

ExoPAG SIG#2

Exoplanet Demographics Update

Rachel Fernandes (she/her, Penn State)

&

Samson Johnson (he/him, JPL)

Co-Chairs

rbf5378@psu.edu

samson.a.johnson@jpl.nasa.gov

ExoPAG 29 Meeting: 06-Jan-2024

SIG#2 Goals

Foundational Goal:

“To extend the SAG#13 work over a wider parameter space, by bringing together groups in the community to discuss their cross-technique and cross-population results, and identify work needed to move forward.”

- A SAG is typically tasked with reporting on a specific issue, and when the analysis of that issue is complete the SAG is disbanded.
- A SIG is typically tasked with collecting community input from a specific community on a longer-term basis.

SIG#2 Update Outline

- Leadership/Logistics Update
- Previous report completed April 2023 under J. Christiansen and M. Meyer
- First major goal: review on previous efforts to determine eta-Earth
- Future goals

SIG#2 Leadership/Logistical Updates

- Previous co-chairs J. Christiansen and M. Meyer handed off positions to R. Fernandes and S. Johnson in June 2023
 - Jennifer Gregory still keeping the ship righted
- ExoPAG Executive Committee approved with added stipulation of forming a steering committee as new co-chairs are early career
 - Steering Committee formed, first meeting will be in mid-January
 - Natalie Batalha, Bertrand Mennesson, Elisa Quintana, (maybe one more)

SIG#2 Leadership/Logistical Updates (cont.)

- Group meetings occur the Second Friday of the Month at 1PM Eastern/10AM Central
- Significant recruitment efforts have increased member numbers by 30%
 - Especially focused on recruiting ECRs, majority of new members
- Established a short Code of Conduct included in meeting reminder emails
 - Specifically concise and “common sense” (no harassment, no stealing others ideas/work, etc.)
 - Especially focused on maintaining an equitable (and pleasant) environment for group members

SIG#2 Meta-Studies Report Update

“Enabling Exoplanet Demographics Studies with Standardized Exoplanet Survey Meta-Data”



- Previous report completed April 2023 under J. Christiansen and M. Meyer
- The report finds that demographics re-analyses or meta-analyses are stymied by the lack of survey meta-data
- It presents a list of data and products to include when publishing exoplanet survey data that would enable other to better utilize their results

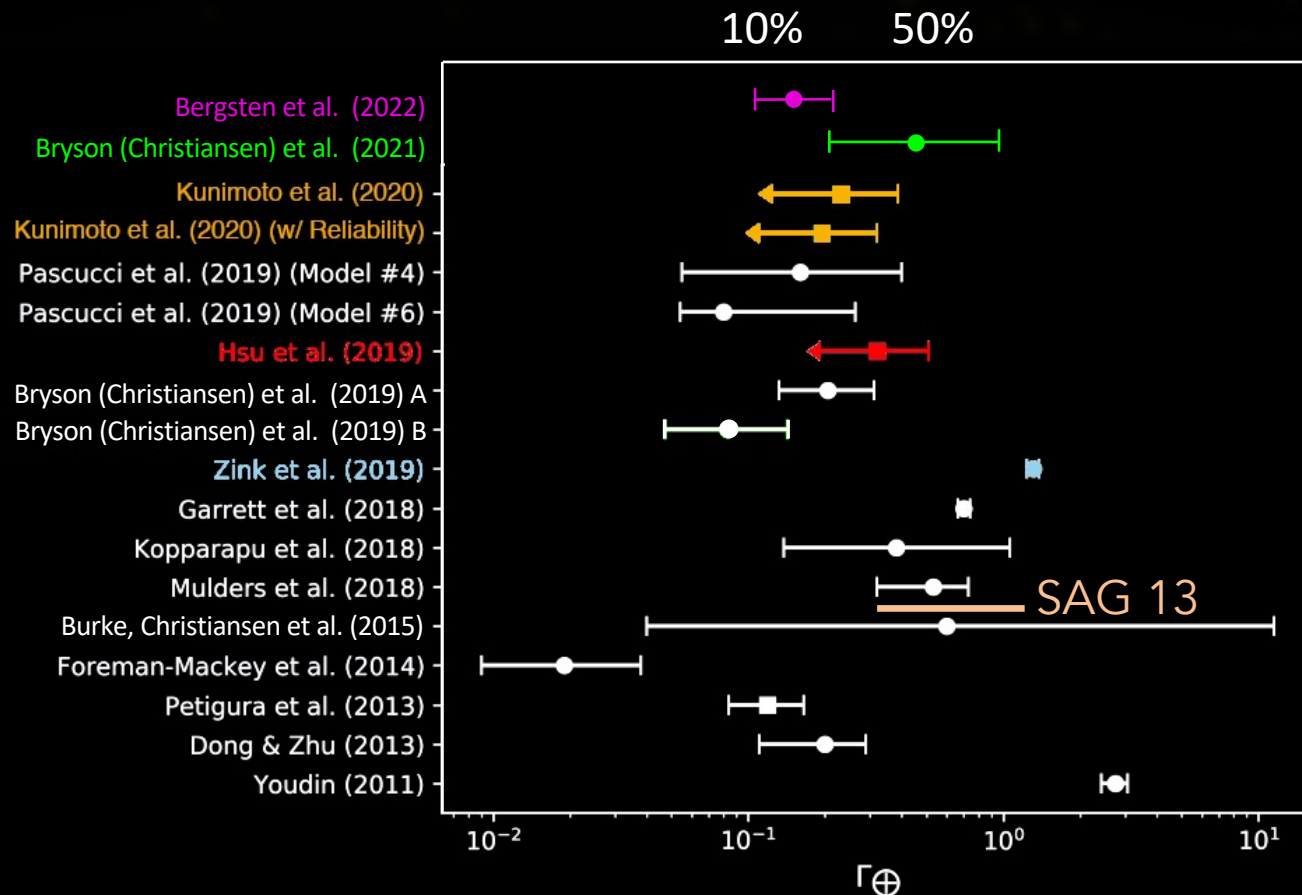
SIG#2 Goals

Foundational Goal:

“To extend the SAG#13 work over a wider parameter space, by bringing together groups in the community to discuss their cross-technique and cross-population results, and identify work needed to move forward.”

SIG#2 eta-Earth Review

First Major Goal: Publish a review on eta-Earth



Challenge interpreting difference in η_{\oplus} values due to differences in

- Stellar sample and parameters
- Planet sample and parameters
- Reliability corrections
- Methodology
- Assumptions (extrapolations, power laws, etc)

SIG#2 eta-Earth Review (cont.)

First Major Goal: Write a review on eta-Earth

- We don't have scope to duplicate SAG13, but want to make progress
- Our first step is to curate a review of past efforts to determine eta-Earth
- Aim is to have this review done by end of 2024

SIG#2 eta-Earth Review (cont.)

First Major Goal: Write a review on eta-Earth

- First sections dedicated to consolidating definitions and summarizing past efforts to measure frequency of Earth-analogs
 - Identify cause of chronological changes and (attempt) to collate results in an “apples-to-apples” comparison
- Latter sections will identify pathways forward
 - Identify sources of systematics that aren’t fully accounted for
 - E.g., planet multiplicity, stellar multiplicity, stellar metallicity
 - Future constraints on eta-Earth from different detection techniques

SIG#2 Future Goals

Foundational Goal:

“To extend the SAG#13 work over a wider parameter space, by bringing together groups in the community to discuss their cross-technique and cross-population results, and identify work needed to move forward.”

- White paper highlighting exoplanet demographic opportunities through Roman
- White paper on synthesizing exoplanet demographics using multiple detection techniques
- Continue fostering a healthy group environment

Thank you!

If you are interested in joining SIG#2, email any of us:

Rachel Fernandes - rbf5378@psu.edu

Jennifer Gregory – jgregory@jpl.nasa.gov

Samson Johnson – samson.a.johnson@jpl.nasa.gov