

## MEMORANDUM

**To:** Dr. Cynthia Atherton, Ms. Camellia Pham **Date:** July 19, 2021  
**From:** Drs. Karl Stapelfeldt, Eric Mamajek, Gary Blackwood, Christine Moran  
**Subject:** Heising-Simons Pegasi b Fellowship Program in Planetary Astronomy - Possibilities for JPL

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The Heising-Simons' 51 Pegasi b Fellows are invited to collaborate with, and be mentored by, scientists in the NASA Exoplanet Exploration Program hosted at the Jet Propulsion Laboratory (JPL). 51 Pegasi b Fellows are welcomed to participate in the JPL Visiting Postdoctoral Scholar Program (VPSP) for any duration (from days to months or more). Accordingly, Drs. Karl Stapelfeldt and Eric Mamajek are available as mentors for topics related to exoplanets, their host stars, and disks. Fellows would also be part of the exoplanet, astrophysics, and planetary science research communities at JPL. A full list of potential advisors is attached including their areas of research interests.

The Exoplanet Exploration Program supports NASA mission studies, technology development, and scientific analysis to inform the NASA Astrophysics Division regarding the design of future missions, support of ground-based resources and opportunities to enable exoplanetary science, organizing exoplanet community groups and activities such as the Exoplanet Program Analysis Group, and public engagement. The NASA Exoplanet Science Institute at Caltech is an integral part of the Exoplanet Exploration Program. 51 Pegasi b Fellows can gain unique experiences and insight through their interactions with scientists, technologists, and engineers that support NASA's Exoplanet Exploration Program at JPL.

The Exoplanet Exploration Program Office is willing to fund travel and other expenses incurred by participation in the VPSP.

Please contact Gary Blackwood at (818) 354-6263, or by email at [Gary.H.Blackwood@jpl.nasa.gov](mailto:Gary.H.Blackwood@jpl.nasa.gov) if you need additional information.

Attachment: Table of Potential Advisors

## Table of Potential Advisors

Potential Advisors	Research Interest	Website
Bailey, Vanessa	High-contrast imaging of exoplanetary systems, with a focus on mission development, implementation, and survey operations; member of the Roman Coronagraph Instrument team	<a href="https://science.jpl.nasa.gov/people/VBailey/">https://science.jpl.nasa.gov/people/VBailey/</a>
Barge, Laurie	Emergence of life on early Earth, hydrothermal vents and mineral-organic chemistry, and understanding how to look for life on Mars and ocean worlds	<a href="https://science.jpl.nasa.gov/people/Barge/">https://science.jpl.nasa.gov/people/Barge/</a>
Beichman, Chas	Detection and characterization of exoplanetary systems and debris disks; Director of NExScI	<a href="https://scienceandtechnology.jpl.nasa.gov/people/c_beichman">https://scienceandtechnology.jpl.nasa.gov/people/c_beichman</a>
Bryden, Geoff	Debris disks around planet-bearing stars (Herschel); Dust obscuring the habitable zones of nearby stars (LBTI); High-contrast imaging of disks and planets from a balloon (Zodiac)	<a href="https://science.jpl.nasa.gov/people/Bryden/">https://science.jpl.nasa.gov/people/Bryden/</a>
Burt, Jennifer	Detection and characterization of exoplanets using radial velocity spectrographs. Stellar and solar variability. Survey design and automation.	<a href="http://www.jenniferburt.com/">http://www.jenniferburt.com/</a>
Cady, Eric	Coronagraph instrument design, engineering, and operations; low- and high-order wavefront control algorithms; instrument modeling and calibration techniques; starshade design and tolerancing. High-order wavefront sensing and control (HOWFSC) architect for Roman Coronagraph	N/A
Chen, Pin	Atmosphere/climate/habitability evolution and coupled hydrosphere-lithosphere-atmosphere chemistry of solar-system and extrasolar planets;	<a href="https://science.jpl.nasa.gov/people/PChen/">https://science.jpl.nasa.gov/people/PChen/</a>

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	coronagraph technology for exoplanet detection; high-resolution of molecular spectroscopy; instrumentation for atmospheric sensing and trace-gas detection, emphasizing ultra-miniature and high sensitive instruments	
Crill, Brendan	Astronomical Instrumentation; Far-IR detectors; Technology for Direct Imaging of exoplanets;	<a href="https://science.jpl.nasa.gov/people/Crill/">https://science.jpl.nasa.gov/people/Crill/</a>
Fayolle, Edith	Chemical evolution from star-formation to young solar systems; light interaction with molecules and star-and-planet formation	<a href="https://science.jpl.nasa.gov/people/Fayolle/">https://science.jpl.nasa.gov/people/Fayolle/</a>
Fleury, Benjamin	Photochemistry and complex organic aerosol foratin in hot exoplanet atmospheres; radiation-induced chemistry of ices in solar system bodies with emphasis on Titan and Europa	<a href="https://science.jpl.nasa.gov/people/Fleury/">https://science.jpl.nasa.gov/people/Fleury/</a>
Friedson, Jim	Planetary atmospheric dynamics; aerosol microphysics; extrasolar planet chemistry and dynamics; Mars sample return back planetary protection	<a href="https://science.jpl.nasa.gov/people/Friedson/">https://science.jpl.nasa.gov/people/Friedson/</a>
Goldsmith, Paul	Structure of molecular clouds; star formation, PI on the Herschel Oxygen Project;	<a href="https://science.jpl.nasa.gov/people/Goldsmith/">https://science.jpl.nasa.gov/people/Goldsmith/</a>
Halverson, Sam	Developing high-precision radial velocity instruments and surveys; radial-velocity exoplanet discovery and characterization; instrumentation for high-resolution spectroscopy and high-precision photometry	<a href="http://www.mit.edu/~shalver/">http://www.mit.edu/~shalver/</a>
Hasegawa, Yasuhiro	Formation of stars and planetary systems; Evolution of protoplanetary disks, planetary systems, and planetary atmospheres; and Origins of the	<a href="https://science.jpl.nasa.gov/people/Hasegawa/">https://science.jpl.nasa.gov/people/Hasegawa/</a>

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	solar system; Big data and machine learning	
Hildebrandt, Sergi	Direct imaging and characterization of exoplanets from space; Member of ROMAN SPACE TELESCOPE, Starshade	<a href="https://science.jpl.nasa.gov/people/HildebrandtRafels/">https://science.jpl.nasa.gov/people/HildebrandtRafels/</a>
Hu, Renyu	Atmosphere, evolution, and habitability of planets in the Solar System and exoplanets; Direct imaging of exoplanets: spectral characteristics and retrieval, member of ROMAN SPACE TELESCOPE	<a href="https://science.jpl.nasa.gov/people/RHu/">https://science.jpl.nasa.gov/people/RHu/</a>
Kataria, Tiffany	Atmospheric structure and dynamics of exoplanetary atmospheres	<a href="https://science.jpl.nasa.gov/people/Kataria/">https://science.jpl.nasa.gov/people/Kataria/</a>
Krist, John	Circumstellar disks; Stellar jets; Young stars; Extrasolar planets; Optical modelling; Image analysis techniques	<a href="https://science.jpl.nasa.gov/people/Krist/">https://science.jpl.nasa.gov/people/Krist/</a>
Lazio, Joseph	Technosignature searches at radio wavelengths, akin to planetary radars or "leakage" transmissions; data mining of images contained within the Planetary Data System (PDS)	
Mamajek, Eric	Formation and Evolution of Exoplanetary Systems: Planets, Substellar Objects, Stars, Circumstellar and Circumplanetary Disks Stellar Ages, Kinematics, Rotation, Magnetic Activity	<a href="https://science.jpl.nasa.gov/people/Mamajek/">https://science.jpl.nasa.gov/people/Mamajek/</a>
Menesson, Bertrand	High contrast high resolution astronomical imaging; Extrasolar planets and debris disks; Evolved stars; Wavefront correction / achromatization techniques, member of ROMAN SPACE TELESCOPE, HabEx	<a href="https://science.jpl.nasa.gov/people/Menesson/">https://science.jpl.nasa.gov/people/Menesson/</a>
Mischna, Michael	Planetary Atmospheres: Planetary weather and climate, radiative transfer, photochemistry, comparative	<a href="https://science.jpl.nasa.gov/people/Mischna/">https://science.jpl.nasa.gov/people/Mischna/</a>

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	climatology, spacecraft observations of weather	
Morales, Farisa	Infrared observations and characterization of planetary debris disks; Direct-imaging of planetary companions around stars with dust in the terrestrial-planet zones; Planetary system formation	<a href="https://science.jpl.nasa.gov/people/Morales/">https://science.jpl.nasa.gov/people/Morales/</a>
Morgan, Rhonda	Large optic metrology, high precision optics, optical testbeds, optical lens design; wavefront sensing and control with interferometry, Shack-Hartman, and Phase Retrieval; optical calibration for flight I&T, acceptance testing for flight I&T; software: Zemax, Matlab, STK	<a href="https://www.linkedin.com/in/rhonda-morgan-9971514/">https://www.linkedin.com/in/rhonda-morgan-9971514/</a>
Orton, Glenn	Infrared astronomy; planetary atmospheres; infrared spectroscopy with emphasis on structure and composition of outer-planet atmospheres. This includes reduction and analysis of spacecraft observations, currently with the (extended) Juno mission and preparations for observations of Uranus and Neptune to be made with JWST	<a href="https://science.jpl.nasa.gov/people/Orton/">https://science.jpl.nasa.gov/people/Orton/</a>
Redding, David	N/A	N/A
Ressler, Mike	Binary/multiple protostar systems; Initial Mass Functions of star forming clouds; Infrared astronomical instrumentation.	<a href="https://science.jpl.nasa.gov/people/Ressler/">https://science.jpl.nasa.gov/people/Ressler/</a>
Riggs, AJ	Coronagraph design, wavefront sensing and control, and optical modeling	N/A
Rocha, Graca	Detection and characterization of Exoplanets in spectroscopic data, direct imaging data, and with radial velocity technique; development of Bayesian statistics	<a href="https://science.jpl.nasa.gov/people/Rocha/">https://science.jpl.nasa.gov/people/Rocha/</a>

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Roudier, Gael	Exoplanet characterization using Bayesian data analysis methods	<a href="https://science.jpl.nasa.gov/people/Roudier/">https://science.jpl.nasa.gov/people/Roudier/</a>
Ruane, Gareth	Enabling the direct detection of exoplanets at small angular separation from their stars	<a href="http://www.astro.caltech.edu/~gruane/">http://www.astro.caltech.edu/~gruane/</a>
Serabyn, Gene	Stellar Double Coronagraph (SDC), advanced high-contrast, small-angle coronagraphic instrument; state-of-the-art high-contrast observations at very small angles from host stars	<a href="https://science.jpl.nasa.gov/people/Serabyn/">https://science.jpl.nasa.gov/people/Serabyn/</a>
Shaklan, Stuart	High contrast coronagraphy;	N/A
Shao, Mike	Precision astrometry for measurement of exoplanet masses and orbits; interferometry; detector characterization	<a href="https://science.jpl.nasa.gov/people/Shao/">https://science.jpl.nasa.gov/people/Shao/</a>
Siegler, Nick	Identifying and maturing technologies needed to enable possible future NASA missions that will ultimately look for evidence of life on exoplanets	<a href="https://exoplanets.nasa.gov/exep/about/people/">https://exoplanets.nasa.gov/exep/about/people/</a>
Stapelfeldt, Karl	Protoplanetary and debris disks, exoplanets, star formation; Optical, infrared, and mm-wave observations; coronagraphy; scattered light and spectral energy distribution modeling of circumstellar disks; missions: Hubble Space Telescope WFPC2 Science Team, Spitzer Space Telescope Project Science Office, Herschel Space Observatory, LBTI Exozodi Key Science Team; Exoplanet imaging mission studies: HabEx, LUVOIR, Exo-C (Study Chair), ROMAN SPACE TELESCOPE, ACCESS, ATLAST, Terrestrial Planet Finder Coronagraph	<a href="https://science.jpl.nasa.gov/people/Stapelfeldt/">https://science.jpl.nasa.gov/people/Stapelfeldt/</a>
Swain, Mark	Observational characterization of exoplanets, observational characterization of the	<a href="https://science.jpl.nasa.gov/people/Swain/">https://science.jpl.nasa.gov/people/Swain/</a>

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	environments in which exoplanets form, and development of techniques and building new instrumentation for high-dynamic-range exoplanet spectroscopy	
Trauger, John	High-contrast imaging techniques and mission concepts for the direct imaging of exoplanetary systems from space, including coronagraph design and implementation, deformable mirror technologies for active wavefront control, laboratory testbed demonstrations, and the inception of the High Contrast Imaging Testbed	<a href="https://science.jpl.nasa.gov/people/Trauger/">https://science.jpl.nasa.gov/people/Trauger/</a>
Turner, Neal	Origins of planets and exoplanets in the disks of gas and dust orbiting young stars; comets and asteroids as relicts of planet formation and sources of interplanetary dust; links between interplanetary dust distribution and planetary orbits	<a href="https://science.jpl.nasa.gov/people/Turner/">https://science.jpl.nasa.gov/people/Turner/</a>
Vasisht, Gautam	Origins of Stars and Planets, precision radial velocity measurements, instrumentation	<a href="https://science.jpl.nasa.gov/people/Vasisht/">https://science.jpl.nasa.gov/people/Vasisht/</a>
Wallace, Kent	Wavefront sensing, novel optical methods and instrumentation, exoplanet detection	<a href="https://science.jpl.nasa.gov/people/JWallace/">https://science.jpl.nasa.gov/people/JWallace/</a>
West, Bob	Radiative transfer in planetary atmospheres, especially observation and interpretation of multiply-scattered light observed by spacecraft and ground-based instruments	<a href="https://science.jpl.nasa.gov/people/West/">https://science.jpl.nasa.gov/people/West/</a>
Willacy, Karen	Chemistry of the interstellar medium, including prestellar cores, protoplanetary disks and circumstellar envelopes around late-type stars; Formation and evolution of pre-biotic	<a href="https://science.jpl.nasa.gov/people/Willacy/">https://science.jpl.nasa.gov/people/Willacy/</a>

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	molecules; Gas/grain interactions in the interstellar medium; Deuterium chemistry	
Ygouf, Marie	High contrast imaging of circumstellar environments; Coronagraphy; Observations with ground-based and space-based instruments; Post-Processing; Bayesian techniques; Member of the Roman Coronagraph Project Science team; Member of the JWST NIRCам team	<a href="https://science.jpl.nasa.gov/people/ygouf/">https://science.jpl.nasa.gov/people/ygouf/</a>
Zellem, Rob	Ground- and space-based spectroscopic and photometric observations of the atmospheres of exoplanets; mission development (FINESSE, Ariel/CASE, Roman/CGI); Roman/CGI Project Science Team Member leading instrument science calibrations and sequences; JPL Commissioning Lead of Palomar/NESSI near-IR spectrograph; Project Lead of Exoplanet Watch, a citizen science project for transit ephemeris maintenance	<a href="https://science.jpl.nasa.gov/people/zellem/">https://science.jpl.nasa.gov/people/zellem/</a>