

French Pro/Am collaborations in exoplanet

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Abstract

Amateur astronomers have access to huge telescope time and can reach photometric precision up to a few mmag as well as radial velocity precision up to $\sim 50 \text{ m.s}^{-1}$ on brightest stars. We will first present some results of french amateur astronomers in transit photometry and radial velocity and then, we will present an over-view of all the collaborations which can be done between professional and amateur astronomers in the competitive exoplanet domain, and especially the current collaboration between french Pro & Am astronomers which was used in publication in A&A. Finally, we will present a new internet wiki page which goal is to develop such collaboration in different countries.

1. Introduction

More than one hundred of transiting exoplanet have been discovered since 2000 [4] mainly using small aperture ground-based telescopes, e.g. TrES [1], XO [5], SuperWASP [3] or HATNet [2]. Many amateur astronomers have small-aperture telescope with a lot of telescope time and could contribute significantly to transiting exoplanet studies.

2. Photometry

Transiting exoplanet characterization, e.g. Rossiter-McLaughlin measurement or IR photometry of the primary or secondary transit require to have precise ephemeris of the system. To keep precise ephemeris

up-to-date, it is very important to continuously observe planetary transit. Following them is also very important to look for transit time variation. We will present some results of photometric observations performed by amateur astronomers [6] (for example Fig. 1).

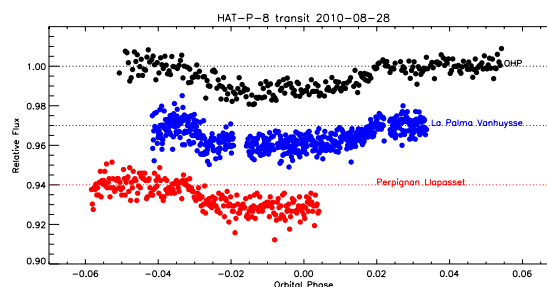


Figure 1: Light curve of the transiting planet HAT-P-8 observed simultaneously with the OHP-1.2m telescope and by two amateurs.

3. Spectroscopy

Using a eShel spectrograph (SHELYAK INSTRUMENT), it is possible to perform high-accuracy radial velocity (RV) measurements with an amateur telescope on bright solar-type stars. We will present the first results of some french amateur astronomers who detected the RV variations of 4 extrasolar planets (e.g. Fig. 2), including 51 Peg b.

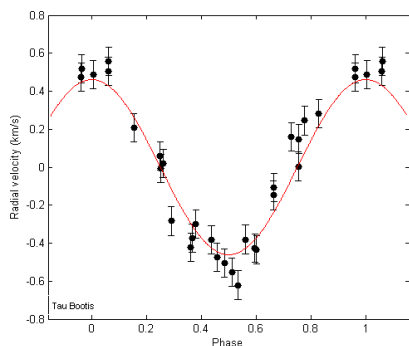


Figure 2: phase-folded RV curve of the extrasolar planet τ Boo b observed with a eShel spectrograph and a 11-inch telescope.

4. Current and future collaborations

Amateur and professional astronomers can collaborate to find, follow and study extrasolar planets. We will present an overview of current collaborations between amateur and professional using high-accuracy photometry with small-aperture telescope. We will also discuss the possible future collaborations, for example in the context of the PLATO space mission.

5 Wiki Pro/Am: a tool for Pro/Am collaboration

With the french association AUDE which main objective is to help amateur / professional collaboration in astronomy, we are going to develop a public international wiki page¹ to help amateurs who want to do scientific observation. This collaborative wiki page will contain tutorials, first targets to observe as well as objects of interest which need observation. We will briefly present and describe the goals of this wiki page.

References

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¹<http://astro-proam.com/> - development on going

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