



RoPACS Annual Network Meeting

LAEX-CAB Team:

Early Stage Researcher (ESR)

Patricia Cruz Gamba

(starting date: Nov. 1st 2009)

Project Supervisor

David Barrado y Navascués

IAC, Tenerife, November 2009

→ *Bachelor of Science: Physics*

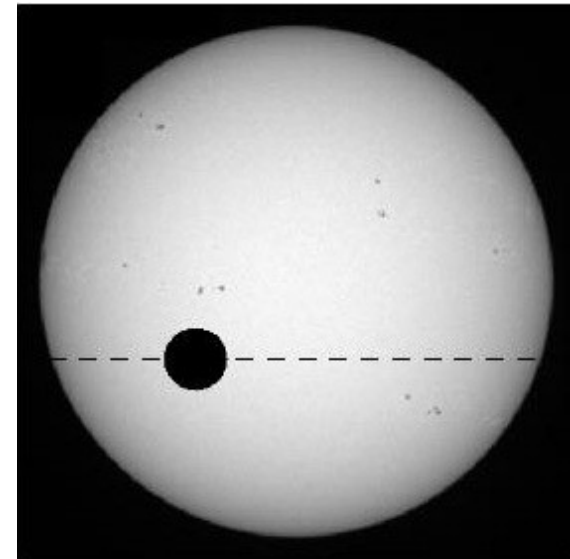
- Degree granted: January 2005
- Institution: Mackenzie University – Sao Paulo, Brazil
- Title: **“TRANSITS OF EXTRA-SOLAR PLANETS”**
- Advisor: Dr. Adriana Valio Roque da Silva

→ *Master of Science: Astrophysics*

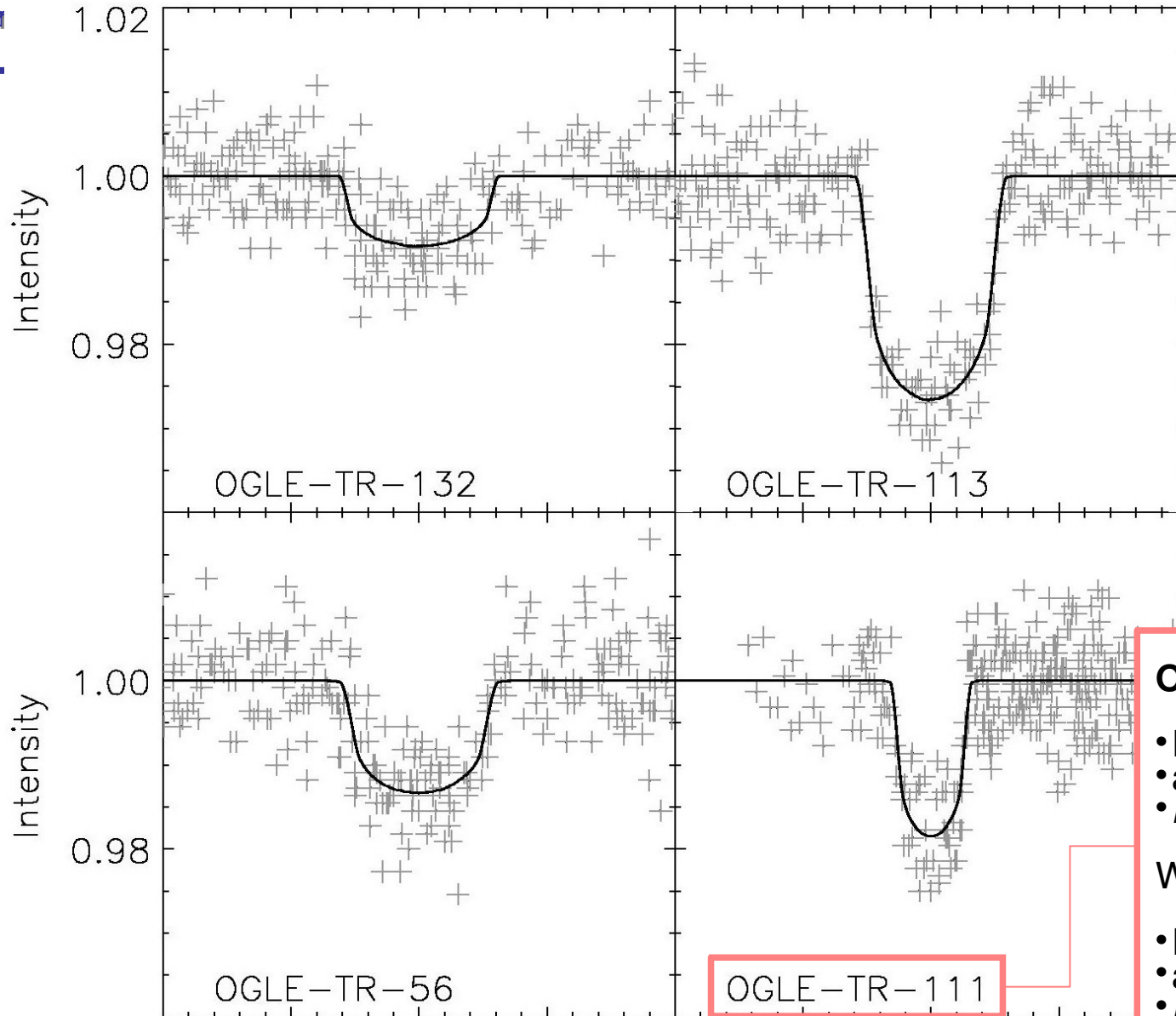
- Degree granted: August 2008
- Institution: University of Sao Paulo – Sao Paulo, Brazil
- Title: **“SPECTROSCOPY OF CENTRAL STARS OF PLANETARY SYSTEMS: DETERMINATION OF PHYSICAL PARAMETERS”**
- Advisor: Dr. Eduardo Janot Pacheco

Transits of Extra-Solar Planets

- 177 observed transits of the OGLE project (Udalski et al., 2002, 2003, 2004).
- Computational program simulates a planetary transit to find R_p/R_s , a_{orb}/R_s and i .
- Model: a dark disk passing through a white light image of the Sun.
- Search in parameter space for the best fit (minimum χ^2) of the light-curve.
- Method tested on 7 known planetary transits.
- Results: 28 proposed planetary candidates for spectroscopic follow up.



“Search for Planetary Candidates within the OGLE Stars”,
Silva, A.V.R.; **Cruz, P. C.** - ApJ, 642, 488-494, 2006



Our results:

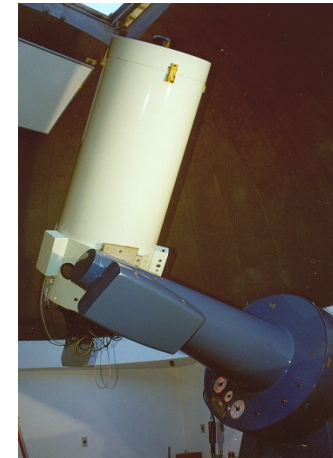
- R_p : 1.16 R_J
- a_{orb} : 0.049 R_s
- i : 88.1 deg

Winn et al. 2007:

- R_p : 1.067 R_J
- a_{orb} : 0.047 R_s
- i : 88.1 deg

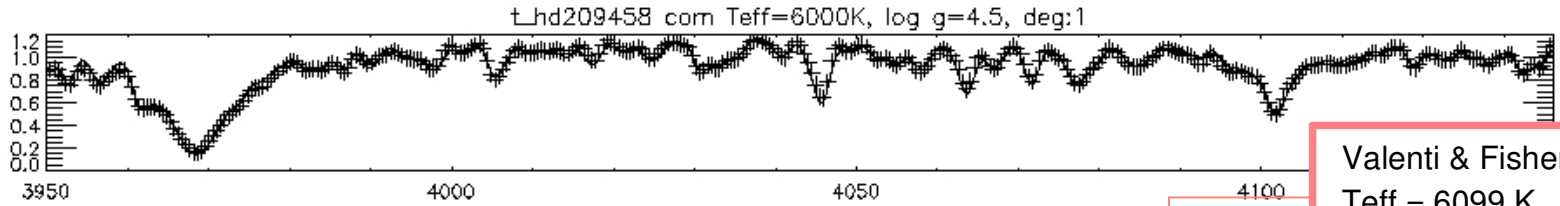
Spectroscopy of Central Stars of Planetary Systems: Determination of Physical Parameters

- 17 standard stars + 89 host-stars observed at $\lambda_c = 4400 \text{ \AA}$ (coverage of $\sim 950 \text{ \AA}$).
- $d\lambda/dx = \sim 0.5 \text{ \AA/pix}$ | $R \approx 2800$.
- Method based on a comparison to synthetic spectra to obtain T_{eff} and $\log g$.
- Library of Coelho et al., 2005:
 - T_{eff} : 3500-7000 K (steps of 250 K),
 - $\log g$: 0.5-5.0 dex (steps of 0.5 dex).
- Computational program provided the best fit between observational and synthetic spectra, assuming solar metallicity.
- Results: 87% in agreement with the literature.

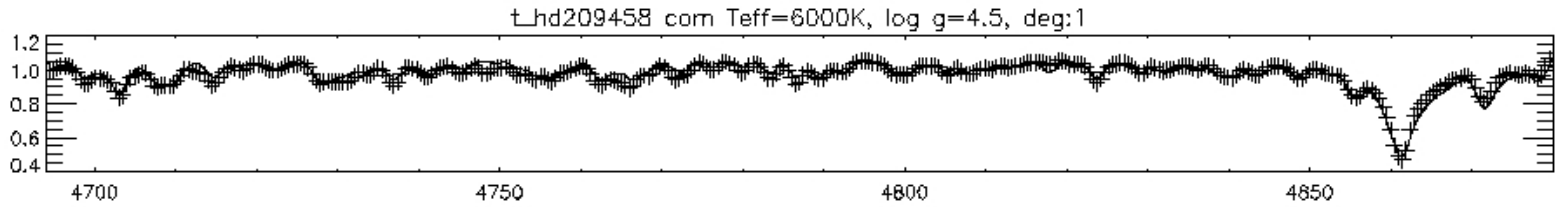
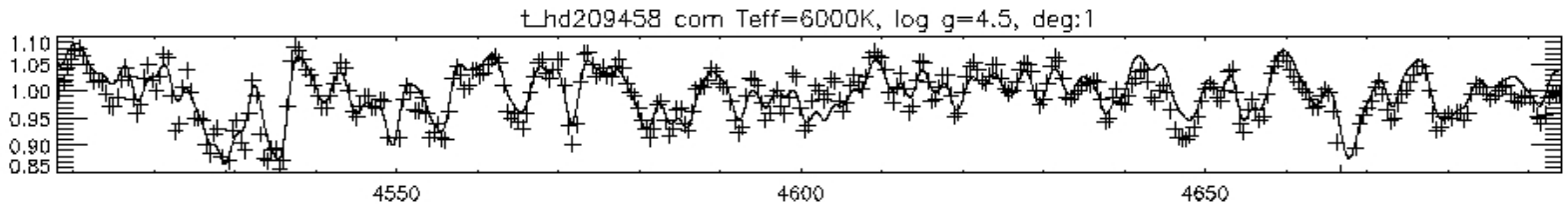
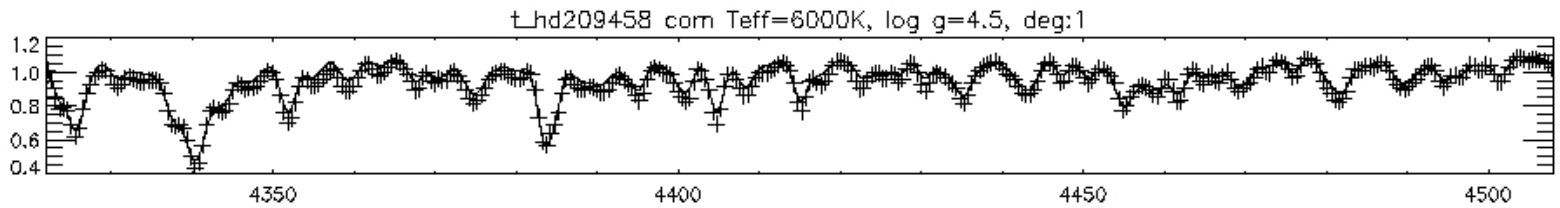
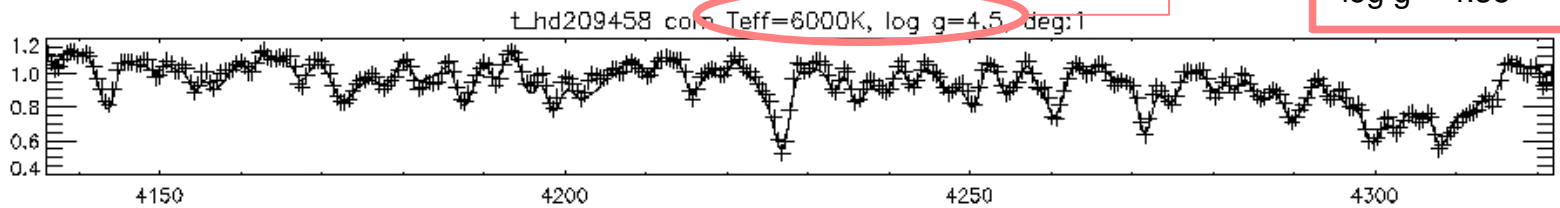


60 cm telescope with a Cassegrain spectrograph grating of 1200 l/mm

“Determination of Fundamental Parameters of Planet-Host Stars”,
Cruz-Gamba, P.; Janot-Pacheco, E. - *in preparation*



Valenti & Fisher, 2005:
Teff = 6099 K
log g = 4.38



LAEX-CAB PhD Project

- (0) Characterization of the host star via low-resolution spectroscopy (Calar Alto proposal submitted in september)
- (i) **Characterize primary and secondary minima during transits by using photometric techniques in the near- and mid-infrared.**
- (ii) build up to establishing a JWST transit follow-up programme.

The new GTC telescope will be used for ground-based measurements, LAEX-CAB group is part of the CanariCam Science Team, a mid-infrared first light instrument on the GTC. CanariCam is being commissioned at the GTC and will be available or semester 2010a. The transit characterization will be complemented with near-IR analysis (WHT/LIRIS).

In addition, the launch of the JWST (near the end of the network) is of great importance to the field of extra-solar planets, and transiting planets (from WTS and elsewhere) will be highly compelling targets for this future facility. The LAEX-CAB is part of the JWST Mid Infrared Instrument (MIRI) science group.

Thank you!