

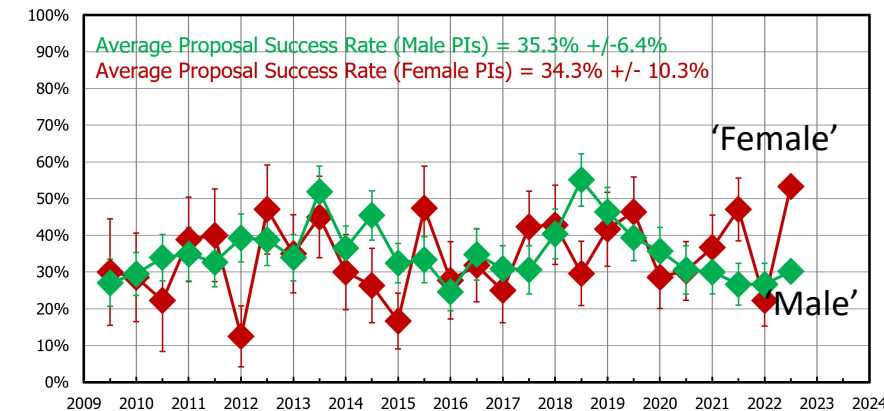




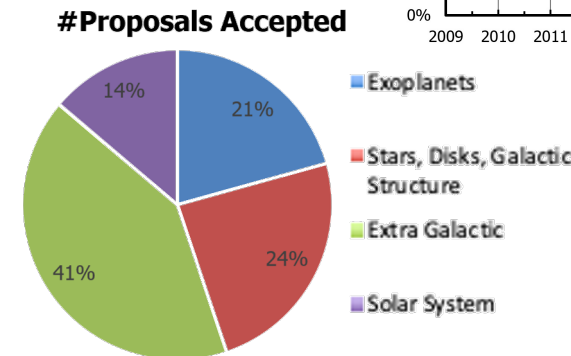
- **2022 July 25-29 Sagan Summer Workshop in-person and on-line**
  - **“Exoplanet Science in the Gaia Era”**
    - Astrometry fundamentals, science, next steps
    - Hands-on data and software sessions
    - Attendee posters and pops
    - In-person and virtual “Lunch” with the Speakers
  - Registration still open
    - “Handful” of spots for In-person attendance open (first come, first serve)
    - Virtual attendance registration fully open
  - <https://nexsci.caltech.edu/workshop/2022/>
  - Twitter: #sagan2022
- **NASA Keck Time**
  - Supports all of astrophysics and solar system
  - WMKO submitted NASA Keck time renewal proposal
  - 2022B GO oversubscription rate ~3.9:1
  - 2023A Proposals due September 15
  - <https://nexsci.caltech.edu/missions/KSA/>



This workshop is dedicated to the memory of Dimitri Pourbaix, a key contributor to the Gaia mission and astrometry, and the inspiration behind this year's workshop topic. He will be greatly missed.



NASA Keck Acceptance  
Rate by Gender



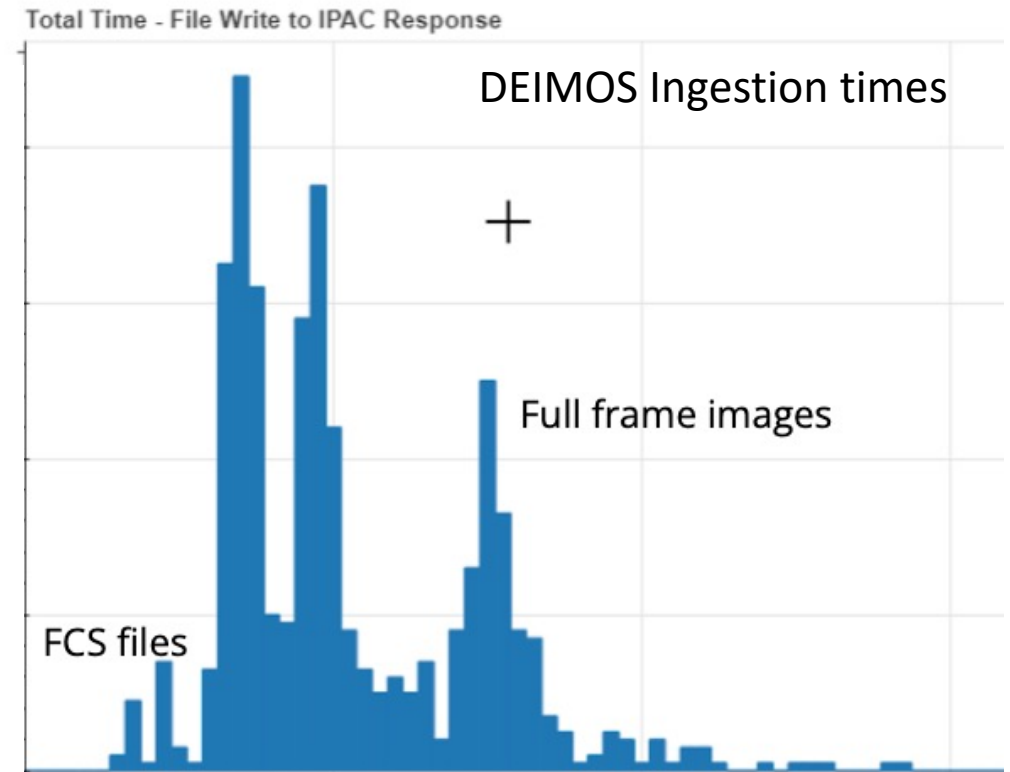


# Keck Observatory Archive (KOA)

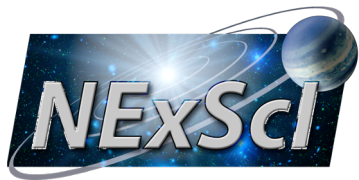
Bruce Berriman  
KOA Lead



- Collaboration between NExSci and WMKO
- Raw data are now ingested into KOA at near real-time (usually within 1 minute of acquisition) for 6 instruments:
  - LRIS, HIRES, ESI, DEIMOS, MOSFIRE and KCWI
  - Remaining 5 will follow incrementally in Summer 2022.
- Developed prototype GUI to enable observers to manage data while observing.
- Quick-look and science-ready reduced products ingested on creation for DEIMOS and KCWI.
- Access to Quick-look reduced data is being integrated into the the KOA Python client.
- KOA User Survey released January 2022 received 70 responses.





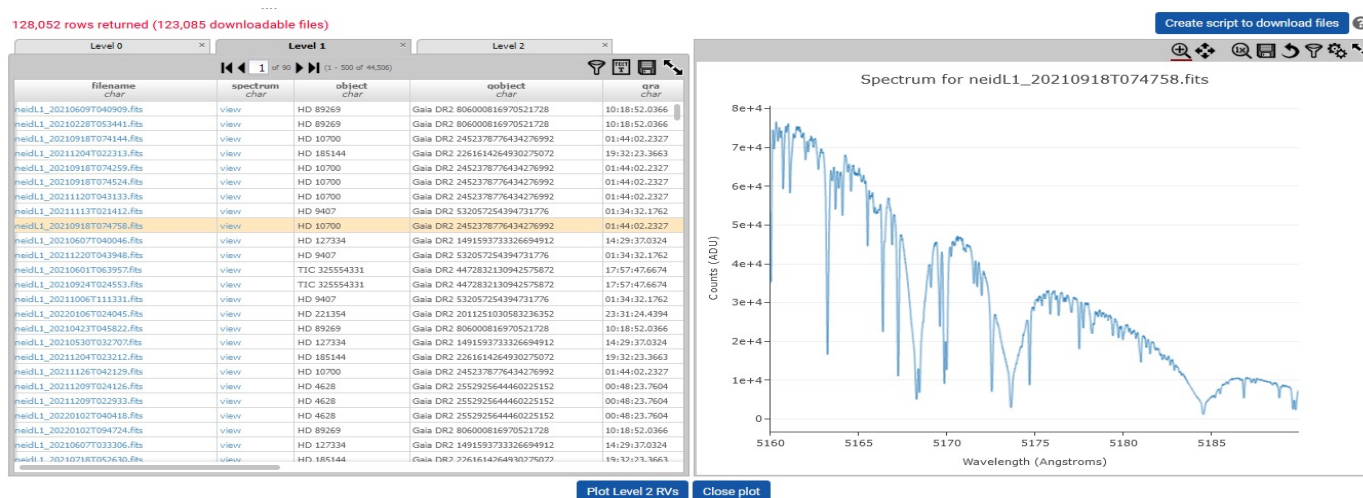
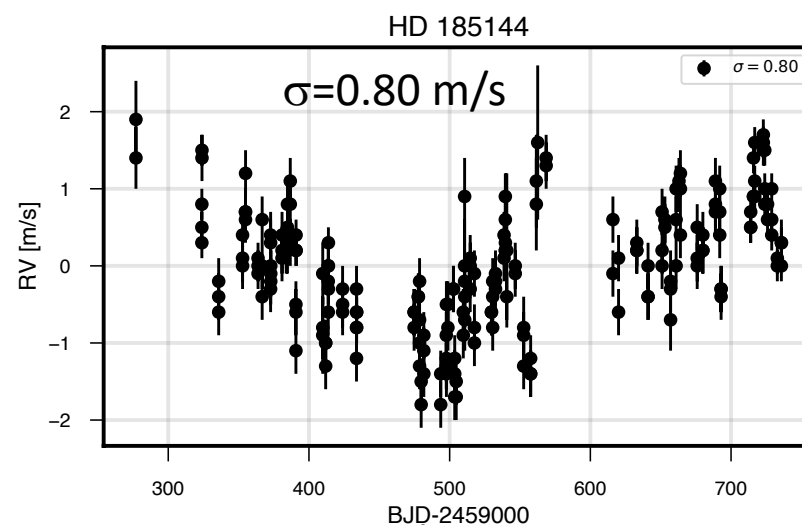
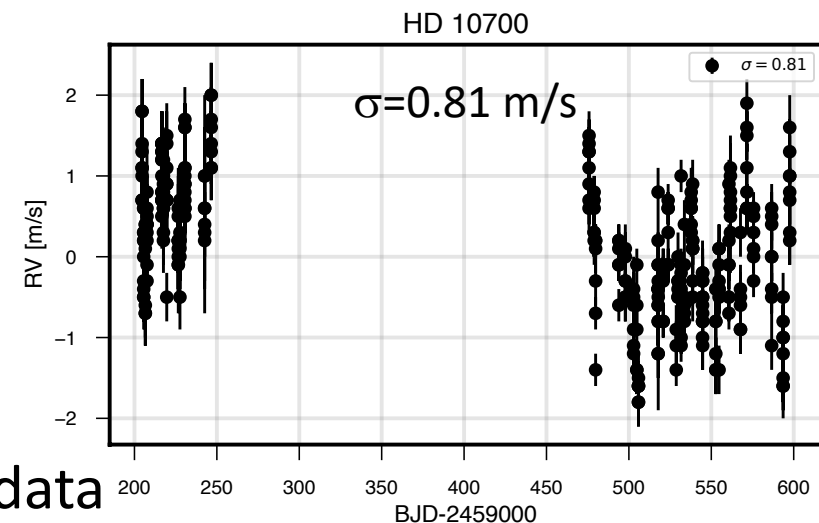


# NEID Stellar and Solar Data Archive

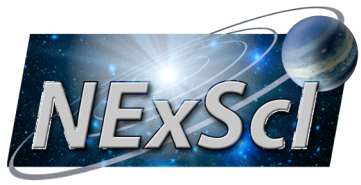
BJ Fulton  
NN-Explore  
Project Scientist



- NEID on WIYN 4<sup>th</sup> semester in operation
- Stellar and solar data archive includes raw spectra, extracted spectra, and derived RVs
- 493k data products and counting
- 91% of data processed and in archive within 24 hours
- pyNEID python package available for searching and extracting data





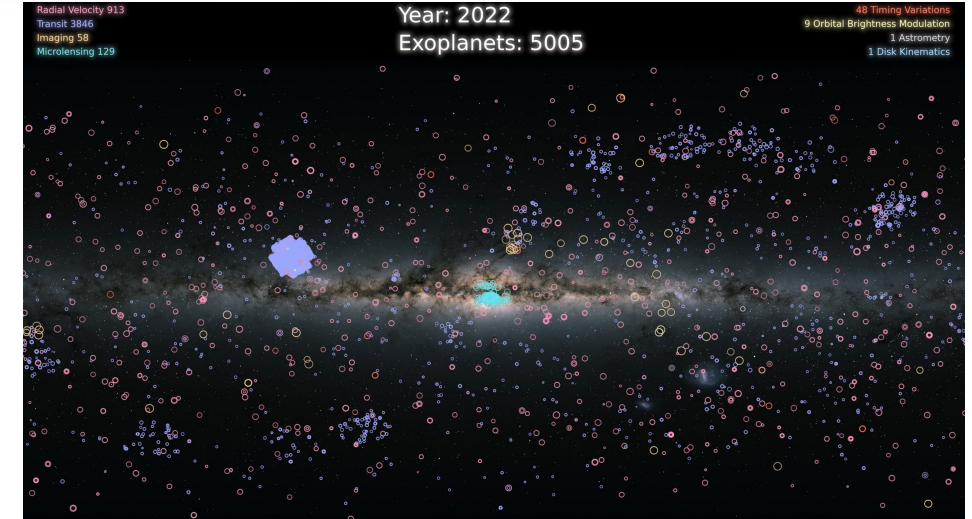


# NASA Exoplanet Archive

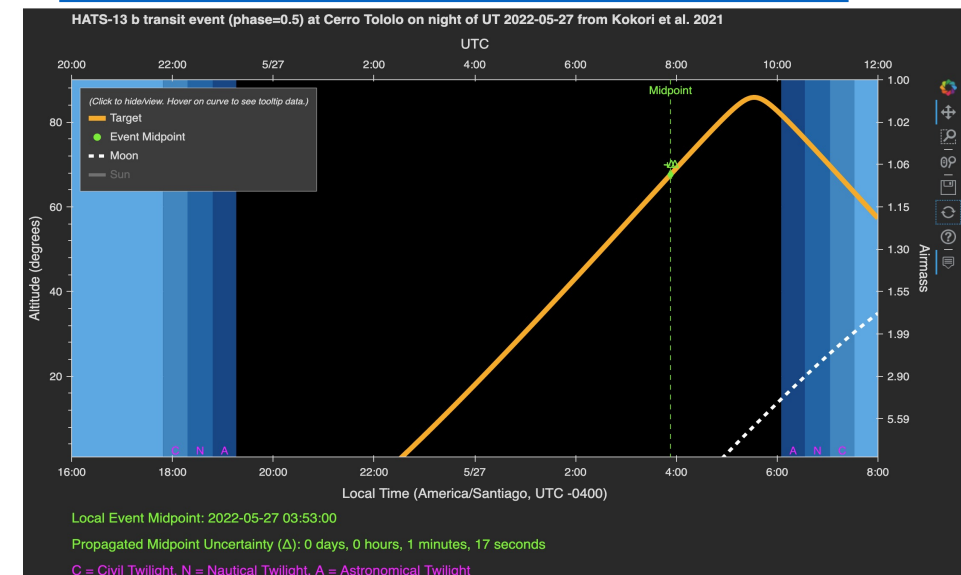
Jessie Christiansen  
Archive Lead Scientist



- 5000 Exoplanets !
  - 5044 exoplanets as of this week
  - More planets in 2021 than any other year except for the big Kepler papers in 2014 and 2016
  - 134 new planets in 2022
    - 46 from TESS
    - 60 from K2
    - 2 Gaia !!!!!
  - 683 planetary solutions added in 2022
- Updates to Transit and Orbit Ephemeris tool
  - Support for JWST
  - Airmass visibility plots for ground-based facilities
  - In testing now – likely to be released July
- Aurora Kesseli joins the team
- Development of atmospheric observation visualization environment starting based upon community working group recommendations

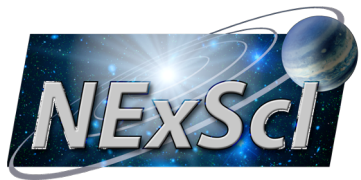


<https://www.youtube.com/watch?v=yv4DbU1CWAY>



<https://exoplanetarchive.ipac.caltech.edu>

ExoPAG 26



# ExoFOP

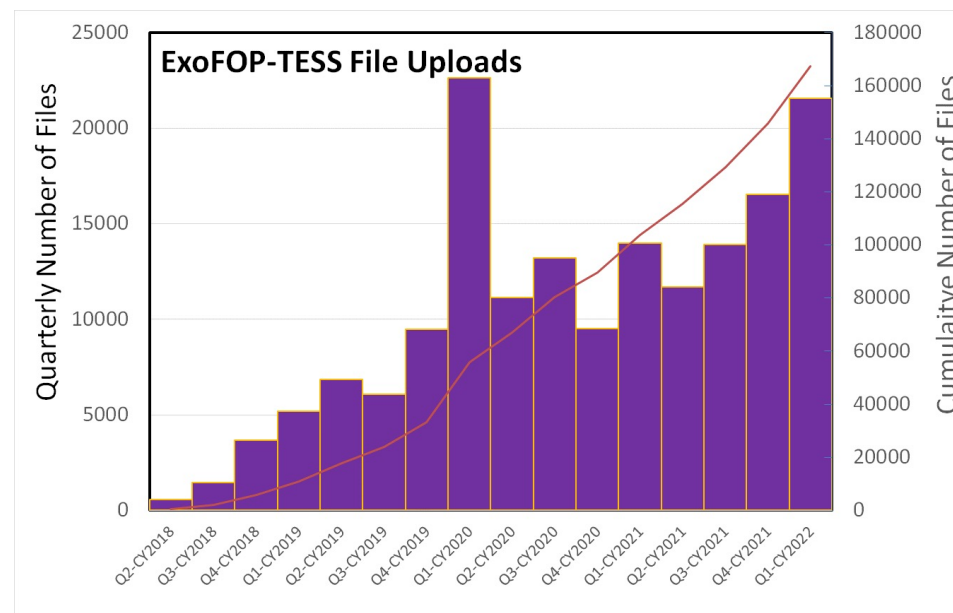
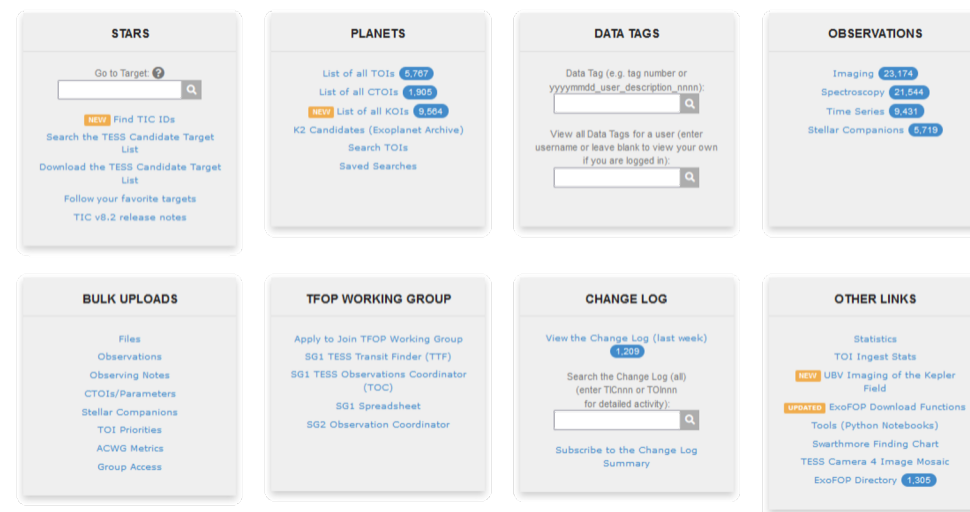
<https://exofop.ipac.caltech.edu>

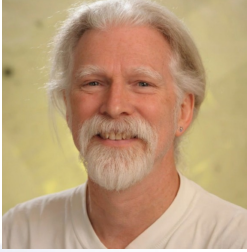


Jessie Christiansen  
Archive Lead Scientist

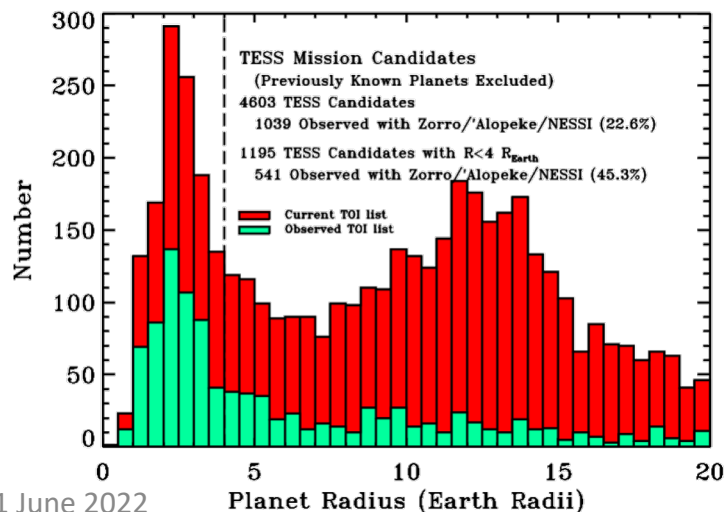


- Support the TESS mission and TESS Follow-up Observation Program
  - 5767 TOIs, 1905 cTOIs
  - 840,000 files; 28,000 observing notes; 54,000 recorded observations across TESS, K2, and Kepler
  - TFOF priorities and dispositions updated daily
  - Over 1300 registered users
- ExoFOP Kepler-K2-TESS consolidation complete
  - All Kepler and K2 data, notes, and observations have been transferred over to the TESS portal
  - Kepler and K2 portals closed
  - List of KOIs linked to TOIs
  - Bulk uploading now enables use of TIC, TOI, KIC, KOI, Kepler, EPIC and K2 names
- Some new tools
  - New online/API tool to lookup TIC ID for any astronomical name
    - Cross-matching of Kepler-TIC and EPIC-TIC available for download
  - Nearby targets enables direct query to Gaia DR3 for an individual object or 1 arcmin search radius
    - Returns ID, RA, Dec, Gmag, pmra, pmdec, ruwe in JSON structure

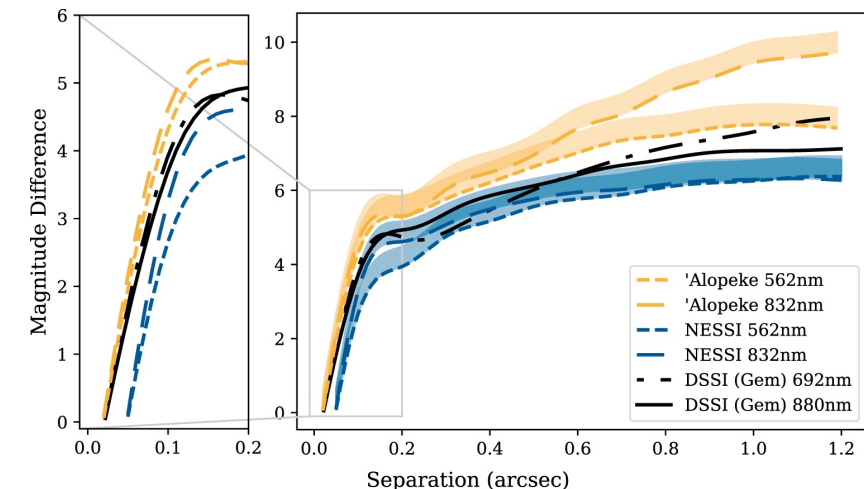
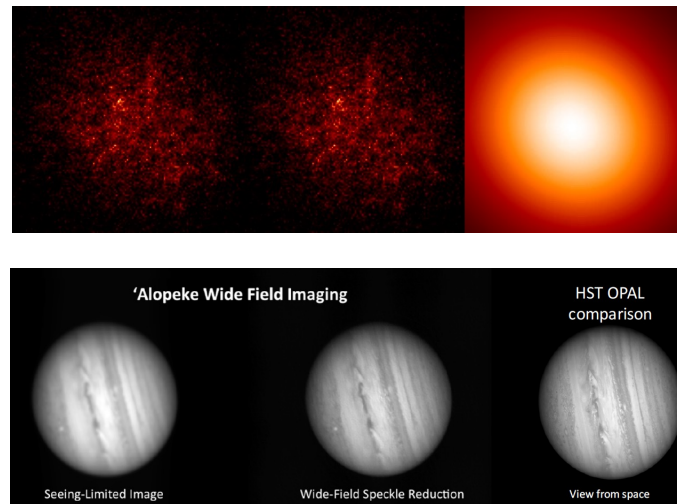




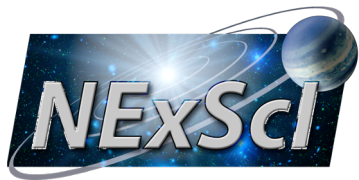
- Community program to detect stellar companions around TESS candidate stellar hosts
  - Lead: Steve Howell (NASA Ames), Deputy: David Ciardi (NExSci)
  - Optical speckle cameras on Gemini-North/South (0.02") and WIYN (0.04") – two filters at once (typically 562nm and 832nm)
  - All images, sensitivity curves, publication-ready plots, and stellar companion properties uploaded to ExoFOP (zero exclusive use period)
- Solicit community targets with each observing run
  - Specific TESS candidates and other NASA exoplanet related targets
  - Screening of JWST PSF stars
- Cameras available through NOIRLab proposal time to general community
  - Programs beyond TESS candidates or small numbers of special targets can go through Gemini proposal process
  - Speckle team takes data and delivers reduced data (standard processing: e.g., point source) to PIs
  - Instruments also have: Suite of standard SDSS filters; ms readout with 10 ns timing precision; wide-field (~1') mode available



11 June 2022







# Community Observing Resources

- Community access to observing resources for exoplanets and more
- Keck
  - Supports strategic programs from all areas of astrophysics and solar system
  - All instruments, both telescopes
- NNEExplore
  - WIYN: NEID (PRV and daily solar data); NESSI (HRI); WHIRC (NIR imaging/time series); HYDRRA (MOS)
  - Southern Hemisphere PRV
    - SMARTS-CHIRON (stellar spectra,  $\sim 10$  m/s)
    - Minerva-Australis (4x0.7m;  $\sim 2 - 10$  m/s)
  - Gemini-North/South
    - 'Alopeke (North) and Zorro (South)
    - High resolution imaging speckle cameras

## Observing Resources

NExSci provides access to a variety of observing resources in support of community research primarily in exoplanets, but also general astrophysics and planetary science.

### NASA Time on the Keck Observatory

The cornerstone of the NExSci supported observing resources is the NASA Keck Time. NExSci manages NASA's partnership with the [W. M. Keck Observatory](#). Both Keck 1 and Keck 2 telescopes and all instruments are available to the community for exoplanet, astrophysical, and planetary science observations. More information on Keck instrumentation and how to apply for NASA Keck time can be found [here](#). in Waimea, Hawaii. The Keck telescopes are two 10-meter aperture telescopes whose primary mirrors are each composed of thirty-six 2 meter mirror segments.



### NN-Explore Program

NASA and the National Science Foundation have established the NASA-NSF Exoplanet Observational Research (NN-Explore) partnership to support community exoplanet research. The NN-Explore program was created in response to the community need for observational resources for exoplanet discovery and characterization. There are multiple resources available to the community through this partnership; more information on how to apply for time through the NN-Explore Program can be found at the [NOIRLab Call for Proposals](#)



#### WIYN

The cornerstone of the NN-Explore Program is the NASA partnership on the [WIYN](#) telescope located at [Kitt Peak Observatory](#). The premiere instrument on the telescope is the high precision radial velocity machine [NEID](#) which is a high resolution spectrometer capable of radial velocity precisions of 30 cm/s. Also available on WIYN is the high spatial resolution optical speckle imager [NN-Explore Exoplanet Stellar Speckle Imager \(NESSI\)](#). Other instruments available to the community include [WHIRC](#), [Hydra](#), and [ODI](#).



#### SMARTS-CHIRON

[CHIRON](#) on the SMARTS 1.5m telescope located at the [Cerro-Tololo Observatory](#) is a fiber-fed high resolution spectrometer capable of radial velocity precisions of a few meters per second. Through the NOIRLab partnership in the [SMARTS consortium](#), NASA has made available time for exoplanet confirmation and characterization - especially for TESS planetary candidates.



#### Minerva-Australis

[Minerva-Australis](#) is an array of 0.7m telescopes all feeding a single precision spectrograph. The facility is located at [Mt. Kent](#) Mt. Kent and is able reach radial velocity precisions of a few meters per second. Through the NN-Explore partnership, NASA has made available time for exoplanet confirmation and characterization - especially for TESS planetary candidates.



# NExSci at the AAS

- Come see us at the NExSci Booth
- Hyperwall talk on Exoplanet Archive and ExoFOP by Jessie Christiansen Tuesday evening
- Some NExSci-related presentations
  - K. Lester (D. Ciardi): “Which Binary Component Hosts the TESS Transiting Planet?” iPoster 205.01
  - C-C Hsu (C. Gelino): “Kinematics, Rotation, and Multiplicity of Ultracool Dwarfs with High-Resolution Near-Infrared Spectroscopy” 208.03D
  - A. Kesseli: “Resolving chemical gradients in exoplanet atmospheres with high resolution spectroscopy” 217.04
  - M. Lund: “A Complete Cross-match of Kepler, K2, and TESS Targets” 217.08
  - F. Marocco (C. Gelino): “The substellar neighborhood: a stunningly diverse population of brown dwarfs with 20pc of the Sun” iPoster 305.17
  - J. Burt (J. Christiansen, D. Ciardi, B. Fulton): “The Observations Needed to Constrain Exoplanet Orbits and Masses for JWST and ARIEL” 320.05
  - C. Bender (B. Fulton): “Overview and Current Status of the NEID Data Reduction Pipeline”, iPoster 401.01
  - K. Sung (B. Cale, C. Beichman): “Improved modeling of telluric absorption features through the retrieval of atmospheric trace gases toward EPRV measurements” 417.04
  - J-B Ruffio (B. Fulton): “Searching for exomoons with planetary radial velocities” 417.06