



**Jet Propulsion Laboratory**  
California Institute of Technology

# NN-EXPLORE

NASA-NSF Exoplanet Observational Research Program

David R. Ardila

NN-EXPLORE Program Manager

# Why NN-EXPLORE?



ExoPlanet Exploration Program

- Astro2010 Decadal Survey:

"NASA and NSF should support an aggressive program of ground-based high-precision radial velocity surveys of nearby stars in order to **validate and characterize exoplanet candidates.**"

- National Academies Exoplanet Science Strategy - 2018:

"NASA and NSF should establish a strategic initiative in extremely precise radial velocities (EPRVs) to develop methods and facilities for **measuring the masses** of temperate terrestrial planets orbiting Sun-like stars."

- Astro2020 Decadal Survey:

"The panel advocates that together NASA and NSF address the grand challenge of achieving the precision required to **measure the masses** of terrestrial planets orbiting Sun-like stars, which implies a single measurement precision of 10 cm/s and control of systematics at the level of 1 cm/s."

"While such measurements will be done from the ground, they are **inextricably linked to the scientific success of numerous current and proposed missions**, namely the legacy Kepler/K2 data set, the ongoing TESS Mission, and a future direct imaging mission."

# NN-EXPLORE: Areas



ExoPlanet Exploration Program



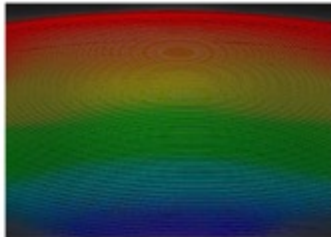
## WIYN/NEID and Guest Observing (GO)

~40 nights of GO on WIYN (3.5 m); Maintain the NEID spectrograph; fund users; process and archive the data (including solar data).



## Southern RV Observing Opportunities

Radial velocity observing time in the southern hemisphere is available for US institutions on CTIO-1.5m/CHIRON (30 nights) and MINERVA-Australis (30 nights).



## NASA-NSF EPRV Initiative

Organize the Extreme Precision Radial Velocity (EPRV) Research Coordination Network and EPRV conferences



## High Resolution Speckle Imaging of Exoplanet Host Stars

Three high resolution speckle imaging instruments (NESSI at WIYN, 'Alopeke in Gemini North, and Zorro in Gemini South).

More information: <https://exoplanets.nasa.gov/exep/NNExplore/>

*This document has been reviewed and determined not to contain export controlled technical data.*

# Which science?



ExoPlanet Exploration Program

General exoplanet-related research, with emphasis on supporting observations for NASA missions, including but not limited to Kepler, K2, TESS, HST, and JWST. For example:

- Confirm or validate exoplanet candidates
- Characterize known exoplanets and exoplanetary systems
- Characterize the (exozodiacal) dust environments of exoplanet-hosting or potentially-exoplanet-hosting stars
- Explore the formation, evolution, and diversity of exoplanetary systems

Stellar observations to characterize stellar properties and search for background eclipsing binaries fall within the scope of the NN-EXPLORE Program, provided that the relevance of the proposed work to the exoplanet-research focus of the Program is clearly established.

# How to propose?



ExoPlanet Exploration Program

<https://time-allocation.noirlab.edu/#/>

**Select NN-EXPLORE TAC**

**Feb – July 2024**

**Deadline Oct 2nd, 2023**

- NN-EXPLORE reserves time for exoplanet research in the following facilities:
  - All instruments at WIYN (~40 nights). Exoplanet Instruments: NESSI and NEID.
    - If your NEID observations are executed we will provide you with a small stipend, enough for some travel and publication charges.
  - SMARTS/CHIRON RV spectrometer at the 1.5m in CTIO (30 nights)
  - MINERVA-Australis at Mt. Kent, Australia (30 nights)
- NN-EXPLORE maintains ‘Alopeke in Gemini North, and Zorro in Gemini South
  - No NN-EXPLORE time
  - Apply via the NOIRLab general call
  - Contact the instrument PI Steve Howell

# Agenda



Title	Speaker	Duration
The NN-EXPLORE Program	David Ardila (JPL)	10 min
The High-Resolution Imaging Program	David Ciardi (NExSci)	10 min
The NEID spectrometer	Sarah Logsdon (NOIRLab)	10 min
The SMARTS/CHIRON spectrometer	Wei-Chun Jao (GSU)	10 min
The MINERVA-Australis spectrometer	Rob Wittenmyer (USQ Aus)	10 min
Additional Discussion	All	10 min

Raise your hand if you want to talk or ask questions in the chat