Jet Propulsion Laboratory
California Institute of Technology

Exoplanet Exploration Program (ExEP) Office

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Jet Propulsion Laboratory
California Institute of Technology

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ExoPAG 32, Virtual Meeting

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Artist concept of Kepler-16b

Supporting:

- The Scientific Community
- The Ongoing Exoplanet Program
- Exoplanet Missions

NASA Exoplanet Exploration Program

Community Engagement & Communications

ExoPAG, Science Gap List, ExoExplorers, ExoFOP, EPRV RCN, Public Engagement

Mission Concepts

Previous IR / O / UV Mission Concepts

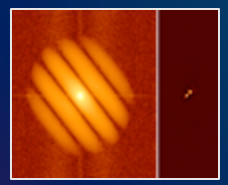
Coronagraph

Starshade

NASA Strategic & Mission Support

NN-EXPLORE

Keck Observatory

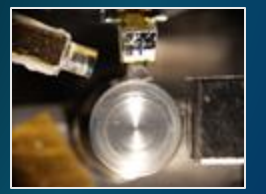


High Resolution Imaging

NASA Exoplanet Science Institute (NExScI)

Archives, Tools, Sagan Program, Professional Engagement, Ground-based Observing Support

Technology Development



Technology Gap Assessment, ExoTAC

Coronagraph & DM Technology Development

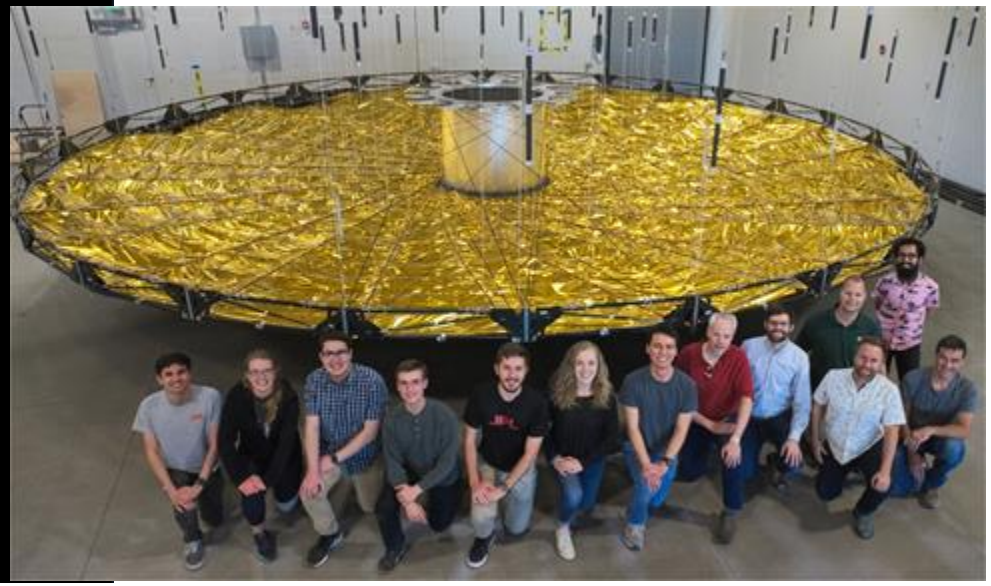
Why Should You Care About NASA's Exoplanet Exploration Program?

- We are an interface between the astronomical community (you!) and Exoplanet Astrophysics at NASA HQ
- We can bring ideas to NASA and turn them into reality:
  - New collaborations, new missions, new sources of funding

- How does ExEP help you? We:
  - Provide access to instruments, telescopes, and data;
  - Manage high contrast imaging testbed facilities;
  - Work on technology development;
  - Compile the community science and technology gap lists;
  - Provide organizational support for the community towards specific goals (ExoPAG, EPRV RCN, etc.);
  - Provide educational opportunities (Sagan Summer Workshop, PROTO);
  - Perform mission studies and trade studies
  - Support the ExoPAG and its priorities

ExEP Technology: Starshade Program Closeout

- Starshade Technology Development Activity completes its work
- 15 of 15 milestones completed
- Day-long close-out briefing and evaluation: April 15
- Summary Report delivered: May
- Briefing to NASA HQ: June 16



Emerging Technologies for Astrophysics Missions

Astrophotonics

(as applied to spectroscopy and imaging)

Artificial Intelligence and Machine Learning Algorithms

(for technology development)

Advanced Materials

(meta-materials, nanofabrication, additive manufacturing, composites)

Quantum Technologies

(sensing, imaging, calibration)

ExEP Technosignatures Survey

Evidence for extra-terrestrial life

Biosignatures:

- biological signatures

- *any* sign of biology that we can use to infer the existence of life elsewhere in the universe

Technosignatures:

- technological signatures

- *any* sign of technology that we can use to infer the existence of intelligent life elsewhere in the universe

ExEP Technosignatures Survey

Technosignature Approaches (35 and counting)

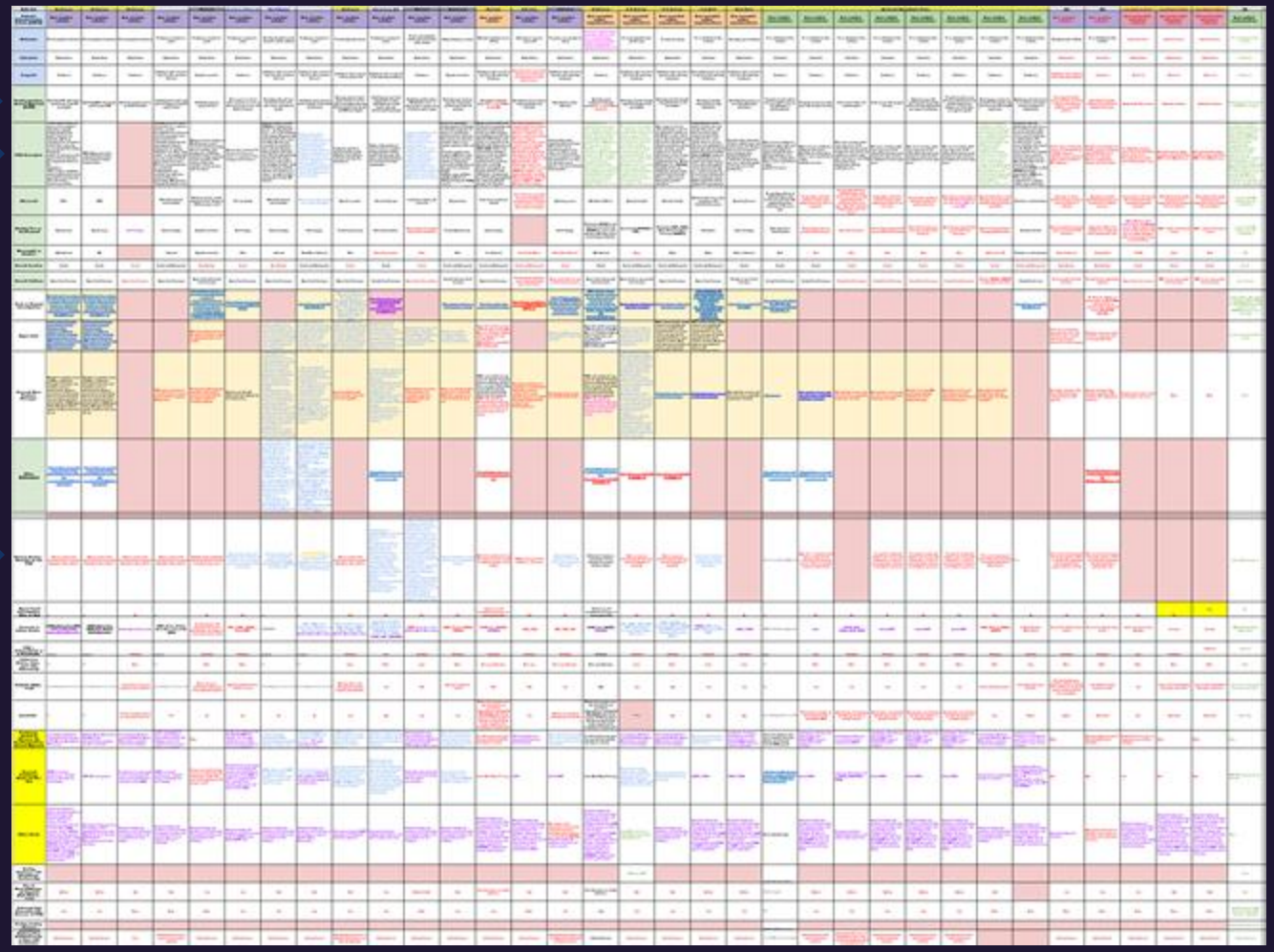
TS Approach and its Description

Data Fields (33)

Current or Future Facilities

Technology Needed

Other Needs



Questions the Survey will answer:

- How many technosignature approaches are known? How do they work?
- What are the top technology needs?
- What does the community need to advance specific approaches?
- What searches for ETI can existing NASA missions conduct? Specifically, JWST, RST, and HWO? Other missions?
- What technologies are NASA advancing that may help the search for

Will inform new investigators in the field, educators, public, philanthropists

Science and Public Engagement

Building our Community

- Professional Tools & Opportunities (PROTO) Workshop & Career Panel
  Sagan workshop companion on nuts & bolts [careers, working with NASA]

- 2025 Cohort of

Making Exoplanets Accessible to All

- Presence at Comic-Con, SXSW, & in popular media

Educating the Community - NASA House at South By Southwest

- ExEP Comms team led event at Austin Public Library
- 9 NASA centers, 8 partner organizations
- 22,665 attendees over only 10 hours
- Exoplanet elements featured throughout, including: NASA's Path to New Worlds (panel), Planet Quest (interactive talk), Experience NASA's Art + Design Process (interactive panel), Eyes on Exoplanets display (exhibit), ExoScents (exhibit), Exoplanet Robots (exhibit)

Sagan Summer Workshop: 21-25 July

Silver Jubilee – Exoplanet Demographics

- How techniques from RV and transits to imaging, astrometry, and microlensing contribute to our understanding of exoplanet demographics
- Fully hybrid: 1,611 total registrations (1,313 remote and 298 in person)
- Video and PDF versions of the talks available online
- Hands-on session material available online

2026 Sagan Summer Workshop: Transits and Microlensing with the Nancy Roman Space Telescope

ExEP/NExScI Observing & Data Opportunities

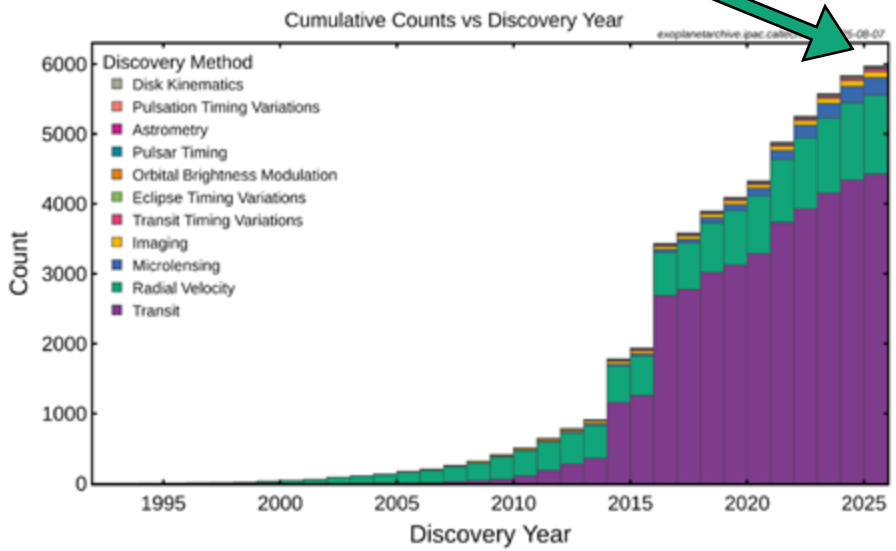
- NASA-NSF Exoplanet Observational Research Program (NN-EXPLORE): Guest Observing Opportunities
  - NEID Spectrograph on 3.5m Kitt Peak WIYN telescope (40 nights)
  - Southern Hemisphere radial velocity opportunities on SMARTS/Chiron (30 nights)
  - High Resolution Speckle Imaging of exoplanet host stars at WIYN, Gemini-North and South
  - NExScI is the Science Center that processes and archives the data
- Extreme Precision Radial Velocity
  - Research Coordination Network organizes seminars, workshops and advances the field: ~220 members and open to anyone - Join here: https://tinyurl.com/4er6ht74
  - Solar data archived for NEID and soon for EXPRES

2026A NASA Keck Call for Proposals

- Proposals for NASA Keck time for 2026A (February 1 – July 31, 2026) due on 11 September 2025
- General Observer programs:
  - Scientific proposals in any area of astrophysics or planetary science
  - Proposed observations need to be critical and/or timely for NASA space missions or science goals
- Key Strategic Mission Support (KSMS) programs:
  - Larger proposals with strong strategic relevance to NASA missions (10-60 nights over 2-4 semesters)
  - Proposals must include a plan for the timely release of processed data through KOA as a contributed dataset
  - Required NOI is due 25 August 2025
- HWO technology maturation programs:
  - Proposals to support **technology** maturation of the HWO mission concept
  - Proposals must obtain an endorsement letter from NASA HQ (Dr. Hashima Hasan); title and abstract to be submitted to Dr. Hasan by 25 August 2025 for review

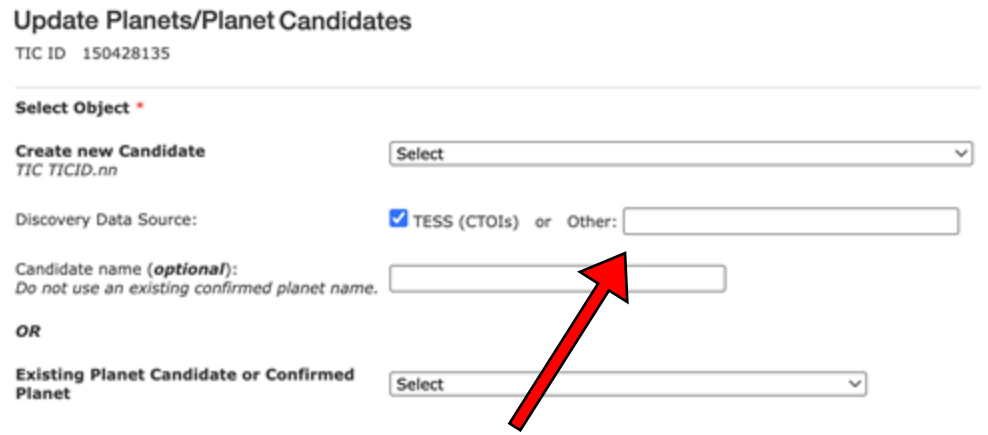
Exoplanet Archive + ExoFOP Growth

Approaching **6000 confirmed planets** in the NASA Exoplanet Archive



(Also passed 1,000 atmospheric spectra!)

More than **one million files** uploaded by the community to ExoFOP



New functionality allows addition of and updates to community planet candidates originating from any project/mission

NASA Exoplanet Archive

ExoFOP

Link to new NASA Exoplanet Archive+ExoFOP reference

ExEP is here to support YOU to advance the field of exoplanets!


NASA
Jet Propulsion Laboratory
California Institute of Technology
exoplanets.nasa.gov

Acknowledgements

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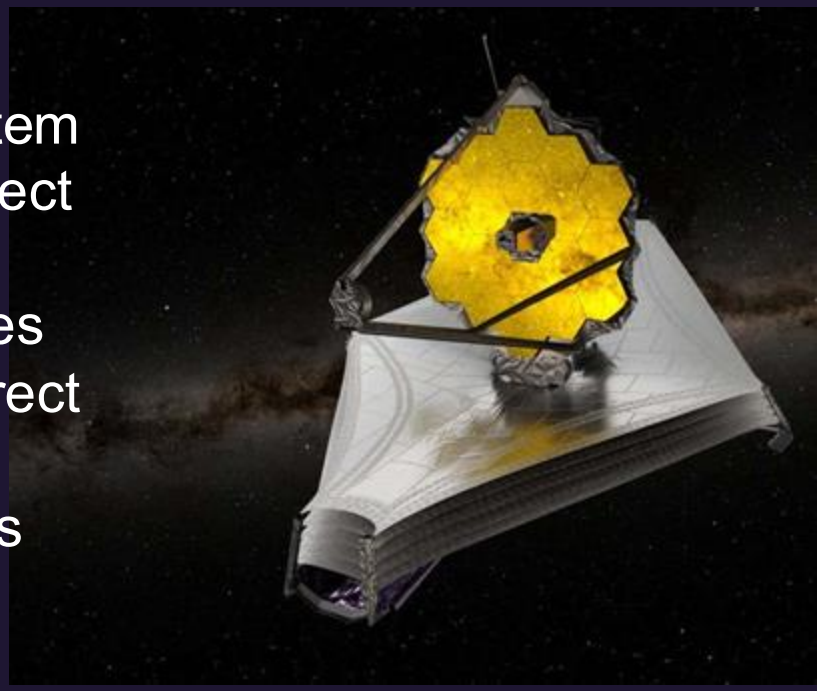
Technosignature Search Approaches with JWST

NASA/ESA/CSA

- Pollutants through transit spectroscopy
- Detecting excess mid- and far-infrared emission from large megastructures around stars
- Searching for ETI-placed stellar relay networks in the solar system
- Searching for signs of solar system spacecraft sails through direct imaging
- Searching transit light curves for the effects of artificial structures
- Detecting artificial illumination on solar system surfaces with direct imaging
- Searching in the anti-sun direction for bodies in the outer realms
- Analyzing climates of multi-planet systems to look for signs of geoengineering
- Searching transit spectra for technologically induced planetary cataclysms
- Visible photon detection from emitting direction of antimatter propulsion
- Photometric and spectroscopic searches for laser pulses from stars



NASA Exoplanet Exploration Program Exoplanet

Astrophysics Division, Science Mission Directorate

= Change since last ExoPAG

Program Office (JPL)
Program Manager - Dr. D. Gelino
Dep Program Manager - Dr. D. Ardila

Exoplanet Exploration Program (NASA HQ)
Program Executive - Dr. L. Paganini
Program Scientist - Dr. H. Jang-Condell
Dep Program Scientist - Dr. J. Wisniewski

Technical Assessment Committee (ExoTAC)
Chair - Dr. A. Boss

Program Science Office
Chief Scientist - Dr. K. Stapelfeldt
Dep Chief Scientist - Dr. E. Mamajek
Scientist - Dr. T. Kataria

Program Engineering Office
Chief Engineer - Dr. R. Amini

Program Analysis Group (ExoPAG)
EC Chair - Dr. Ian Crossfield

Program Business Management
Manager - M. Romejko
Schedules - K. Manvelyan

Program Business Office
Manager - R. Lemus
Admin. - J. Gregory
Staff Asst- Nina Pretty

Science Engagement
Science Ambassador – Dr. A. Tripathi

Exoplanet Communications (JPL)
POC - K. Abbott-Soares

NN-EXPLORE Project
Manager - Dr. D. Ardila, JPL (AD)
Project Scientist – Dr. B.J. Fulton, CIT
EPRV Scientist - Dr. J. Burt

Program Technology (JPL)
Manager - Dr. N. Siegler
Dep Manager - Dr. B. Crill
Dep Manager - Dr. P. Chen

ExEP Postdocs
Program Science - Dr. A. Duck (8/25/25)
HCIT – Dr. N. Desai

High Resolution Imaging Project
PI - Dr. S. Howell, ARC
ExoFOP - Dr. D. Ciardi, CIT

NExScI
Ex Dir - Dr. C. Beichman, JPL/CIT
Dep Dir – Dr. D. Ciardi, CIT
Chief Scientist - Dr. J. Christiansen, CIT
NExScI Ops Lead – F. Langilotti, CIT

NASA Exoplanet Exploration Program

Astrophysics Division, NASA Science Mission Directorate

NASA's search for habitable planets and life beyond our solar system

Program purpose per Charter

1. Discover planets around other stars
2. Characterize their properties
3. Identify candidates that could harbor life

ExEP serves the Science Community and NASA:

- As a focal point for exoplanet science and technology
- By Integration of cohesive strategies for future discoveries

https://exoplanets.nasa.gov

- ExP is located at JPL
  - Our Science Center, NExScI, is located on the Caltech campus

Recent Program Highlights

Congrats to the Starshade Team!!

- The Starshade program successfully completed its each of its 15 milestones over the past 6 years
- A close-out briefing took place in April 2025 to assess status, assess broadly the possible applicability of starshade technology to Habitable Worlds Observatory, and capture lessons learned
- A final report is imminent