Exoplanet Program Analysis Group (ExoPAG) Report:

Michael Meyer (ExoPAG EC Chair)
June 29th, 2021.
ExoPAG Executive Committee

Michael Meyer (Chair)  University of Michigan
Tom Barclay  University of Maryland
Natasha Batalha  NASA-Ames
Jacob Bean  The University of Chicago
Jessie Christiansen  NExScI/Caltech
Rebecca Jensen-Clem  UC-Santa Cruz
John Debes  Space Telescope Science Institute
Tiffany Kataria  JPL/Caltech
Josh Pepper  Lehigh University
Dmitry Savransky  Cornell
Laura Schaefer  Stanford University
Vikki Meadows (Past Chair)  University of Washington

Douglas Hudgins (Astrophysics)  NASA HQ
Hannah Jang-Condell (ExEP DS)  NASA HQ
Doris Daou (Planetary Liaison)  NASA HQ
Richard Eckman (Earth Liaison)  NASA HQ
Gaylan Fowler (Heliophys Liaison)  NASA HQ

Thank you for your service!
ExoPAG Executive Committee

Michael Meyer (Chair) University of Michigan
Natasha Batalha NASA-Ames
Jacob Bean The University of Chicago
Michael Bottom The University of Hawaii
Ofer Cohen University of Massachusetts Lowell
Knicole Colon Goddard Space Flight Center
John Debes Space Telescope Science Institute
Tiffany Kataria JPL/Caltech
Ilaria Pascucci The University of Arizona
Josh Pepper Lehigh University
Dmitry Savransky Cornell
Laura Schaefer Stanford University
Douglas Hudgins (Astrophysics) NASA HQ
Hannah Jang-Condell (ExEP DS) NASA HQ
Doris Daou (Planetary Liaison) NASA HQ
Richard Eckman (Earth Liaison) NASA HQ
Gaylan Fowler (Heliophys Liason) 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)
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<thead>
<tr>
<th>Time (EST)</th>
<th>Speaker</th>
<th>Title</th>
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<tbody>
<tr>
<td>12:00 PM</td>
<td>Michael Meyer (U. Michigan)</td>
<td>Welcome</td>
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<tr>
<td>12:10 PM</td>
<td>Hannah Jang-Condell (NASA HQ)</td>
<td>NASA Headquarters Exoplanet Exploration Program Overview</td>
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<tr>
<td>12:40 PM</td>
<td>Gary Blackwood (NASA JPL)</td>
<td>Exoplanet Exploration Program Office Overview</td>
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<tr>
<td>12:55 PM</td>
<td>Eric Mamajek (NASA JPL)</td>
<td>Program Science Update</td>
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<tr>
<td>1:10 PM</td>
<td>Tiffany Kattersia (NASA JPL)</td>
<td>ExoExplorers Update</td>
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<tr>
<td>1:25 PM</td>
<td>Brendan Cril (NASA JPL)</td>
<td>Exoplanet Exploration Program Technology Update</td>
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**Science Updates (Chair: Knicone Colon)**

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<th>Time (EST)</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>1:55 PM</td>
<td>Alex Giocer (GSFC) &amp; Holly Gilbert (UCAR)</td>
<td>Heliophysics Overview</td>
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<tr>
<td>2:25 PM</td>
<td>Néstor Espinoza (STSCI)</td>
<td>SAGZ1 update - The Effect of Stellar Contamination on Space-based Transmission</td>
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<tr>
<td>2:45 PM</td>
<td>Emily Gilbert (U. Chicago)</td>
<td>The Pandora SmallSat Mission: Science Objectives</td>
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<tr>
<td>3:00 PM</td>
<td>Jordan Karburn (LLNL)</td>
<td>The Pandora SmallSat Mission: Instrument Design</td>
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<tr>
<td>3:15 PM</td>
<td>Steve Howell (NASA Ames)</td>
<td>Multiplicity of TESS Objects of Interest</td>
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<td>3:35 PM</td>
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<td>BREAK (15 min)</td>
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**Business Meeting (Chair: M. Meyer)**

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<tr>
<th>Time (EST)</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>3:50 PM</td>
<td>Joshua Pepper (Lehigh U.)</td>
<td>SAG 22 Update - Investigating an Exoplanet Target Star Archive</td>
</tr>
<tr>
<td>3:55 PM</td>
<td>Jessica Christiansen (Caltech)</td>
<td>S1GZ2 Update - Exoplanet Demographics</td>
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<tr>
<td>4:10 PM</td>
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<td>Future Activities and Possible Future Findings</td>
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<td>5:15 PM</td>
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<td>Adjourn</td>
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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/](https://exoplanets.nasa.gov/exep/exopag/overview/)

<table>
<thead>
<tr>
<th>Close Year</th>
<th>SAG or SIG</th>
<th>Title</th>
<th>Lead</th>
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<tbody>
<tr>
<td>2021</td>
<td>SAG 19</td>
<td>Exoplanet imaging signal detection theory and rigorous contrast metrics (closed)</td>
<td>Mawet &amp; Jensen-Clem</td>
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<td>----</td>
<td>SIG 2</td>
<td>Exoplanet Demographics.</td>
<td>Christiansen &amp; Meyer</td>
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<td>SIG 3</td>
<td>Exoplanet Solar System Synergies.</td>
<td>Meadows &amp; Mandt</td>
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<td>SAG 21</td>
<td>Stellar Contamination on Transit Spectra.</td>
<td>Rackham &amp; Espinoza (Barclay)</td>
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<td>SAG 22</td>
<td>Exoplanet Host Properties Database (report in summer)</td>
<td>Pepper, Stark, &amp; Hinkel</td>
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*All are very active and open to participation if any community members would like to know more!*
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.

- Monthly SIG3 Tutorial/Journal Club to explain key concepts to each other
- ExoSS Slack Channel – all are welcome! (Email: 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
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.

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