JWST (e.g., simultaneous, reconnaissance/pilot observations)?
- How can these timing considerations best be implemented?

Your answer

Scale of Resources:

Please respond to one or more of the following questions (1750 character limit):

Community Feedback: White Paper Option

The goal of this is provide **more in depth** ideas, concepts, and feedback to the committee

Key Features of the White Papers:

1. **Limit 1 page of text, 1 page of figures** (meant to not be too onerous).
2. **What they can address:**
 - a. Four main charge areas being considered by the committee.
 - b. Specific concept ideas for ~500 hour DDT program.
3. **Fully anonymized.**

White Paper Logistics

- Must be written using [anonymous formatting](#) (only STScI will have access to author names). **Why?** All ideas need to be evaluated without bias.
- Must use overleaf template [here](#):



- Will be **published de-anonymized** at the end of the working group activities.
Why? Traceability of ideas

White Paper Template

Strategic Exoplanet Initiatives with HST and JWST White Paper

Your Title

Thematic Areas (Check all that apply):

- (Theme A) Key science themes that should be prioritized for future JWST and HST observations
- (Theme B) Advice on optimal timing for substantive follow-up observations and mechanisms for enabling exoplanet science with HST and/or JWST
- (Theme C) The appropriate scale of resources likely required to support exoplanet science with HST and/or JWST
- (Theme D) A specific concept for a large-scale (~500 hours) Director's Discretionary exoplanet program to start implementation by JWST Cycle 3.

Summary: Your summary goes here

**Template requires
selection of the
thematic area that
is part of the
committee charge**

White Paper Template for theme D: DDT Concept

Strategic Exoplanet Initiatives with HST and JWST White Paper

Anticipated Science Objectives: Your text goes here.

Urgency: Your text goes here.

Risk/Feasibility: Your text goes here.

Timeliness: Your text goes here.

Cannot be accomplished in the normal GO cycle: Your text goes here.

Basic Examples of Potential Concept Ideas

- **Dedicated time on high-value targets:** Precise panchromatic spectra of archetypal exoplanets to answer key questions about their formation, composition and chemistry.
- **Broad survey:** Mass-metallicity population trend and dispersion.
- **High risk, high reward survey:** Imaging search for sub-Jovian planets.
- **Potentially high-risk, high-reward targets:** An Atmospheric Inventory of Temperate, Terrestrial Planets.

Fictitious white paper example [can be found here](#)

Strategic Exoplanet Initiatives with HST and JWST White Paper

Constraining the atmospheric composition of a unique exoplanet system (a fictitious example)

Thematic Areas (Check all that apply):

- (Theme A) Key science themes that should be prioritized for future JWST and HST observations
- (Theme B) Advice on optimal timing for substantive follow-up observations and mechanisms for enabling exoplanet science with HST and/or JWST
- (Theme C) The appropriate scale of resources likely required to support exoplanet science with HST and/or JWST
- (Theme D) A specific concept for a large-scale (~500 hours) Director's Discretionary exoplanet program to start implementation by JWST Cycle 3.

Summary: We advocate for deep spectroscopic characterization of the exoplanet system HD 1234567 bcdefghi, a young (0.5 Myr) Solar System twin transiting exoplanet system (four inner rocky and four outer gas giant exoplanets) at a distance of only 5 pc. Observations using JWST NIRISS/SOSS + NIRSpec/G395H would characterize all exoplanets in the $0.6 - 5\mu\text{m}$ range, together with high-contrast coronagraphic imaging via NIRCcam ($2-5\mu\text{m}$) and MIRI ($11-16\mu\text{m}$) to determine the spectral energy distributions (SEDs) of the outer gas giant exoplanets and perform a blind search for additional exoplanets. These will be complemented with HST WFC3/UVIS to characterize the UV/optical spectra $0.3 - 0.6\mu\text{m}$ of all planets and HST STIS and COS (NUV and FUV) to fully characterize the stellar radiation field. Total ~ 500 hours of JWST time, ~ 100 HST orbits.



Purpose of fictitious example:
enables community to
understand scope and style

Final Important Dates

- July 19, 2023:** Town Hall #2 (9 AM EDT, All Welcome)
- July 31, 2023:** Town Hall #3 (2 PM EDT, Early Career Researchers)
- September 8:** Due date for **survey feedback** and **white papers**.
- Fall of 2023:** **WG will provide initial findings** to the STScI Director, the STUC and the JSTUC.
- Early 2024:** WG will **publish a report** of recommendations.



Questions?

Slido: <https://tinyurl.com/wg-exo>