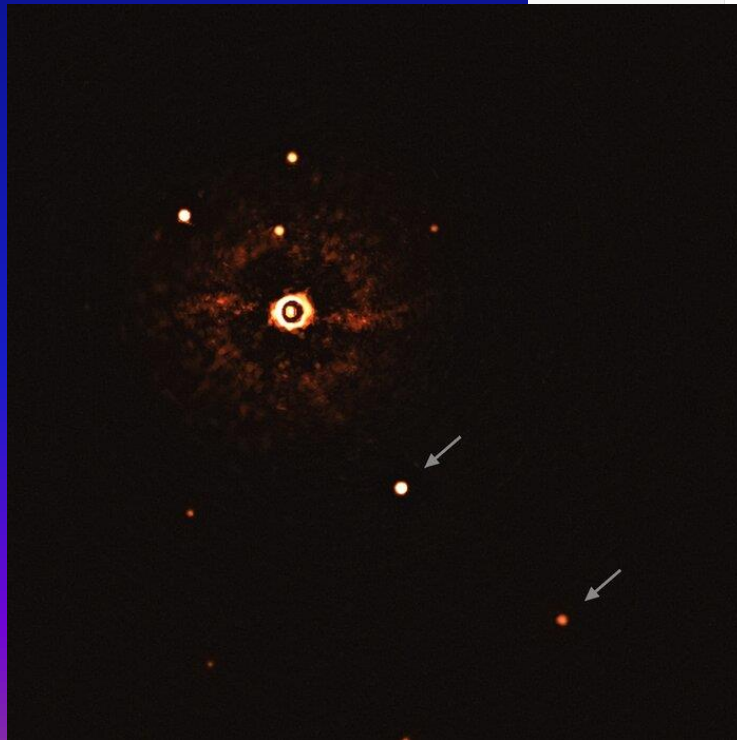
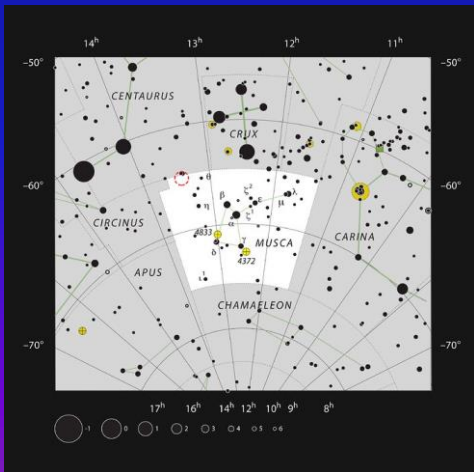
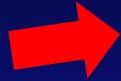


MUNDOS LEJANOS

EXOPLANETAS

22/07/2020:
¡URGENTE!



eso.org/public/chile/news/eso2011/

Gmail YouTube Maps Radio Cooperativa Portal to the Univer... SDSS NASA Catálogo de exopla... GOOGLE El Mostrador SDSS SkyServer DR8 Planet

Select Language (es-cl) Subscribe Contact Site Map Science User Portal

SOBRE IMÁGENES VIDEOS NOTICIAS ESOSHOP TELESCOPIOS E INSTRUMENTOS DESCUBRIMIENTOS EVENTOS DIVULGACIÓN PRODUCTOS NEGOCIOS@ESO EMPLEO

eso2011es-cl — Foto noticia

Un telescopio de ESO capta la primera imagen de un sistema con varios planetas alrededor de una estrella de tipo solar

22 de Julio de 2020

El telescopio VLT (Very Large Telescope) del Observatorio Europeo Austral (ESO) ha tomado la primera imagen de una estrella joven similar al Sol acompañada de dos exoplanetas gigantes. Las imágenes de sistemas con múltiples exoplanetas son extremadamente difíciles de obtener y, hasta ahora, los astrónomos nunca habían observado directamente a más de un planeta orbitando una estrella similar al Sol. Las observaciones pueden ayudar a los astrónomos a entender cómo se formaron y evolucionaron los planetas alrededor de nuestro propio Sol.

Acerca de la nota de prensa

Nota de prensa No.: eso2011es-cl

Nombre: TYC 8998-760-1

Tipo: Milky Way : Star : Circumstellar Material : Planetary System

Facility: Very Large Telescope

Instruments: SPHERE

Imágenes

Imagen eso2011a

Primera imagen de un sistema planetario múltiple alrededor de una estrella de tipo solar

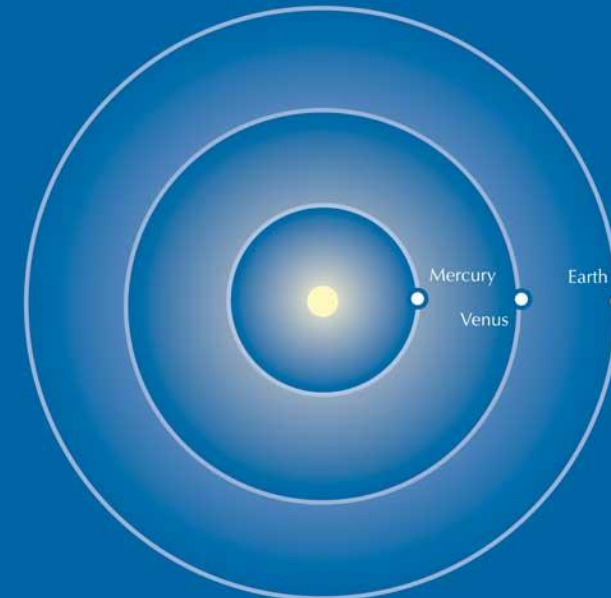
Hace 25 años atrás YA era noticia ...

"Se detecta primer exoplaneta" ...

Comparison of planets

	Mercury	Earth	Jupiter	Saturn	51 Pegasi b
Mass	0.06	1.00	317.8	95.2	148.8
Diameter	0.38	1.00	11.2	9.5	ca. 10
Density (water=1)	5.4	5.5	1.3	0.7	ca. 1
Distance from star	0.39	1.00	5.20	9.54	0.52
Orbital period	88 days	1 year	11.9 years	29.5 years	4.2 days
Day temperature (°C)	350	15	-150	-180	1000
Composition	iron rock	rock iron	H and He gas	H and He gas	H and He gas

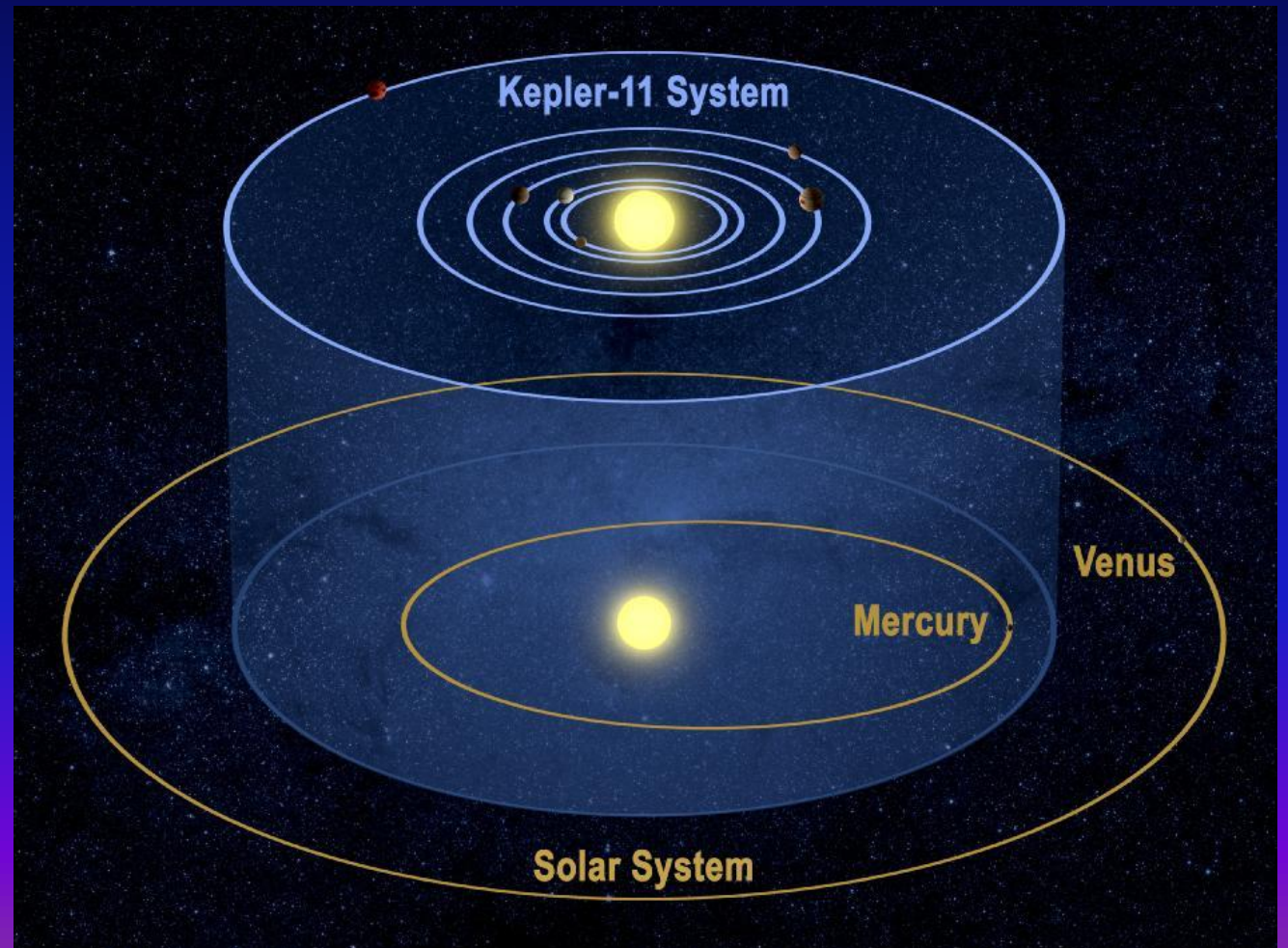
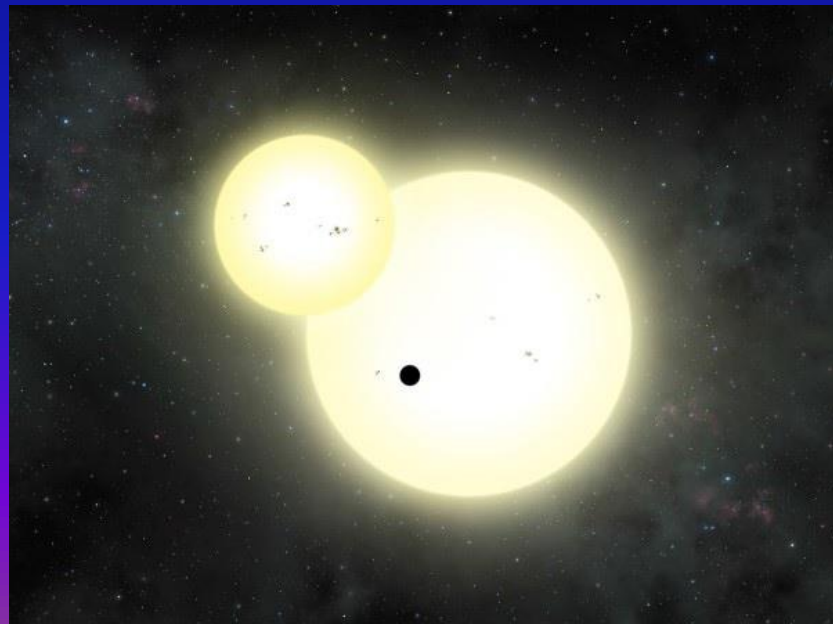
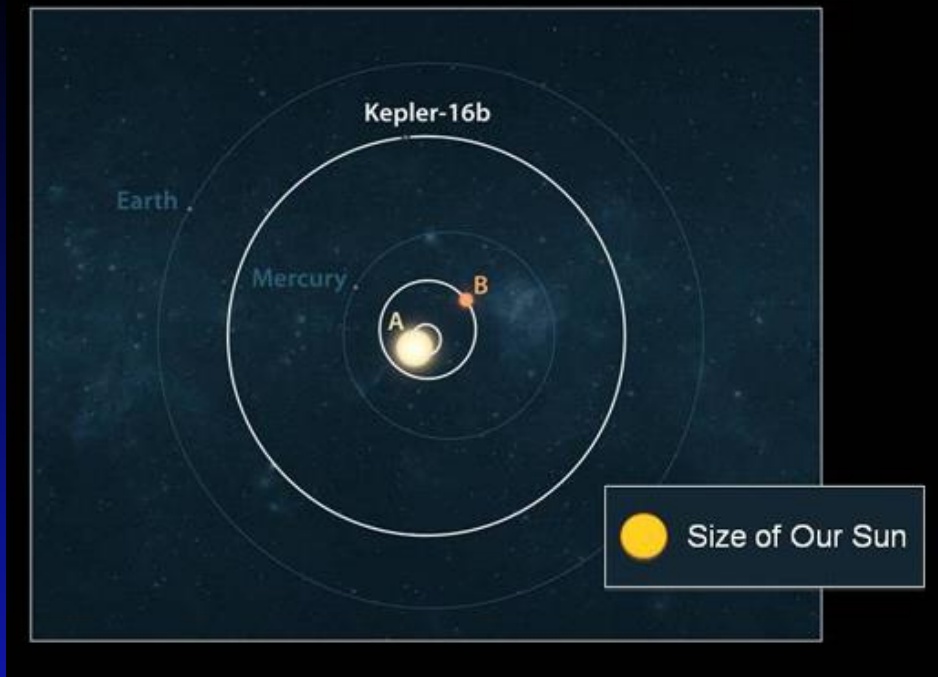
Our Solar System



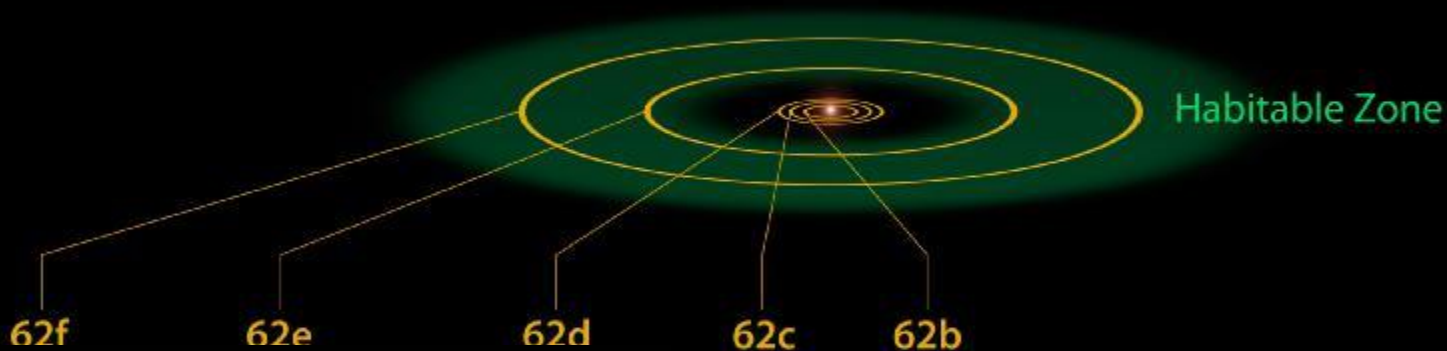
Comparison of the Sun and 51 Pegasi

	Sun	51 Pegasi
Radius	1.0	1.4
Mass	1.0	0.95
Temperature (°C)	5500	5430
Age	4.6 billion years	8 billion years
Metallicity	1.0	1.2 to 1.5
Spectral type	G2 (main sequence)	G3 (main sequence)
Luminosity	1.0	1.8

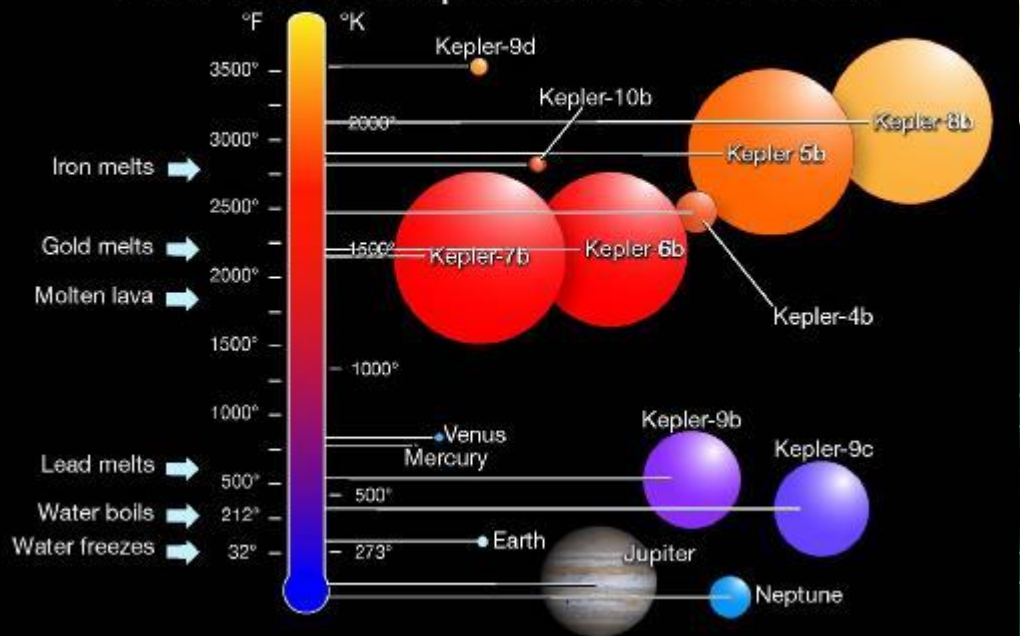
Sistemas planetarios
totalmente distintos al
nuestro ...



Kepler-62 System

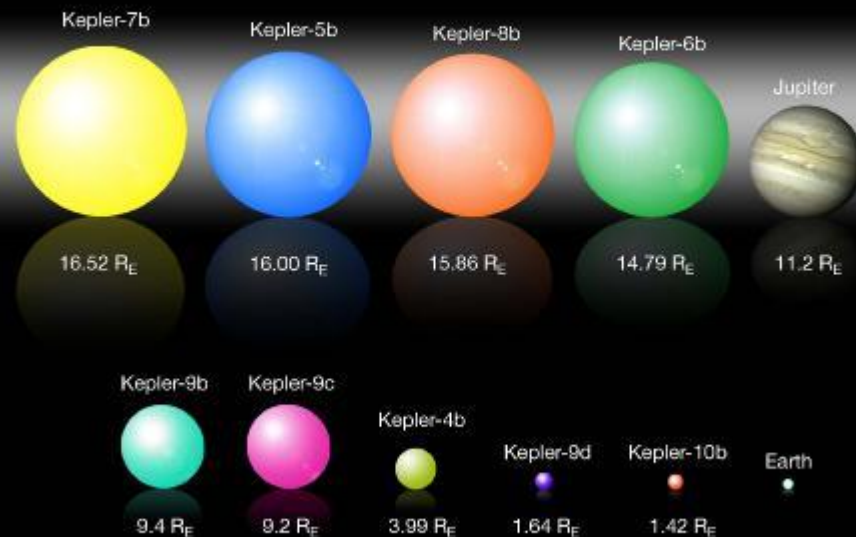


Planet Temperature & Size



Planets and orbits to scale

Planet Size



URL: exoplanet.eu/catalog/

Hasta octubre/2020 se han detectado ¡4356! exoplanetas

¿Cómo se logra?



Exoplanet.eu

Principal Todos los catálogos Diagramas Bibliografía Búsquedas Reuniones Otros Sitios VO

VO CONNECTION ? OFF ON

Catalog ?

Download VOTable | CSV | DAT

Status Detection ? Filter

Showing 4301 planets / 3176 planetary systems / 703 multiple planet systems

Show 100 entries

Planet Search

Show / hide columns

Planet	Mass (M_{Jup})	Radius (R_{Jup})	Period (day)	a (AU)	e	i (deg)	Ang. dist. (arcsec)	Discovery	Update
HD 86226 b	—	—	1628	2.73	0.059	—	0.061205	2010	2020-07-29
Kepler-138 b	0.000588	0.06254	10.31320643	0.0746	0	89.95	—	2014	2020-07-29
Kepler-138 c	0.0164	0.149	13.78164	—	0.05	—	—	2014	2020-07-29
Kepler-138 d	0.00368	0.1499	23.08933	—	0.024	—	—	2014	2020-07-29
Lalande 21185 b	—	—	9.8684	0.068	0.22	—	—	2017	2020-07-29
K2-72 b	—	0.0964	5.577212	0.04	0.11	89.15	—	2016	2020-07-29
K2-72 c	—	0.1035	15.189034	0.078	0.11	89.54	—	2016	2020-07-29
K2-72 d	—	0.0901	7.76	0.05	0.11	89.26	—	2016	2020-07-29
K2-72 e	—	0.1151	24.159	0.106	0.11	89.68	—	2016	2020-07-29
K2-3 d	0.0088	0.135	44.55646	0.2086	0.045	89.79	—	2015	2020-07-29
WASP-74 b	0.826	1.248	2.13775138	0.03443	0.88	80.32	—	2014	2020-07-29
pr Men c	0.01517	0.16719	6.26784	0.06702	0.15	87.553	—	2018	2020-07-29

Se detectan, NO se observan

Detection

- ☐ Radial Velocity
- ☐ Timing
- ☐ Microlensing
- ☐ Imaging
- ☐ Primary Transit
- ☐ Astrometry
- ☐ TTV
- ☐ Default
- ☐ Secondary Transit

Técnicas de detección:

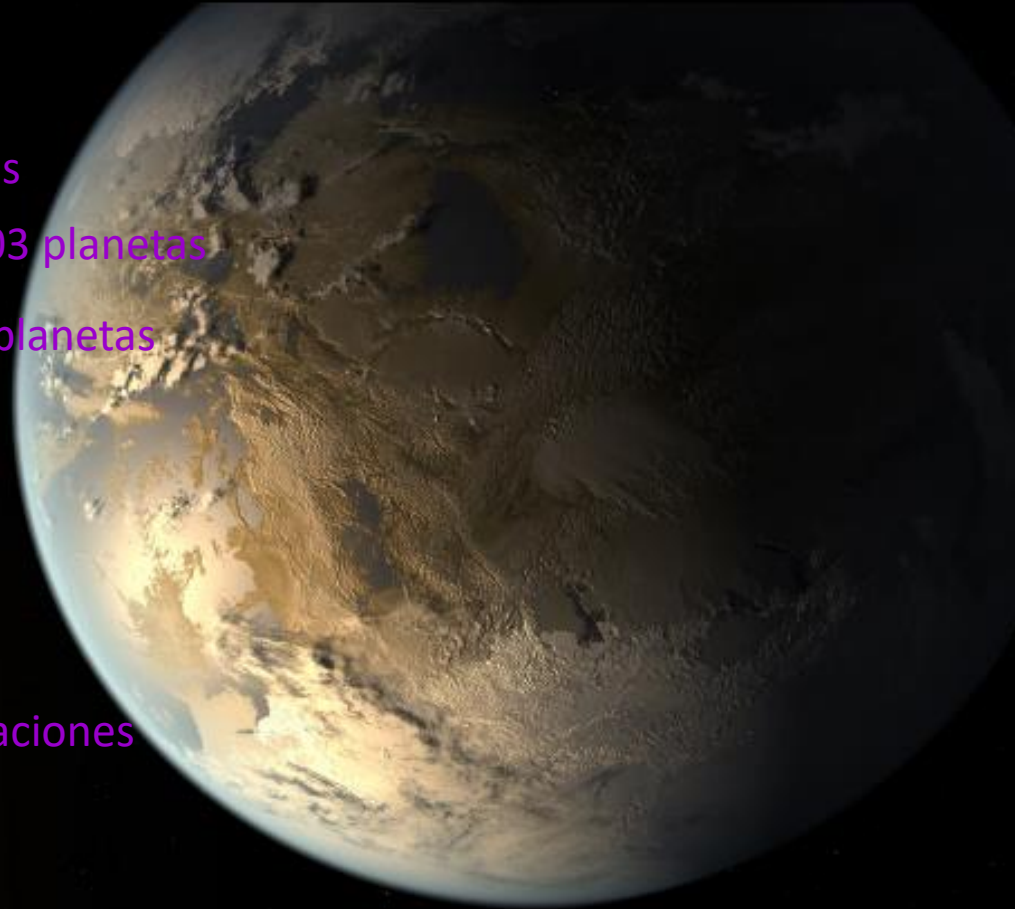
- Tránsito primario: cambios en la curva de luz = 3100 planetas
- Velocidad radial: mide oscilaciones = 903 planetas
- Astrometría: cambios de posición = 12 planetas

Micro lente gravitacional: detecta desviaciones de la luz = 130 planetas

Imagen directa = 141 planetas

Tiempos de pulsares = 43 planetas

Variación en el tiempo de tránsito = 20 planetas



- Tránsito

- Velocidad radial

Técnicas de detección



Parámetros del planeta:

Radio

Masa

Órbita (excentricidad e inclinación)

Densidad

Tamaño

Composición

Temperatura

Distancia

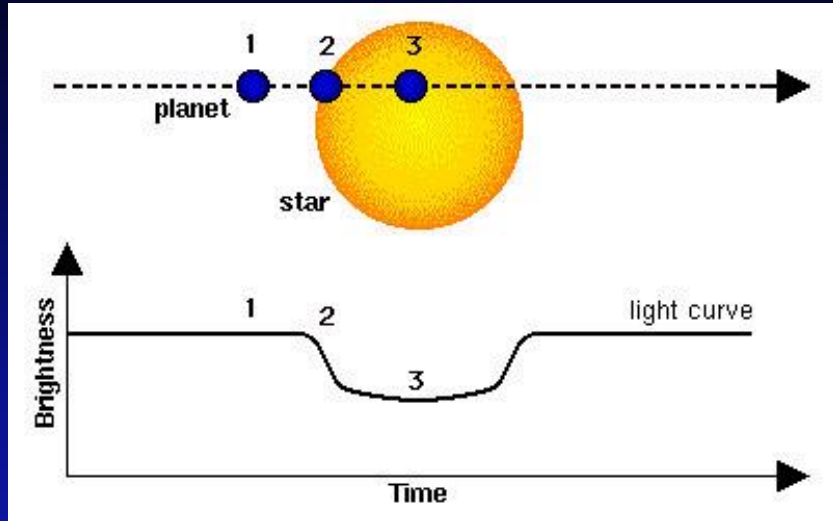
Biomarcadores en las atmósferas

¿Cómo se hace?



TRÁNSITO = 3100 exoplanetas
VELOCIDAD RADIAL = 903 exoplanetas

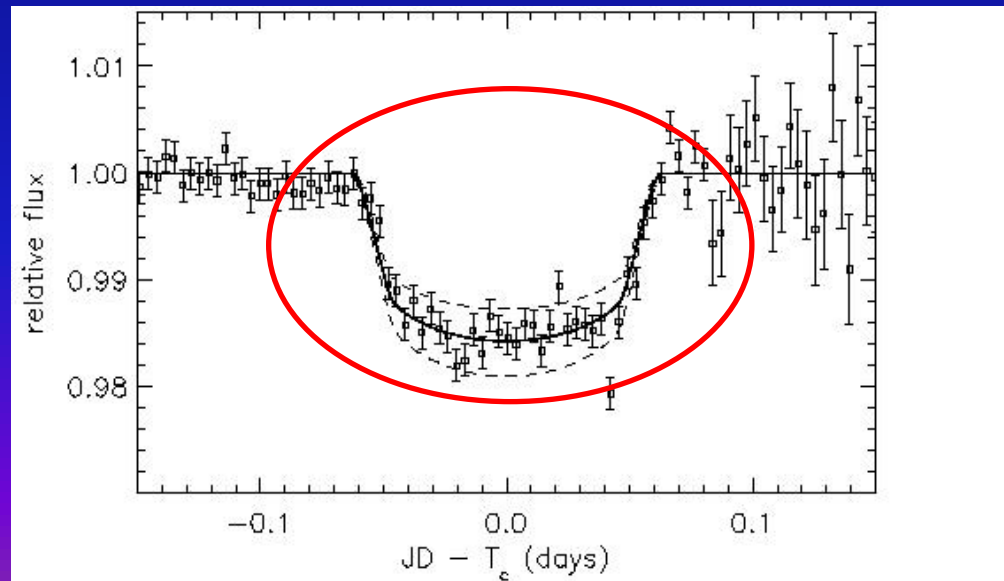
Tránsito



Con el instrumento llamado *fotómetro* se detectan cambios en la curva de luz de una estrella.

El flujo continuo de la luz proveniente de una estrella es interrumpido por el *tránsito* de un planeta por frente de ésta y en dirección al instrumento.

Es decir, se registran pequeñas variaciones en la intensidad de la luminosidad de la estrella.



Los *fotómetros* se acoplan a un telescopio terrestre o están montados en vehículos espaciales.

Velocidad Radial

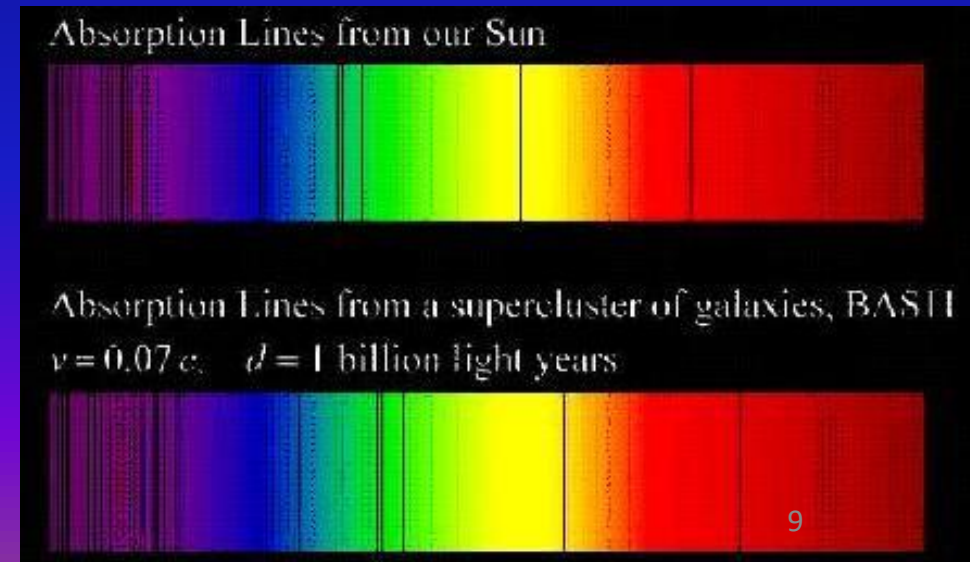
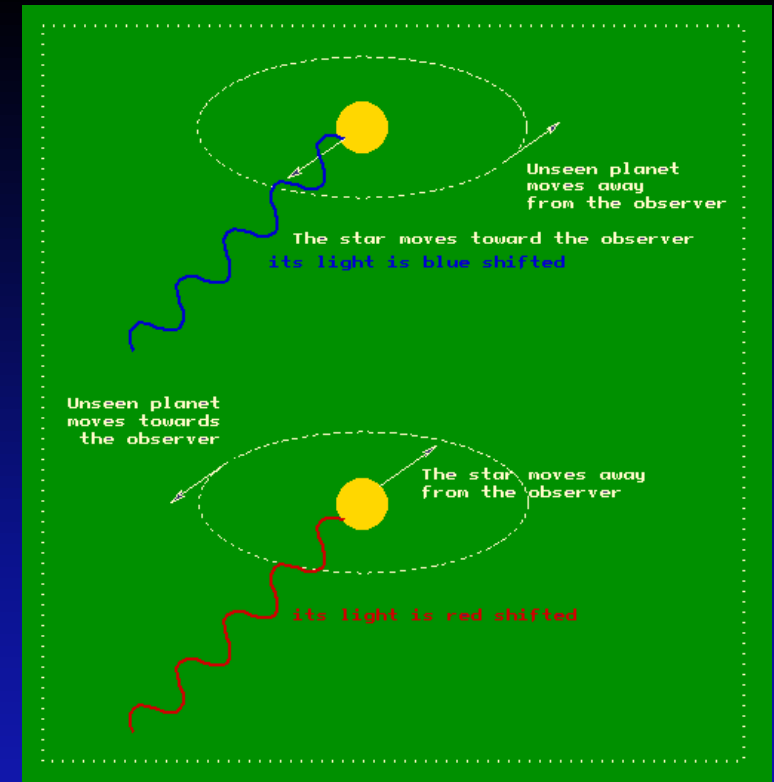
Se detectan pequeñas oscilaciones de una estrella causadas por la influencia gravitacional de algún cuerpo que la orbita.

Las oscilaciones se observan en el *espectro* de una estrella, el cual se obtiene con un *espectrógrafo*.

El cambio de posición de las líneas de absorción en el espectro determina si una estrella se mueve.

Si las líneas están corridas hacia la parte roja del espectro, se habla de *redshift* y significa que la estrella se aleja; si es hacia el azul: *blueshift*, es decir se acerca.

Los espectrógrafos se acoplan a telescopios de observatorios científicos.



INSTRUMENTACIÓN → FOTÓMETROS

URL: nasa.gov/misión_page/Kepler/overview/index.html

Mission overview | NASA

[nasa.gov/misión_page/Kepler/overview/index.html](#)

Aplicaciones Gmail YouTube Maps Radio Cooperativa Portal to the Univer... SDSS NASA ESO Catálogo de exopla... GOOGLE El Mostrador

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Launch

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Related Topics

NASA Ames

Exoplanets

Kepler Science

The scientific objective of the Kepler Mission is to explore the structure and diversity of planetary systems. This is achieved by surveying a large sample of stars to:

- Determine the percentage of terrestrial and larger planets that are in or near the habitable zone of a wide variety of stars
- Determine the distribution of sizes and shapes of the orbits of these planets
- Estimate how many planets there are in multiple-star systems
- Determine the variety of orbit sizes and planet reflectivities, sizes, masses and densities of short-period giant planets
- Identify additional members of each discovered planetary system using other techniques
- Determine the properties of those stars that harbor planetary systems.

The Transit Method of Detecting Extrasolar Planets

When a planet passes in front of a star as viewed from Earth, the event is called a "transit". On Earth, we can observe an occasional Venus or Mercury transit. These events are seen as a small black dot creeping across the Sun—Venus or Mercury blocks sunlight as the planet moves between the Sun and us. Kepler finds planets by looking for tiny dips in the brightness of a star when a planet crosses in front of it—we say the planet transits the star.

Once detected, the planet's orbital size can be calculated from the period (how long it takes the planet to orbit once around the star) and the mass of the star using Kepler's Third Law of planetary motion. The size of the planet is found from the depth of the transit (how much the brightness of the star drops) and the size of the star. From the orbital size and the temperature of the star, the planet's characteristic temperature can be calculated. From this the question of whether or not the planet is habitable (not necessarily inhabited) can be answered.

BRIGHTNESS

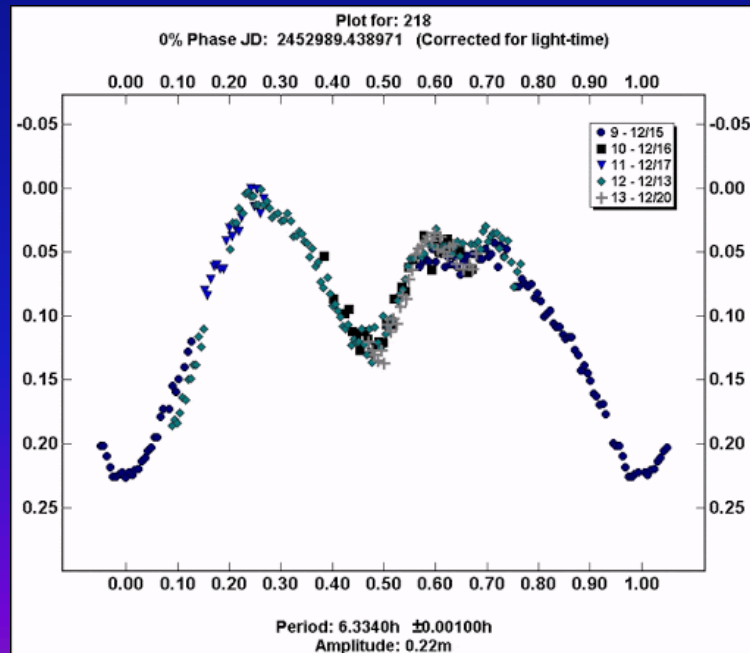
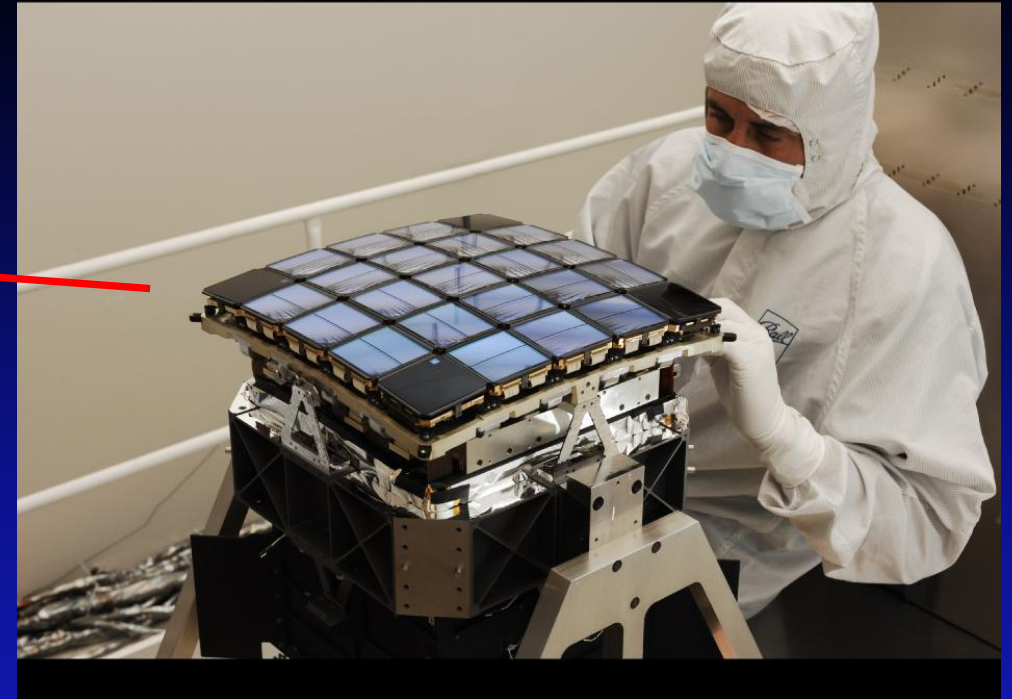
TIME IN HOURS

When a planet crosses in front of its star as viewed by an observer, the event is called a transit. Transits by terrestrial planets produce a small change in a star's brightness of about 1/10,000 (100 parts per million, ppm), lasting for 2 to 16 hours.

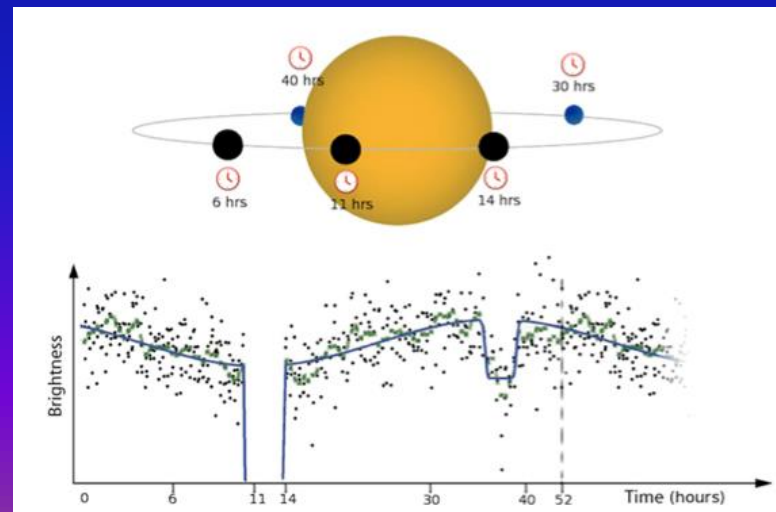
Credits: NASA Ames

Escribe aquí para buscar

16:33 31-07-2020



Curvas de luz





FOTÓMETROS

URL: eso.org/public/chile/

ESPECTRÓGRAFOS

The screenshot shows the ESO website interface. At the top, there is a navigation bar with flags and a language selector set to 'es-cl'. Below this is a secondary menu with links like 'SOBRE', 'IMÁGENES', 'VIDEOS', 'NOTICIAS', 'ESOSHOP', 'TELESCOPIOS E INSTRUMENTOS', 'DESCUBRIMIENTOS', 'EVENTOS', 'DIVULGACIÓN', 'PRODUCTOS', 'NEGOCIOS@ESO', and 'EMPLEO'. The 'TELESCOPIOS E INSTRUMENTOS' link is highlighted with a red arrow. The main content area shows a list of observatories and instruments. 'La Silla Observatory' is selected, and the 'HARPS' instrument is highlighted with another red arrow. The list of instruments includes ADONIS, CASPEC, IRSPEC, HARPS, MEFOS, NIRPS, OPTOPUS, TIMMI/2, Infrared Photometer/Spectrophotometer, Standard Photometer, Infrared Specklegraph, Infrared Speckle Interferometer, and EFOSC.

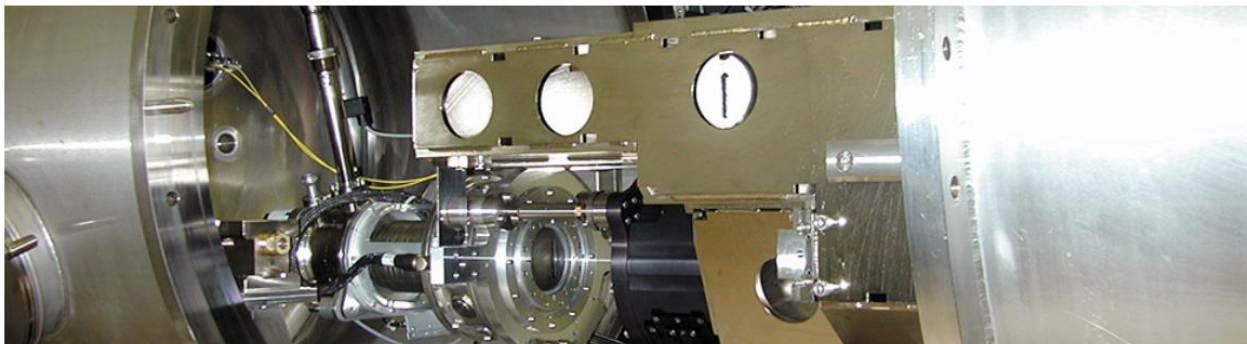
Observatory	Instrument
Paranal Observatory	Telescopio Submilimétrico Sueco-ESO
La Silla Observatory	New Technology Telescope
APEX	El Telescopio de 3,6 metros de ESO
ALMA	Telescopio MPG/ESO de 2,2 metros
ELT	Swiss 1.2-metre Leonhard Euler Telescope
Tecnología para los telescopios	Telescopio Rapid Eye Mount
Instruments	TRANSiting Planets and Planetesimals Small Telescope-South
	Telescopio Danés de 1,54 metros
	Télescope à Action Rapide pour les Objets Transitoires
	Telescopio Schmidt de 1 metro
	Telescopio ESO de 1,52 metros
	Telescopio de 1 metro de ESO
	Telescopio ESO de 0,5 metros



European
Southern
Observatory

HARPS

High Accuracy Radial velocity Planet Searcher



ESO's La Silla Observatory is home to one of the most successful planet finders in the history of astronomy: HARPS, or High Accuracy Radial velocity Planet Searcher, which is currently "the" planet hunter of ground-based astronomy.



Attached to the ESO 3.6-metre telescope, HARPS searches nightly, and with unparalleled accuracy, for exoplanets. Today it leads the field, regularly generating astounding results that will present fresh challenges for future telescopes like the ELT.

But what does HARPS do to detect these planets? It is all matter of

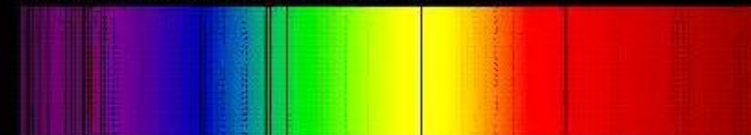
cannot see their
ute wobbles in the
und together by

HARPS

The authoritative technical specifications as offered for astronomical observations are available from the [Science Operation page](#).

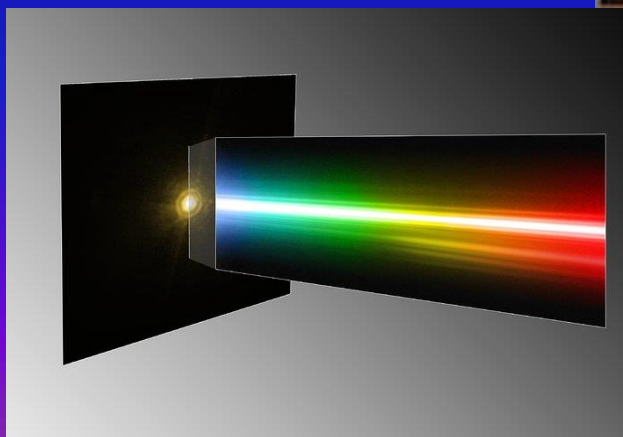
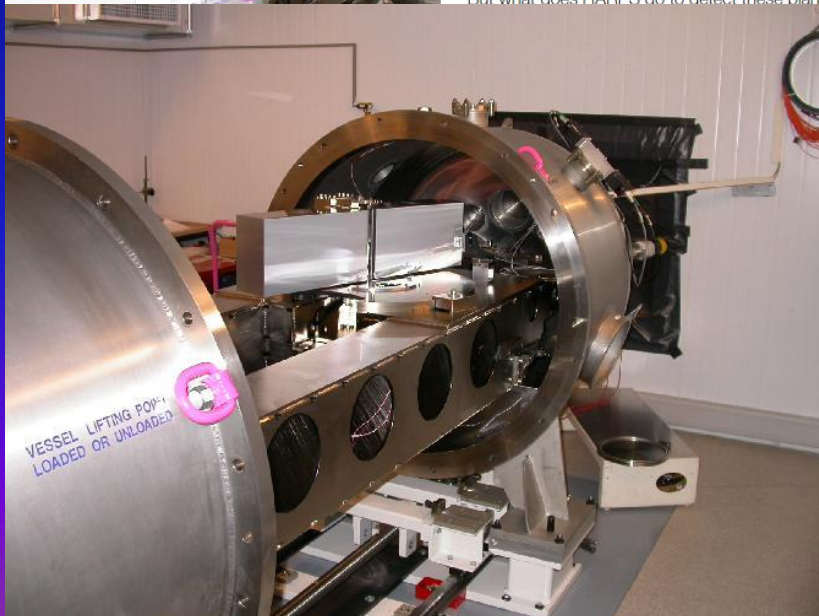
Site:	La Silla
Telescope:	ESO 3.6-metre telescope
Focus:	Fibre adapter for the Cassegrain / coudé

Absorption Lines from our Sun



Absorption Lines from a supercluster of galaxies, BASTI

$v = 0.07 c$, $d = 1$ billion light years



Espectro



El 'tira y afloja' entre la estrella y el planeta puede medirse en el espectro. HARPS detecta oscilaciones de 1m/s.

URL: eso.org/public/chile/

The screenshot shows a web browser window with the URL eso.org/public/chile/. The browser's address bar and tabs are visible at the top. Below the address bar is a navigation bar with various links and a language selector. The main content area features a large image of a butterfly nebula. On the left side of the page, there is a vertical sidebar with social media icons for Facebook, Twitter, and Pinterest, along with a printer icon and an email icon. The main article is titled "Una impresionante mariposa espacial captada por un telescopio de ESO" and includes a sub-header "ESO2012ES-CL — FOTO NOTICIA". Below the title, there is a text block in Spanish and English regarding COVID-19 safety measures.

ESO Chile

eso.org/public/chile/

Aplicaciones Gmail YouTube Maps Radio Cooperativa Portal to the Univer... SDSS NASA Catálogo de exopla... GOOGLE El Mostrador SDSS SkyServer DR8 Personaliza y controla Google Chrome

Select Language (es-cl) Subscribe Contact Site Map Science User Portal

SOBRE IMÁGENES VIDEOS NOTICIAS ESOSHOP TELESCOPIOS E INSTRUMENTOS DESCUBRIMIENTOS EVENTOS DIVULGACIÓN PRODUCTOS NEGOCIOS@ESO EMPLEO

COMUNICADOS DE PRENSA

ESO
European
Southern
Observatory

ESO2012ES-CL — FOTO NOTICIA

Una impresionante mariposa espacial captada por un telescopio de ESO

In response to the COVID-19 outbreak, ESO has taken a number of measures to ensure the safety of staff and visitors, including gradually suspending science observations and cancelling public visits and activities. For more information, please check the 'COVID-19 coronavirus measures at ESO' announcement.

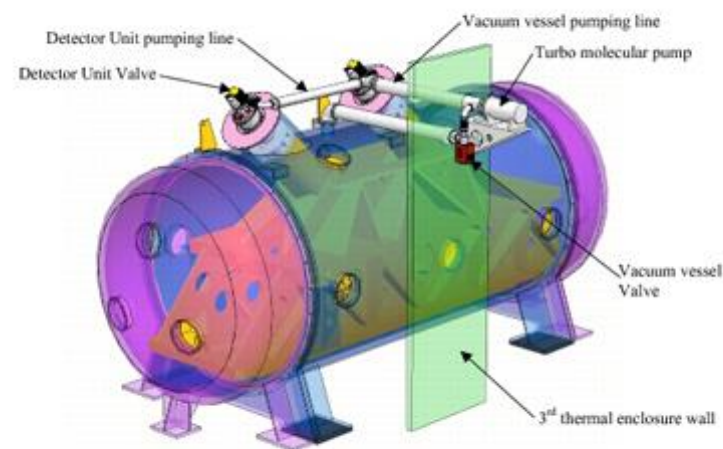
En respuesta al brote de COVID-19, ESO ha tomado una serie de medidas para garantizar la seguridad del personal y sus visitantes, incluida la suspensión gradual de las observaciones científicas y la cancelación de visitas y actividades públicas. Para obtener más información, por favor consulte el anuncio "Medidas adoptadas por ESO ante el coronavirus COVID-19".

- Instrumentos del VLT > 4LGSF
- Nombres de las Unidades de Telescopio del VLT > AMBER
- Telescopios Auxiliares > CRIRES
- ESPRESSO



ESPRESSO

Echelle SPECTrograph for Rocky Exoplanet and Stable Spectroscopic Observations



ESPRESSO

authoritative technical specifications as offered for nomical observations are available from the [Ice Operations page](#).

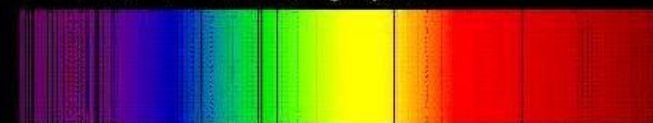
e: Paranal / Very Large Telescope

escape: VLT Combined-Coude

Absorption Lines from our Sun



Absorption Lines from a supercluster of galaxies, BASTI
 $v = 0.07 c$, $d = 1$ billion light years



Los tirones gravitacionales provocan un pequeño efecto Doppler en las líneas del espectro de la estrella.
ESPRESSO detecta oscilaciones de 10 cm/s.

SUGERENCIAS WEBGRÁFICAS:

URL:

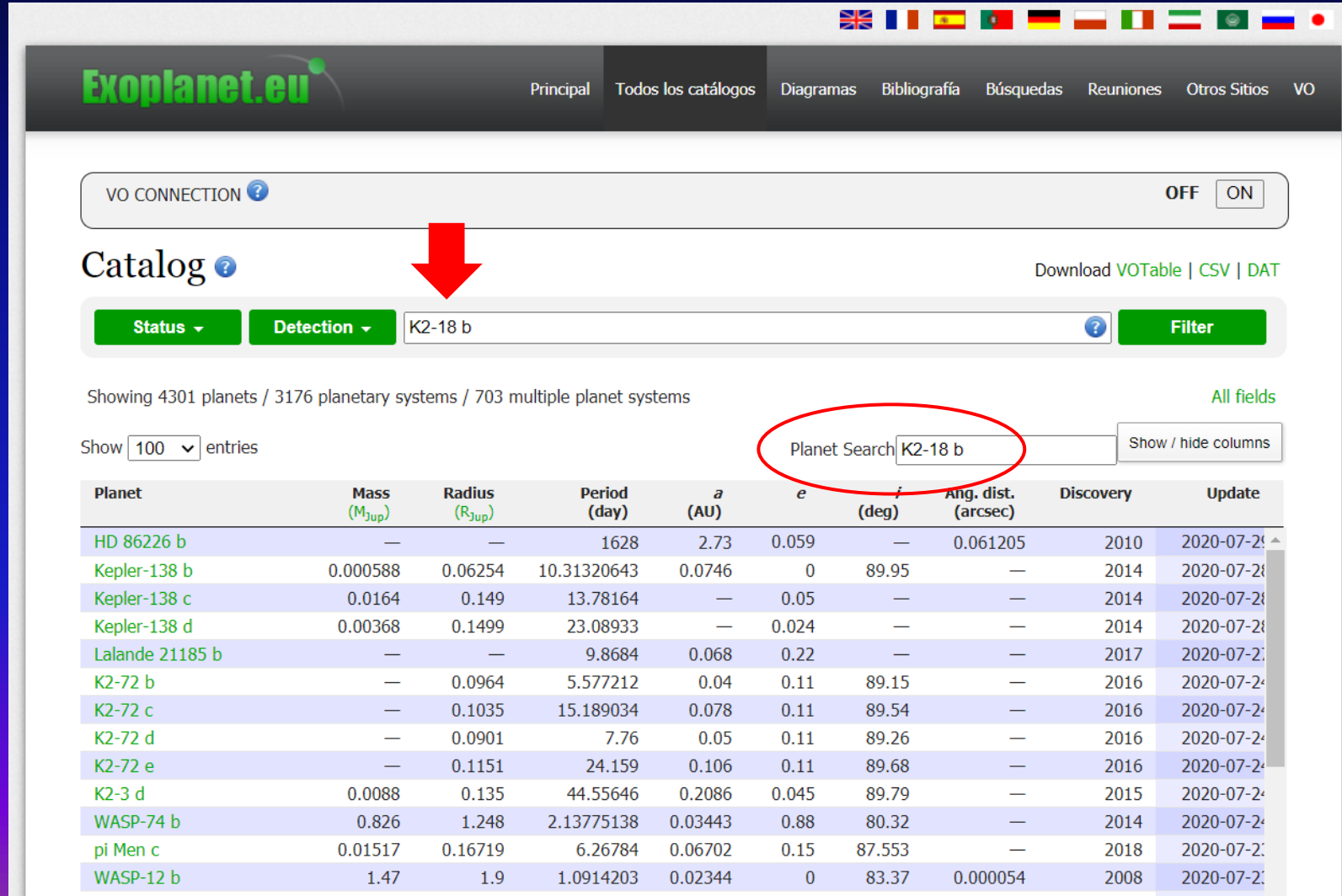
- eso.org/public/chile/
- exoplanet.eu/catalog/
- phl.upr.edu/hec
- palereddot.org
- heasarc.gsfc.nasa.gov/docs/tess/gallery.html

DESAFÍO 1:

Cómo obtener datos de una Súper Tierra ...

Caso de estudio:
Planeta K2-18b

URL: exoplanet.eu/catalog/



Exoplanet.eu

Principal Todos los catálogos Diagramas Bibliografía Búsquedas Reuniones Otros Sitios VO

VO CONNECTION ? OFF ON

Catalog ?

Download VOTable | CSV | DAT

Status Detection K2-18 b ? Filter

Showing 4301 planets / 3176 planetary systems / 703 multiple planet systems All fields

Show 100 entries

Planet Search K2-18 b Show / hide columns

Planet	Mass (M_{Jup})	Radius (R_{Jup})	Period (day)	a (AU)	e	i (deg)	Ang. dist. (arcsec)	Discovery	Update
HD 86226 b	—	—	1628	2.73	0.059	—	0.061205	2010	2020-07-29
Kepler-138 b	0.000588	0.06254	10.31320643	0.0746	0	89.95	—	2014	2020-07-29
Kepler-138 c	0.0164	0.149	13.78164	—	0.05	—	—	2014	2020-07-29
Kepler-138 d	0.00368	0.1499	23.08933	—	0.024	—	—	2014	2020-07-29
Lalande 21185 b	—	—	9.8684	0.068	0.22	—	—	2017	2020-07-29
K2-72 b	—	0.0964	5.577212	0.04	0.11	89.15	—	2016	2020-07-29
K2-72 c	—	0.1035	15.189034	0.078	0.11	89.54	—	2016	2020-07-29
K2-72 d	—	0.0901	7.76	0.05	0.11	89.26	—	2016	2020-07-29
K2-72 e	—	0.1151	24.159	0.106	0.11	89.68	—	2016	2020-07-29
K2-3 d	0.0088	0.135	44.55646	0.2086	0.045	89.79	—	2015	2020-07-29
WASP-74 b	0.826	1.248	2.13775138	0.03443	0.88	80.32	—	2014	2020-07-29
π Men c	0.01517	0.16719	6.26784	0.06702	0.15	87.553	—	2018	2020-07-29
WASP-12 b	1.47	1.9	1.0914203	0.02344	0	83.37	0.000054	2008	2020-07-29

Planet K2-18 b

Name	K2-18 b
Planet Status	Confirmed
Discovered in	2015
Mass	0.02715 ($\pm$ 0.00425) M_J
Mass*sin(i)	—
Semi-Major Axis	0.1591 ($\pm$ 0.0004) AU
Orbital Period	32.944 ($\pm$ 0.002) day
Eccentricity	0.2 ($\pm$ 0.08)
ω	—
T _{peri}	—
Radius	0.24186 ($\pm$ 0.0058) R_J
Inclination	89.5785 (-0.0088 $+0.0079$)
Update	2020-05-09
Detection Method	Primary Transit

RA ₂₀₀₀	11:30:14.5
Dec ₂₀₀₀	+07:35:18
Alternate Names	EPIC 201912552
Planetary system	2 planets

More data

- [Simbad](#)
- [Most recent references \(ADS\)](#)

Star

K2-18

Nombre	K2-18
Distance	34.0 ($\pm$ 4.0) pc
Spectral type	—
Apparent magnitude	—



Portal

Simbad

VizieR

Aladin

X-Match

Other

Help

K2-18

other query
modes :Identifier
queryCoordinate
queryCriteria
queryReference
queryBasic
queryScript
submission

TAP

Output
options

Help

Query : K2-18

submit id

C.D.S. - SIMBAD4 rel 1.7 - 2020.07.31CEST23:25:41

[Available data](#) : [Basic data](#) • [Identifiers](#) • [Plot & images](#) • [Bibliography](#) • [Measurements](#) • [External archives](#) • [Notes](#) • [Annotations](#)

Basic data :

K2-18 -- High proper-motion Star

Other object types:

ICRS coord. (*ep=J2000*) :FK4 coord. (*ep=B1950 eq=1950*) :Gal coord. (*ep=J2000*) :Proper motions *mas/yr* :

Radial velocity / Redshift / cz :

Parallaxes (*mas*):

Fluxes (10) :

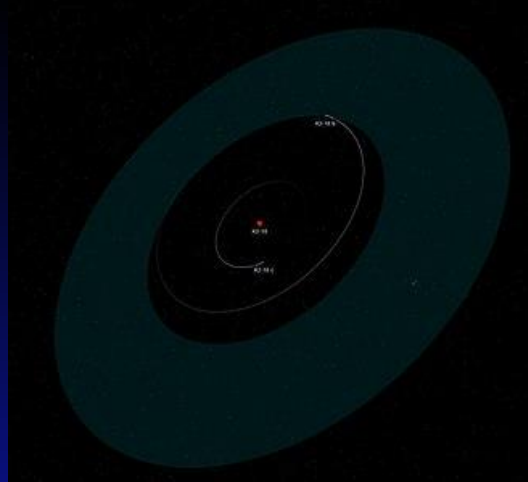
* (Ref,UCAC4,...), PM* (Ref,PM), V* (Ref), IR (2MASS)
11 30 14.5176249117 +07 35 18.257210626 (Optical) [0.0495 0.0331 90] A 2018yCat.1345....0G
254.6323634992315 +62.5757489346614 [0.0495 0.0331 90]
-80.377 -133.142 [0.083 0.063 90] A 2018yCat.1345....0G
V(km/s) 0.328 [~] / z(~) 0.000001 [~] / cz 0.33 [~]
(Opt) D 2018A&A...612A..49R
26.2686 [0.0546] A 2018yCat.1345....0G
B 15.01 [0.06] D 2012yCat.1322....0Z
V 13.50 [0.05] D 2012yCat.1322....0Z
R 13.24 [0.07] E 2012yCat.1322....0Z
G 12.4154 [0.0005] C 2018yCat.1345....0G
J 9.763 [0.028] C 2003yCat.2246....0C
H 9.135 [0.026] C 2003yCat.2246....0C
K 8.899 [0.019] C 2003yCat.2246....0C
g 14.22 [0.05] D 2012yCat.1322....0Z
r 12.86 [0.04] D 2012yCat.1322....0Z
i 11.66 [0.08] D 2012yCat.1322....0Z

SIMBAD with radius arcmin

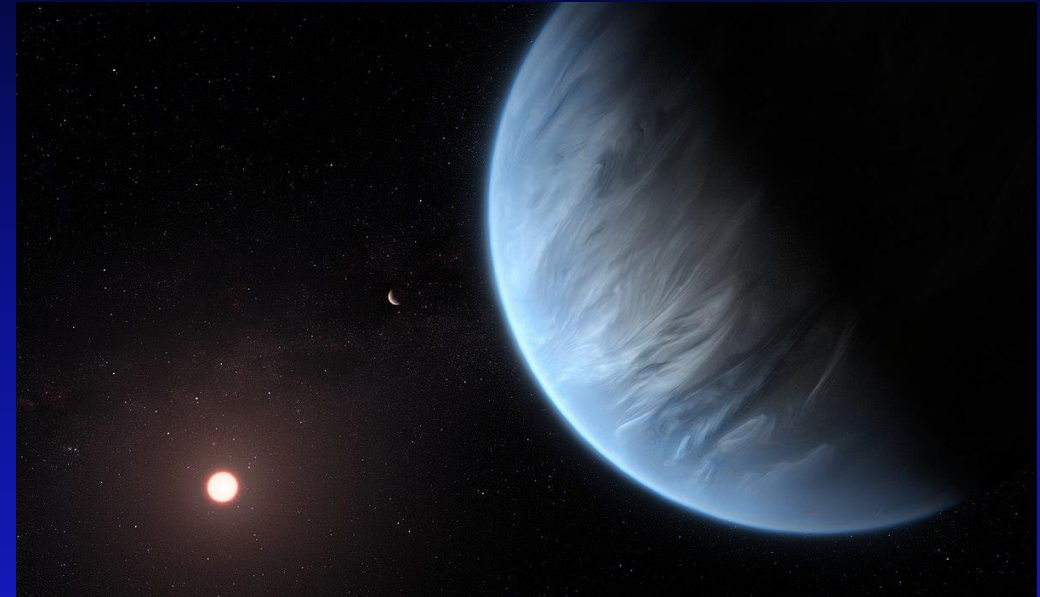
Interactive AladinLite view



Otro integrante del sistema: K2-18c



Sistema planetario K2



Planet K2-18 c	
Name	K2-18 c
Planet Status	Confirmed
Discovered in	2017
Mass	—
Mass*sin(i)	0.01768 (± 0.00264) M _J
Semi-Major Axis	0.067 (± 0.0002) AU
Orbital Period	8.962 (± 0.008) day
Eccentricity	0.2 (-0.2 ^{+0.0})
ω	—
T _{peri}	—
Radius	—
Inclination	—
Update	2020-05-09
Detection Method	Radial Velocity

Star	
K2-18	
Nombre	K2-18
Distance	34.0 (± 4.0) pc
Spectral type	—
Apparent magnitude V	13,5
Mass	0.413 (± 0.043) M _{Sun}
Age	—
Effective temperature	3503.0 (± 60.0) K
Radius	0.394 (± 0.038) R _{Sun}
Metallicity [Fe/H]	0.09 (± 0.09)
Detected Disc	—
Magnetic Field	—

Inténtalo con estos otros planetas:

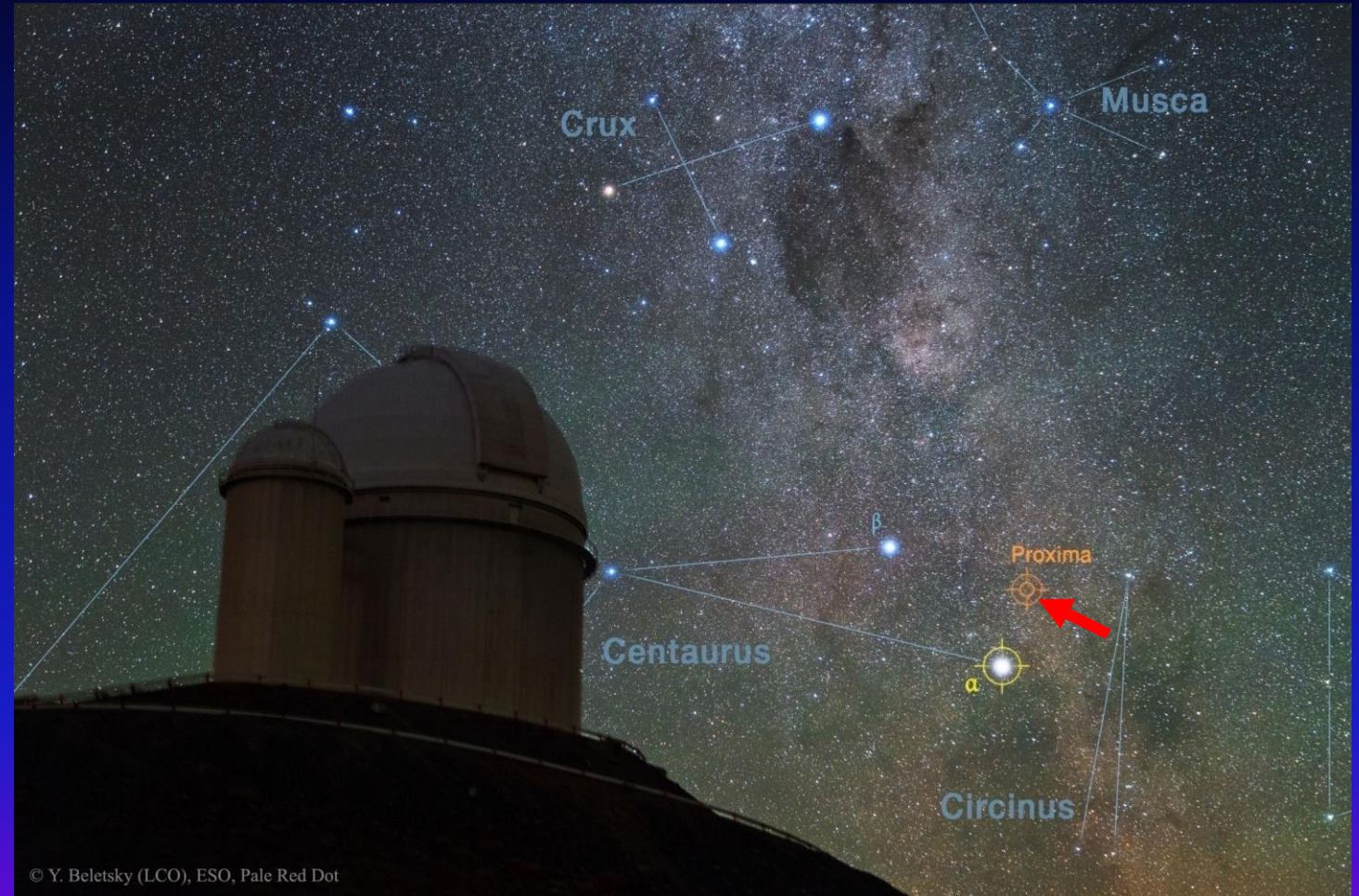
- Trappist 1-e
- K186f
- GJ357d

DESAFÍO 2:

¿Cuál es el exoplaneta
más cercano a nosotros?

Alfa Cen se encuentra a 4,3
años-luz y se compone de dos
estrellas similares al Sol y una
enana roja.

Proxima Cen b, perteneciente
al sistema Alfa Cen



El sistema es triple y posee dos planetas:
uno en Alfa Cen B y otro en Proxima.

URL: phl.upr.edu/hec



Planetary Habitability Laboratory
University of Puerto Rico at Arecibo

MAPPING THE HABITABLE UNIVERSE

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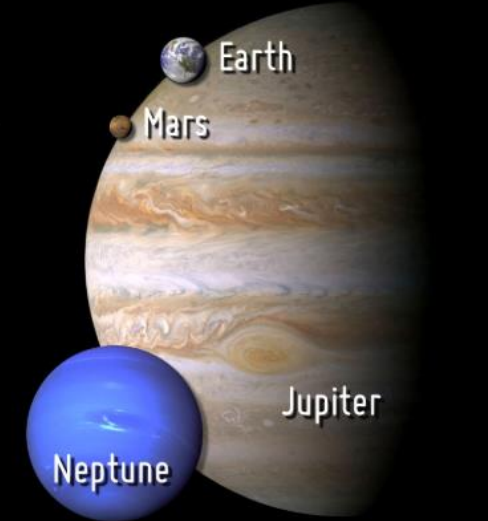
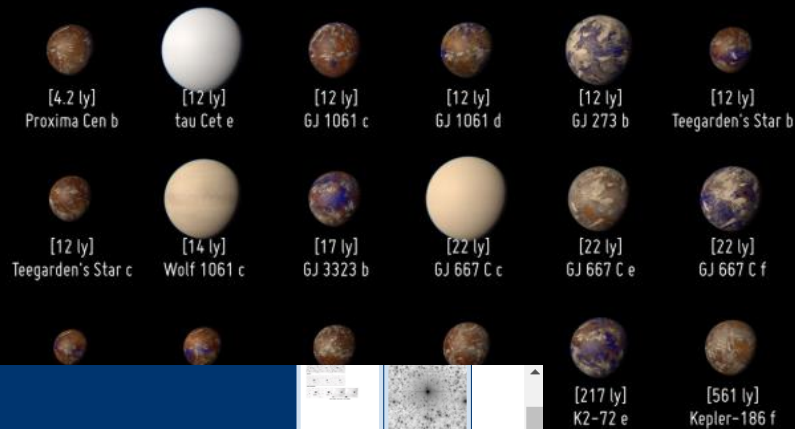
RESOURCES

Last Update: 2019-09-04

The catalog will be updated soon with new planets from Rodríguez *et al.* (2020) and Feng *et al.* (2020)

Potentially Habitable Exoplanets

Ranked by Distance from Earth (light years)



CONFIRMED PLANET OVERVIEW PAGE



Object and Aliases

Default Alias	Aliases
Proxima Cen b	2MASS J14294291-6240465 b, GJ 551 b, HIP 70890 b, IRAS 14260-6227 b, LHS 49 b, Proxima Centauri b, Proxima b, TYC 9010-04949-1 b, V0645 Cen b, WDS J14396-6050 C b, alf Cen C b

NASA Exoplanet Archive Links

Planet	Related Overviews	Transit Service
Proxima Cen b	Confirmed, New System Overviews (alpha), Kepler Pipeline	Proxima Cen b Transits

Planet Orbital Properties

Planet	Period (days)	Semi-Major Axis (au)	Inclination (deg)	Eccentricity	Time of Periastron Passage (days)	Transit Time System Reference Frame	Longitude of Periastron (deg)	RV Amplitude Value (m/s)	Date of Orbital Solution	Reference
b	11.1855 ^{+0.0015} _{-0.0014}	null	null	0.080 ^{+0.006} _{-0.006}	null	null	252 ⁺¹³⁶ ₋₁₃₆	1.32 ^{+0.12} _{-0.12}	null	Jenkins <i>et al.</i> 2019
b	11.186 ^{+0.002} _{-0.002}	0.0485 ^{+0.0021} _{-0.0021}	null	<0.35	null	null	310	1.38 ^{+0.21} _{-0.21}	null	Anglada-Escudé <i>et al.</i> 2016

Planet Parameters

Planet	M sin(i) (Jupiter Mass)	(Earth Mass)	Mass (Jupiter Mass)	(Earth Mass)	Radius (Jupiter Radii)	(Earth Radii)	Density (g/cm ³)	Equilibrium Temperature (K)	Insolation Flux Value (Earth Flux)	Reference
b	null	null	null	null	null	null	null	null	null	Jenkins <i>et al.</i> 2019
b	0.00400 ^{+0.00005} _{-0.00005}	1.27 ^{+0.13} _{-0.13}	null	null	null	null	null	234 ⁺¹⁴ ₋₁₄	0.65	Anglada-Escudé <i>et al.</i> 2016

Planet Transit Properties

Planet	Depth (perc)	Duration (hours)	Mid-Point (days)	Impact Parameter	Occultation Depth (perc)	Ratio of Distance to Stellar Radius	Ratio of Planet to Stellar Radius	Reference
b	null	null	null	null	null	null	null	Jenkins <i>et al.</i> 2019
b	null	null	null	null	null	null	null	Anglada-Escudé <i>et al.</i> 2016

General Information

Planet	Method	Year	Discovery	Reference	Controversial Flag	System Information	Kepler Flag	K2 Flag	TTV Flag	Exoplanet Encyclopedia Link	Exoplanets Data Explorer Link
b	Radial Velocity	2016	Anglada-Escudé <i>et al.</i> 2016	0	3	1	0	0	0	http://exoplanet.eu/catalog/proxima_centauri_b/	Unavailable

Notes

Planet	Note	Reference
	No Data Available	

Summary of Stellar Information

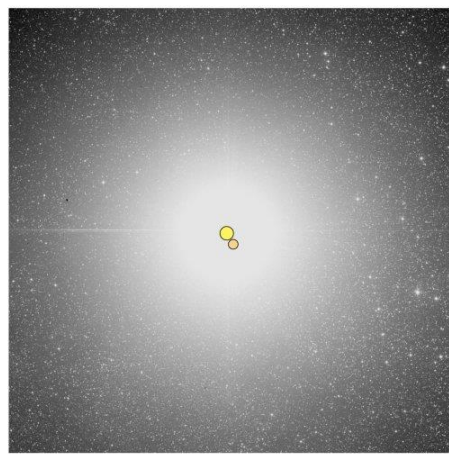
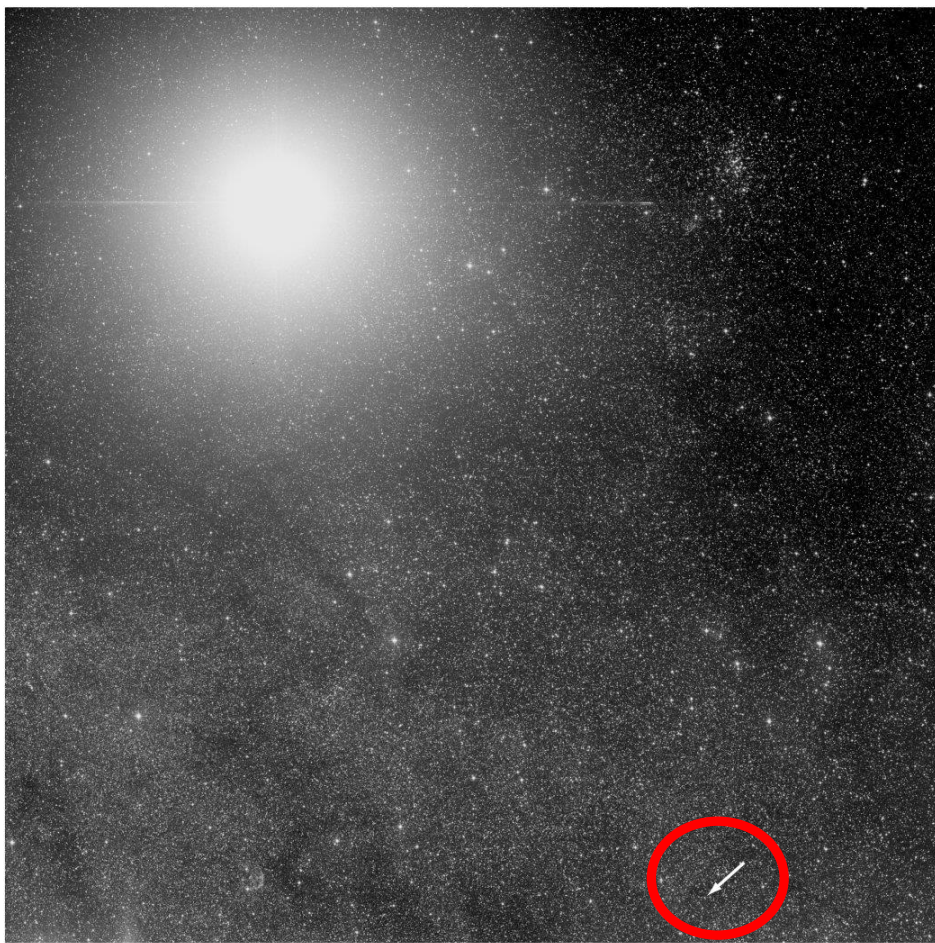
Right Ascension	14h29m42.95s	Declination	-62d40m46.1s
Galactic Longitude (deg)	313.93988	Galactic Latitude (deg)	-1.92708
Parallax (mas)	768.50036533339176±0.20302126916721	Distance (pc)	1.3012355557775019±0.00034375844948999
RA Proper Motion (mas/yr)	-3781.3059409680022±0.0851812263318	Dec Proper Motion (mas/yr)	-769.76565334865859±0.18895487215250
Total Proper Motion (mas/yr)	3858.862±0.092	Radial Velocity (km/s)	null
B-band (mag)	12.770±0.020	K-band (mag)	4.384±0.033
Spectral Type	M5.5 V	Effective Temperature (K)	3050±100
r.536.437A/abstract 2)	null	Luminosity (log(L _{sun}))	-2.81 ^{+0.02} _{-0.02}

have a rocky composition and maintain surface liquid water (*i.e.* 0.5 < Planet mass in Earth masses). They are represented artistically in the top image.

Mass (M _E)	Radius (R _E)	Flux (S _E)	T _{eq} (K)	Period (days)	Distance (ly)	ESI
≥1.05	—	1.21	267	4.9	12	0.93
—	1.29	1.11	261	24.2	217	0.90
≥2.02	—	1.23	265	5.4	17	0.90
0.41	0.77	1.21	267	4.0	41	0.89
≥1.75	—	1.35	275	6.7	12	0.88
0.62	0.92	0.70	233	6.1	41	0.87
≥2.54	—	0.85	245	39.0	22	0.87
≥1.27	—	0.69	227	11.2	4.2	0.87
1.25	0.72	0.72	225	11.2	4.2	0.85

Veamos dos imágenes y dos representaciones ...





α Cen A & B



Pro

The Triple Stellar System Alpha Centauri (ESO 1-m Schmidt Telescope)

ESO PR Photo 07a/03 (15 March 2003)

© European Southern Observatory



Una vista desde la superficie del planeta Proxima b, con su estrella Proxima y, allá lejos, Alfa y Beta Cen ...



SÍNTESIS DE APRENDIZAJE:

- Los exoplanetas pertenece a otros sistemas planetarios.
- Por su tamaño y distancia a la que se encuentran no es posible observarlos, sólo se *detectan*.
- Se hace empleando sofisticadas técnicas que necesitan de una instrumentación de avanzada tecnología.
- Las principales técnicas de detección son *tránsito primario* y *velocidad radial*.
- En la técnica de tránsito se trabaja con la curva de luz de la estrella anfitriona; en la de velocidad radial se analiza el espectro de la luz de dicha estrella.
- Datos aportados por ambas técnicas permiten saber una serie de parámetros del planeta: masa, tamaño, composición, temperatura, distancia a la estrella, órbita y otros datos.

Si se llegan a detectar muchos planetas tipo Tierra habitables, podría significar que el Universo se encuentra lleno de vida. Si no se encuentra nada, esto puede significar que estamos solos en la Galaxia.

Conforme a los últimos estudios, en nuestra Galaxia hay 300 mil millones de estrellas y el 50% contaría con planetas, o sea unos 150 mil millones de estrellas.

Recientes estimaciones indican que el 20% de las estrellas de la Vía Láctea albergaría *planetas habitables* ...



O sea, en 60 mil millones de estrellas