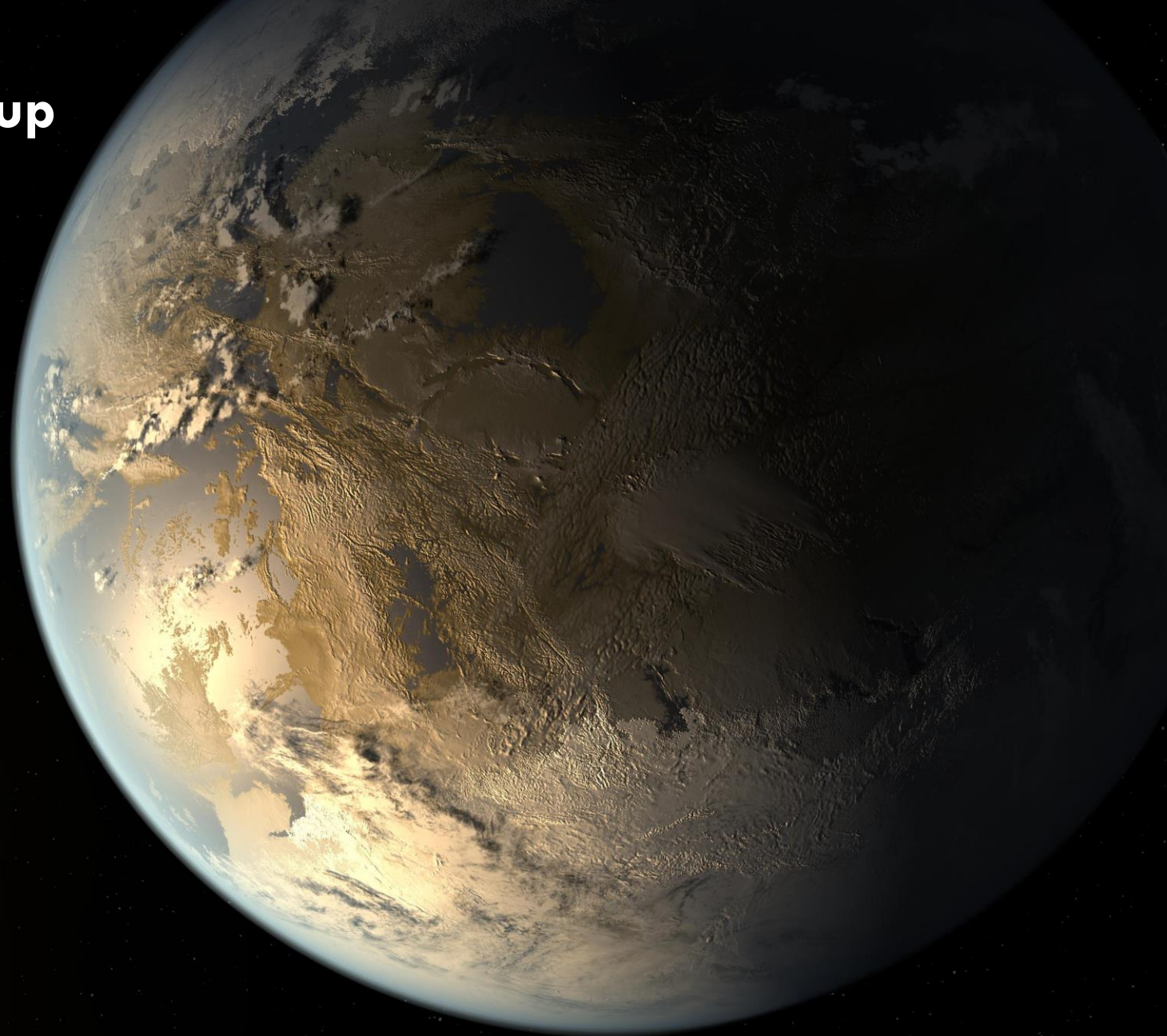


# Exoplanet Program Analysis Group (ExoPAG) Report:

Michael Meyer (ExoPAG EC Chair)  
June 29<sup>th</sup>, 2021.

Astrophysics Advisory Committee

Credit: NASA



# ExoPAG Executive Committee

Michael Meyer (Chair)

*Tom Barclay*

Natasha Batalha

Jacob Bean

*Jessie Christiansen*

Rebecca Jensen-Clem

John Debes

Tiffany Kataria

Josh Pepper

Dmitry Savransky

Laura Schaefer

*Vikki Meadows (Past Chair)*

Douglas Hudgins (Astrophysics)

Hannah Jang-Condell (ExEP DS)

Doris Daou (Planetary Liaison)

Richard Eckman (Earth Liaison)

Gaylan Fowler (Heliophys Liason)

University of Michigan

*University of Maryland*

NASA-Ames

The University of Chicago

*NExSci/Caltech*

UC-Santa Cruz

Space Telescope Science Institute

JPL/Caltech

Lehigh University

Cornell

Stanford University

*University of Washington*

NASA HQ

NASA HQ

NASA HQ

NASA HQ

NASA HQ

*Thank you for your service!*



# ExoPAG Executive Committee

Michael Meyer (Chair)

Natasha Batalha

Jacob Bean

*Michael Bottom*

*Ofer Cohen*

*Knicole Colon*

John Debes

Tiffany Kataria

*Ilaria Pascucci*

Josh Pepper

Dmitry Savransky

Laura Schaefer

Douglas Hudgins (Astrophysics)

Hannah Jang-Condell (ExEP DS)

Doris Daou (Planetary Liaison)

Richard Eckman (Earth Liaison)

Gaylan Fowler (Heliophys Liason)

University of Michigan

NASA-Ames

The University of Chicago

*The University of Hawaii*

*University of Massachusetts Lowell*

*Goddard Space Flight Center*

Space Telescope Science Institute

JPL/Caltech

*The University of Arizona*

Lehigh University

Cornell

Stanford University

NASA HQ

NASA HQ

NASA HQ

NASA HQ

NASA HQ

*Our newest members!*

# ExoPAG Recent Activities (since ExoPAG23)

- Continuation of Exoplanet Explorers.
- Present to PSAC in June (L. Schaefer).
- Participated in NExSS/P/AG roundtable in May.  
*(Stay tuned for news about Exoplanets in Our Backyard II in 2022).*
- New APD Cross PAG activities (telecon June 16):
  - New TOR for Cross PAG SAG on barriers to participation.
  - Session proposed for SACNAS (and planned for NSBP).
  - Discuss Tech Gap synergies & NASA data policy.
- ExoPAG 24 (held June 24)

PLANET HOP FROM  
**TRAPPIST-1e**

VOTED BEST "STUDY ABROAD" DESTINATION WITHIN 12 PARSECS OF EARTH

ExEP Program (Chair: Michael Meyer)	Speaker	Time (EST)	Duration
Welcome	Michael Meyer (U. Michigan)	12:00 PM	0:10
NASA Headquarters Exoplanet Exploration Program Overview	Hannah Jang-Condell (NASA HQ)	12:10 PM	0:30
Exoplanet Exploration Program Office Overview	Gary Blackwood (NASA JPL)	12:40 PM	0:15
Program Science Update	Eric Mamajek (NASA JPL)	12:55 PM	0:15
ExoExplorers Update	Tiffany Kataria (NASA JPL)	1:10 PM	0:15
Exoplanet Exploration Program Technology Update	Brendan Crill (NASA JPL)	1:25 PM	0:15
BREAK (15 min)		1:40 PM	0:15
Science Updates (Chair: Knicole Colon)			
Heliophysics Overview	Alex Glocer (GSFC) & Holly Gilbert (UCAR)	1:55 PM	0:30
SAG21 update- The Effect of Stellar Contamination on Space-based Transmission	Néstor Espinoza (STSCI)	2:25 PM	0:20
The Pandora SmallSat Mission: <i>Science Objectives</i>	Emily Gilbert (U. Chicago)	2:45 PM	0:15
The Pandora SmallSat Mission: <i>Instrument Design</i>	Jordan Karburn (LLNL)	3:00 PM	0:15
Multiplicity of TESS Objects of Interest	Steve Howell (NASA Ames)	3:15 PM	0:20
BREAK (15 min)		3:35 PM	0:15
Business Meeting (Chair: M. Meyer)			
SAG 22 Update- Investigating an Exoplanet Target Star Archive	Joshua Pepper (Lehigh U.)	3:50 PM	0:05
SIG2 Update- Exoplanet Demographics	Jessie Christiansen (Caltech)	3:55 PM	0:15
Future Activities and Possible Future Findings	General Discussion	4:10 PM	1:05
Adjourn		5:15 PM	



# What are “ExoPAG Findings”?:

- Process for whole community to contribute to analyses forwarded to Astrophysics Division leadership as input.
- We do not give “recommendations” but “findings” based on analysis.
- Three findings approved in January 2020 and one in March 2021.  
<https://exoplanets.nasa.gov/exep/exopag/exopagFoundingDocuments/exopag-findings/>
- Ideas for new findings solicited from community (e.g. ExoPAG email and at Business Meetings) and discussed at community forum (e.g. Summer ExoPAG).
- Those with community support are reviewed by ExoPAG EC and top 1-3 findings put forward to ExoPAG for a vote (more than 2/3 support needed to “pass”).
- Ideas not adopted (or selected for vote) can be kept and re-discussed in future.
- Affirmation of findings generally scheduled for winter ExoPAG meeting.

# Current Status of SAGs and SIGs:

<https://exoplanets.nasa.gov/exep/exopag/overview/>

Close Year	SAG or SIG	Title	Lead
2021	SAG 19	Exoplanet imaging signal detection theory and rigorous contrast metrics (closed)	Mawet & Jensen-Clem
----	SIG 2	Exoplanet Demographics.	Christiansen & Meyer
----	SIG 3	Exoplanet Solar System Synergies.	Meadows & Mandt
----	SAG 21	Stellar Contamination on Transit Spectra.	Rackham & Espinoza (Barclay)
----	SAG 22	Exoplanet Host Properties Database (report in summer)	Pepper, Stark, & Hinkel

*All are very active and open to participation if any community members would like to know more!*

Credit: NASA

# SIG 2 - Exoplanet Demographics

**Chairs:** Jessie Christiansen (NExSci/IPAC) & M. Meyer (UM)

- Monthly telecons discuss new demographic results from multiple techniques (radial velocity, microlensing, transit, direct imaging).
- Curating a list of open questions/ongoing projects for the community.
- Draft report on value of public database of demographic products, covering all techniques, to be submitted this fall (update at ExoPAG 24).



# SIG 3 ExoSS Goals, Progress, Plans

**Chairs:** Victoria Meadows (UW/NExSS/ExoPAG), Kathy Mandt (JHU/APL/OPAG)

**Goal:** To provide a forum for interaction between the Solar System and exoplanet communities on topics of mutual interest, and to work to identify ways in which NASA and the scientific community could enhance these interactions.

**Status:** The SIG3 is active and open to all.

- Promoted community-led Planetary Decadal activities: List of lists - <https://bit.ly/3fu6ang>
- Monthly SIG3 Tutorial/Journal Club to explain key concepts to each other
- ExoSS Slack Channel – all are welcome! (Email: [meadows@uw.edu](mailto:meadows@uw.edu))
- Gathering community input on key ExoSS synergies: <https://tinyurl.com/yxbnyfwu>
- Recruiting members from diverse science communities (e.g. DPS and PEN).
- Promote potential collaboration between the exoplanet and Solar System communities, such as a future Exoplanets in Our Backyard 2 (fall 2022).

# **SAG 21: The Effect of Stellar Contamination on Space-based Transmission Spectroscopy**

*Coordinators: Néstor Espinoza & Ben Rackham.*

*Report at ExoPAG 24 (June 24).*

# **SAG 22 – Exoplanet Host Properties**

*Coordinators: Joshua Pepper, Chris Stark, & Natalie Hinkel*

*Will report at Community Forum in fall.*

*Both SAGS have several dozens of participants, initiated monthly telecons, drafted work plans, and split up into working groups. Both reports are expected in fall 2021.*

# New Ideas for ExoPAG Activities:

---

- Consider a new exozodi SAG based on the results from the HOSTS survey, new results from ALMA, recent high contrast imaging of debris disks in reflected light, studies of dust in the Solar system (and beyond), and archival results from Spitzer/Herschel (cf. SAG-1 report). Do we need a renewed effort to assess risk to exoplanet imaging missions presented by zodiacal light? (J. Debes).
- Discussion of common standards for publishing exoplanet discoveries (D. Savransky).
- Analysis of synergies between ground- and space-based technology (wavefront control and diffraction suppression), as well as science algorithm development, in the context of high contrast imaging. This could be particularly relevant in the era of JWST, rapid developments on the ground (e.g. focal plane wavefront sensing), ELTs, Roman CGI, and future direct imaging missions (to be discussed in future).



# Tentative Plans for ExoPAG Community Forum:

---

- After Astro2020 is released.
- Discussion to understand the recommendations, not proposing changes!
- May invite members of the committee for discussion:

<https://tinyurl.com/2skx23s5>

- NASA will be charged with making a formal response and will do so later in the year (and will not soliciting input on that at this community forum).
- Will also have other agenda items at this forum (e.g. update on SAG22, etc).

# Back-up



Credit: NASA



# ExoPAG Proposed Finding:

---

**On the value of investing in interdisciplinary exoplanet science of scale over longer periods of performance.**

"Whereas exoplanet science is inherently interdisciplinary, requiring expertise in heliophysics, earth science, planetary science, and astrophysics, among other disciplines, as well as deep and broad knowledge in theory, computation, observation, experiment, statistics, and instrument development, and whereas interdisciplinary research can require longer timeframes and greater resources to take full advantage of such diverse expertise within a collaboration, and whereas existing opportunities of scale that permit longer periods of performance to support interdisciplinary research teams are restricted to areas that specifically address the goals of the astrobiology program,

We find that longer term programs of scale (e.g. five year periods of performance and up to several million USD awards) would enable NASA to rapidly and efficiently address linked sets of the Exoplanet Exploration Program Science Gaps, for example 01-03, 02, 04-06, and 07-08-10, which contribute significantly to achieving NASA's strategic goals, provided that such new opportunities did not come at the expense of existing programs which are also extremely valuable to help NASA achieve its strategic goals."



# Exoplanet Explorers Program Launched!

Steering Committee (all are members of ExoPAG EC):

T. Kataria (JPL), N. Batalha (NASA-Ames), J. Christiansen (IPAC), & J. Pepper (Lehigh)

Early career (grad students & postdocs) cohort for speakers series.

Half-hour monthly seminar series.

Stipend for presentation and weekly interaction with cohort.

Monthly professional development interaction with senior scientists in the field.

Additional professional development workshops to be decided by cohort.

Proposals due November 5, 2020! To be selected by ExoPAG EC.

Pilot Program January-June 2021.

For more information: <https://exoplanets.nasa.gov/exep/exopag/exoexplorers/>

