MINERVA Australis

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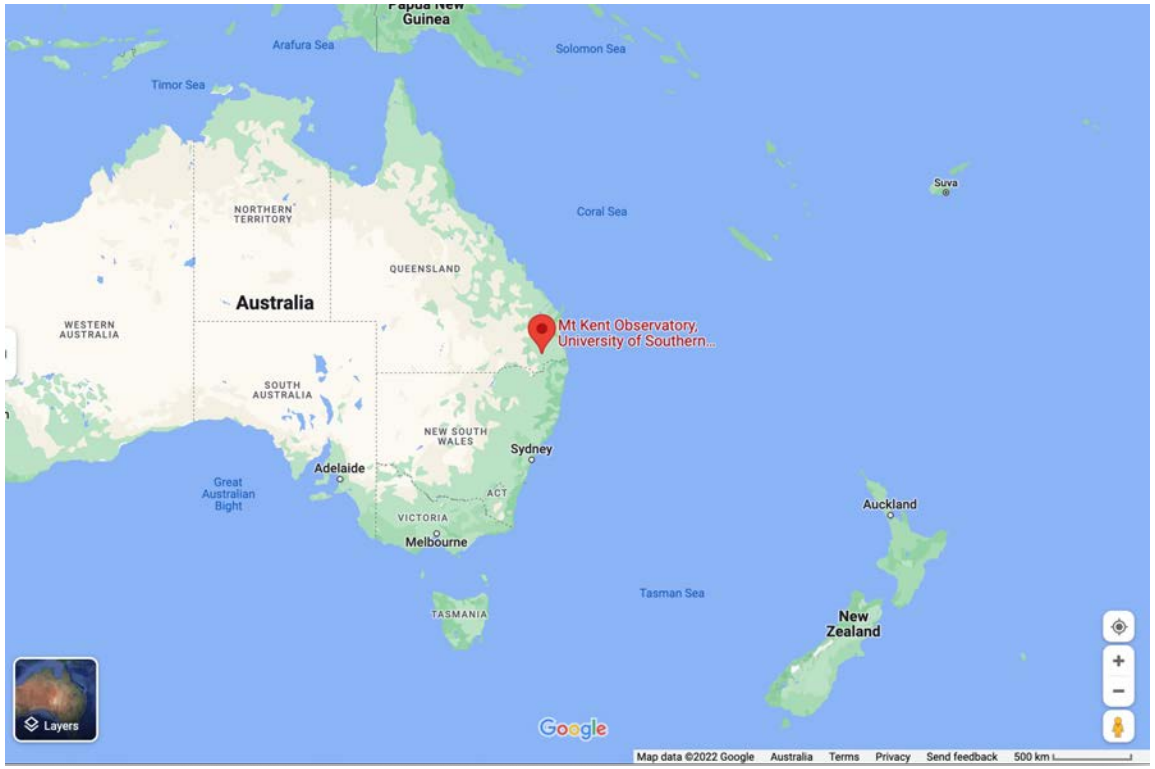
MINERVA Australis Mt Kent Observatory

- Located in South-East Queensland, Australia
- 151° E Lon. -28° Lat.
- Best weather May-Oct
- Current proposals due Sept 30 for period Feb – July



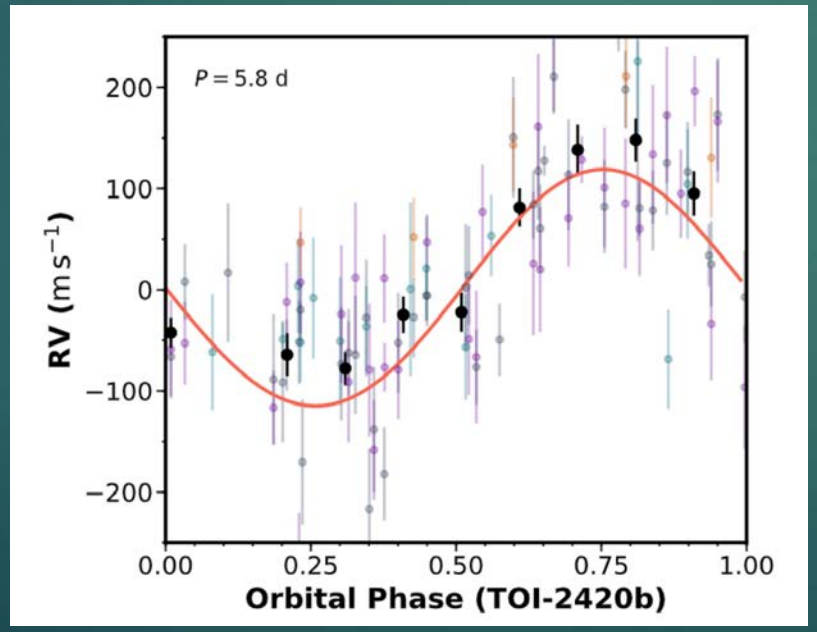
Minerva Australis Spectroscopy

- Fully robotic array of four 0.7m Planewave CDK700 telescopes
- High resolution R>80000, 484 – 627nm
- V<11.5
- Wavelength calibration is a simultaneous white-light back-lit iodine cell (separate fibre, not starlight-through system)
- Short period precision (<20d) on bright RV target <3m/s
  - e.g. tau Ceti 300s exposure
- Typical precision on a fainter or higher Vsini star can be <10m/s
- Limits: tracking efficiency decreases >85 degrees altitude

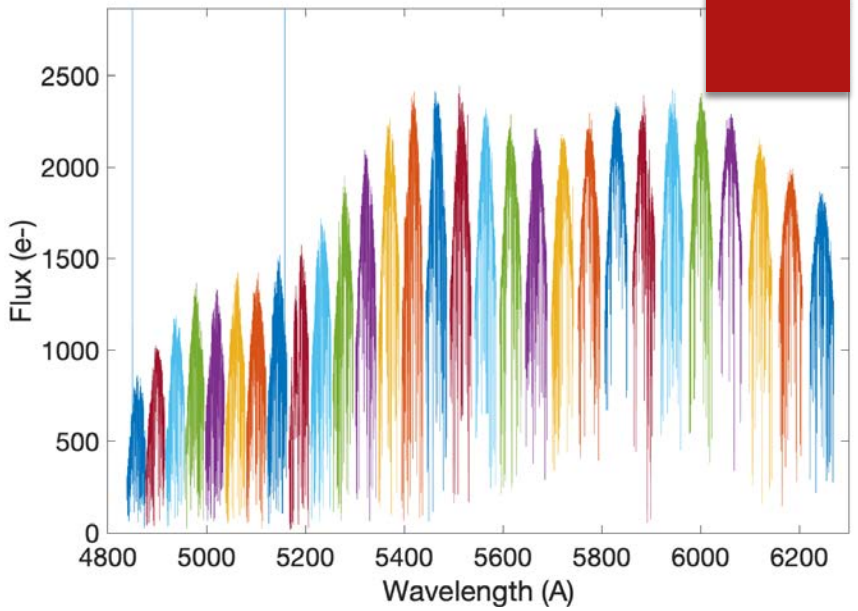
Minerva Australis Spectroscopy

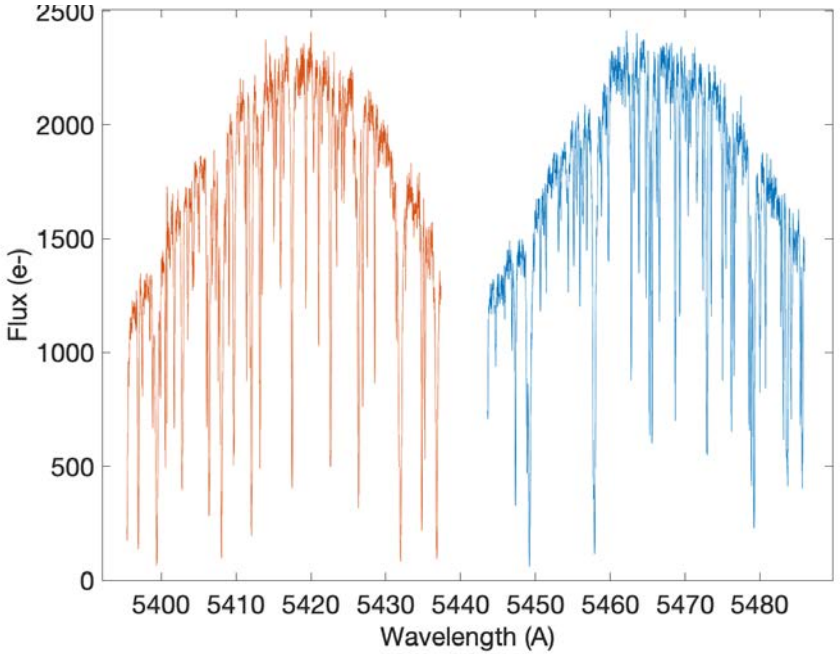
- Data is automatically reduced and RV's obtained every few days
- Each telescope provides an independent spectrum

TOI2420
Teff=5700K
V = 11.57
60min exposures
Vsini < 5km/s



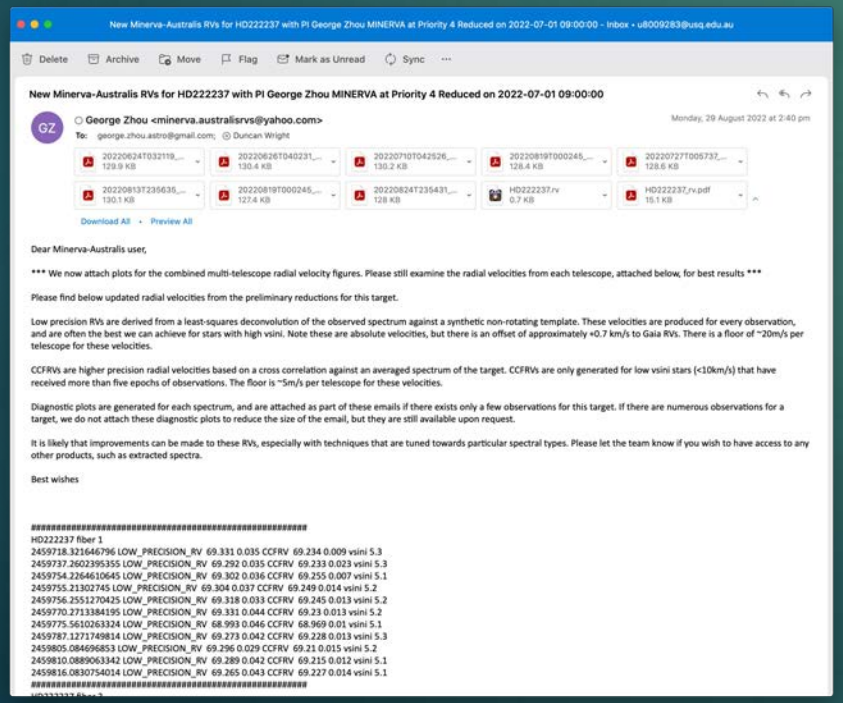
TOI2474 Teff=5000K V = 8.7
30min exposure Vsini < 5km/s





Minerva Australis Spectroscopy

- As your data is reduced you will receive an automated email
- Most TESS targets are V>8 and $V_{rot} \sin i > 5$ km/s



New Minerva-Australis RVs for HD222237 with PI George Zhou MINERVA at Priority 4 Reduced on 2022-07-01 09:00:00 - Inbox - u8009283@usq.edu.au

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New Minerva-Australis RVs for HD222237 with PI George Zhou MINERVA at Priority 4 Reduced on 2022-07-01 09:00:00

GZ George Zhou <minerva.australisrvs@yahoo.com>
To: george.zhou.astro@gmail.com; Duncan Wright
Monday, 29 August 2022 at 2:40 pm

20220624T032119_... 129.9 KB | 20220626T040231_... 130.4 KB | 20220710T042526_... 130.2 KB | 20220819T000245_... 128.4 KB | 20220727T005737_... 128.6 KB
20220813T235636_... 130.1 KB | 20220819T000245_... 127.4 KB | 20220824T235431_... 128 KB | HD222237.rv 0.7 KB | HD222237_rv.pdf 15.1 KB
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Dear Minerva-Australis user,

*** We now attach plots for the combined multi-telescope radial velocity figures. Please still examine the radial velocities from each telescope, attached below, for best results ***

Please find below updated radial velocities from the preliminary reductions for this target.

Low precision RVs are derived from a least-squares deconvolution of the observed spectrum against a synthetic non-rotating template. These velocities are produced for every observation, and are often the best we can achieve for stars with high vsini. Note these are absolute velocities, but there is an offset of approximately +0.7 km/s to Gaia RVs. There is a floor of ~20m/s per telescope for these velocities.

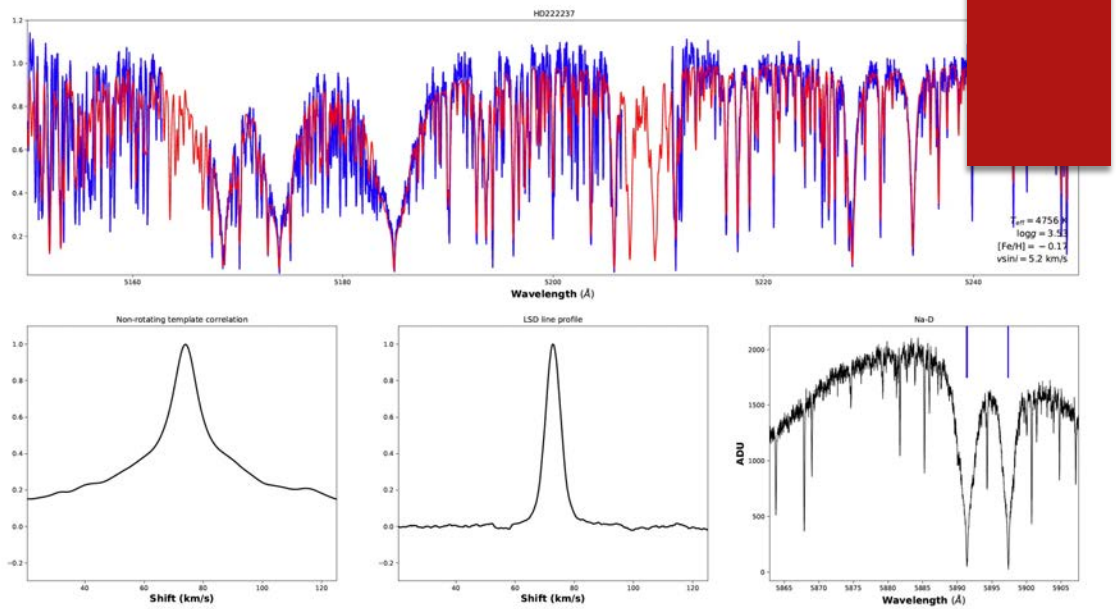
CCFRVs are higher precision radial velocities based on a cross correlation against an averaged spectrum of the target. CCFRVs are only generated for low vsini stars (<10km/s) that have received more than five epochs of observations. The floor is ~5m/s per telescope for these velocities.

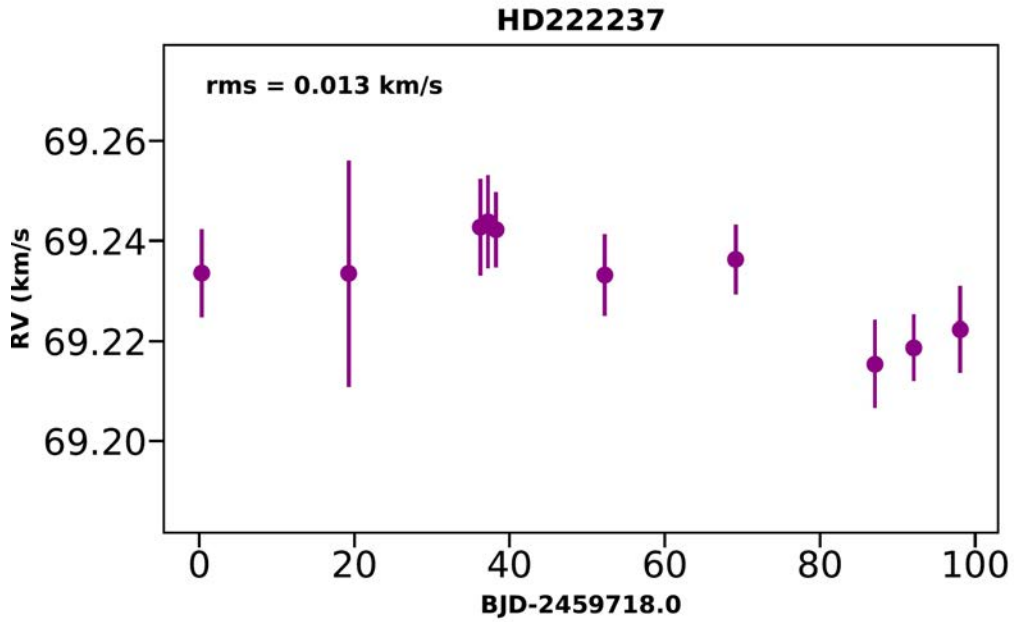
Diagnostic plots are generated for each spectrum, and are attached as part of these emails if there exists only a few observations for this target. If there are numerous observations for a target, we do not attach these diagnostic plots to reduce the size of the email, but they are still available upon request.

It is likely that improvements can be made to these RVs, especially with techniques that are tuned towards particular spectral types. Please let the team know if you wish to have access to any other products, such as extracted spectra.

Best wishes

##########
HD222237 fiber 1
2459718.321646796 LOW_PRECISION_RV 69.331 0.035 CCFRV 69.234 0.009 vsini 5.3
2459737.2602395355 LOW_PRECISION_RV 69.292 0.035 CCFRV 69.233 0.023 vsini 5.3
2459754.2264610645 LOW_PRECISION_RV 69.302 0.036 CCFRV 69.255 0.007 vsini 5.1
2459755.21302745 LOW_PRECISION_RV 69.304 0.037 CCFRV 69.249 0.014 vsini 5.2
2459756.2551270425 LOW_PRECISION_RV 69.318 0.033 CCFRV 69.245 0.013 vsini 5.2
2459770.2713384195 LOW_PRECISION_RV 69.331 0.044 CCFRV 69.23 0.013 vsini 5.2
2459775.5610263324 LOW_PRECISION_RV 68.993 0.046 CCFRV 68.969 0.01 vsini 5.1
2459787.1271749814 LOW_PRECISION_RV 69.273 0.042 CCFRV 69.228 0.013 vsini 5.3
2459805.084696853 LOW_PRECISION_RV 69.296 0.029 CCFRV 69.21 0.015 vsini 5.2
2459810.0889063342 LOW_PRECISION_RV 69.289 0.042 CCFRV 69.215 0.012 vsini 5.1
2459816.0830754014 LOW_PRECISION_RV 69.265 0.043 CCFRV 69.227 0.014 vsini 5.1
##########

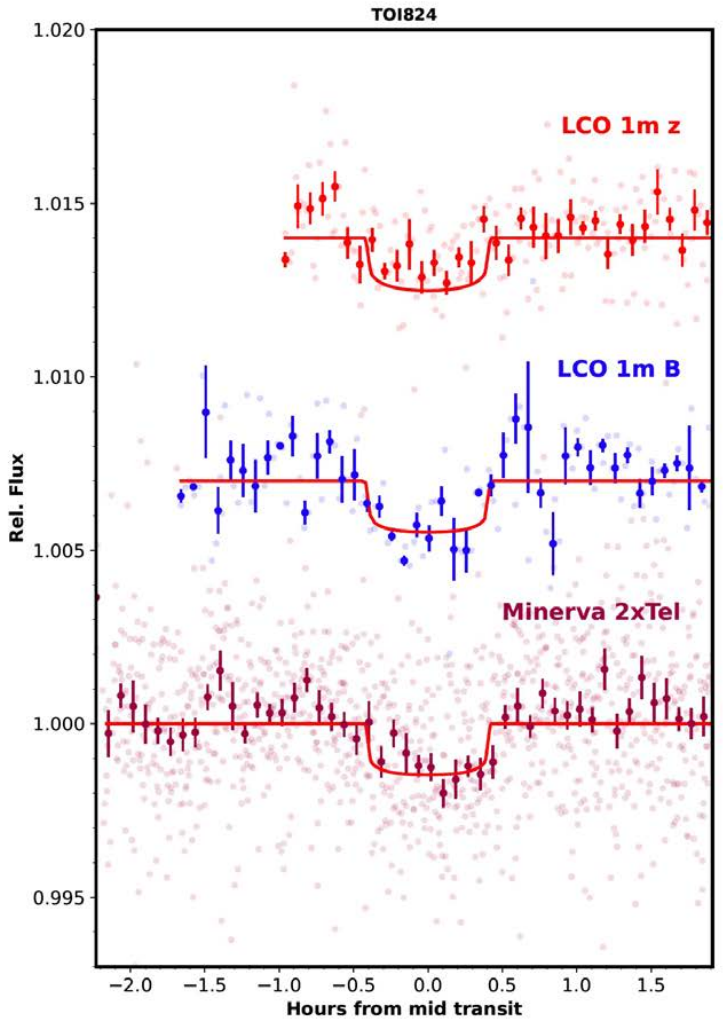




Minerva Australis Photometry

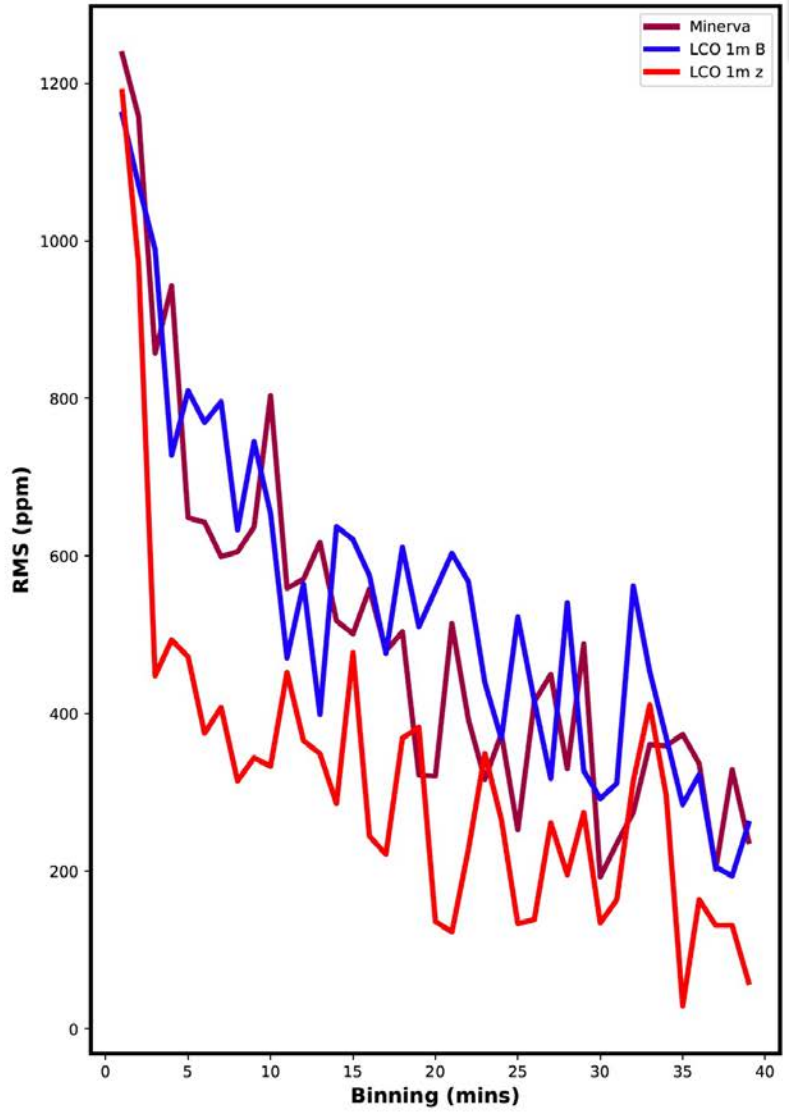
- Fully robotic array of four 0.7m Planewave CDK700 Alt-Az telescopes
- Multicolour photometry available (ugriz, UVBRI, exoplanet-BB)
- Current best photometric precision is obtained using no filter
- We are using Alt-Az telescopes at Nasmyth focus with a derotator-focuser
- Guiding includes RA, Dec and rotation correction using science images

TOI824b transit
Depth 1.49ppt



Minerva Australis Photometry

- Within a day or two of your data being taken we will reduce it and send you a summary email
- Different telescopes can observe different targets simultaneously
- Multiple filters, exposure times, telescope defocusing, other requests



Minerva Australis
NN-Explore Proposals

- 300 Hours of NN-Explore time per seemster
- Proposals for 2023A (Aug 1 2023 – Jan 31 2024)
- Due 11:59pm MST on 31 March 2023
- See https://nexsci.caltech.edu/missions/Minerva/ for the details
- Proposals should be submitted using the standard NSF NOIR Lab Observing Proposal Dashboard
- https://time-allocation.noirlab.edu/#/proposal/create/
- Select "NASA Exoplanet TAC" as the proposal type
- Select "MINERVA-A: MINERVA" in the telescope configuration
- Questions: contact Duncan.Wright@usq.edu.au or Rob.Wittenmyer@usq.edu.au