MINERVA-Australis is measuring the masses and orbital obliquities of planets discovered by TESS.

Introduction

MINERVA-Australis is the only southern hemisphere facility fully dedicated to the radial velocity (RV) follow-up of TESS candidate planets orbiting bright (V ≤ 10) stars [1]. It is an array of five 0.7m telescopes located at the University of Southern Queensland’s Mt Kent Observatory in Australia. Each telescope feeds light through a fiber to a high-resolution (R ~ 80,000) spectrograph. MINERVA-Australis is delivering RV precision of better than 3 m/s and improvements to the spectrograph’s thermal stability are expected to result in ~1 m/s precision in the near future.

Objectives

MINERVA-Australis primary objectives are:
1. Confirm TESS planet candidates. Only 21 out of 842 planet candidates have been confirmed [2].
2. Measure their masses & eccentricities. In particular for sub-Jovians, warm-Jupiters, & multi-planet systems.
3. Determine planet bulk compositions from MINERVA- Australis mass measurements & radii from TESS. This will distinguish compositions of sub-Neptunes.
5. Search for long-period planets (such as Jupiter & Saturn analogs) by long-term RV monitoring of TESS targets to establish the frequency of Solar System analogs [6].

Results & Conclusions

MINERVA-Australis is perfectly suited for RV follow-up of TESS planet candidates. This facility has already helped to confirm three TESS planetary systems around HD 1397, DS Tuc, & HR 858 [7,8,9]. We are actively following-up several dozen candidate planets to confirm their planetary nature, and to measure their masses and orbital obliquities.

References
