

## Schedule for Habitable Worlds 2021 Workshop (all times EST)

### Monday, February 22 Introduction

- 12:00 – 12:09 [Welcoming Remarks](#)  
Steve Desch (Arizona State) and Dawn Gelino (NASA Exoplanet Science Institute, IPAC, Caltech)
- 12:10 – 12:39 Laura Schaefer (Stanford)  
[Primer Talk #1](#): “Terrestrial Planet Atmospheres are Connected to Their Planets’ Interiors”
- 12:40 – 12:54 Sasha Warren (U. Chicago)  
[Contributed talk](#): “Degassing, Decarbonization and Dehydration: Making Room for an Early Habitable Period in Venus’s Atmospheric Evolution”
- 12:55 – 1:10 Siyi Xu (Gemini Observatory)  
[Contributed talk](#): “A New Method to Measure the Chemical Compositions of Extrasolar Planets”
- 1:10 – 1:40 [Break/Open Engagement](#) - All
- 1:40 – 2:09 Josh Krissansen-Totton (UC Santa Cruz)  
[Primer Talk #2](#): “Identifying Biosignatures Depends on the Whole Planetary Context”
- 2:10 – 2:24 Jaime Crouse (NASA GSFC)  
[Contributed talk](#): “Biosignature Gas Pairs: Detectability and Implications for Future Observing Strategies”
- 2:25 – 2:39 Sara Seager (MIT)  
[Contributed talk](#): “Prospects for Life on Sub-Neptune-Sized Exoplanets”
- 2:40 – 3:05 [Review of Pre-Meeting Activities](#)  
Cayman Unterborn (Arizona State), Daniel Apai (U. Arizona)
- 3:05 – 3:35 [Break/Open Engagement](#) - All
- 3:35 – 4:04 Scott Gaudi (Ohio State)  
[Primer Talk #3](#): “Observing Planets at Interstellar Distances is Not the Same as Observing Them From a Few AU or Less”
- 4:05 – 4:19 Vikki Meadows (U. Washington)  
[Contributed Talk](#): “Feasibility of Detecting Biosignatures in the TRAPPIST-1 Planetary System with *JWST*”

- 4:20 – 4:34 Alex Bixel (U. Arizona)  
[Contributed Talk](#): “Bioverse: A Simulation Framework to Assess the Statistical Power of Future Biosignature Surveys”
- 4:35 – 4:40 [Brief Remarks](#)
- 4:40 – 5:00+ [Open Engagement](#) - All

## Schedule for Habitable Worlds 2021 Workshop (all times EST)

### Tuesday, February 23 Star-Planet Interactions

- 12:00 – 12:09      [Introductory Remarks](#)  
Natalie Hinkel (SwRI)
- [Theme 1: Stellar Activity and Life](#)
- 12:10 – 12:19      Julián Alvarado-Gómez (Leibniz Inst. Astrophysik, Potsdam)  
[Plenary Talk](#): “Eruptive Events in Active Stars: Lessons Learned From Numerical Simulations”
- 12:20 – 12:29      Chris Davis (U. Washington)  
[Plenary Talk](#): “Effects of M-dwarf UV Variability on Detecting and Interpreting Biosignatures”
- 12:30 – 12:44      Amy Glazier (UNC, Chapel Hill)  
[Contributed Talk](#): “Constraints on Post-Superflare Exo-Auroral Emission with SOAR and the Evryscope Fast Transient Engine”
- 12:45 – 12:59      Raissa Estrela (JPL)  
[Contributed Talk](#): “Diversity in Terrestrial Worlds: Analysis of Multi-dimensional Factors That Shape Their Evolution”
- 1:00 – 1:14        Keavin Moore (McGill U.)  
[Contributed Talk](#): “Keeping M-Earths Habitable in the Face of Atmospheric Loss from a 1-D Atmosphere by Sequestering Water in the Mantle”
- 1:15 – 1:45        [Panel Discussion](#): “[Stellar Activity and Life](#)”  
Julián Alvarado-Gómez, Chris Davis, Raissa Estrela, Amy Glazier, Keavin Moore
- 1:45 – 2:00        [Break](#)
- 2:00 – 2:45        [Open Engagement](#) – Session “A”
- [Theme 2: “Stars to Planets to Atmospheres”](#)
- 2:45 – 2:54        Vardan Adibekyan (Inst. Astrofisica de Canarias) and Natalie Hinkel (SwRI)  
[Plenary Talk](#): “Observational Evidence of the Compositional Link Between Rocky Planets and Their Hosts” and “Combining Stellar Abundances and the Biogeosciences to Take a Critical Step Toward Detecting Life on Exoplanets”

- 2:55 – 3:04 Guillaume Gronoff (NASA LaRC)  
[Plenary Talk](#): “Atmospheric Escape Processes and Planetary Atmospheric Evolution: From Misconceptions to Challenges”
- 3:05 – 3:19 Romy Rodríguez-Martínez (Ohio State)  
[Contributed Talk](#): “Analytic Estimates of the Achievable Precision of the Properties of Transiting Exoplanets”
- 3:20 – 3:34 Christopher Colose (NASA GISS)  
[Contributed Talk](#): “Effects of Spin-Orbit Resonances and Tidal Heating on the Inner Edge of the Habitable Zone”
- 3:35 – 4:04 Cecilia Garraffo (Harvard, SAO)  
[Contributed Talk](#): “Studying Stars to Understand Planets [Studying How Space Weather, via Stellar Magnetic Fields, Influences a Planet]”
- 4:05 – 4:34 [Panel Discussion](#): “Stars to Planets to Atmospheres”  
Vardan Adibekyan, Christopher Colose, Cecilia Garraffo, Guillaume Gronoff, Natalie Hinkel, Romy Rodríguez-Martínez
- 4:35 – 5:00+ [Open Engagement](#) - All

## Schedule for Habitable Worlds 2021 Workshop (all times EST)

### Wednesday, February 24 Planetary Atmospheres

- 12:00 – 12:09      [Introductory Remarks](#)  
Stephen Kane (UC Riverside)
- 12:10 – 12:19      [Theme: “Connecting Models and Observations”](#)  
Eliza Kempton (U. Maryland, College Park)  
[Plenary Talk:](#) “How Can the Outcome of Atmospheric Models be Tested Through Observation?”
- 12:20 – 12:29      Eric Wolf (U. Colorado, Boulder)  
[Plenary Talk:](#) “What Observables are Needed to Better Constrain Atmospheric (GCM) Models?”
- 12:30 – 12:44      Tiffany Jansen (Columbia U.)  
[Contributed Talk:](#) “Effects of Rotation Rate on the Habitability of Earth-Like Planets Using NASA’s ROCKE-3D GCM”
- 12:45 – 12:59      Athena Coustenis (Paris Observatory)  
[Contributed Talk:](#) “Seasonal Changes in Titan’s Atmosphere from the Cassini Mission”
- 1:00 – 1:14      Kenneth Gordon (U. Central Florida)  
[Contributed Talk:](#) “Earth as an Exoplanet: Comparing Earthshine Observations to Models of an Exo-Earth”
- 1:15 – 1:29      Amber Young (Northern Arizona U.)  
[Contributed Talk:](#) “Constraining Chemical Disequilibrium Biosignatures for an Earth-Like Exoplanet Using Retrieval Analysis Techniques”
- 1:30 – 2:15      [Panel Discussion: “Connecting Models with Observations”](#)  
Athena Coustenis, Kenneth Gordon, Tiffany Jansen, Eliza Kempton, Eric Wolf, Amber Young
- 2:15– 2:30      [Break](#)
- 2:30 – 3:15      [Open Engagement](#) – Session “B”
- 3:15 – 4:15      [Panel Discussion: “Biosignatures and Venus”](#)  
Chris Reinhard (UC Riverside), Eddie Schwieterman (UC Riverside), Clara Sousa-Silva (Harvard CfA), Mike Wong (U. Washington)
- 4:15 – 5:00+      [Open Engagement](#) - All

## Schedule for Habitable Worlds 2021 Workshop (all times EST)

Thursday, February 25  
Planetary Interiors

- 12:00 – 12:09 [Introductory Remarks](#)  
Paul Byrne (North Carolina State U.)  
  
[Theme: “Diversity of Planet Compositions and Their Consequences”](#)
- 12:10 – 12:24 Tim Lichtenberg (U. Oxford)  
[Plenary Talk: “Diversity of Planet Interiors”](#)
- 12:25 – 12:54 [Panel Discussion: “Forming Habitable Planets”](#)  
Megan Barnett (U. Chicago), Damanveer Grewal (Rice U.), Ilaria Pascucci (U. Arizona)
- 12:55 – 1:09 Catherine Walsh (U. Leeds)  
[Contributed Talk: “The Chemistry of Planet Formation: The Organic Content of Planet-Forming Disks, as Observed with ALMA”](#)
- 1:10 – 1:25 Matt Clement (Carnegie Inst. Washington)  
[Contributed Talk: “The Potential for Delayed Planetesimal Bombardment to Deliver Volatiles and Reconstitute Atmospheres on Potentially Habitable M-Dwarf-Hosted Planets”](#)
- 1:25 – 1:40 [Break](#)
- 1:40 – 2:25 [Open Engagement](#) – Session “C”
- 2:25 – 2:39 Francis Nimmo (UC Santa Cruz)  
[Plenary Talk: “How Evolution of Planets is Affected by Composition”](#)
- 2:40 – 3:09 [Panel Discussion: “Magnetic Fields”](#)  
David Brain (U. Colorado, Boulder), Jim Green (NASA), Suk-Bin Kang (NASA GSFC), T. Joseph Lazio (JPL)
- 3:10 – 3:24 Brendan Dyck (Simon Fraser U.)  
[Contributed Talk: “Core Formation Sets the Thickness, Composition, and Surface Evolution of Rocky Planet Crust”](#)
- 3:25 – 3:39 John Chambers (Carnegie Inst. Washington)  
[Contributed Talk: “How Seafloor Weathering Affects Planetary Habitability”](#)

3:40 – 4:09

Panel Discussion: “Atmosphere-Interior Connections”

Scott Guzewich (NASA GSFC), Benjamin Hayworth (Penn. State), Nisha Katyal (Technical U., Berlin), Nancy Kiang (NASA GISS), Varnana Kumar (University College, Thiruvananthapuram)

4:10 – 4:39

Panel Discussion: “Super-Earths”

Ed Kite (U. Chicago), William Misener (UC Los Angeles), Mykhaylo Plotnykov (U. Toronto), Allona Vazan (Open U., Israel)

4:40 – 5:00+

Open Engagement - All

## Schedule for Habitable Worlds 2021 Workshop (all times EST)

Friday, February 26

### Breaking the Barriers to Interdisciplinary Research

- 12:00 – 12:04 [Introductory Remarks](#)  
Dawn Gelino (NASA Exoplanet Science Institute, IPAC, Caltech)
- 12:05 – 12:35 [Panel Discussion: “How Can NASA Foster Interdisciplinary Research?”](#)  
Richard Eckman (NASA), Doug Hudgins (NASA), Jared Leisner (NASA), Mary Voytek (NASA)
- 12:40 – 12:54 Jessica Noviello (NASA, NExSS)  
[Contributed Talk: “Suggested Practices for Interdisciplinary Science Communication”](#)
- 12:55 – 1:54 [Panel Discussion: “How Can Missions and Institutions Foster Interdisciplinary Research?”](#)  
Hilairy Hartnett, (Arizona State) Stephen Kane (UC Riverside), Kathleen Mandt (JHU-APL), Alycia Weinberger (Carnegie Inst. Washington)
- 1:55 – 2:25 [Open Engagement](#) - All
- 2:25 – 3:24 [Group Discussion: “Interdisciplinary Obstacles and Opportunities”](#)  
Daniel Apai (U. Arizona), Cayman Unterborn (Arizona State)
- 3:25 – 3:55 [Closing Thoughts: Habitable Worlds 2021 SOC](#)