Jet Propulsion Laboratory
California Institute of Technology

Exoplanet Exploration Program (ExEP) Overview

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4826

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ExoPAG XXVII

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Artist concept of Kepler-16b

NASA Exoplanet Exploration Program

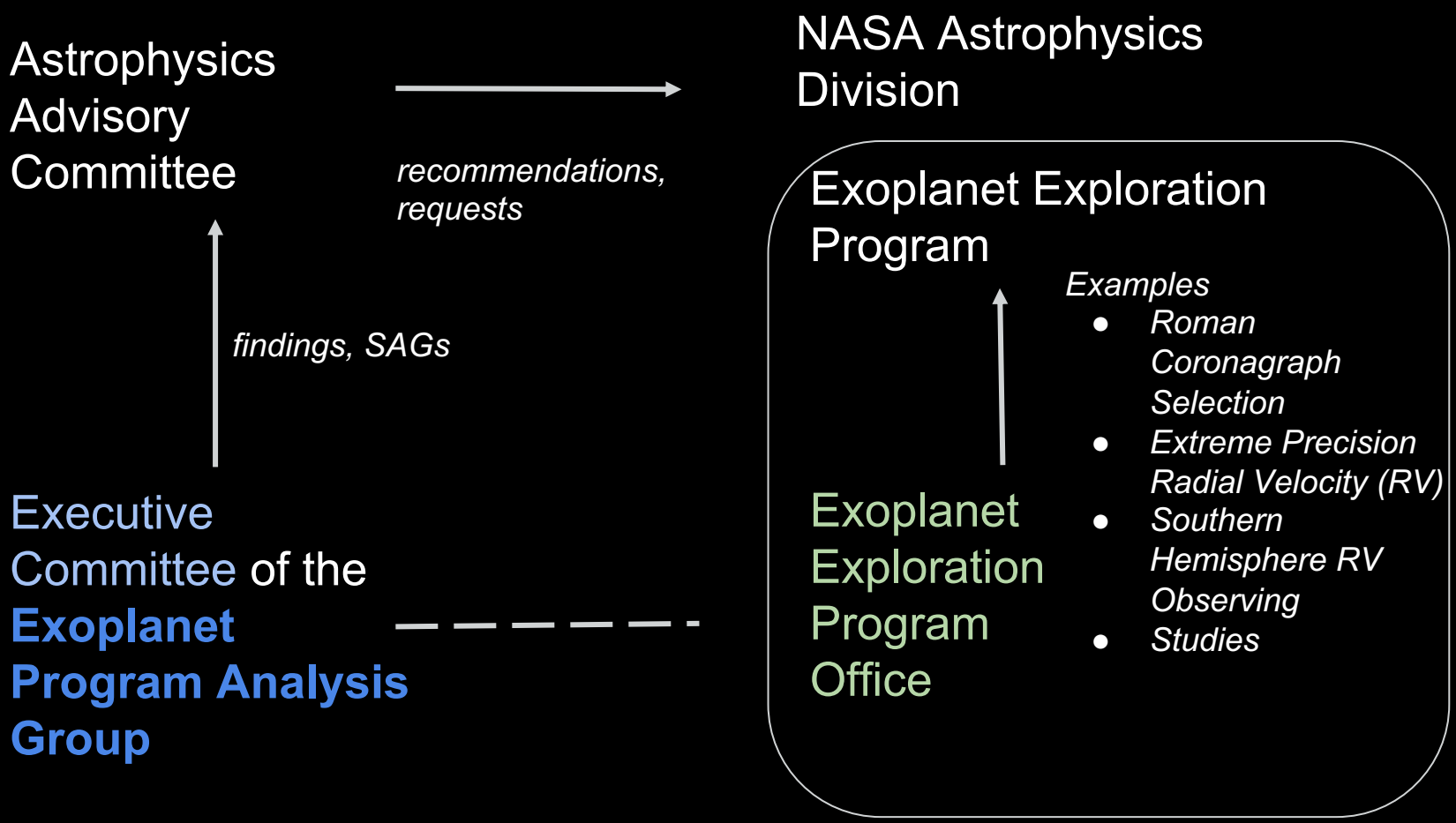
Astrophysics Division, NASA Science Mission Directorate

- Program Office managed for NASA by JPL/Caltech, located in Pasadena, CA
- Extension of HQs to serve the exoplanet community
- Analyzes and recommends to HQs
- Implements

ExEPO serves the Science Community and NASA:

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

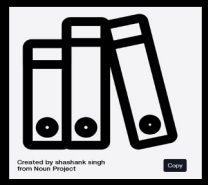
How the ExoPAG can Influence



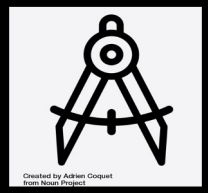
Looking Back:
ExEP Investments Toward Astro2020

Technology

Precursor Science

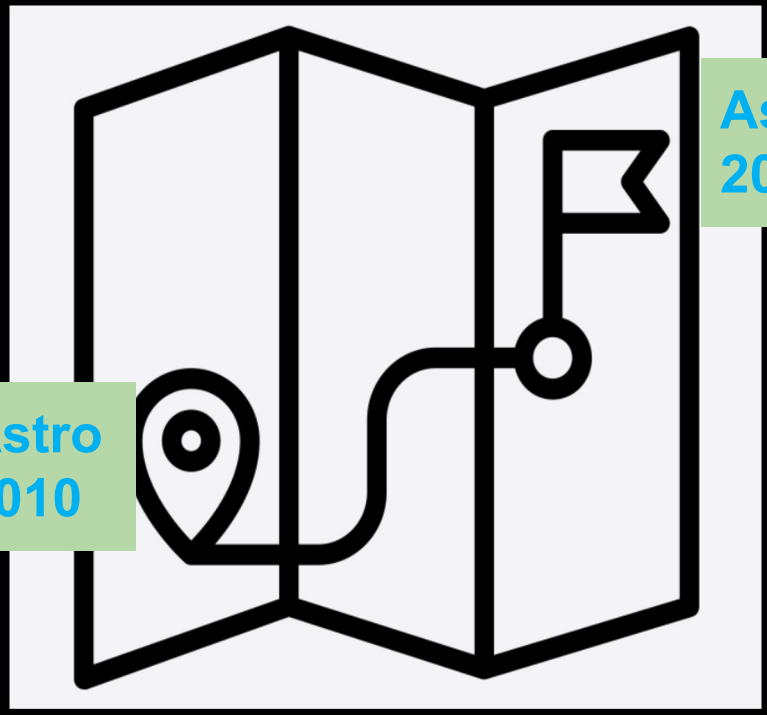


Exoplanet Archives



Architecture Studies

Comms



NASA Exoplanet Exploration Program

Space Missions and Concept Studies

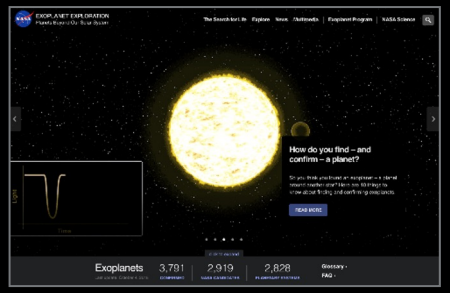
Kepler K2

Large- and Probe-Scale Mission Concepts

Coronagraph

Starshade

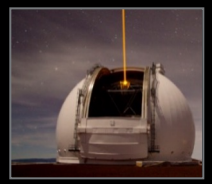
Exoplanet Communications



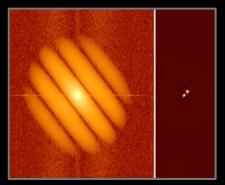
Supporting Research & Technology

Key Sustaining Research

NN-EXPLORE

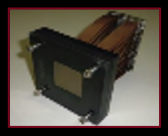


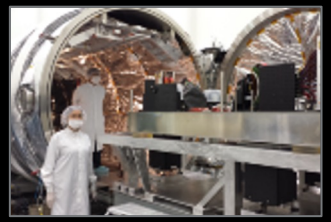
Keck Observatory



High Resolution Imaging

Technology Development

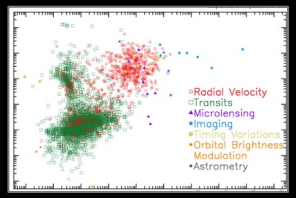




Coronagraph Technology Development

Starshade Technology Development (S5)

NASA Exoplanet Science Institute (NExScI)



Archives, Tools, Sagan Program, Professional Engagement

NASA Exoplanet Exploration Program

Astrophysics Division, Science Mission Directorate

ExEP NASA EXOPLANET EXPLORATION PROGRAM

Changes since last ExoPAG

Program Office (JPL)

PM - Dr. G. Blackwood
Deputy PM - Vacant
Chief Scientist - Dr. K. Stapelfeldt
Chief Technologist - Dr. N. Siegler

Exoplanet Exploration Program (NASA HQ)

Program Executive - E. L. Cox
Program Scientist - Dr. D. Hudgins
Deputy Program Scientist -
Dr. H. Jang-Condell
Dr. J. Pepper

Program Analysis Group (ExoPAG)

Dr. Ilaria Pascucci, EC Chair

Program Science Office

PCS - Dr. K. Stapelfeldt
DPCS - Dr. E. Mamajek
Scientist - Dr. T. Kataria
Science Ambassador -
Dr. A. Tripathi

Program Engineering Office

Chief Engineer - K. Warfield
Optical Engineer - Dr. R. Morgan

Technical Assessment Committee (ExoTAC)

Dr. A. Boss, chair

Staff Assistant – K. Miller

Staff Assistant – R. Gonzalez

Executive Staff Coordinator – J. Blumberg

Program Business Office

Manager - R. Lemus
Admin. - J. Gregory

Mission Assurance

Manager - P. Lock

Business Operations

Program Bus. Mgr. - M. Romejko
Resources - K. Marrero
Schedules - A. Strand

ExEP Postdocs

Program Science - Dr. E. Gilbert
Program Technology - Dr. A. Potier
NExScI Science - Dr. C. Clark
NPP at NExScI – Dr. B. Cale

Exoplanet Communications (JPL)

Manager - T. Schirner
Writer/Editor - P. Brennan
Web & Soc Media - K. Walbolt
Outreach Spec –
Dr. N. Bailey

NN-EXPLORE Project

PM - Dr. D. Ardila, JPL
PI - Dr. S. Mahadevan, PSU
Project Scientist –
Dr. B.J. Fulton, CIT
JPL EPRV Scientist -
Dr. J. Burt

Program Technology (JPL)

Manager - Dr. N. Siegler
Deputy - Dr. B. Crill
Dpy Manager - Dr. P. Chen

AstroComm (JPL)

Manager - T. Schirner
Outreach Spec - K. Soares
Outreach Spec – C. Gohd

High Resolution Imaging Project (ARC)

PI - Dr. S. Howell
ExoFOP - Dr. D. Ciardi, CIT

NExScI

Ex Dir - Dr. C. Beichman, JPL/CIT
Dep Dir - Dr. D. Gelino, CIT
Chief Scientist - Dr. D. Ciardi, CIT
NExScI Mgr - Dr. S. Carey, CIT

Starshade Technology Project (JPL)

PM - Dr. C. Bradford
PS - Dr. R Hu

Looking Forwards:
Towards the Habitable Worlds Observatory

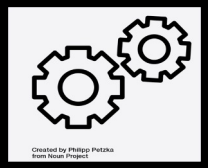
Project Start (Phase A)

External Review

The Exoplanet Exploration Program Office will partner with the Community and NASA HQ and PhysCOS/COR Program Offices to prepare for a successful External Review

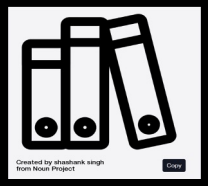
Created by Jesper Vestergaard
from Noun Project

Today

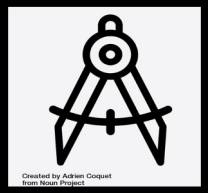


- **High Contrast @ Bandwidth @Dynamic @ Inner and outer working angle @ Throughput**
- **Stable Telescopes**

- **Planet Mass (Radial Velocity)**
- **Eta-Earth Demographics**
- **Science Metrics**



- **Archives for Science of 2020s**

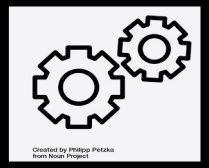


- **Architecture Studies**

- **Communications**

Towards the Habitable Worlds Observatory

Announcing Studies and Workshops - Building Blocks



You will hear today from Brendan Crill:

- Deformable Mirror Technology Roadmap
- Coronagraph Architectures Survey
- Segmented Optical Telescope Assembly Simulator Study
- Coronagraph Technology Roadmap
- Starlight Suppression Workshop

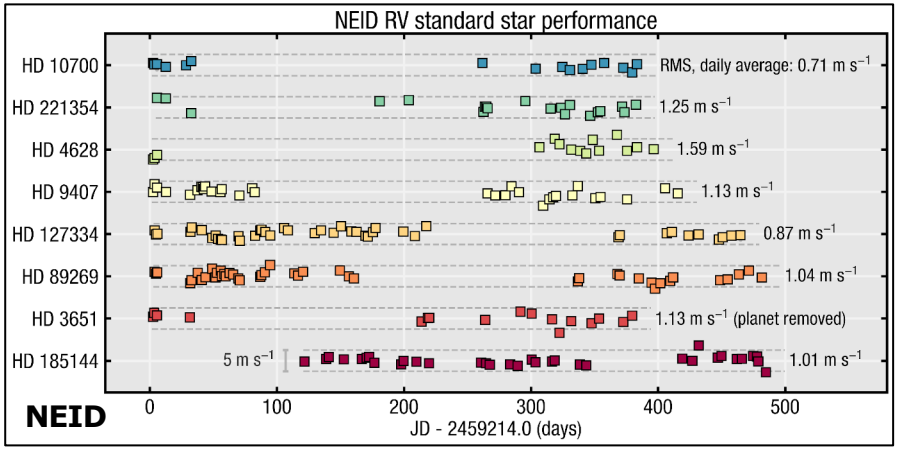
You will hear today from Eric Mamajek:

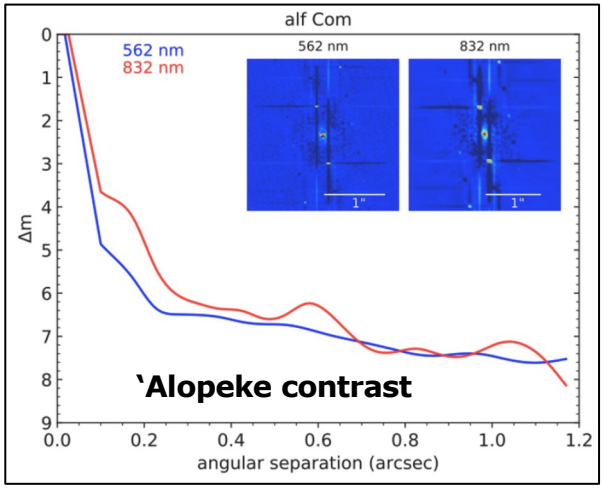
- Exoplanet Science Metrics Working Group

Will announce via Exopagannounce:

- Exoplanet yield tools workshop in June with EXOSIMS hack session

- Extreme Precision Radial Velocity – Research Coordination Network, ROSES call
- Maintain the **NEID spectrometer** at WIYN, process and archive the data at NExScI.
- Process and archive NEID solar data
- Maintain speckle imagers **NESSI** at WIYN, **'Alopeke** at Gemini North, **Zorro** at Gemini South, and process and archive the data.
- Reserve time for exoplanet characterization, at **WIYN, SMARTS/CHIRON,** and **MINERVA-Australis**, for researchers affiliated with US Institutions





Splinter Session

NASA-NSF Ground-based support for Exoplanet Discovery and Characterization

Come hear about:

- NEID at WIYN Telescope / Kitt Peak
- MAROON-X at Gemini North
- EXPRES at the Lowell Discovery Telescope
- KPF at Keck Observatory
- US access to SMARTS/CHIRON
- US access to MINERVA-Australis
- NESSI, Zorro, 'Alopeke
- Foundational Science results for Extreme Precision Radial Velocity

- EPRV ROSES solicitation on Foundation Science released! Step 1 due Feb. 16, 2023.
- Registration is open for the EPRV 5 Conference, to discuss progress since the last conference, 4 years ago

EPRV
March 27 – 30, 2023
Hilton Beachfront Resort
Santa Barbara, CA

Monday, January 9th, 2023; 9:00 AM - 11:30 AM PST
Hybrid: Seattle Convention Center - Room 304;
https://jpl.webex.com/meet/ardila

“O TRAPPIST-1, How Lovely Are Thy Planets”

In December 2022, we debuted a short sing-along video which combined our love of the TRAPPIST-1 system and the joyful holiday season.

The video serves as **a forerunner to JWST’s observations of the system** and provide an accessible onroad for the families and kids to engage with exoplanet science.

The lyrics increase public awareness of the promise of the TRAPPIST-1 exoplanets (**especially TRAPPIST-1e, -1f, and -1g**) and the concept of a habitable zone.

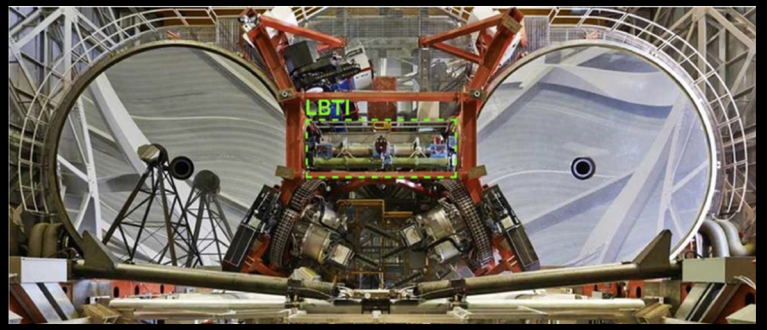
See more of our public comms work:

Other Recent Highlights

- ExoExplorers Science Series: completed 2nd cohort, selected third

- Redesigned Exoplanet Travel Bureau with new functions and new interactive guided tours in English and Spanish.

- Large Binocular Telescope Interferometer:
  closed Project and donated instrument to the University of Arizona



How can You Participate?

- Research
  - Postdoc and Fellowship
  - ExoExplorers
- NExScI
  - Archive, Follow-Up Observing, Sagan Summer workshops
- Science
  - Observing Opportunities
  - Participation
  - Research
- Technology
  - Participation
  - Research

https://bit.ly/exoopportunities

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 through the Exoplanet Exploration Program Office in the following ways:

	Activity	How do I get involved?	Links
Technology Development	NASA's Strategic Astrophysics Technology (SAT)	Propose to SAT proposal calls	https://inspires.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/
	Starshade Science and Industry Partnership (SIP)	Participate in Starshade Science and Industry Partnership (SIP)	https://exoplanets.nasa.gov/exep/technology/starshade/
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 Open to Compete to give a talk	https://exoplanets.nasa.gov/exep/exopag/ https://exoplanets.nasa.gov/exep/exopag/student-travel/
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 Spectograph on WIYN 3.5-m	Apply for observing time through NOIRLab proposal calls	https://noirlab.edu/science/observing-noirlab/proposals/call-for-proposals
	High Contrast 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/call-for-proposals 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/call-for-proposals Instrument contact: Todd Henry (GSU) thenry@astro.gsu.edu
	MINERVA-Australis	Apply for NN-EXPLORE observing time through NOIRLab proposal calls	https://noirlab.edu/science/observing-noirlab/proposals/call-for-proposals Instrument contact: Rob Wittenmyer (USQ) Rob.Wittenmyer@usq.edu.au

Acknowledgements

This work was carried out at the Jet Propulsion Laboratory, California Institute of Technology under contract with the National Aeronautics and Space Administration.

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California Institute of Technology

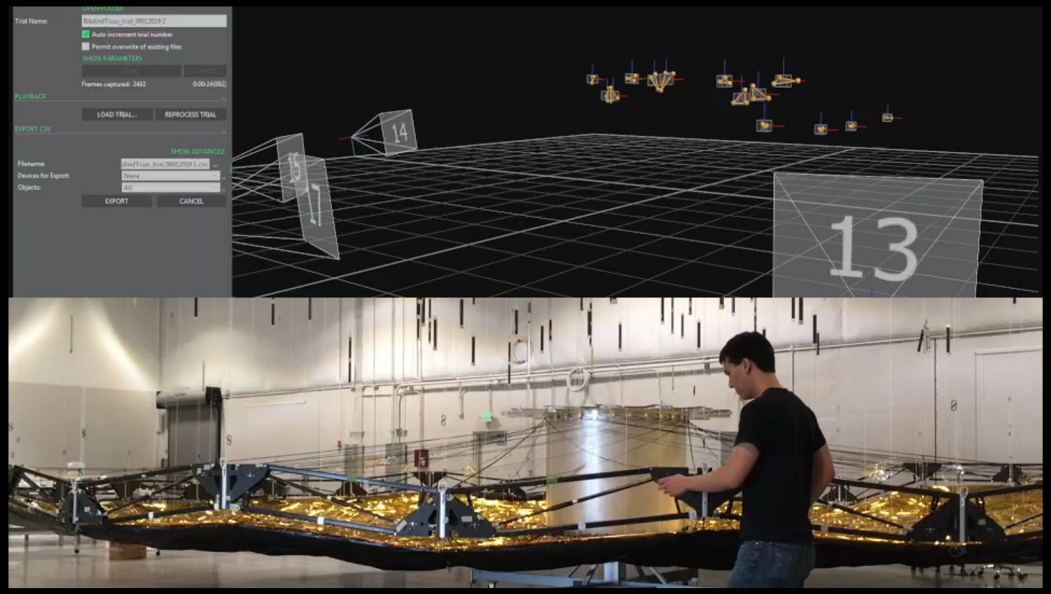
exoplanets.nasa.gov

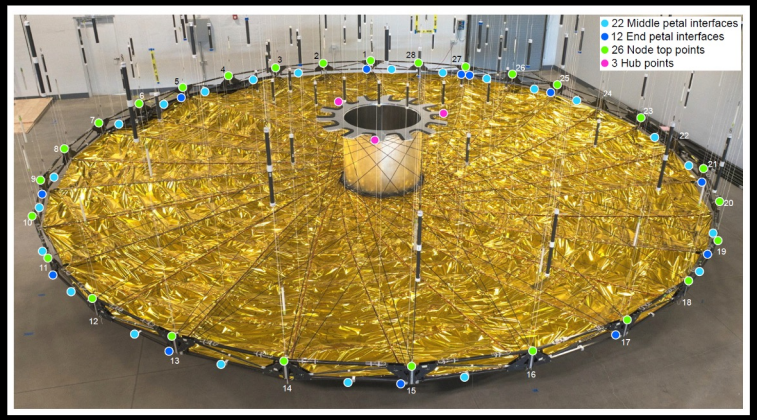
Backup

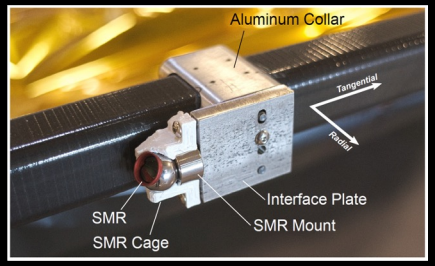
National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology

Starshade Technology







Kenzo Neff, Tendeg (former JPL intern) demonstrating motion tracking

Credit: NASA / TENDEG

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Closing Starshade Technology Gaps

https://exoplanets.nasa.gov/exep/technology/starshade/