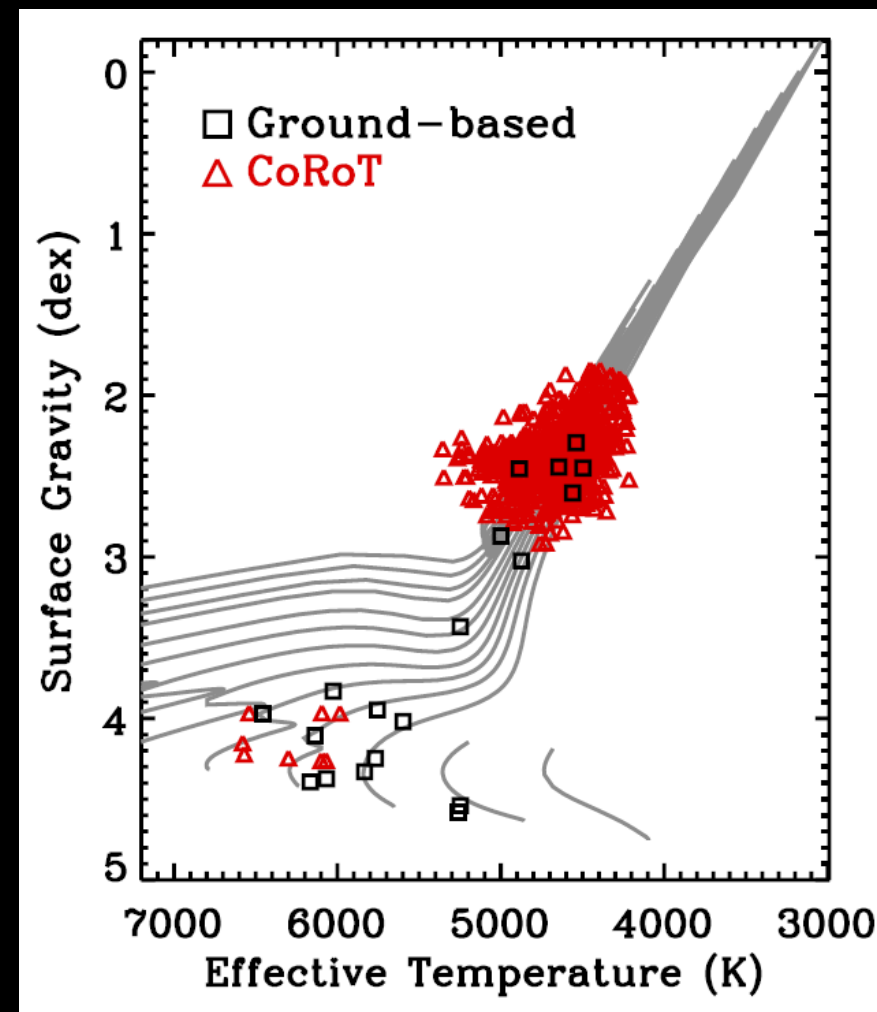
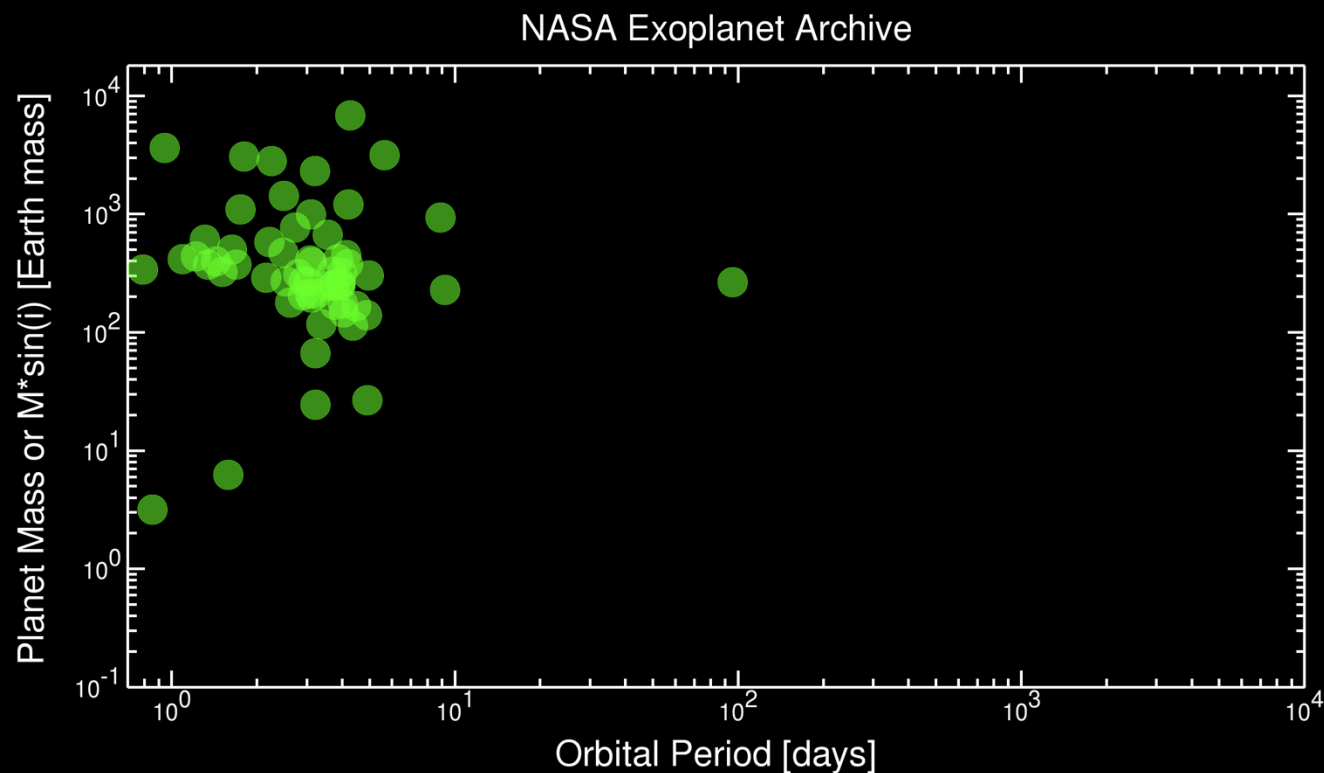
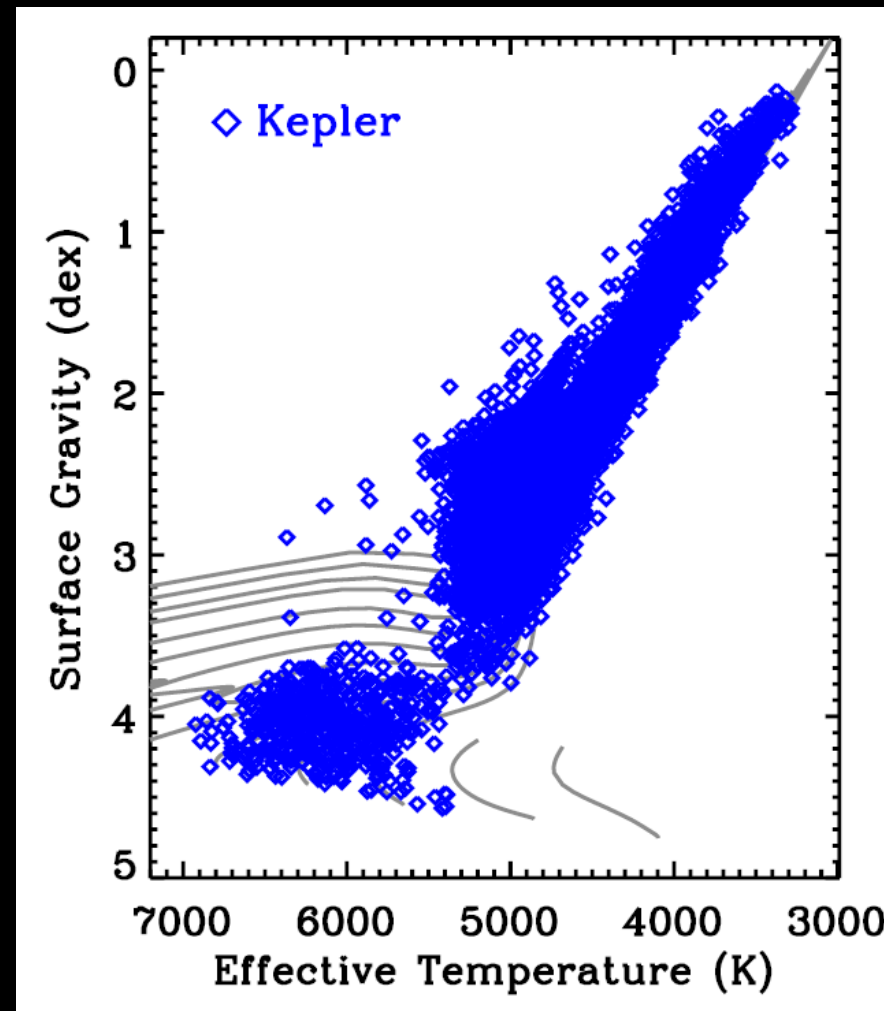
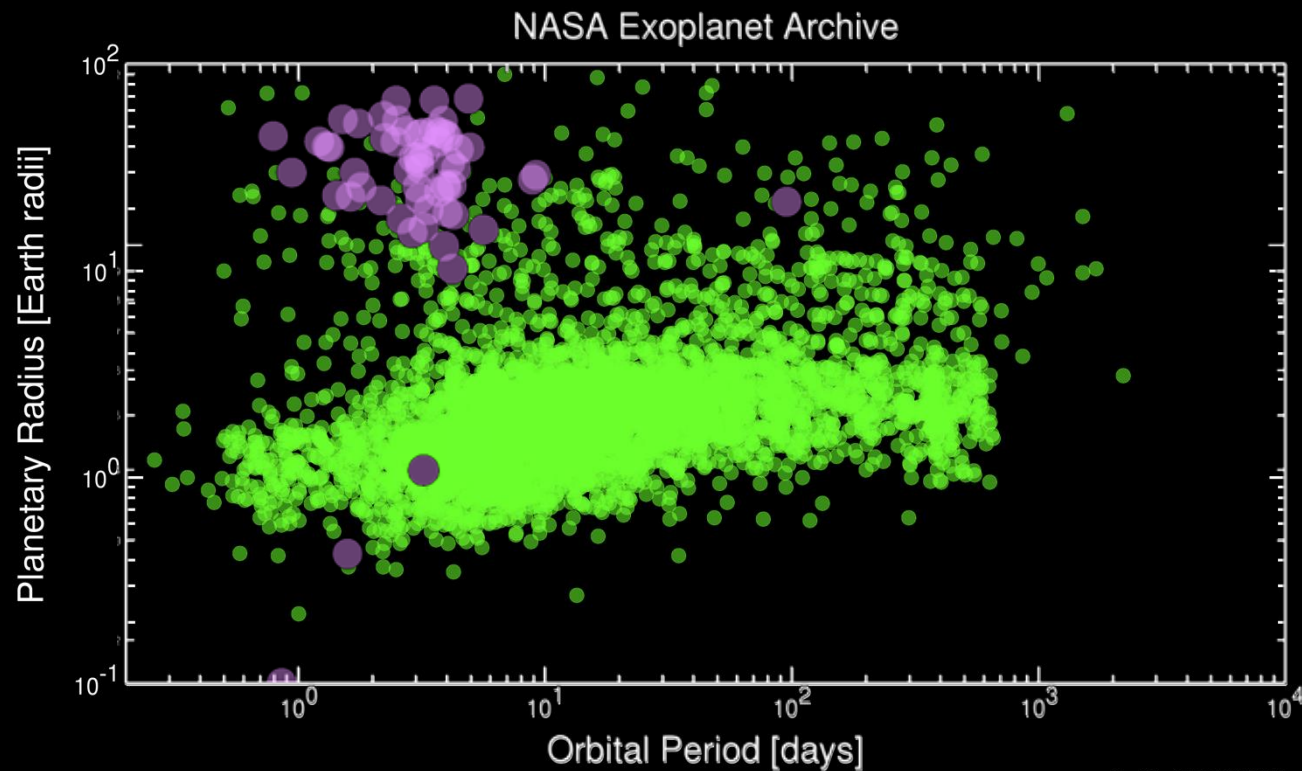


Evolving frontier of exoplanets



Evolving frontier of exoplanets

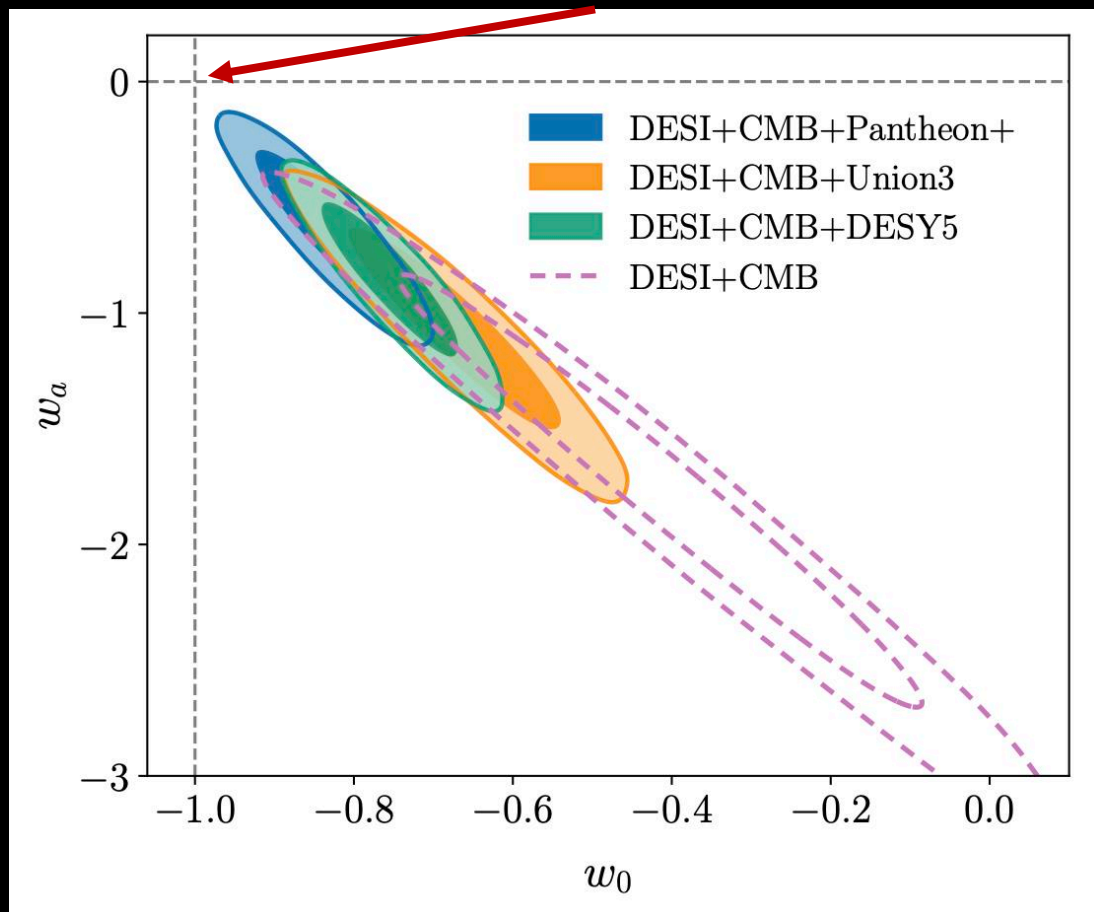


The Kepler spacecraft revolutionized stellar astronomy & exoplanet demographics



Frontiers of cosmology

Cosmological constant Λ ($w_0=-1$, $w_a=0$)



arXiv:2503.14738



The screenshot shows the NASA Exoplanet Archive website. At the top is the IPAC logo and the text "NASA EXOPLANET ARCHIVE" and "A SERVICE OF NASA EXOPLANET SCIENCE INSTITUTE". Below this is a navigation bar with links: Home, About Us, Data, Tools, and Support. Two large boxes display statistics: "6,324 Confirmed Planets 07/16/2026" and "910 TESS Confirmed Planets 07/16/2026". Below these is a search section titled "Explore the Archive" with a text input for "Name or Coordinates", a "Search" button, and an "Optional Radius (arcsec)" input. There is also a link for "Advanced Search". At the bottom is a section titled "Featured NASA Mission Products" which includes a grid of links for JWST (Transmission Spectra, Eclipse Spectra, Direct Imaging Spectra, Documentation) and TESS (NExoList). At the very bottom are buttons for JWST, TESS, Kepler/K2, and Pandora (Coming Soon).

Exoplanet Data Resources



exofof.ipac.caltech.edu/tess/

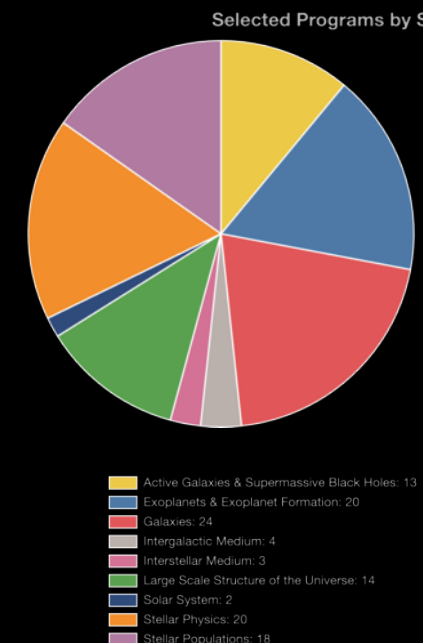
Welcome to ExoFOP

The Exoplanet Follow-up Observing Program (ExoFOP) website is designed to optimize resources and facilitate collaboration in follow-up studies of exoplanet candidates. ExoFOP serves as a repository for project and community-gathered data by allowing upload and display of data and derived astrophysical parameters.

Roman

The screenshot shows the Roman Science Support Center at IPAC website. It features the "NANCY GRACE ROMAN SPACE TELESCOPE" logo on the left. The main heading is "Roman Science Support Center at IPAC". Below this is a navigation bar with links: About, Science, Gallery, News, and Events. The background image shows the Roman Space Telescope in space. At the bottom, the text "Cycle 1 Approved Programs" is displayed.

roman.ipac.caltech.edu



How I use AI in my research: Concrete things I do

*Research ideation:

Ask the agent to do

1. a **deep search of the literature** & then
2. **.build websites** to compare the methods.

*Coding

(usually with Claude code or codex)

Steps:

- 1) Manage project location, description and memory in CLAUDE.md file
- 2) Planning
- 3) Verify via tests
- 4) Follow along via notebooks

Key questions to ask

- Do I have **enough expertise to verify** what the agent is doing?
- If this succeeds or fails, do I **understand it well enough to** defend it and **reproduce** it?
- Do I know the **AI rules of the venue** where I am showing or submitting this work?
- Will I be **okay with a front page NYT documenting what happened** in the process?



References & where to go next with AI

Foundations

Vaswani et al. 2017 · Brown et al. 2020 · Kaplan et al. 2020 · Hoffmann et al. 2022

Wei et al. 2022 (emergence; chain-of-thought) · Schaeffer et al. 2023
Ouyang et al. 2022 (RLHF) · Rafailov et al. 2023 (DPO) · Bai et al. 2022
Lewis et al. 2020 (RAG) · Holtzman et al. 2020 · OpenAI o1 2024 ·
DeepSeek-AI 2025

further reading: Nakaishi et al. 2024 (a critical point in sampling temperature)

A mathematical framework for transformer circuits (<https://transformer-circuits.pub/2021/framework/index.html>) Anthropic

Astronomy

Grèzes et al. 2021 (astroBERT) · Nguyen et al. 2023 (AstroLLaMA)
Donoso-Oliva et al. 2023 (Astromer) · Smith et al. 2024 (AstroPT)
Parker et al. 2024 (AstroCLIP) · Cabrera-Vives et al. 2024 (ATAT)
Kamai et al. 2026 (Talking with the Latents, ICLR)
Moss 2025 (AI Cosmologist) · Wang et al. 2025 (StarWhisper)
Villaescusa-Navarro et al. 2025 (Denario) · Ye et al. 2025
(ReplicationBench)

Policies

AAS journals (Vishniac 2023) · APS · Science/AAAS · COPE · NSF & NIH ·
Nature Astronomy 2026



[1hr Talk] Intro to Large Language Models

Andrej Karpathy

Nice Lectures

Karpathy — “Intro to Large Language Models” and “Let’s build GPT”

3Blue1Brown — visual transformer & attention chapters

Stanford CME 295 — Transformers & LLMs (esp. Lecture 3) · CS25 · CS224n



PUBLICATION DATE FILTER

1990



exoplanet

KELT-11b: A Highly Inflated Sub-Saturn
Exoplanet Transiting the V = 8 Subgiant HD 93396

Pepper, Joshua · 2016 · 49 citations

Exoplanet Transits Enable High-Resolution Spectroscopy Across Spatially Resolved Stellar Surfaces

Dravins, Dainis · 2016 · 1 citations

The QACITS pointing sensor: from theory to on-sky operation on Keck/NIRC2

Huby, Elsa · 2016 · 4 citations

The Gemini NICI Planet-Finding Campaign: The Orbit of the Young Exoplanet β Pictoris b

Nielsen, Eric L. · 2014 · 40 citations



The Transit Light Curve Project. VII. The Not-So-Bloated Exoplanet HAT-P-1b

Author: Winn, Joshua N.

Date: 2007-07-01

Citations: 78

arXiv: 0707.1908



Welcome to Pathfinder

ASTRO LITERATURE EXPLORER

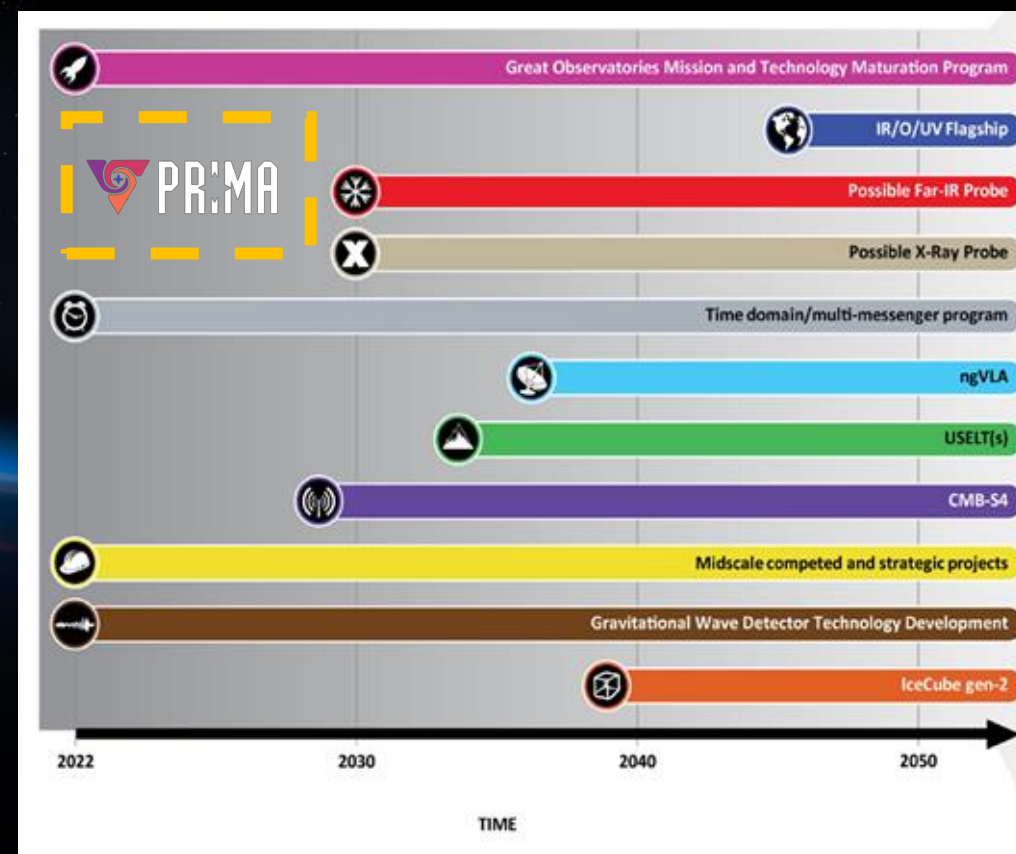
Discover the Universe Through AI-Powered Astronomy Research

Pathfinder (use the tool at pfinder.app or read the paper at [Iyer et al 2024 ApJS 275 38](#)) harnesses the power of modern large language models (LLMs) in combination with papers on the arXiv and ADS to navigate the vast expanse of astronomy literature.



Astrophysics

Decadal Survey Missions



Opportunities to learn about missions:

[NASA Astrophysics Mission Design School](#)

[NASA PI Launchpad](#) *Not offered in 2026*

Get involved with

- Mission development ([HWO](#), [ASTRA](#))
- Writing whitepapers





Exoplanet Missions

- ¹ NASA/ESA Partnership
- ² NASA/ESA/CSA Partnership
- ³ CNES/ESA
- ⁴ ESA/Swiss Space Office
- ⁵ NSF Partnership (NN-EXPLORE)



Get Involved through NASA's Exoplanet Exploration Program

NASA's Exoplanet Exploration Program, a program office managed by NASA's Jet Propulsion Laboratory for the NASA Astrophysics Division, Science Mission Directorate, implements NASA's Space Science vision for exoplanets. Learn how to get involved with the Exoplanet Exploration Program Office in the following ways:

**science.nasa.gov/astrophysics/
programs/exep/missions/**

	Activity	How do I get involved?	Links
Technology Development	NASA's Strategic Astrophysics Technology (SAT)	Propose to SAT proposal calls	https://nspires.nasaprs.com https://exoplanets.nasa.gov/exep/technology/TDEM-awards http://www.astrostrategictech.us https://exoplanets.nasa.gov/exep/technology
	ExEP Technology Gap List	Provide input to ExEP Technology Gap List (reviewed and updated biennially)	https://exoplanets.nasa.gov/exep/technology/gap-lists/ https://apd440.gsfc.nasa.gov/technology.html
	ExEP Technology Colloquium Series	Sign up for ExEP tech colloquium announcement list	https://exoplanets.nasa.gov/exep/technology/tech_colloquium
Science	ExEP Science Gap List	Input to ExEP Science Plan & Gap List (reviewed and updated annually)	https://exoplanets.nasa.gov/exep/science-overview
	Exoplanet Exploration Program Analysis Group (ExoPAG)	Apply to join ExoPAG Executive Committee. Attend Biannual ExoPAG Meetings and apply to give a talk	https://exoplanets.nasa.gov/exep/exopag https://exoplanets.nasa.gov/exep/exopag/talk-guidelines
	Exo Explorers	Apply to join ExoExplorers early career professional development program	https://exoplanets.nasa.gov/exep/exopag/exoexplorers/exoexplorers-welcome
NASA Exoplanet Science Institute	NASA Exoplanet Archive	Open for use to everyone	http://exoplanetarchive.ipac.caltech.edu
	Exoplanet Follow-Up Observing Program (ExoFOP) for Kepler, K2, TESS	Open for use to everyone	https://exofop.ipac.caltech.edu
	Sagan Summer Workshops	Register to attend Sagan Workshops	https://nexsci.caltech.edu/conferences
	NASA Hubble Fellowship Program	Apply for Sagan Fellowships	https://nexsci.caltech.edu/sagan/fellowship.shtml
Observing Opportunities	NASA Keck Time	Apply for observing time	http://nexsci.caltech.edu/missions/KSA
	NEID Precision Radial Velocity Spectrograph on WIYN 3.5-m	Apply for observing time through NOIRLab proposal calls	https://noirlab.edu/science/observing-noirlab/proposals/nn-explore
	High Resolution Imaging (Dual Channel Speckle Imagers on WIYN, Gemini-N, Gemini-S)	Apply for observing time through NOIRLab proposal calls	https://noirlab.edu/science/observing-noirlab/proposals/nn-explore Instrument Contact: Steve Howell (Ames) steve.b.howell@nasa.gov
	CHIRON on SMARTS 1.5-m (Southern Radial Velocity)	Apply for NN-EXPLORE observing time through NOIRLab proposal calls	https://noirlab.edu/science/observing-noirlab/proposals/nn-explore Instrument contact: Todd Henry (GSU) thenry@astro.gsu.edu
	MINERVA-Australis (Southern Radial Velocity)	Apply for NN-EXPLORE observing time through NOIRLab proposal calls	https://noirlab.edu/science/observing-noirlab/proposals/nn-explore Instrument contact: Rob Wittenmyer (USQ) Rob.Wittenmyer@usq.edu.au



Launching on or after 30 August 2026

ROMAN SPACE TELESCOPE

AND THE JOURNEY TO SPACE

Communication Tips & Tricks for Posters and Pops

PROTO Sagan Pre-Workshop

Dr. Alison Duck
NASA Exoplanet Exploration Program Office

Pre-Workshop held on 23 June 2026.

Slides + Video available on PROTO website, or youtube.com/watch?v=1V4c64x1r7M.



Tripathi, Anjali (US 322J)



Duck, Alison E (US 322J)



yuwei hu...



Yuvraj si...



Sanidhya...



Sahill



Cal Whyte



How to Attend a Poster Session

PROTO Sagan Pre-Workshop

Dr. Alison Duck

Jet Propulsion Laboratory, California Institute of Technology



Jet Propulsion Laboratory
California Institute of Technology

How to be a Good Poster Session Audience Member

■ Ask Questions!

- You can begin an interaction at a poster by asking “Can you tell me about your work?”
- If something at the beginning of the presentation is unclear, it is best to ask about it right away!
- It is very likely that other people listening to the poster presentation have the same question.

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■ Engage!

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- You could ask for the person’s professional contact information if you would like to continue the scientific discussion beyond the poster session.

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- Go to posters on a **wide variety** of topics!
 - Helps broaden your knowledge of active research.
 - Helps presenters practice talking to someone outside of their field

How to be a Good Poster Session Audience Member

- Posters are often grouped by topic, if you find one poster that catches your eye, there may be many more near by!
- Presenting Virtually: Engage with the slack channel! Feel free to ask and answer questions about your work on slack! You can follow up conversations about your posters with Direct Messages in the slack as well!
 - *Try to find connections between your work and share your posters with each other!*

How to be a Good Poster Session Audience Member

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