

# Updates from the NASA Exoplanet Science Institute (NExSci)

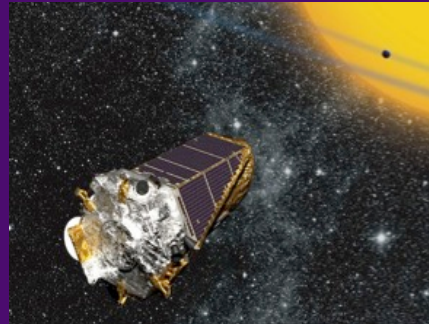


David R. Ciardi  
 NExSci Chief Scientist  
 On Behalf of the NExSci Team  
 ExoPAG-25 10 January 2022

Sagan Program  
 & Community  
 Support



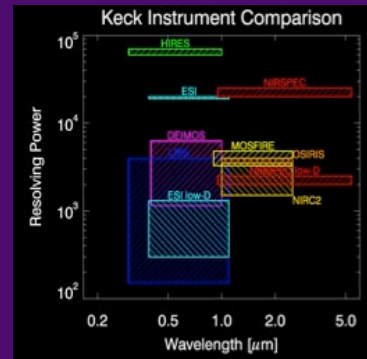
Exoplanet  
 Archive and  
 ExoFOP



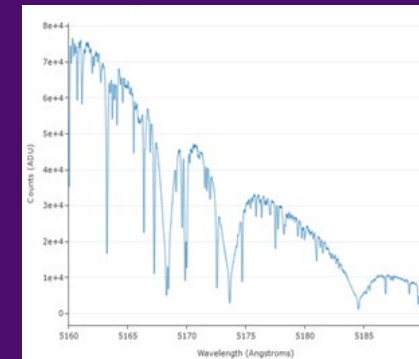
Long Term  
 Archives



Keck  
 Operations and  
 Archive (KOA)



NN-Explore  
 (NEID PRV)





# Science Affairs Highlights

Dawn Gelino,  
Deputy Director

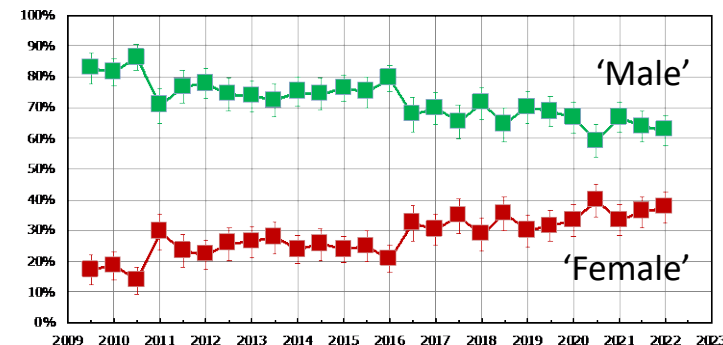
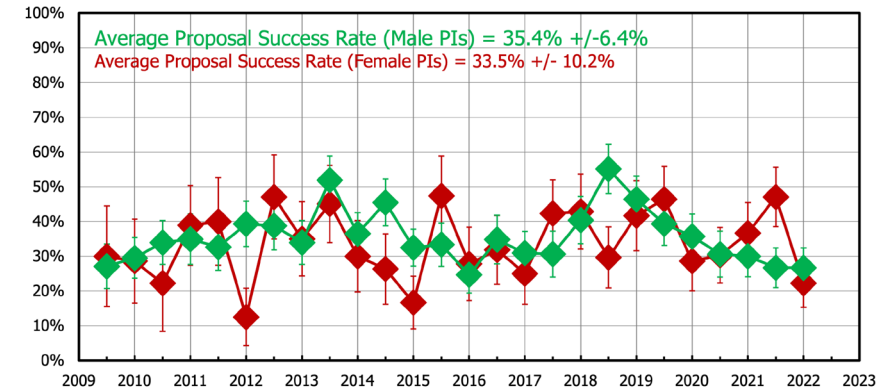


- **Largest Sagan Summer Workshop in 21-Year history**
  - “Circumstellar Disks and Young Planets”
  - Over 800 people participated in the virtual 2021 Sagan Summer Workshop, July 19-23, 2021
- 2022 hybrid SSW, July 25-29, 2022
  - “Exoplanet Science in the Gaia Era”
  - <https://nexsci.caltech.edu/workshop/2022/>

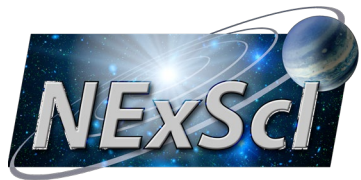


Some SSW 2021 participants

- **2022A NASA Keck Time**
  - Successful full implementation of Dual Anonymous Proposal Review (DAPR) process
    - 2022A GO oversubscription rate – 4.7:1
    - Highest number of new proposers ever
  - 4<sup>th</sup> NASA Keck Key Strategic Mission Support
    - Large programs that specifically support NASA space missions
    - Oversubscription rate - 5.6:1
- 2022B Proposals due March 17, call live Feb 17
  - <https://nexsci.caltech.edu/missions/KSA/>



NASA Keck Submissions by Gender Over Time

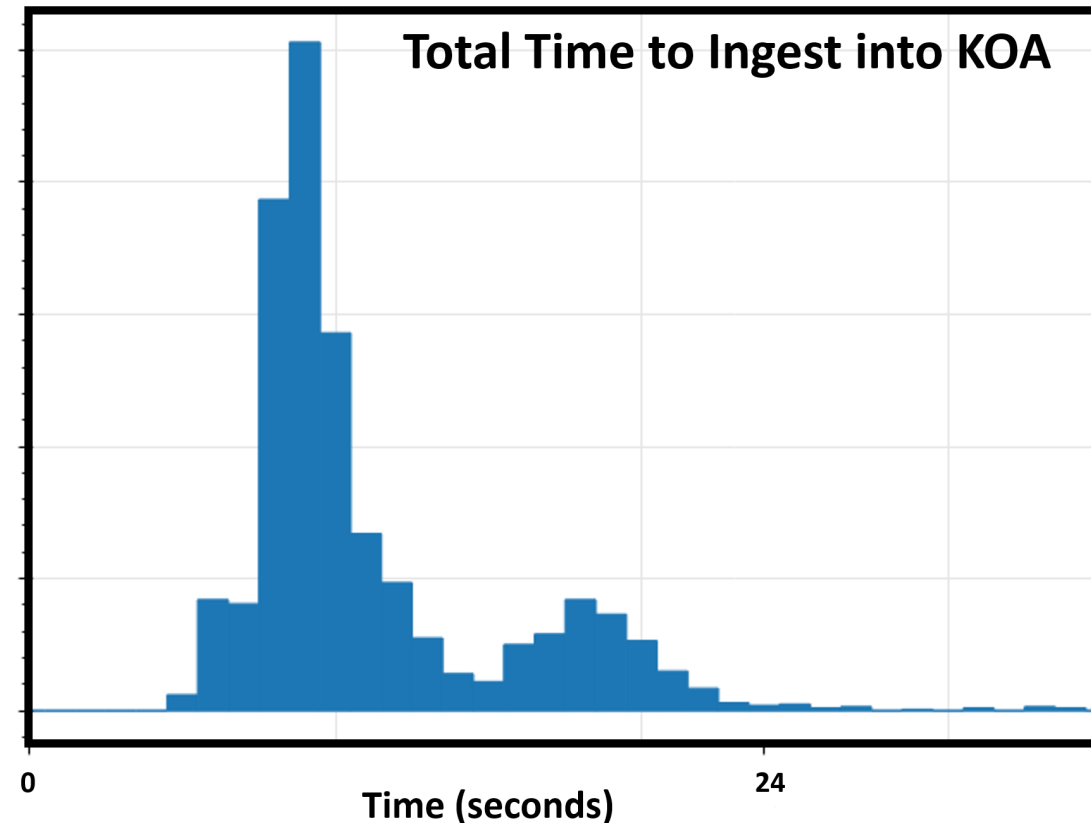


# Keck Observatory Archive (KOA)

Bruce Berriman  
KOA Lead



- Collaboration between NExSci and WMKO
- Raw data from instruments available through a Python API, built on top of VO protocols.
  - Public and private data, and calibration associations, and accessible through the PyKOA client.
  - Public data are accessible through four third-party clients: IRSA Viewer, TOPCAT, PyVO and TAP+
  - <https://koa.ipac.caltech.edu/UserGuide/PyKOA/TAPClients.html>
- Preparing for near real-time ingestion of newly acquired data and generation of science ready data products.
  - Incremental deployments for each instrument in 2022.
- The first KOA User Survey released at 239<sup>th</sup> AAS Meeting, January 2022.



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



# NEID Stellar and Solar Data Archive

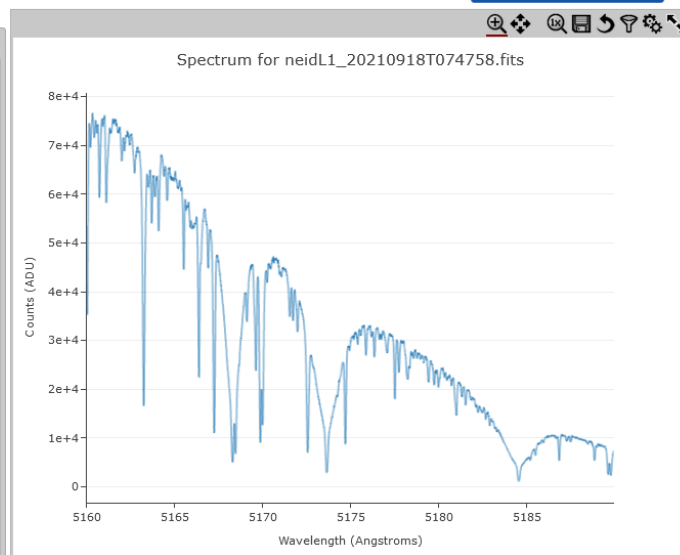
BJ Fulton  
NN-Explore  
Project Scientist



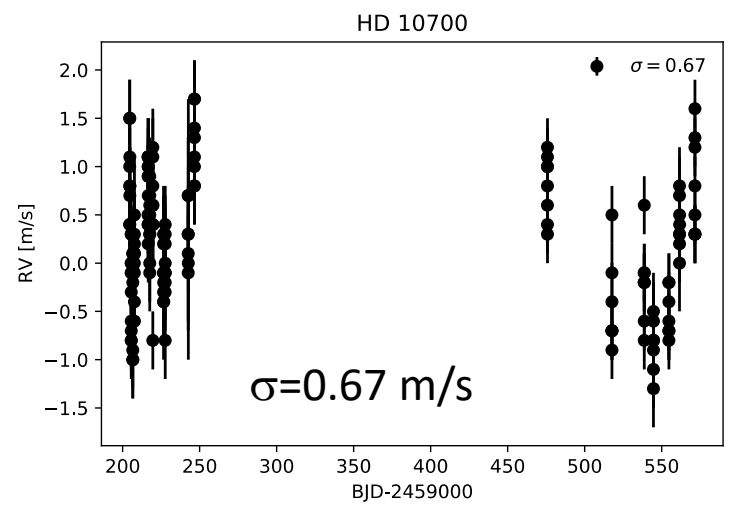
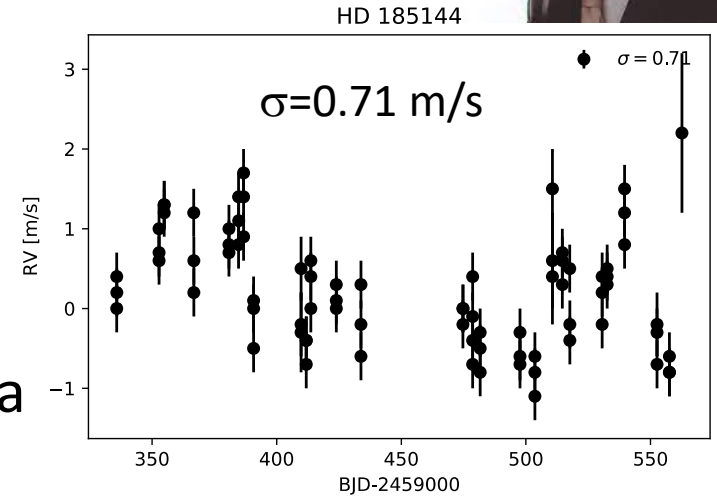
- NEID on WIYN available for community (see Callas Talk)
- Stellar and solar data archive includes raw spectra, extracted spectra, and derived RVs
- ~90% of data processed and in archive within 24 hours
- pyNEID python package available for searching and extracting data

128,052 rows returned (123,085 downloadable files)

| filename                     | spectrum | object        | object                       | qra           |
|------------------------------|----------|---------------|------------------------------|---------------|
| char                         | char     | char          | char                         | char          |
| neidL1_20210609T040909.fits  | view     | HD 89269      | Gaia DR2 806000816970521728  | 10:18:52.0366 |
| neidL1_20210228T053441.fits  | view     | HD 89269      | Gaia DR2 806000816970521728  | 10:18:52.0366 |
| neidL1_20210918T074144.fits  | view     | HD 10700      | Gaia DR2 2452378776434276992 | 01:44:02.2327 |
| neidL1_20211204T022313.fits  | view     | HD 185144     | Gaia DR2 2261614264930275072 | 19:32:23.3663 |
| neidL1_20210918T074259.fits  | view     | HD 10700      | Gaia DR2 2452378776434276992 | 01:44:02.2327 |
| neidL1_20210918T074524.fits  | view     | HD 10700      | Gaia DR2 2452378776434276992 | 01:44:02.2327 |
| neidL1_20211120T043133.fits  | view     | HD 10700      | Gaia DR2 2452378776434276992 | 01:44:02.2327 |
| neidL1_20211131T021412.fits  | view     | HD 9407       | Gaia DR2 532057254394731776  | 01:34:32.1762 |
| neidL1_20210918T074758.fits  | view     | HD 10700      | Gaia DR2 2452378776434276992 | 01:44:02.2327 |
| neidL1_20210607T040046.fits  | view     | HD 127334     | Gaia DR2 1491593733326694912 | 14:29:37.0324 |
| neidL1_20211220T043948.fits  | view     | HD 9407       | Gaia DR2 532057254394731776  | 01:34:32.1762 |
| neidL1_20210601T063957.fits  | view     | TIC 325554331 | Gaia DR2 4472832130942575872 | 17:57:47.6674 |
| neidL1_20210924T024553.fits  | view     | TIC 325554331 | Gaia DR2 4472832130942575872 | 17:57:47.6674 |
| neidL1_20211006T111335.fits  | view     | HD 9407       | Gaia DR2 532057254394731776  | 01:34:32.1762 |
| neidL1_20220106T024045.fits  | view     | HD 221354     | Gaia DR2 2011251030583236352 | 23:31:24.4394 |
| neidL1_20210423T045822.fits  | view     | HD 89269      | Gaia DR2 806000816970521728  | 10:18:52.0366 |
| neidL1_20210530T032707.fits  | view     | HD 127334     | Gaia DR2 1491593733326694912 | 14:29:37.0324 |
| neidL1_20211204T023212.fits  | view     | HD 185144     | Gaia DR2 2261614264930275072 | 19:32:23.3663 |
| neidL1_20211126T042129.fits  | view     | HD 10700      | Gaia DR2 2452378776434276992 | 01:44:02.2327 |
| neidL1_20211209T024126.fits  | view     | HD 4628       | Gaia DR2 255292564460225152  | 00:48:23.7604 |
| neidL1_20211209T022933.fits  | view     | HD 4628       | Gaia DR2 255292564460225152  | 00:48:23.7604 |
| neidL1_20220102T040414.fits  | view     | HD 4628       | Gaia DR2 255292564460225152  | 00:48:23.7604 |
| neidL1_20220102T0794724.fits | view     | HD 89269      | Gaia DR2 806000816970521728  | 10:18:52.0366 |
| neidL1_20210607T033306.fits  | view     | HD 127334     | Gaia DR2 1491593733326694912 | 14:29:37.0324 |
| neidL1_20210718T052630.fits  | view     | HD 185144     | Gaia DR2 2261614264930275072 | 19:32:23.3663 |



Plot Level 2 RVs Close plot





# NASA Exoplanet Archive

Jessie Christiansen  
Archive Lead Scientist



- Updated holdings: 4884 Planets, 32000 Parameter Sets
  - More planets in 2021 than any other year except for the big Kepler papers in 2014 and 2016
  - 500+ planets and 1000+ parameter sets in 2021
- Approaching 5000 Confirmed Exoplanets
- Continued improving accessibility to archive holdings
  - Migrated additional tables to our TAP service, which allows users to programmatically access and retrieve data
  - Updated public Python package astroquery to support new planetary system and planetary system composite parameter tables
- Released new K2 Planets and Candidates table
  - This table contains the super-set of confirmed, validated, and candidate planets discovered in the NASA K2 mission data (1740 total objects)
- Reached 10,000 twitter followers

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

The screenshot shows the NASA Exoplanet Archive website. At the top, it says "NASA EXOPLANET ARCHIVE" and "A SERVICE OF NASA EXOPLANET SCIENCE INSTITUTE". There are navigation links for Home, About Us, Data, Tools, Support, and Login. A header bar displays statistics: 4,884 Confirmed Planets (as of 12/13/2021), 175 TESS Confirmed Planets (as of 12/13/2021), and 5,164 TESS Project Candidates (as of 01/07/2022). Below this is a search bar labeled "Explore the Archive" with a search button and an "Advanced Search" link. A section for "Transit Surveys" highlights TESS with 107,628,888 Light Curves and a brief description of the mission. There are buttons for "Confirmed Planets", "ExoFOP-TESS", "Project Candidates", and "Community Candidates". A "Tools & Services" section includes links for "Build a Query (TAP)", "Build a Query (API)", "Transit and Ephemeris Service", "EXOFAST: Transit and RV Fitting", "Periodogram", and "Predicted Observables for Exoplanets (POE)". A "Work with Data" section offers links for "Planetary Systems", "Pre-generated Plots", "Transmission Spectroscopy", "Microlensing Planets", "Planetary Systems Composite Data", "ExoFOP", "Emission Spectroscopy", and "Direct Imaging". A "News" section features "The Lucky Seven" update from December 16, 2021. At the bottom, there are links for "FAQ", "Documentation", "Videos", and "Contact Us".



# ExoFOP

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

Jessie Christiansen  
Archive Lead Scientist



- ExoFOP continues to support the TESS mission and TESS Follow-up Observation Program
  - 5164 TOIs, 1700 cTOIs
  - 140,000 files; 20,500 observing notes; 20,000 recorded observations
  - TFOF priorities and dispositions updated daily
- ExoFOP consolidation nearly complete
  - Close-out of these portals and having just one ExoFOP in the next few months
  - ExoFOP-Kepler migration done
  - ExoFOP-K2 migration in process
- Improving data access
  - Python Notebook examples to using pandas to download and explore ExoFOP tables
  - Submitting MyTargets requests to stay up-to-date on changes
  - Updated ExoFOP-TESS php download scripts
  - Saved Searches
- Receive a daily email log of what has been uploaded on ExoFOP

Welcome to ExoFOP-TESS

**TARGETS (TIC V8.2)**  
Single Target Lookup  
Search the TESS Candidate Target List  
Download the TESS Candidate Target List  
Follow your favorite targets  
TIC v8.2 release notes

**TOIS/CTOIS:**  
List of all TOIs: 5,164  
List of all CTOIs: 1,700  
Search TOIs  
NEW Saved Searches

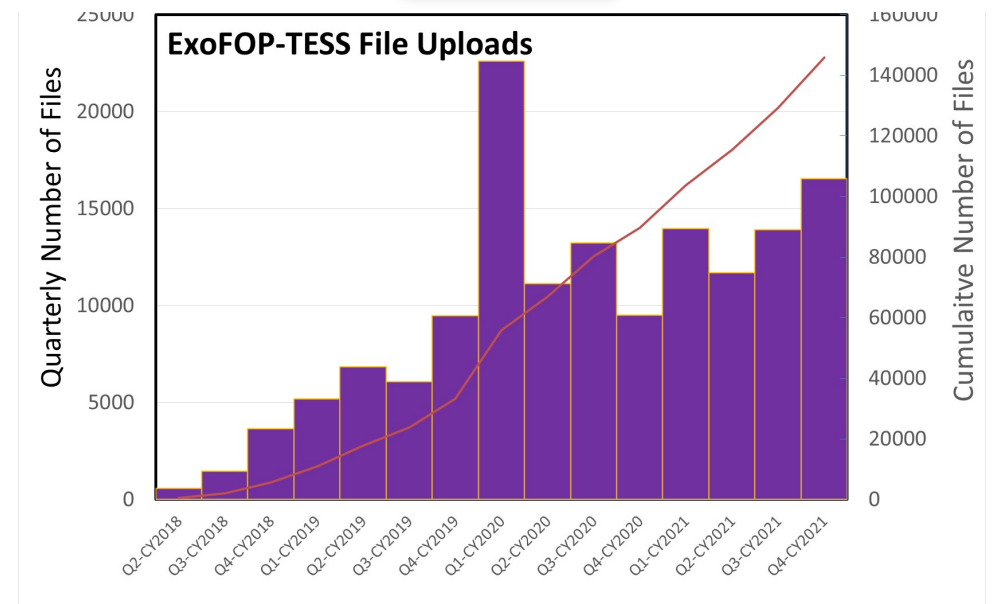
**DATA TAGS**  
Data Tag (e.g. tag number or yyyyymmdd\_user\_description\_nnnn):  
View all Data Tags for a user (enter username or leave blank to view your own if you are logged in):

**OBSERVATIONS**  
Imaging: 18,987  
Spectroscopy: 17,530  
Time Series: 7,828  
Stellar Companions: 5,404

**BULK UPLOADS**  
Files  
Observations  
Observing Notes  
CTOIs/Parameters  
Stellar Companions

**CHANGE LOG**  
View the Change Log (last week): 149  
Search the Change Log (all) (enter TICnnn or TOInnn for detailed activity):  
Subscribe to the Change Log Summary

**OTHER LINKS**  
Swarthmore Finding Chart  
NEW ExoFOP-TESS Download Functions  
Tools (Python Notebooks)  
Apply to Join TFOF Working Group  
TESS Camera 4 Image Mosaic  
ExoFOP Directory: 1,235  
ExoFOP Help





# Come Join the Team ...

- System Administrator (coming soon)
  - Work on the Exoplanet Archive and other NExSci projects in the managing software releases and development of user-oriented services for visualizing and data interaction
  - Background in Astronomy, Physics, Math, Computer Science, Computer Engineering, Information Sciences, or a related field.
  - Experience with Unix/Linux scripting, Python, SQL, current software management practices and cloud services, and containerization
- Science Data Analyst (coming soon)
  - Work on the Exoplanet Archive to make crucial contributions in maintaining the up-to-date database and archive content
  - Background in astronomy or physics
  - Experience with basic programming and scripting with python, perl etc.