ORO

Observatorio Robótico Optico del IAFE

Andrea
Buccino

ORO

El ORO es el Observatorio Robótico Óptico del IAFE.

Actualmente cuenta con una sede en San Juan donde posee 4 telescopios “pequeños” con los que se puede realizar fotometría de alta precisión.

ORO

- **Telescopio Horacio Ghielmetti (**

MEADE RCX-400 16'' f/8, modelo Ritchey Chretien modificado.

Montura Ecuatorial de Horquilla, automatizad

Sitio CASLEO-Co. Burek desde 2009
(actualmente en reparación)

ORO

- **Telescopio MATE (Magnetic Activity and Transiting Exoplanets)**

MEADE LX 200 16” f/10, modelo Ritchey Chretien modificado

Montura Ecuatorial de Horquilla, automatizada

Adquirido con PICT 2008-0734

Sitio OAFA desde 2012

ORO

- **Telescopio IAFE1-YESSY**

MEADE LX 600 16” f/8, modelo Ritchey Chretienmodificado
Sistema autoguíado Starlock incluido
Montura Ecuatorial de Horquilla, automatizada
Microenfocador Zero
Image Shift Electronic
Adquirido con PICTE 2014-0132
Sitio OAFA desde 2018

ORO

- **Telescopio IAFE2-BRAIAN**

MEADE LX 600 16” f/8, modelo Ritchey Chretien modificado
Sistema autoguíado Starlock incluido
Montura Ecuatorial de Horquilla, automatizada
Microenfocador Zero
Image Shift Electronic
Adquirido con PICTE 2014-0132
Sitio OAFA desde 2018

ORO

BRAIAN+ U8300

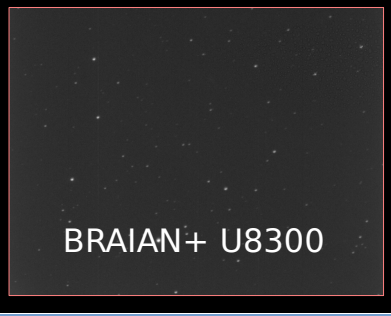
MATE+SBIG

THG+U16 M

Cámara	CCD	Tamaño del px	Escala	FoV
Apogee U16M	4096 x 4096 px	9 μm	0.57”/px	49' x 49'
Apogee U8300	3326 x 2504 px	5.4 μm	0.32”/ px	19' x 14'
SBIG STL-11000	4008 x 2745 px	9 μm	0.47”/px*	31' x 21'*
Moravian G3-16200 MarkII	4500 x 3600 px	6 μm	En proceso de compra PICT 2013-1768	

* Con Telescopio MATE (f/10), cambia con THG, BRAIAN o YESSY

ORO



Cámara	CCD	Tama		
Apogee U16M	4096 x 4096 px	9 µm		
Apogee U8300	3326 x 2504 px	5.4 µ		
SBIG STL-11000	4008 x 2745 px	9 µm	0.457”/px*	31' x 21'*
Moravian G3-16200 MarkII	4500 x 3600 px	6 µm	En proceso de compra PICT 2013-1768	

* Con Telescopio MATE (f/10), cambia con THG, BRAIAN o YESSY

Resultados científicos
Proyecto ORO

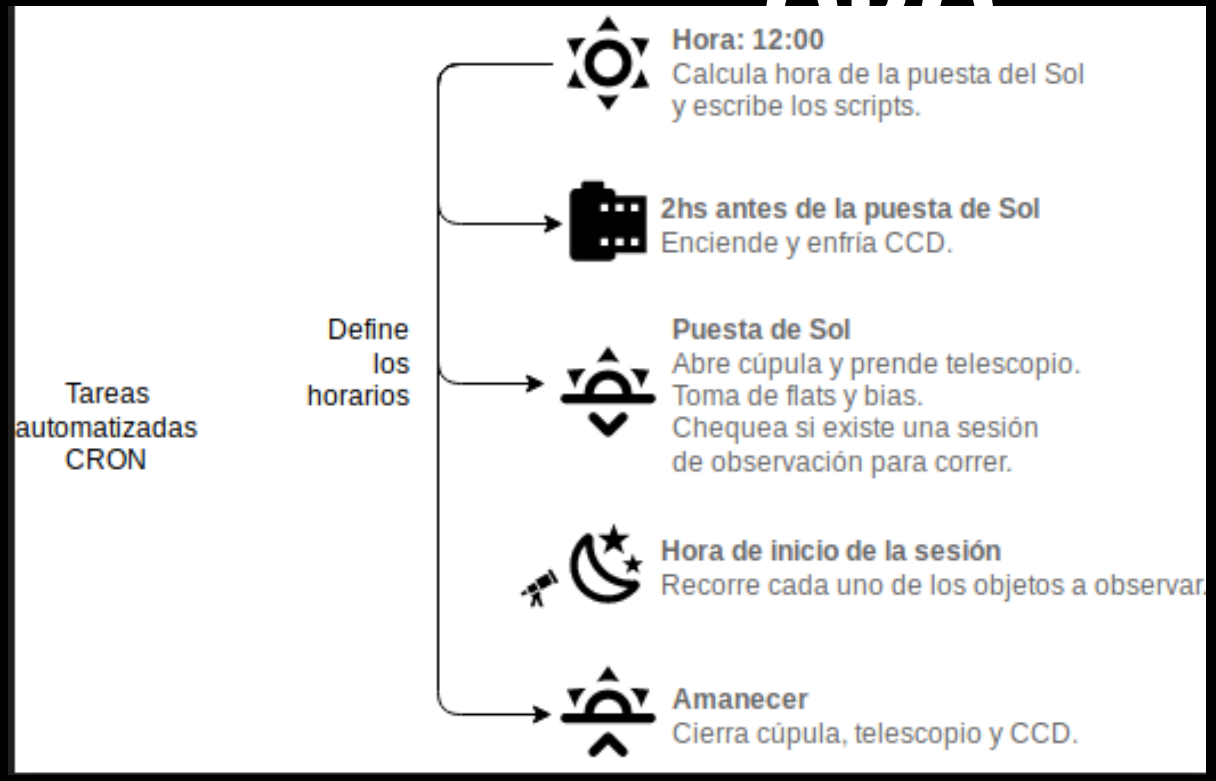
Imágenes
de campo amplio

THG+Apogee Alta U16M
Sin guíado
texp 15 min

THG+Apogee Alta U16M
con guíado
texp 15 min

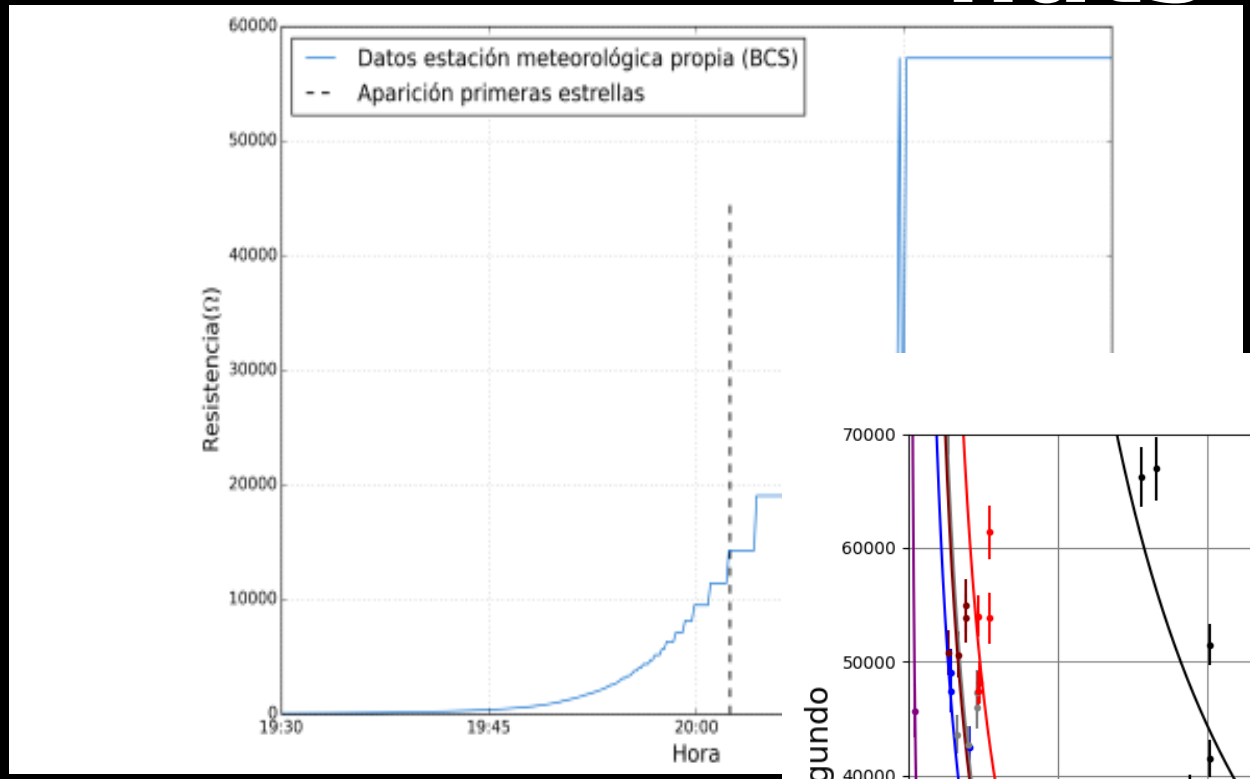
YESSY+Apogee Alta U16M
con Starlock (guíado
incorporado)
texp 20 min

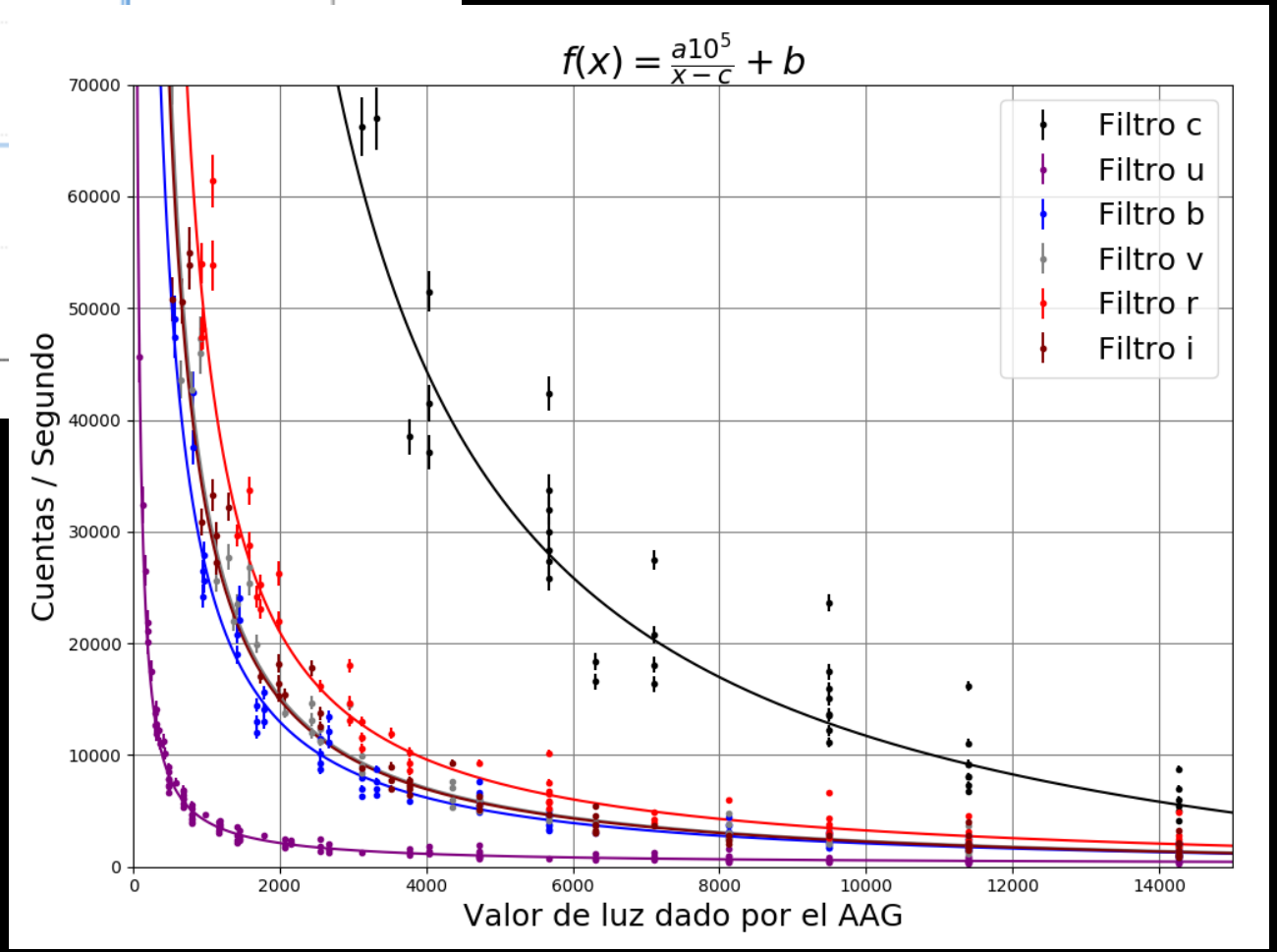
Funcionamiento automático CRON



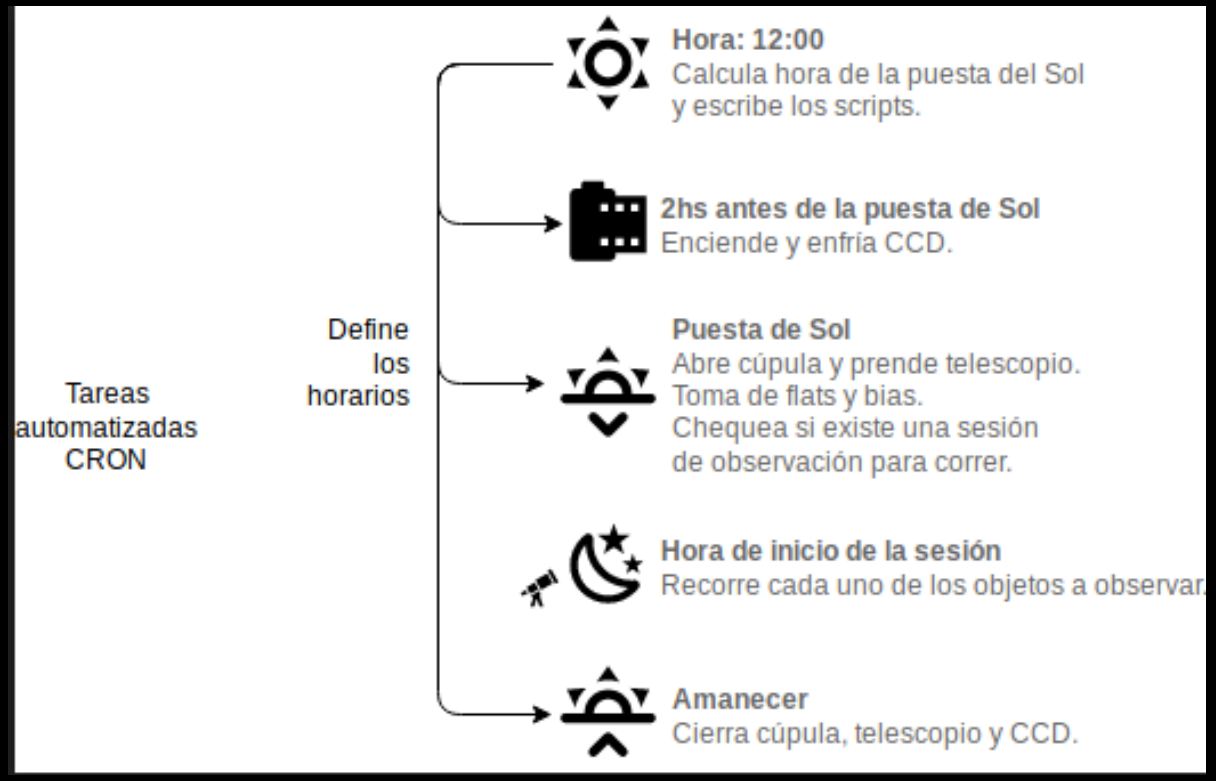
Alertas climáticas o alimentación

Automatización de toma de flats





Funcionamiento ORO



Alertas climáticas o alimentación

Protocolo de observación
ORO

Session

```
openSession

teleSlew  22:04:15.87  -56:43:12.46
setFilter V
sleep 30s
tomaexpo HD209100_V  1 60 1  0
setFilter R


teleSlew 15:33:33   -49:33:40 J2000
sleep 50s

horaActual1=$(date +%j%H%M)
horalim1=1160400
while [ $horaActual1 -le $horalim1 ]
do
   tomaexpo TIC461963757_r  1 20 2 0
   horaActual1=$(date +%j%H%M)
done

closeSession
```

Procesamiento ORO

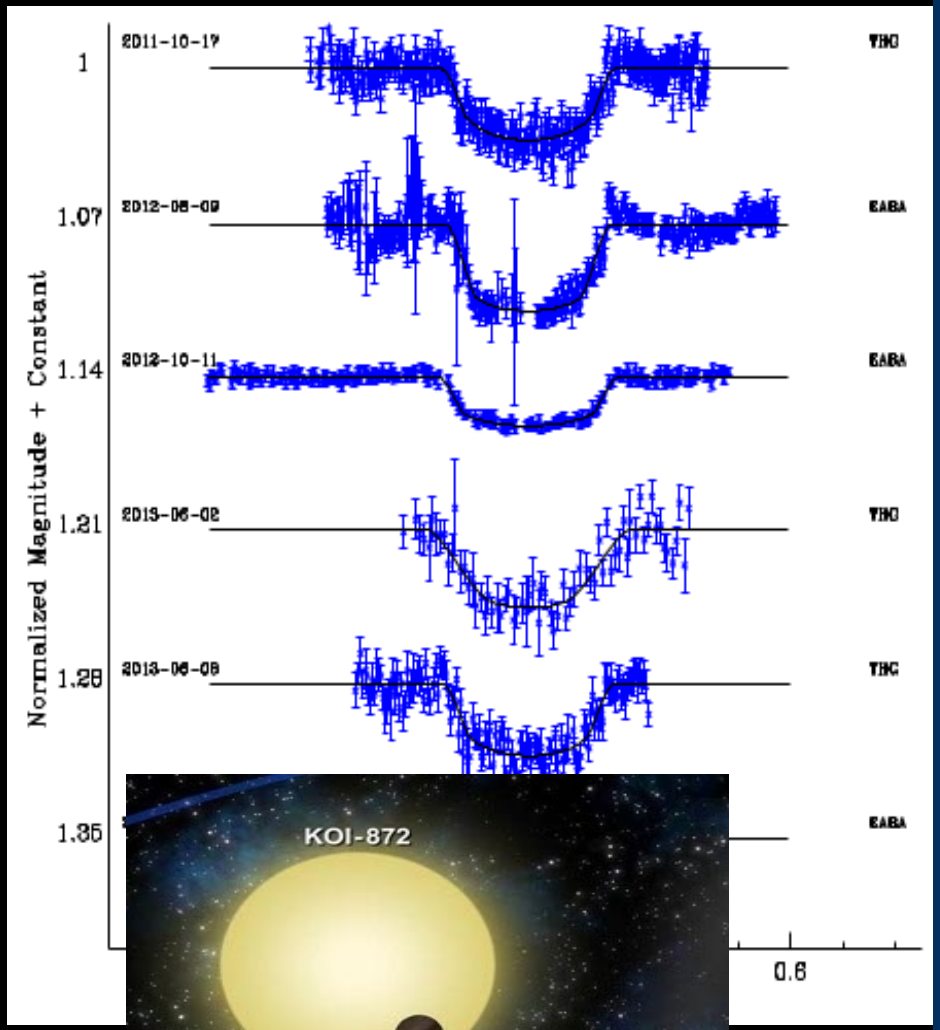
- Fotometría diferencial standard en python (+pyraf).
- Procesamiento cuasiautomático.
- Procesamiento remoto de campos previamente proces

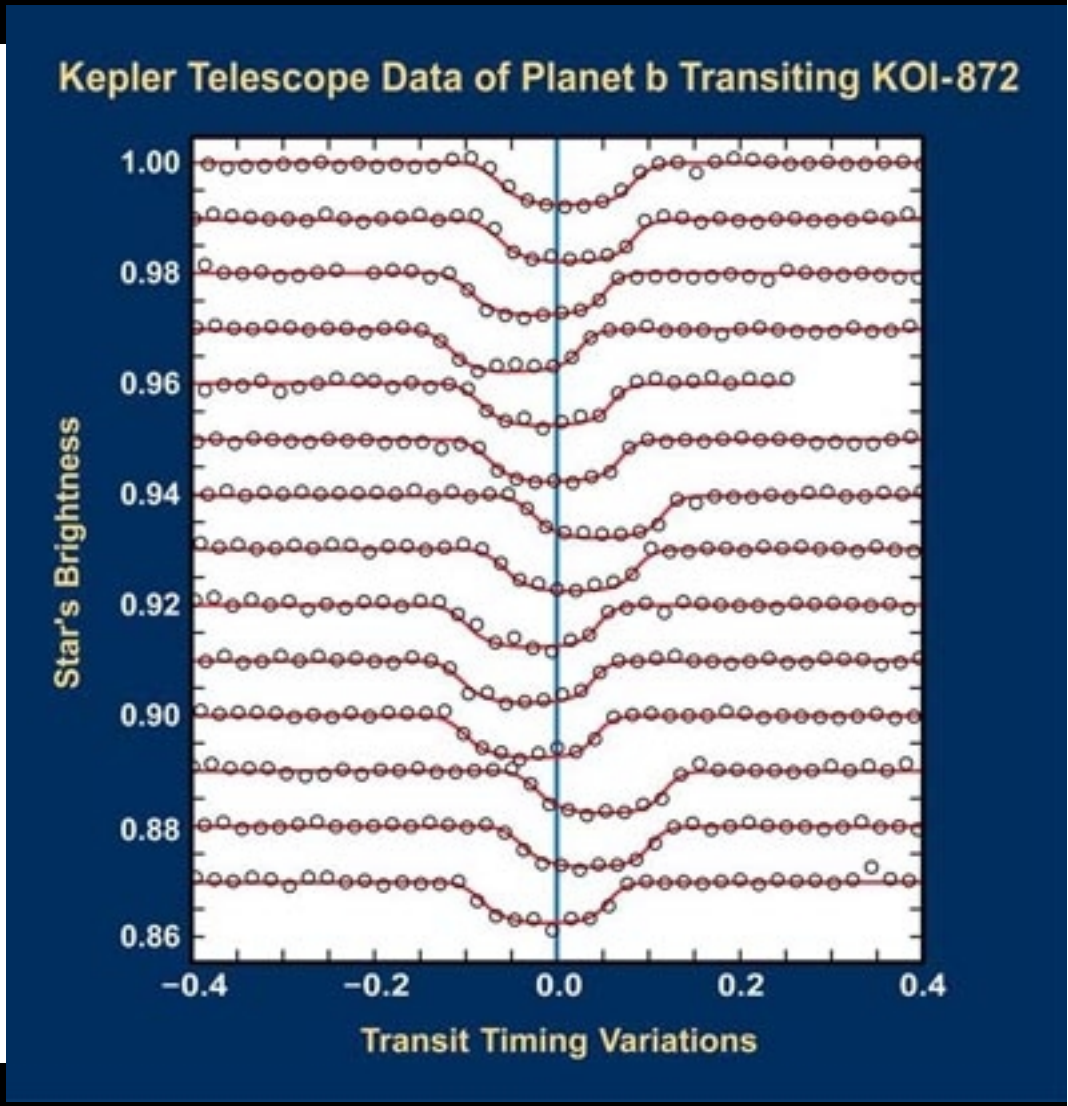
Tamaño de la imagen en bin 2x2 de 4.2 Mb a 8.4 Mb

Total de 400-1200 imágenes por noche
en funcionamiento óptimo

Resultados científicos- ORO

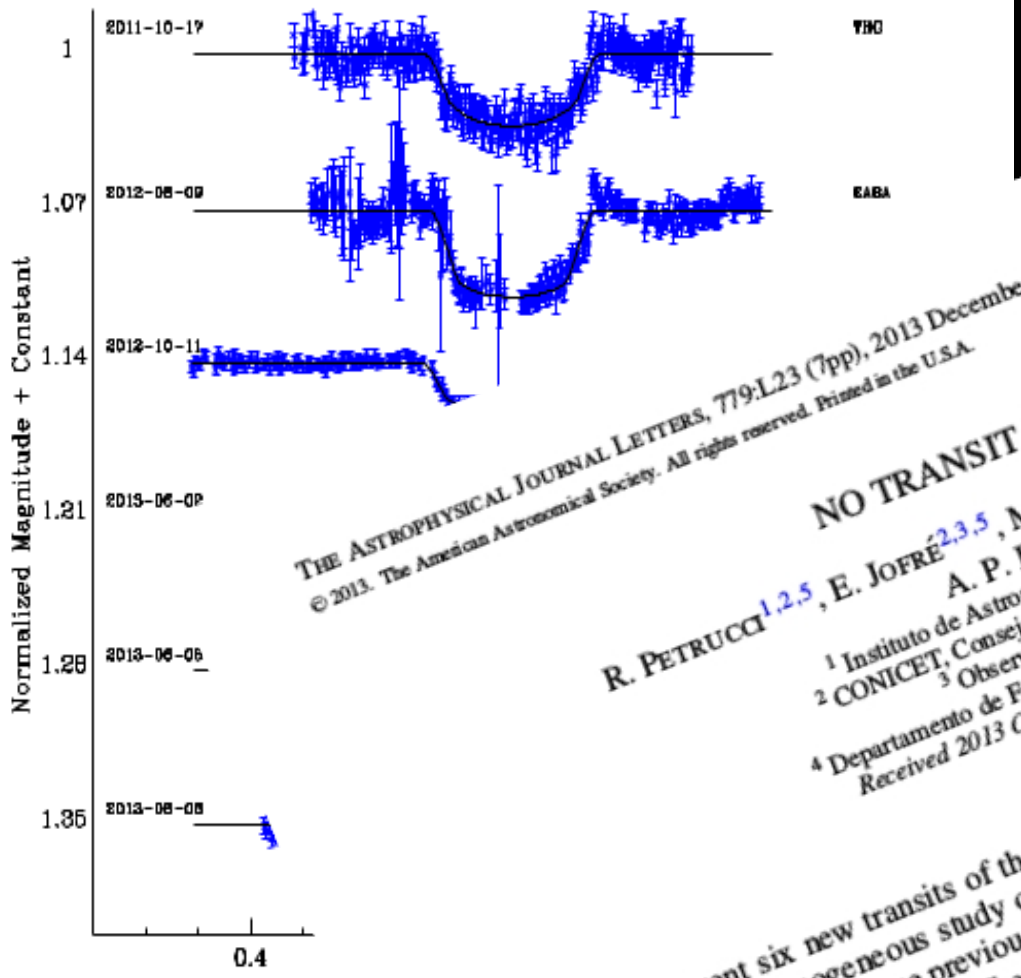
Tránsitos planetarios





Resultados científicos- ORO

Tránsitos planetarios



Transi

doi:10.1088/2041-8205/779/2/L23

The Astrophysical Journal Letters, 779:L23 (7pp), 2013 December 20
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NO TRANSIT TIMING VARIATIONS IN WASP-4

R. Petrucci[1,2,5], E. Jofré[2,3,5], M. Schwartz[1,2], V. Cúneo[2,3], C. Martínez[3], M. Gómez[2,3], A. P. Buccino[1,2,4], and P. J. D. Mauas[1,2]

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Received 2013 October 4; accepted 2013 October 29; published 2013 December 4

ABSTRACT

We present six new transits of the system WASP-4. Together with 28 light curves published in the literature perform a homogeneous study of its parameters and search for variations in the transits' central times. The values agree with those previously reported, except for a slightly lower inclination. We find no significant lon variations in i or R_P/R_*. The $O-C$ mid-transit times do not show signs of transit timing variations grea 54 s.

Key words: planetary systems – stars: individual (WASP-4) – techniques: photometric

Online-only material: color figures

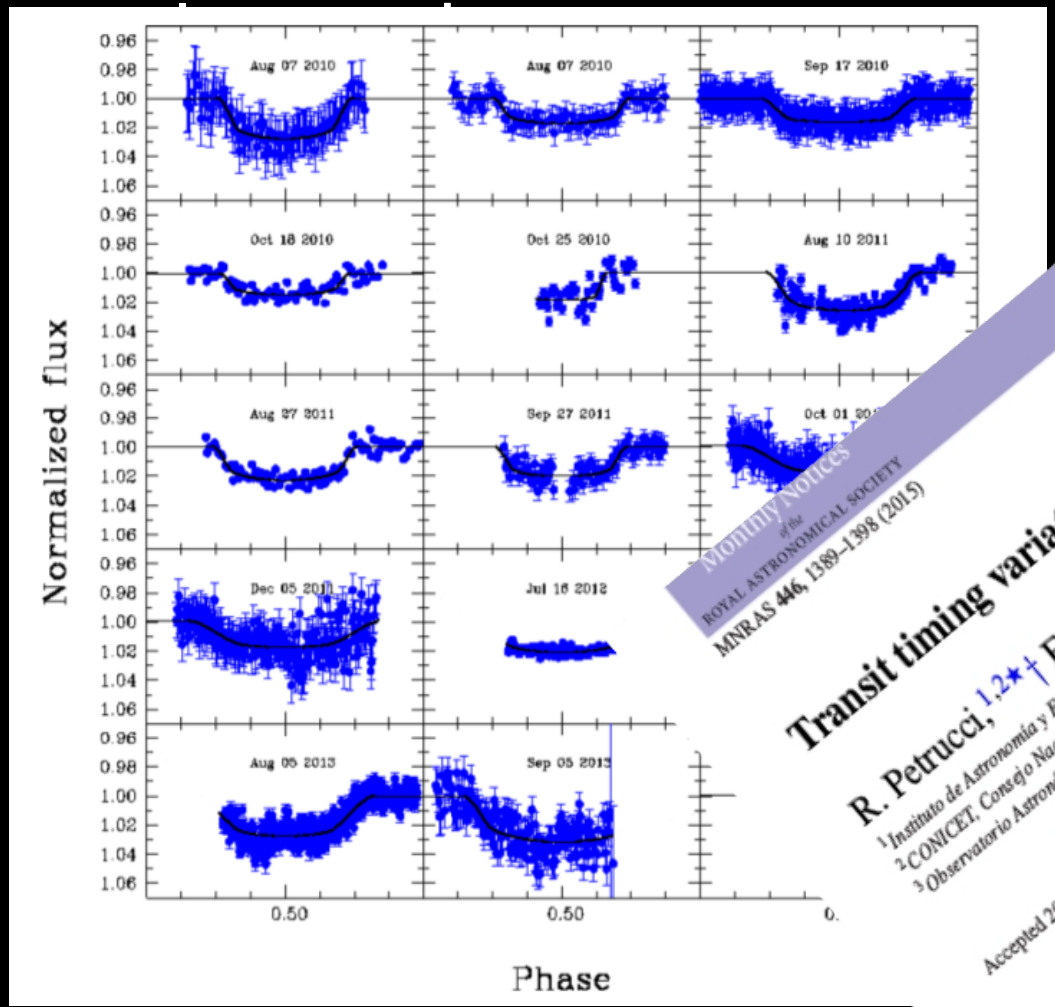
(Petrucci

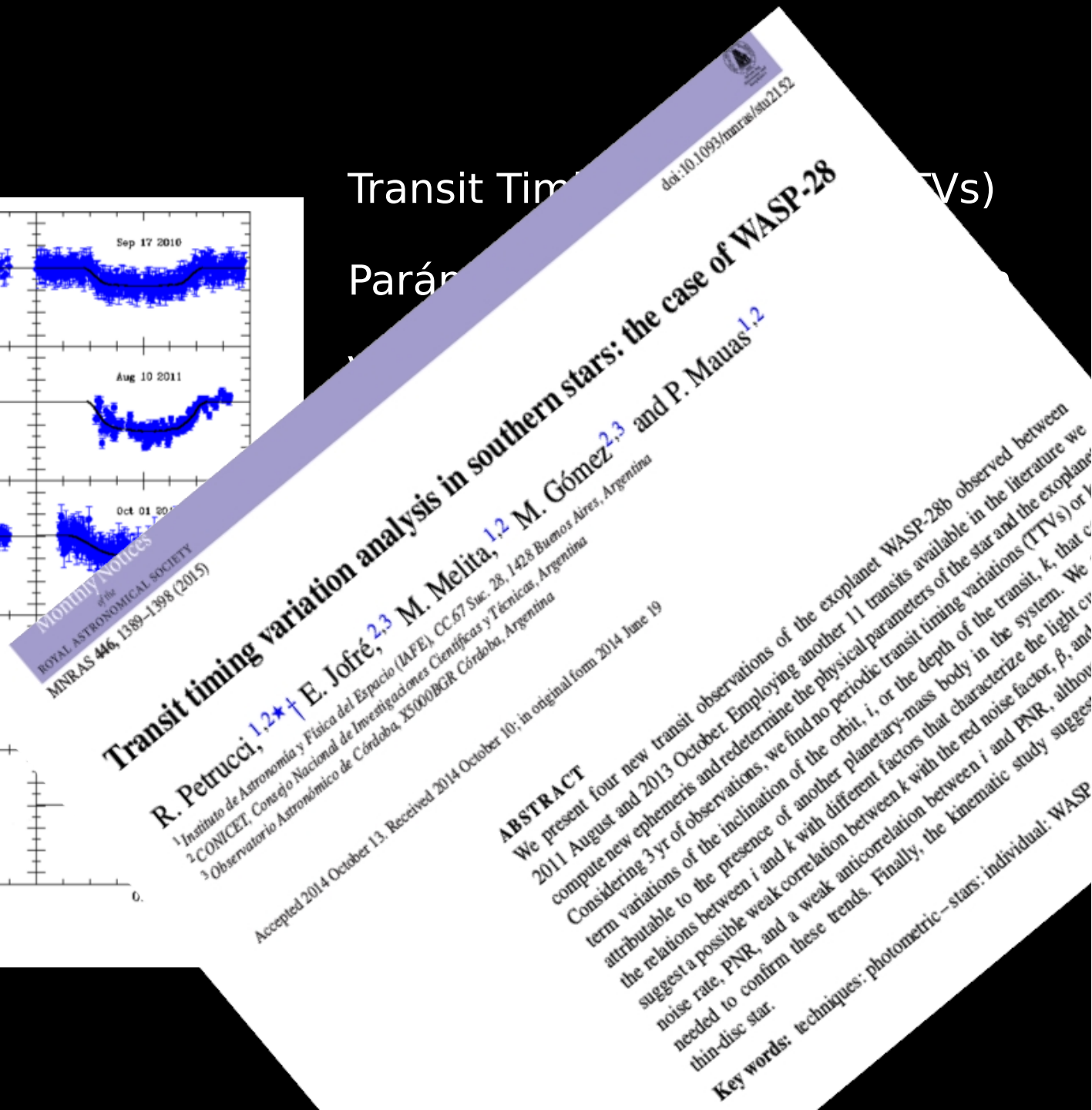
Resultados científicos- ORO

Tránsitos

Transit Tim… …Vs)

Parám…





doi:10.1093/mnras/stu2152

Monthly Notices of the ROYAL ASTRONOMICAL SOCIETY

MNRAS 446, 1389–1398 (2015)

Transit timing variation analysis in southern stars: the case of WASP-28

R. Petrucci,[1,2⋆†] E. Jofré,[2,3] M. Melita,[1,2] M. Gómez[2,3] and P. Mauas[1,2]

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[3] Observatorio Astronómico de Córdoba, X5000BGR Córdoba, Argentina

Accepted 2014 October 13. Received 2014 October 10; in original form 2014 June 19

ABSTRACT

We present four new transit observations of the exoplanet WASP-28b observed between 2011 August and 2013 October. Employing another 11 transits available in the literature we compute new ephemeris and redetermine the physical parameters of the star and the exoplanet. Considering 3 yr of observations, we find no periodic transit timing variations (TTVs) or long-term variations of the inclination of the orbit, *i*, or the depth of the transit, *k*, that can be attributable to the presence of another planetary-mass body in the system. We also suggest a possible weak correlation between *i* and *k* with different factors that characterize the light curve noise rate, PNR, and a weak anticorrelation between *k* with the red noise factor, *β*, and are needed to confirm these trends. Finally, the kinematic study suggests a thin-disc star.

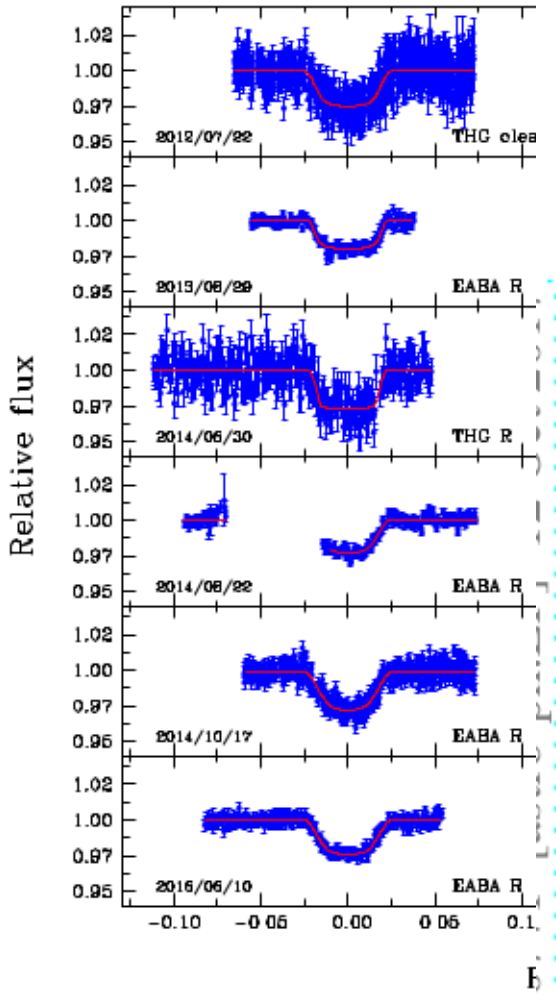
Key words: techniques: photometric – stars: individual: WASP

(Petrucci et al. 2015)

Resultados científicos-ORO

Tránsitos

Transit Timing Variations (TTVs)



(Petrucci et al. 20

A search for transit timing variations and orbital decay in WASP-46b*†

R. Petrucci[1,3]‡§, E. Jofré[1,3], L. V. Ferrero[1,3], V. Cúneo[1,3], L. Saker[1,3], F. Lovos[1,3], M. Gómez[1,3] and P. Mauas[2,3]

[1] *Universidad Nacional de Córdoba, Observatorio Astronómico, Laprida 854, X5000BGR, Córdoba, Argentina*
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[3] *Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Argentina*

Last updated 2015 May 22; in original form 2013 September 5

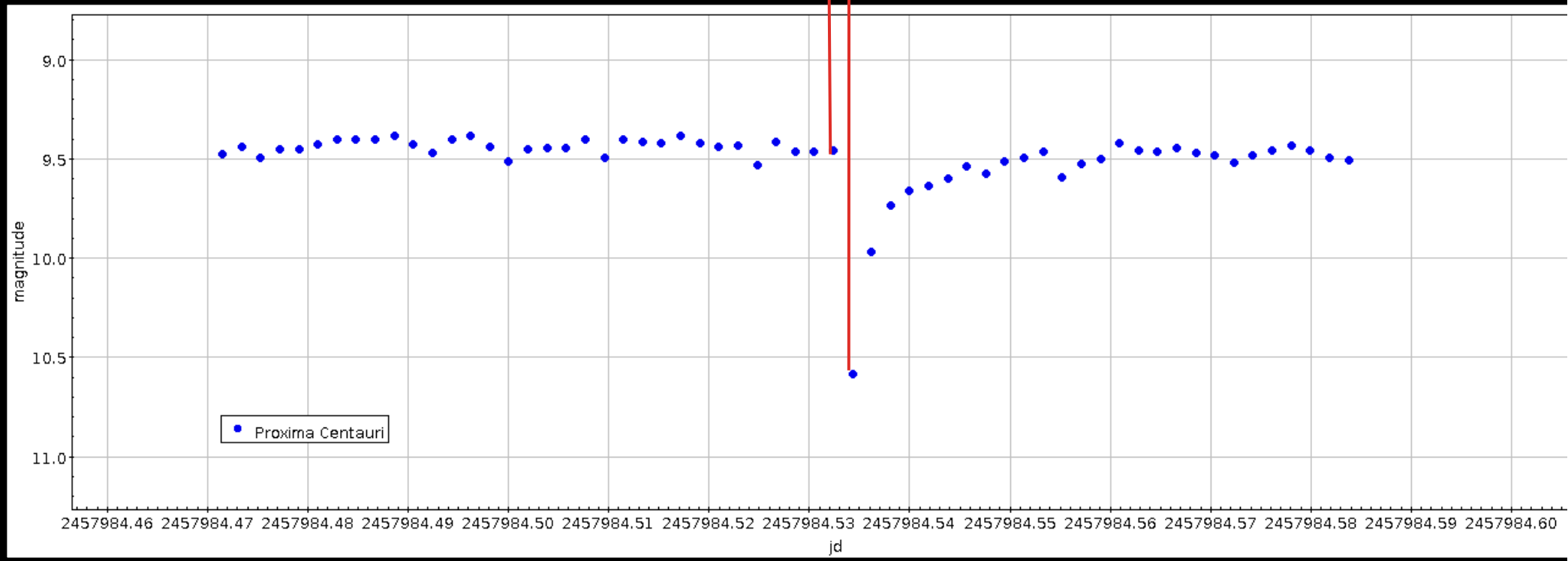
ABSTRACT

We present 12 new transit observations of the exoplanet WASP-46b obtained with the 1.54-m telescope at Estación Astrofísica de Bosque Alegre (EABA, Argentina) and the 0.40-m Horacio Ghielmetti and 2.15-m Jorge Sahade telescopes at Complejo Astronómico El Leoncito (CASLEO, Argentina). We analyse them together with 37 light curves from the literature to re-determine the physical parameters and search for additional planets via transit timing variations (TTVs). We consider the 31 transits with uncertainties in their mid-transit times (e_{T_0}) < 1 minute, to perform the first homogeneous study of TTVs for the system, finding a dispersion of $\sigma = 1.66$ minutes over a 6 year baseline. Since no periodic variations are found, our interpretation for this relatively high value of σ is that the stellar activity could be affecting the measured mid-transit times. This value of dispersion allows us to rule out the presence of additional bodies with masses larger than 2.3, 4.6, 7, and 9.3 $M_\oplus$ at the first-order mean-motion resonances 2:1, 3:2, 4:3, and 5:4 with the transiting planet, respectively. Despite the 6 year baseline and a typical light curve precision of 2×10^{-3}, we find that we cannot significantly demonstrate a slow decrease of the orbital period of WASP-46b. We place a lower limit of $Q_\star > 7 \times 10^3$ on the tidal quality factor and determine that an additional 6 year baseline is required to rule out $Q_\star < 10^5$.

Key words: techniques: photometric – stars: planetary systems – planets and satellites: individual: WASP-46b – stars: individual: WASP-46 – stars: starspots

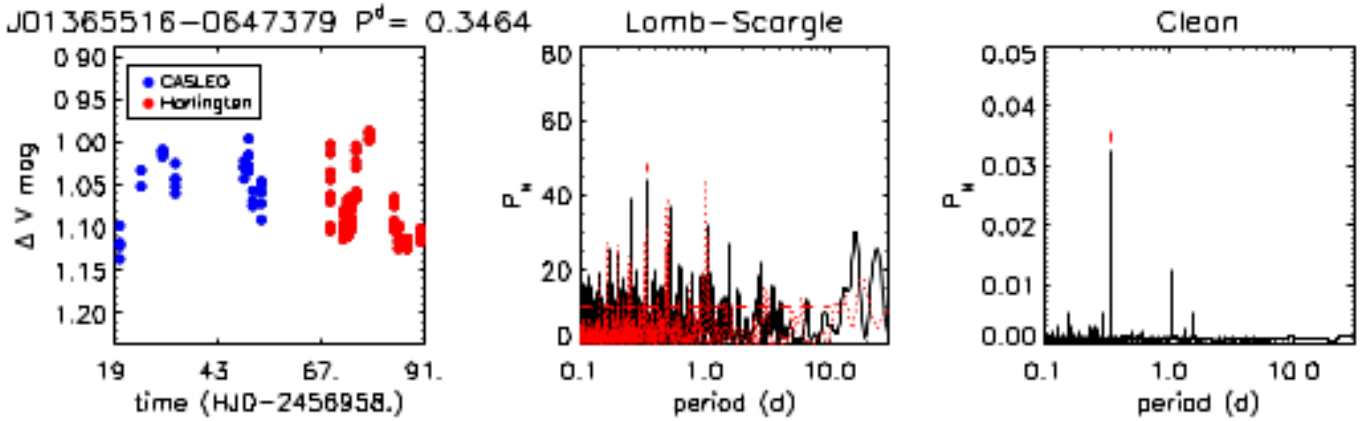
Resultados científicos-ORO

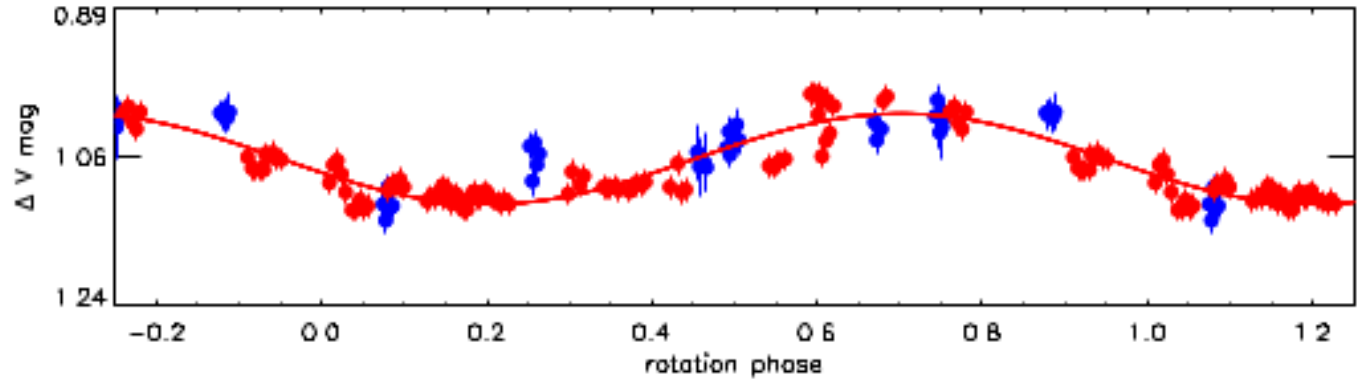
Fulguraciones



Resultados científicos-ORO

Rotación con alta precisión (colaboración con el Dr. Messina)





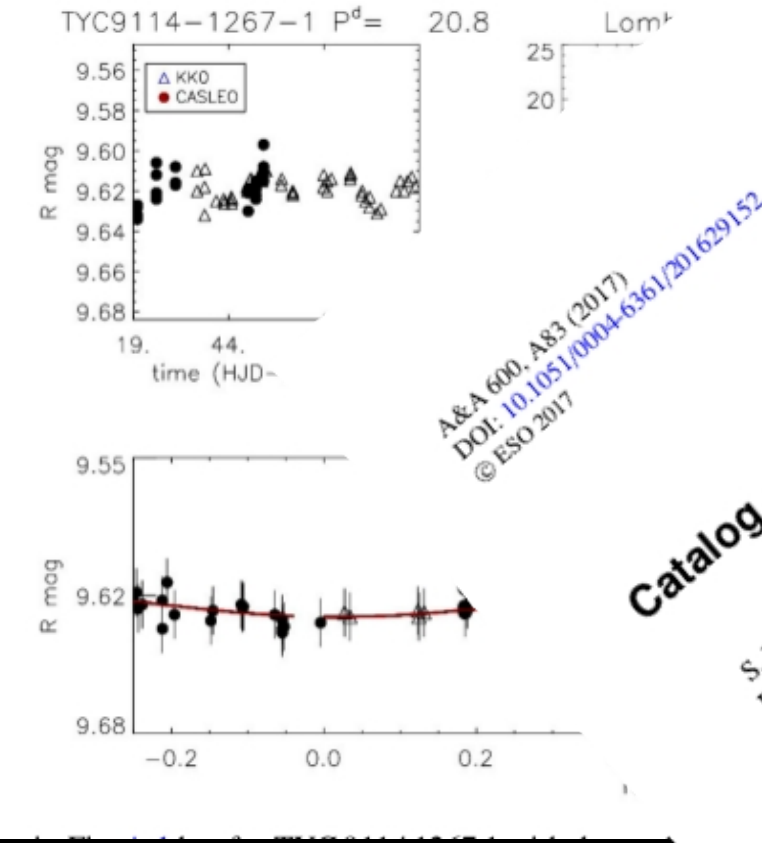
13 observatorios

112 miembros bona-fide y candidatas de la asociación β Pic

Messina et al. (2017)

Resultados cie -ORO

Rotación con alta preci
(colaboración con el Dr
Messina)



A&A 600, A83 (2017)
DOI: 10.1051/0004-6361/201629152
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Astronomy & Astrophysics

The β Pictoris association: Catalog of photometric rotational periods of low-mass members and candidate members ★,★★,★★★

S. Messina[1], M. Millward[2], A. Buccino[3,4,★★★★], L. Zhang[5], B. J. Medhi[6], E. Jofré[7,8], R. Petrucci[7,8], Q. Pi[5], F.-J. Hambsch[9,10], P. Kehusmaa[11], C. Harlingten[11], S. Artemenko[12], I. Curtis[13], V.-P. Hentunen[14], L. Malo[15], P. Mauas[3,4], B. Monard[16], M. Muro Serrano[17], R. Naves[18], R. Santallo[19], A. Savuskin[12], and T. G. Tan[20]

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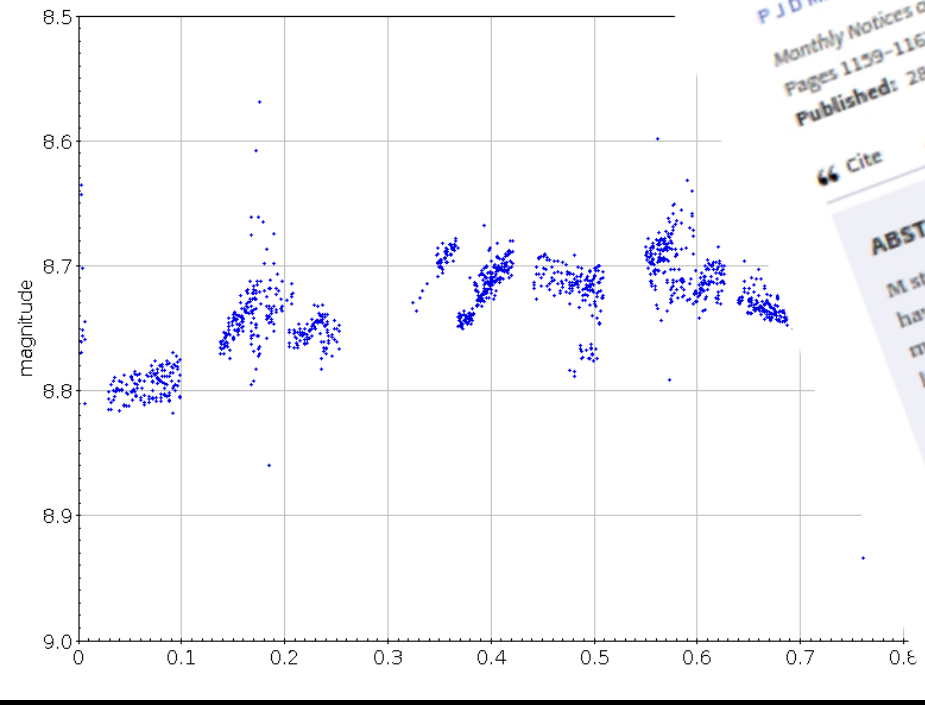
[17] Observatory, 28008 Madrid, Spain
[18] Observatory, C/Jaume Balmes, 24, Cabrils, Spain
[19] Observatory, Pamatai, Tahiti, French Polynesia, France
[20] Survey Telescope, Western Australia, Australia

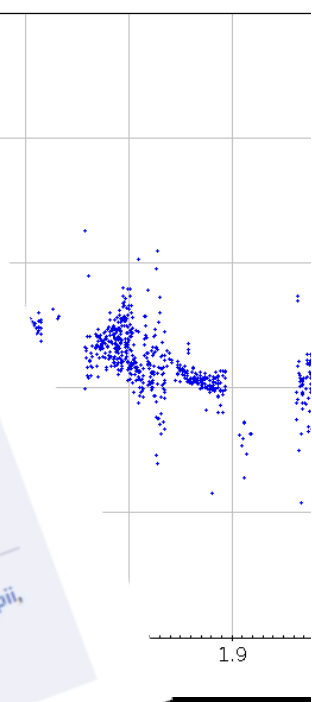
Accepted 9 September 2016

Messina et al. (2017)

Resultados científicos-ORO

Rotación con alta pr
(complemento de
HKα)





First long-term activity study of AU Microscopii: a possible chromospheric cycle

R V Ibañez Bustos, A P Buccino, M Flores, C I Martinez, D Maizel, Sergio Messina, P J D Mauas

Monthly Notices of the Royal Astronomical Society, Volume 483, Issue 1, February 2019, Pages 1159–1167, https://doi.org/10.1093/mnras/sty3147
Published: 28 November 2018 **Article history**

Cite Permissions Share

ABSTRACT

M stars are ideal targets to search for Earth-like planets. However, they usually have high levels of magnetic activity, which could affect their habitability and make difficult the detection of exoplanets orbiting around them. Unfortunately, long-term variability of dM stars has not been extensively studied, due to their low intrinsic brightness. For this reason, in 1999 we started the HKα project, which systematically observes the spectra of a large number of stars, in particular dM stars, at the Complejo Astronómico El Leoncito (CASLEO). In this work, we study the long-term activity of the young active dM1 star AU Microscopii. We analyse the Mount Wilson index S derived from CASLEO spectra obtained between 2004 and 2016, which we complement with the S-index derived from HARPS, FEROS, and UVES public spectra. We also analyse the simultaneous photometric counterpart provided by the ASAS public data base for this star between 2000 and 2009, and our own photometry. In both totally independent time series, we detect a possible activity cycle of period ∼5 yr. We also derived a precise rotation period for this star P_{rot} = 4.85 d, consistent with the literature. This activity cycle reflects that an αΩ dynamo could be operating in this star.

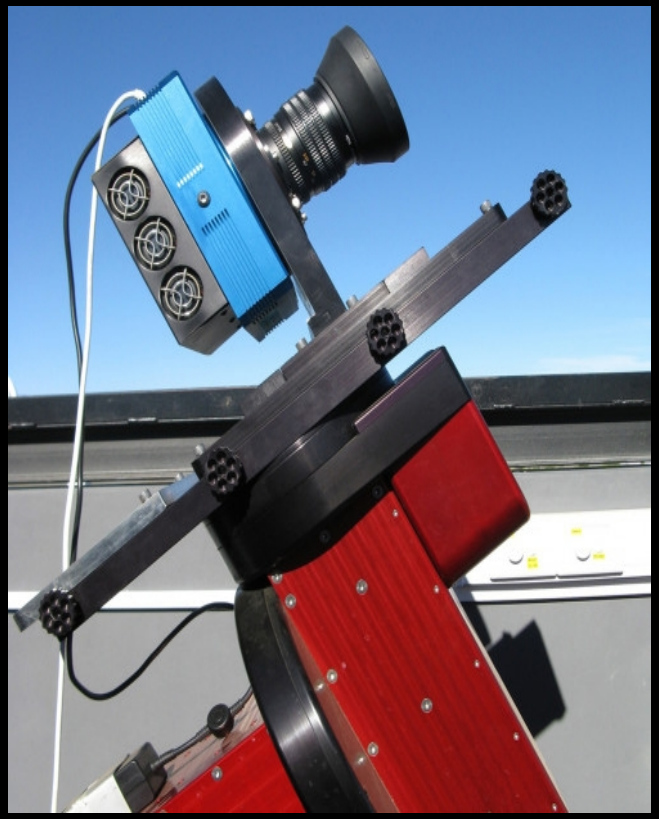
Keywords: stars: activity, stars: chromospheres, stars: individual: AU Microscopii, stars: low-mass, stars: rotation
Issue Section: Article

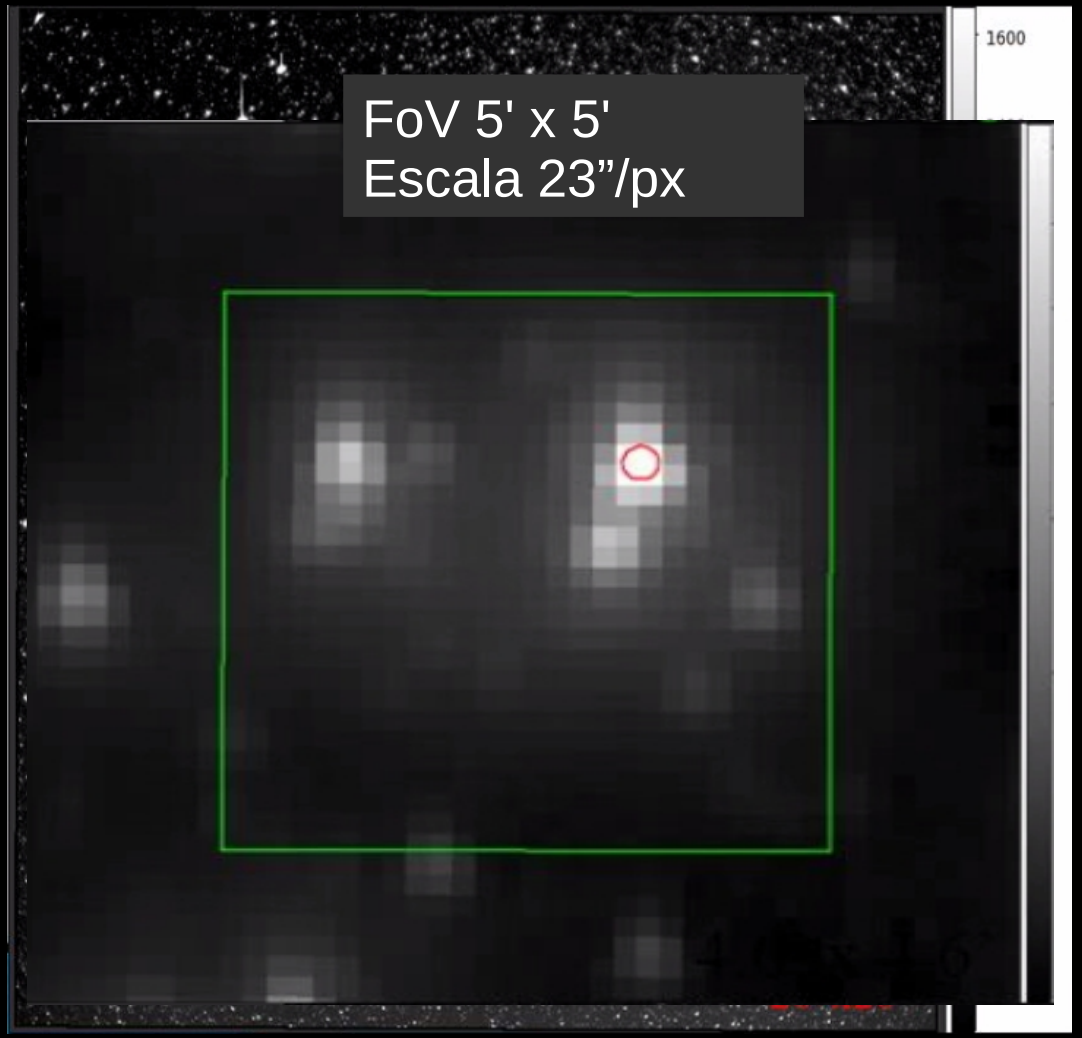
P_{rot} = (4.843± 0.004) días

…tos et al. (2019)

Resultados científicos
Proyecto ORO

Colaboración con KELT
(Kilogree Extremely Little Telescope)

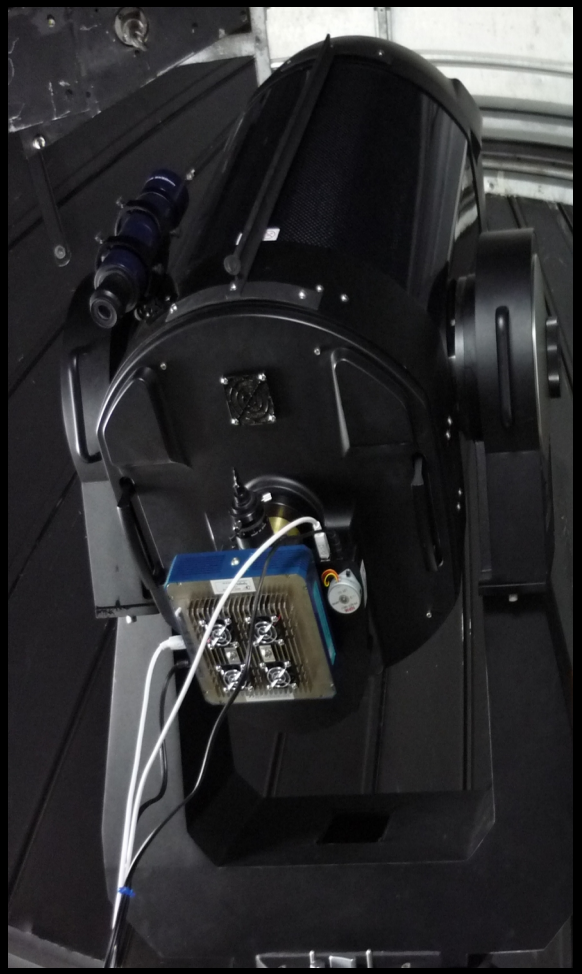


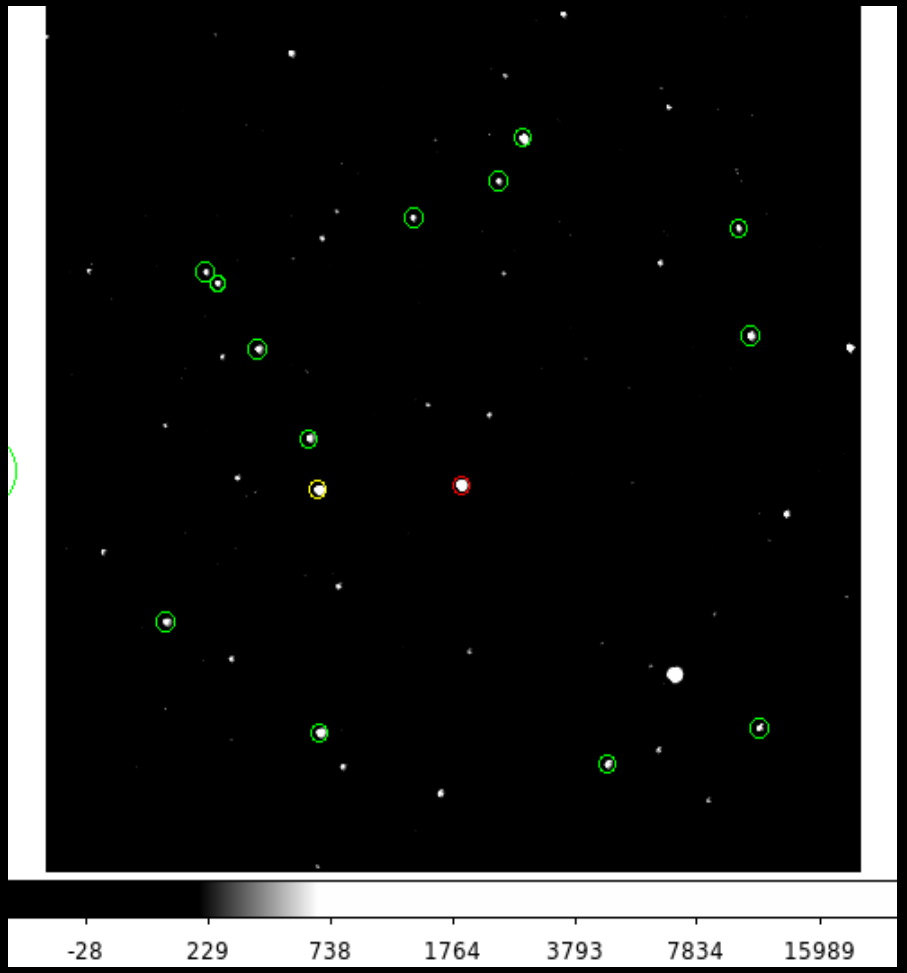


FoV 26° x 26°
Escala 23”/px

Resultados científicos
Proyecto ORO

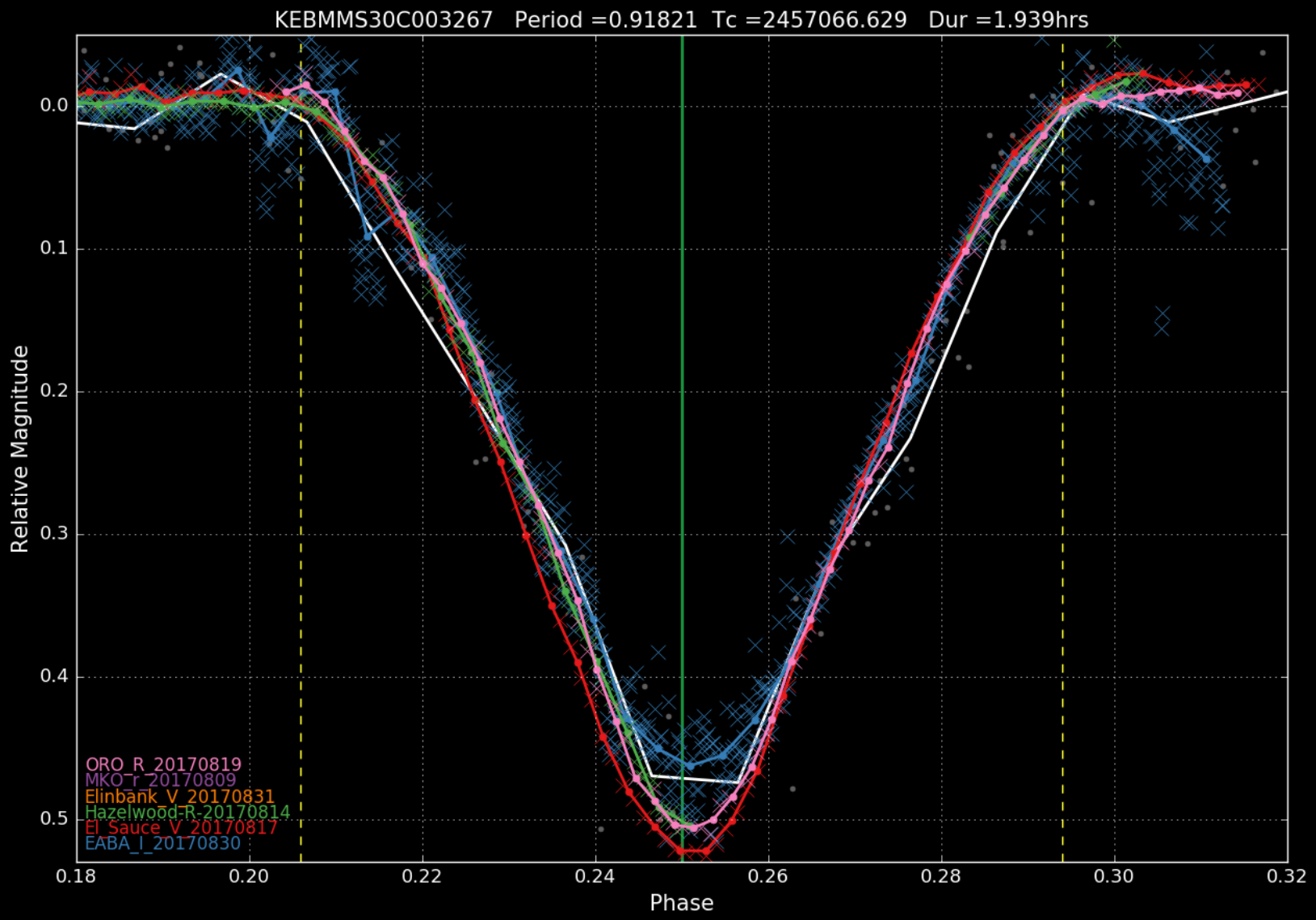
Colaboración con KELT (Kilogree Extremely Little Telescope)





THG+Apogee ALTA U16M
FoV 49' x 49'
Escala 1.14”/px

Resultados científicos
Proyecto ORO



ORO-Resumen final

- Telescopios pequeños de funcionamiento automático.
- Procesamiento de datos cuasiautomático.
- Fotometría de alta precisión (rotación, tránsitos, fulgur
- Búsqueda de campo amplio. Soporte de búsquedas de resolución.
- Imágenes de alta calidad.

ORO Staff

Pablo Mauas

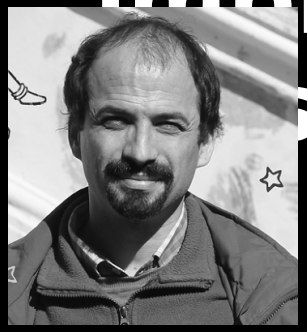
Carlos Francile

Cristian Martinez

Pablo Perna

Andrea Buccino

Colaboradores imprescindibles

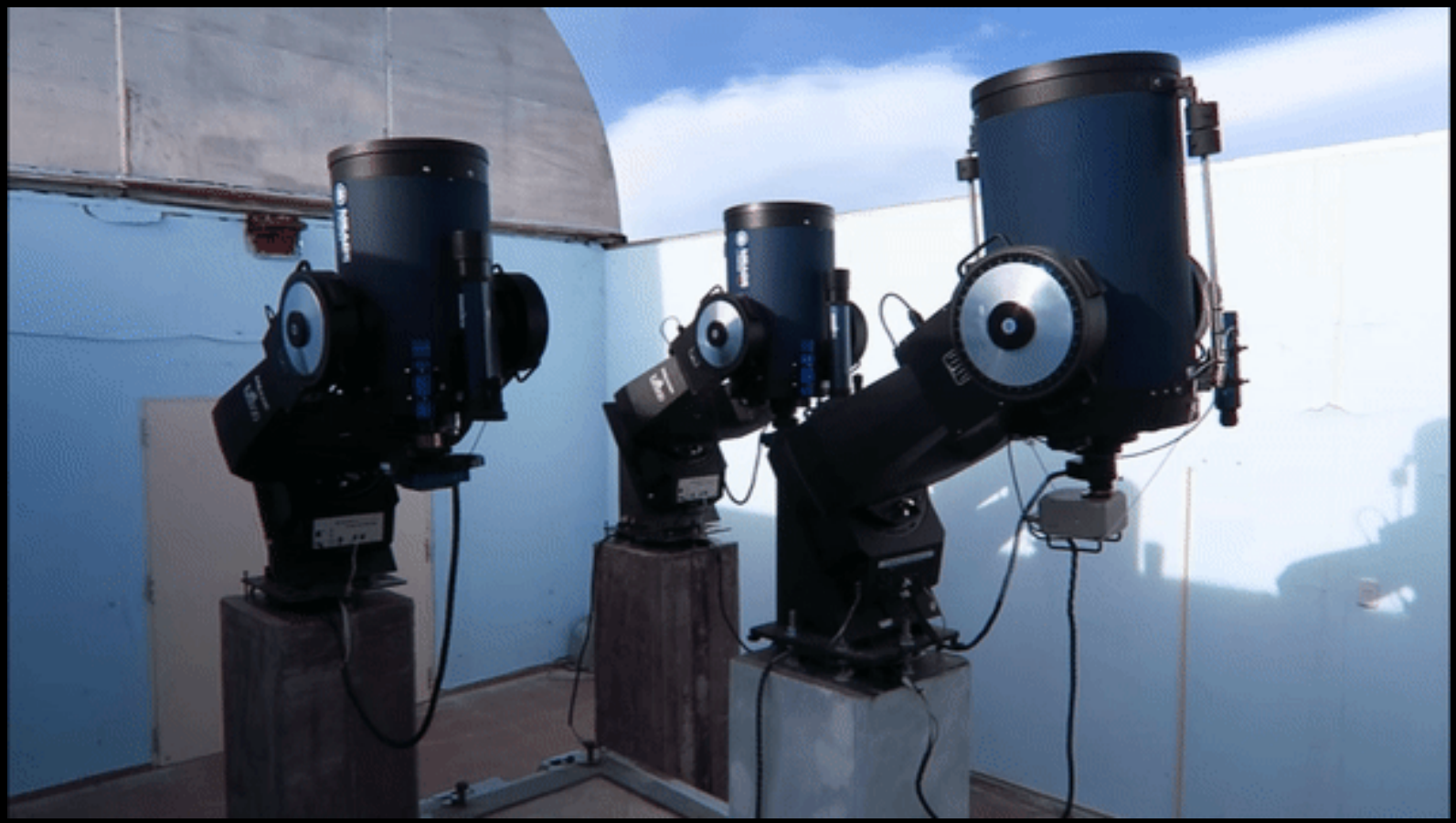


Martín Schwartz

Romina Petrucci

Carolina von Essen

Mario Melita

A. Cornudella y W. Gómez

Baile de telescopios