El fotón viajero

un paseo por los planetas

Charlas Manuel Félix Herrera Gómez

Año 2015, año internacional de la Luz

A 300.00.000 km/s . . .

Mercurio: 3 minutos

Venus: 6 minutos

La Tierra: 8 minutos

Marte: 13 minutos

Júpiter: 43 minutos

Saturno: 80 minutos

Urano: 160 minutos

Neptuno: 250 minutos

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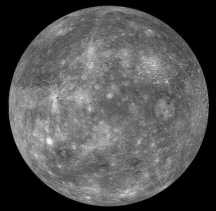
Exoplaneta más cercano: 4 años

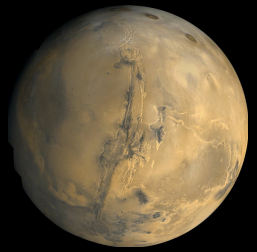
Primera parte del viaje: Los planetas interiores



Mercurio

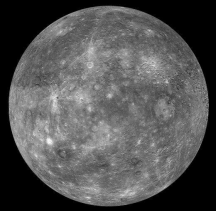
Venus

La Tierra



Marte

Primera parte del viaje: Los planetas interiores

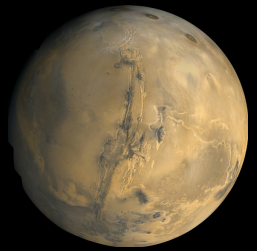


Mercurio

3 minutos

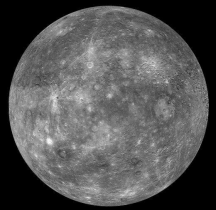
Venus

La Tierra

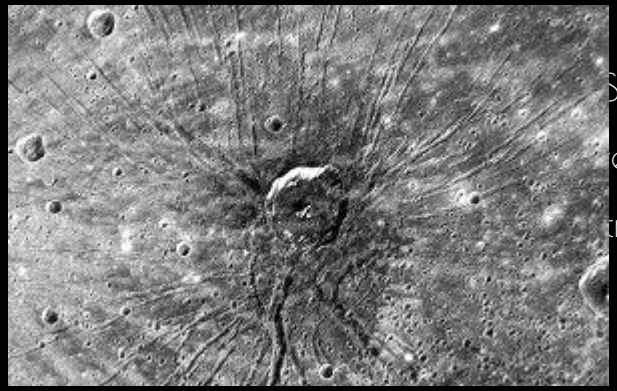


Marte

Primera parte del viaje: Los planetas interiores



Mercurio



La Araña

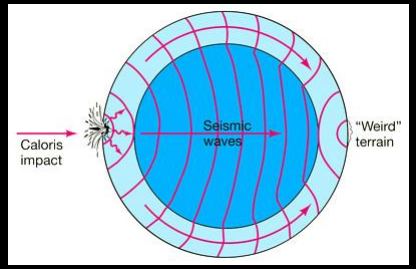
Sol

es

tres

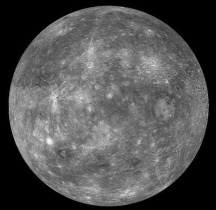
- Visitado desde 1974: Mariner 10, Messenger, Bepi Colombo

Cuenca Caloris

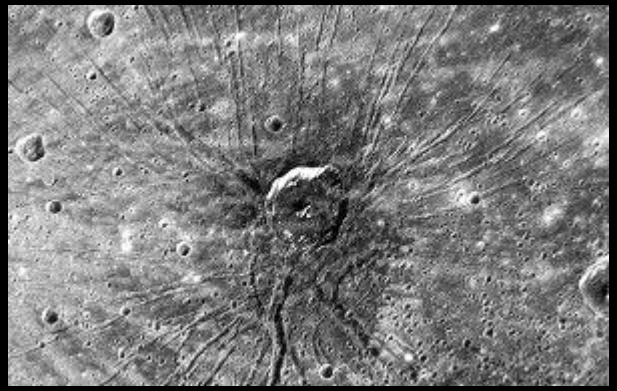


Terreno extraño

Primera parte del viaje: Los planetas interiores

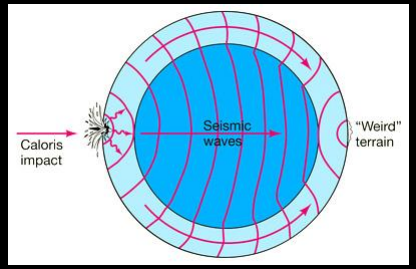


Mercurio



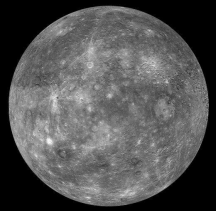
La Araña

Cuenca Caloris



Terreno extraño

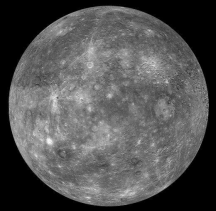
Primera parte del viaje: Los planetas interiores



Mercurio

Doble atardecer

Primera parte del viaje: Los planetas interiores

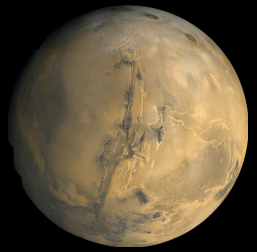


Mercurio

6 minutos

Venus

La Tierra



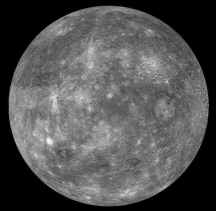
Marte

Primera parte del viaje: Los planetas interiores

- Masa, composición y tamaño parecidos al terrestre
- Dia Venusiano = 243 Dias Terrestres
- Año Venusiano = 225 Días Terrestres
- Rotación retrograda
- Gruesa atmósfera de CO_2 + ácido sulfúrico
- Vientos de 350 km/h, temperaturas de 480º y una presión 90 veces superior a la terrestre
- Rayos no caen a la superficie
- Ha sido visitado desde 1961: Venera 1-9, Mariner 5, Pioner Venus, Magallanes, Venus express, Planet C

Venus

Primera parte del viaje: Los planetas interiores

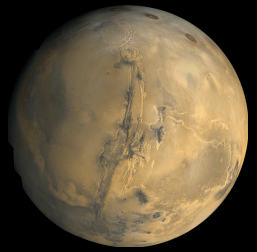


Mercurio

Venus

La Tierra

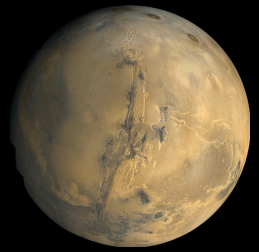
13 minutos



Marte

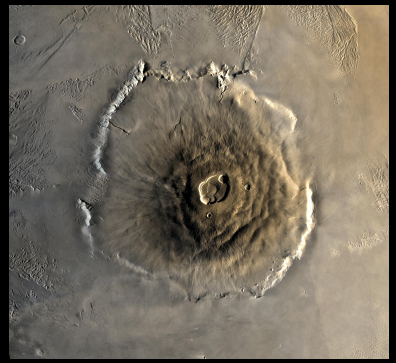
Primera parte del viaje: Los planetas interiores

- Más pequeño que la Tierra, pero parecido en muchos aspectos
- Dia Marciano = Dia Terrestre
- Año Marciano = 687 Días Terrestres
- Posee estaciones igual que la Tierra
- Color rojo debido al óxido de hierro
- Posee cráteres de impacto, campos de lava, cauces de ríos secos, dunas de arena y géiseres
- Misterio del Metano
- Ha sido visitado desde 1963: Marsnik 1 y 3, Mariner 4, 6 y 7, Viking 1 y 2, Spirit y Opportunity, Phoenix, Curiosity, Mars Express . . .



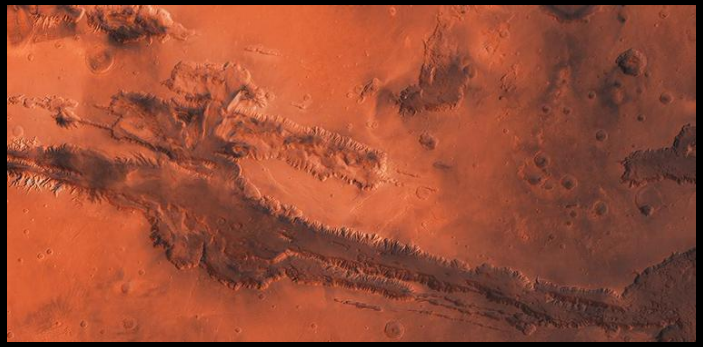
Marte

Primera parte del viaje: Los planetas interiores

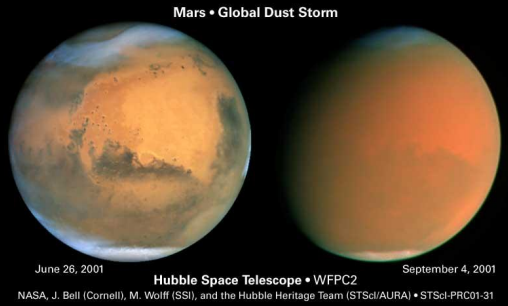


Monte Olimpo

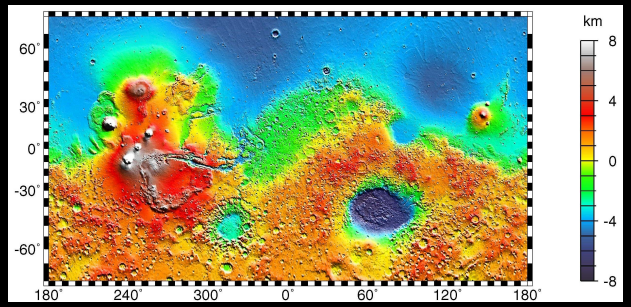
Valle Marineris

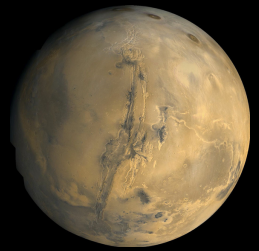


Tormenta Global



Orografía

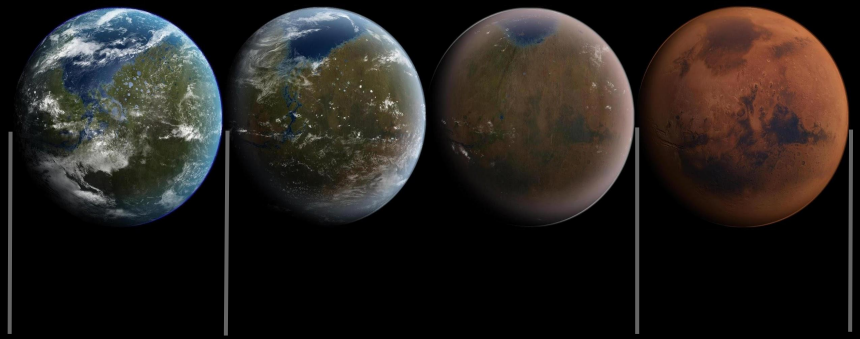




Marte

Primera parte del viaje: Los planetas interiores

La vida en Marte



1000 Myr

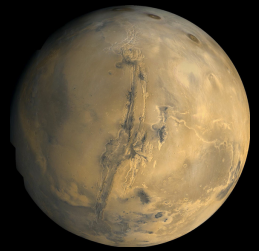
200 Myr

3500 Myr

Condiciones favorables para la vida

Cambio climático

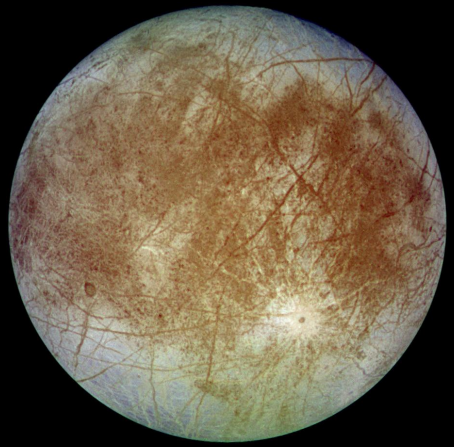
Planeta frío, seco e inerte



Marte

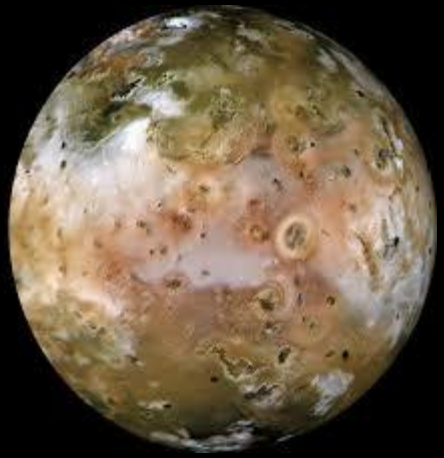
Segunda parte del viaje: El Sistema Solar Exterior

Júptier: 43 mintuos

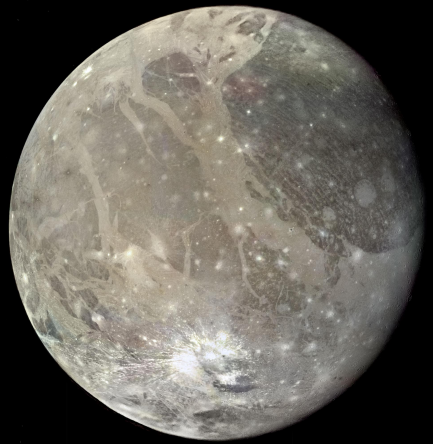


Europa

Io



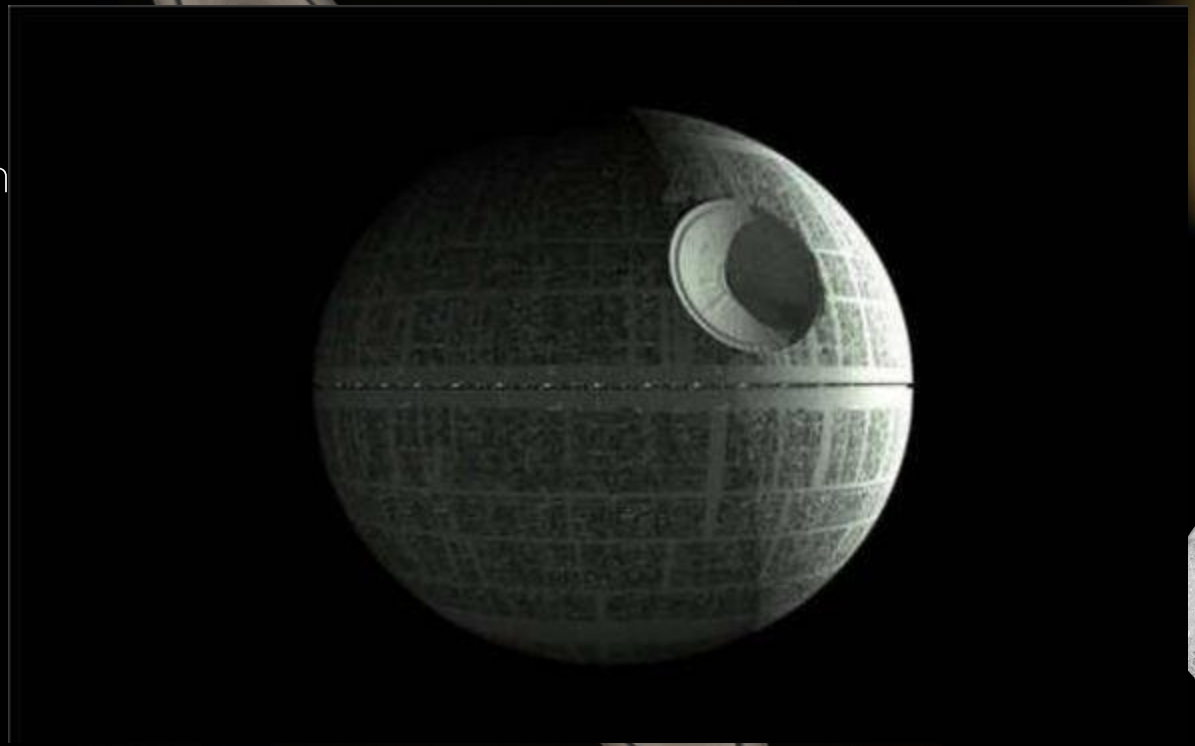
Ganimedes



Calisto

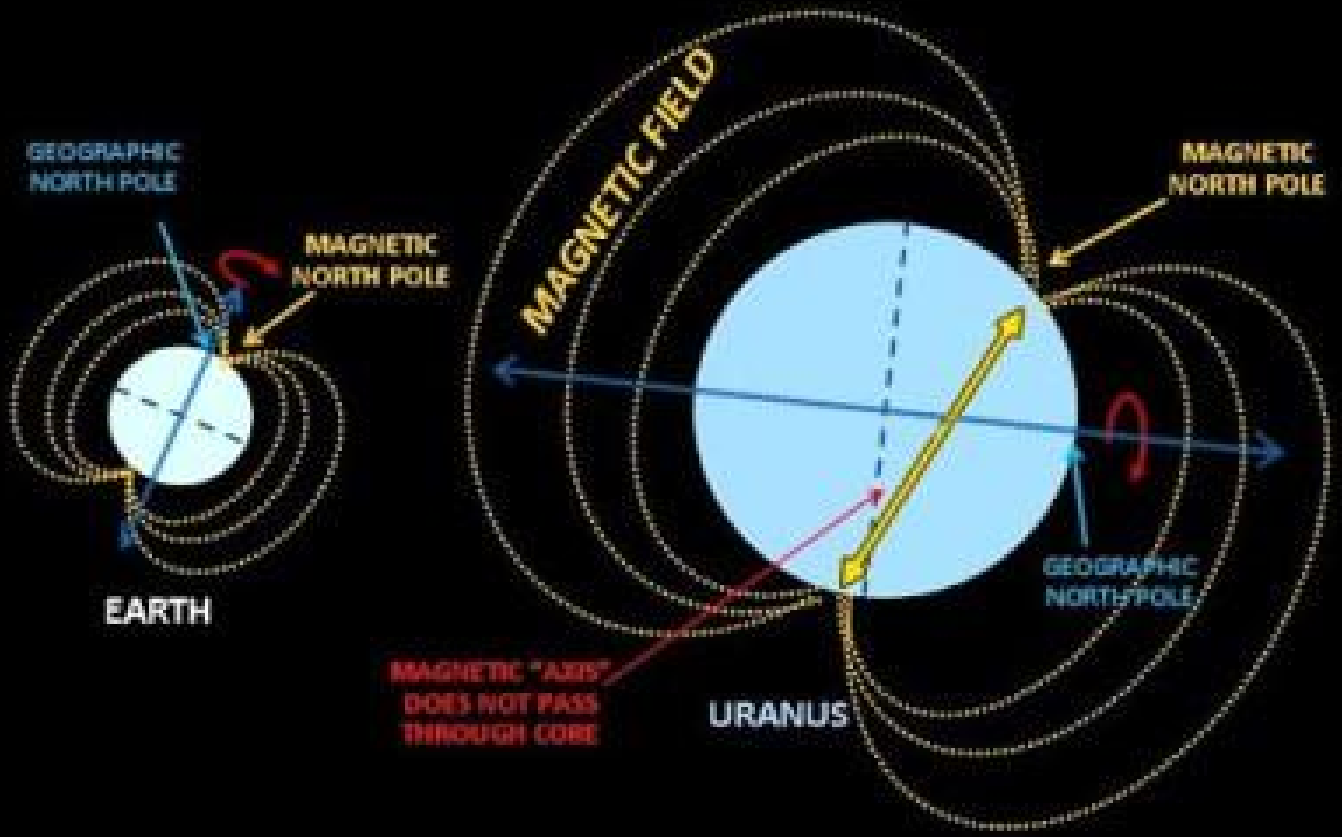
Titán

Saturno: 80 m

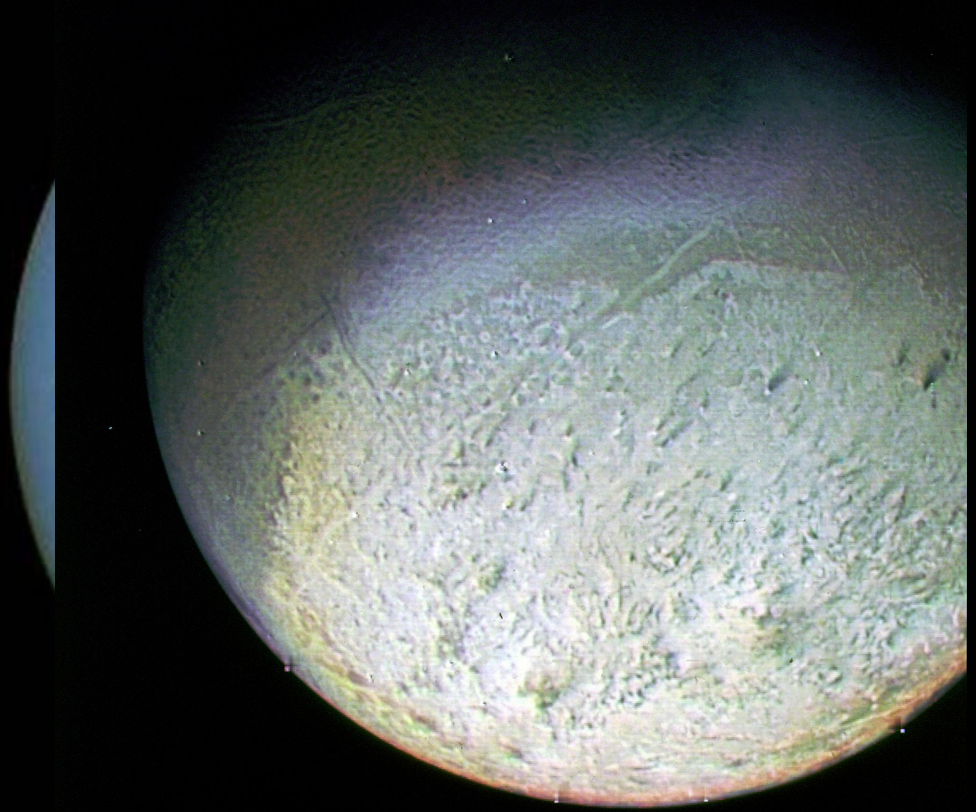


Urano: 160 min

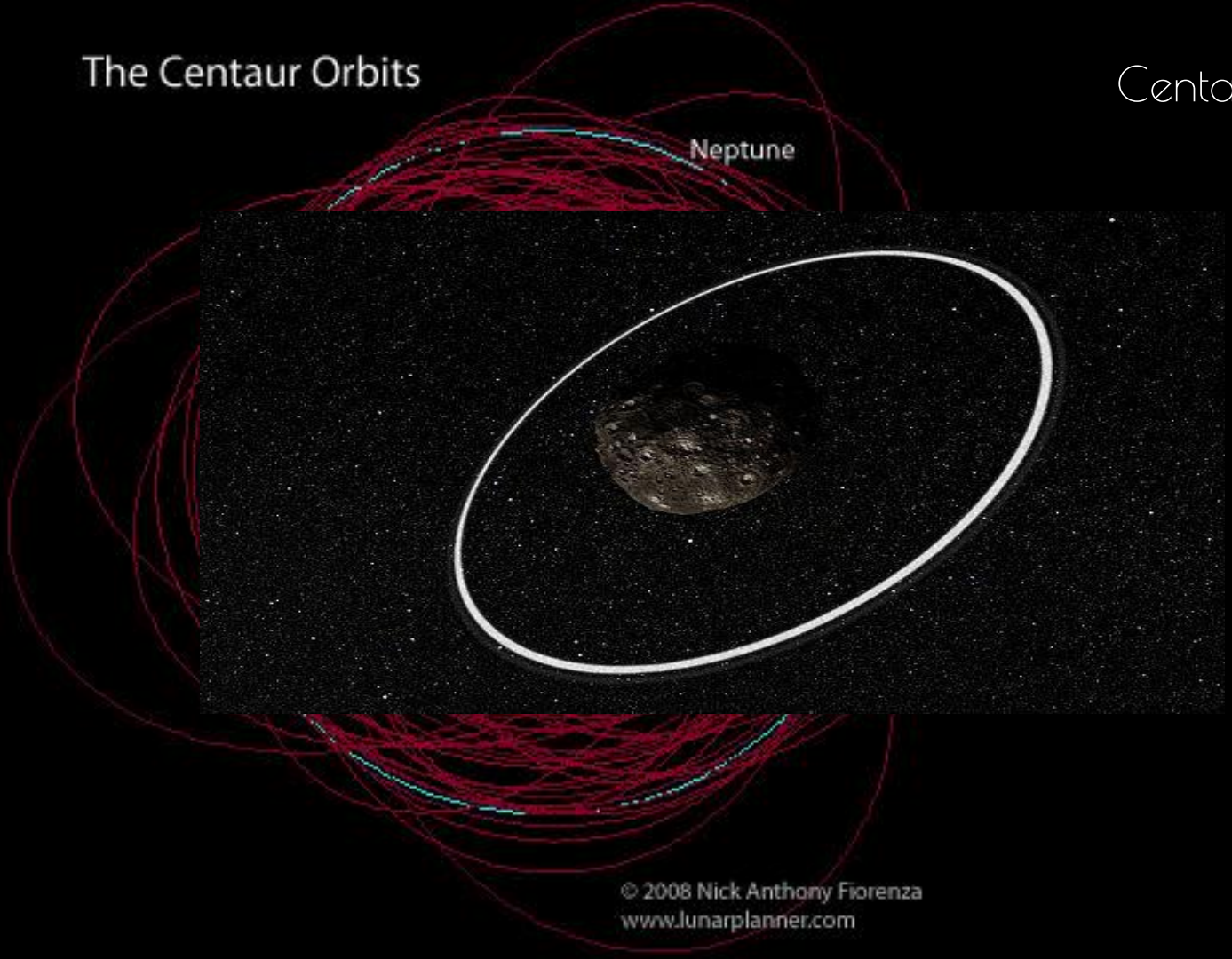
Magnetic Fields of Earth, Uranus



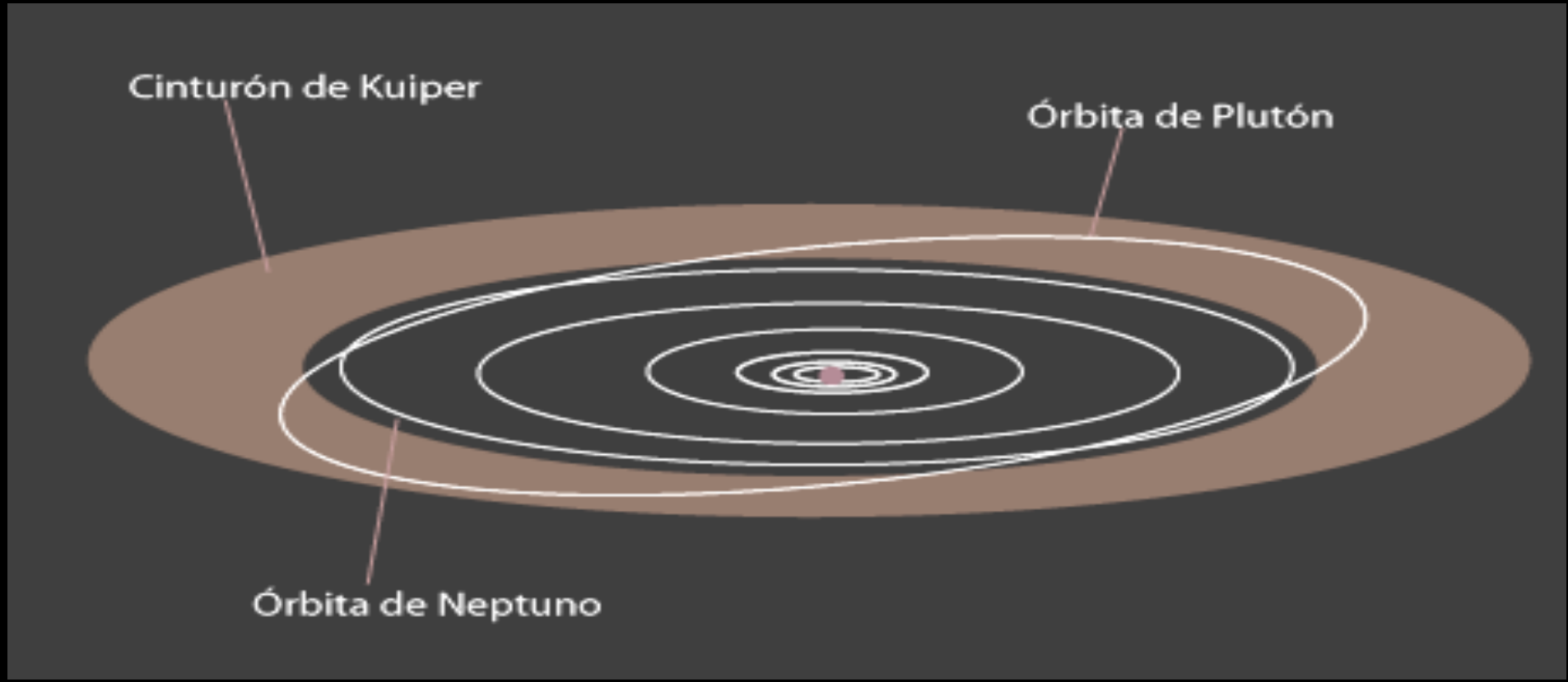
Neptuno: 250 min



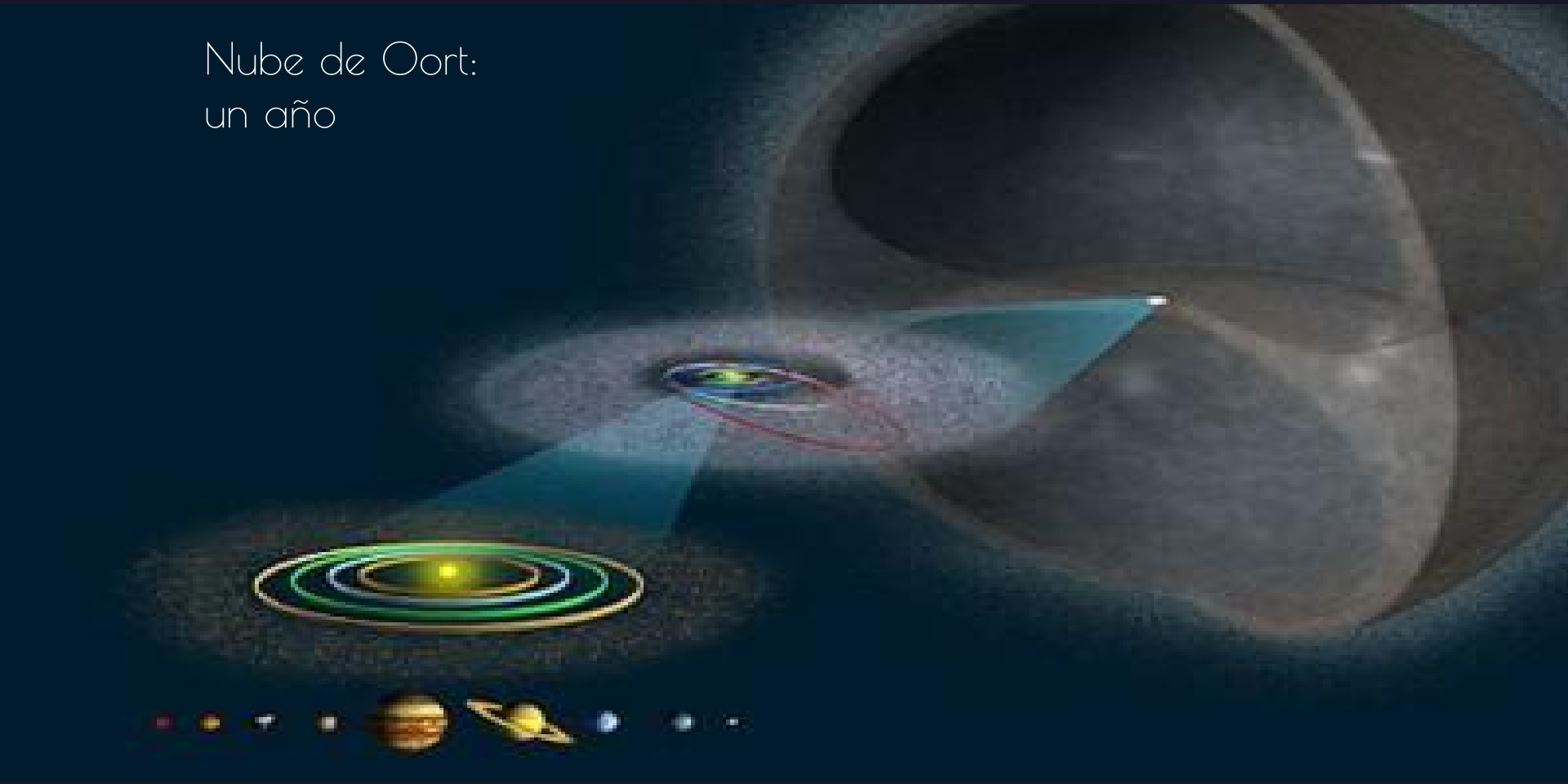
Centauros


The Centaur Orbits
Neptune
© 2008 Nick Anthony Fiorenza
www.lunarplanner.com

Objetos Trans-Neptunianos

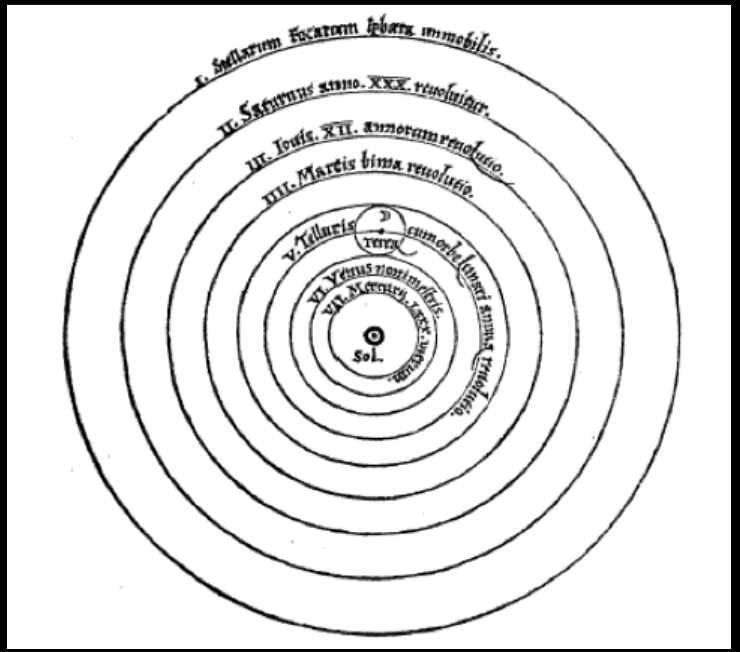


Nube de Oort:
un año



Tercera parte del viaje: Exoplanetas

NICOLAI CO
PERNICI TORINENSIS
DE REVOLVTIONIBVS ORBI
um cœleſtium, Libri VI.



THE ASTRONOMICAL JOURNAL VOLUME 68, NUMBER 7 SEPTEMBER 1963

Astrometric Study of Barnard's Star from Plates Taken with the 24-inch Sproul Refractor

PETER VAN DE KAMP
Sproul Observatory, Swarthmore College
(Received 21 June 1963)

Twenty-five consecutive years of photographic observations of Barnard's star show deviations from uniform proper motion and secular acceleration which can be represented by Keplerian motion with a period of 24 yr and semi-axis major of ".0245±".002 (p.e.). Assuming a value of 0.15⊙ for the mass of Barnard's star, the mass of the companion proves to be 0.0015⊙, or 1.6 times the mass of Jupiter.

El sueño frustrado de Peter Van de Kamp

THE ASTRONOMICAL JOURNAL VOLUME 78, NUMBER 8 OCTOBER 1973

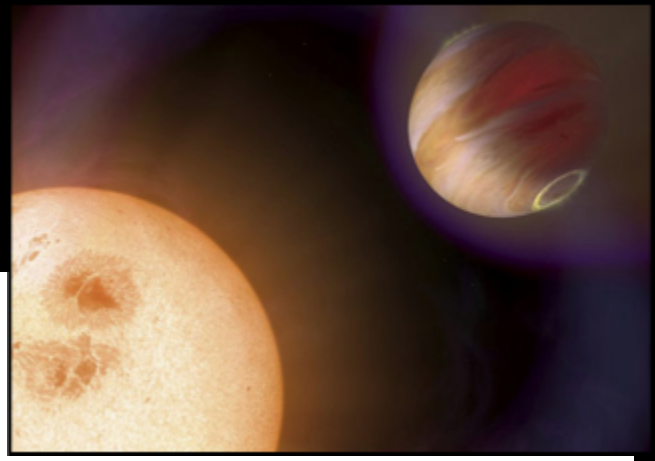
An unsuccessful search for a planetary companion of Barnard's star* (BD + 4 °3561)

George Gatewood
Allegheny Observatory, University of Pittsburgh, Pittsburgh, Pennsylvania

Heinrich Eichhorn
Department of Astronomy, University of South Florida, Tampa, Florida
(Received 8 February 1973; revised 30 April 1973)

The parallax, proper motion, and acceleration in position of Barnard's Star have been determined from 241 Allegheny and Van Vleck Observatory photographic plates. The measurements were reduced by means of a variant of a rigorous overlap type method previously proposed by one of us. (Eichhorn 1960). Despite relatively small rms errors, several test failed to confirm van de Kamp's published orbit. The weighting system was carefully studied from the adjustment residuals. In essence, the weight of a Thaw or Van Vleck plate is proportional to the number of exposures.

51 Peg b. primer planeta descubierto orbitando una estrella similar al Sol



article

Nature **378**, 355 - 359 (23 November 1995); doi:10.1038/378355a0

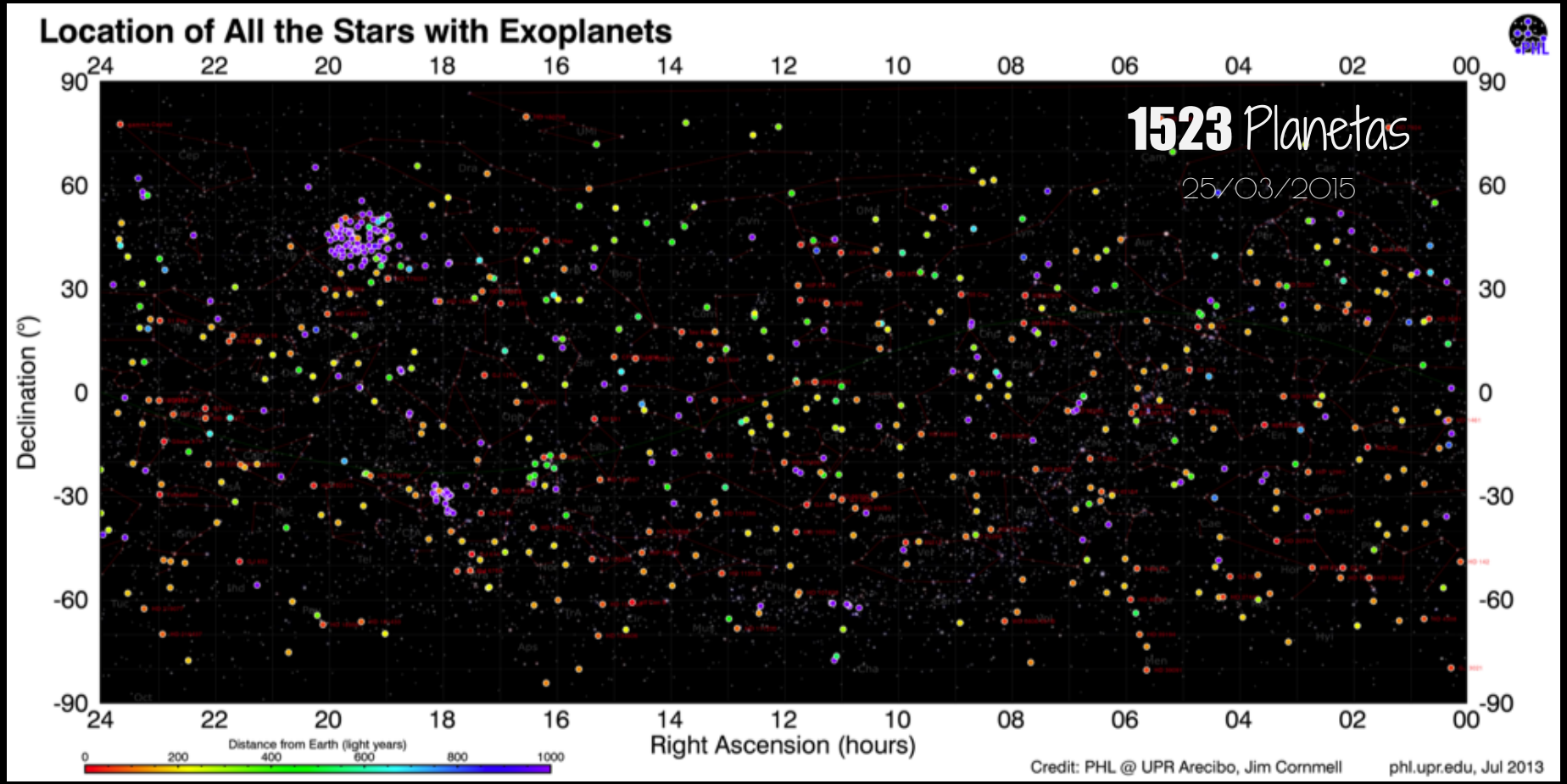
A Jupiter-mass companion to a solar-type star

MICHEL MAYOR & DIDIER QUELOZ

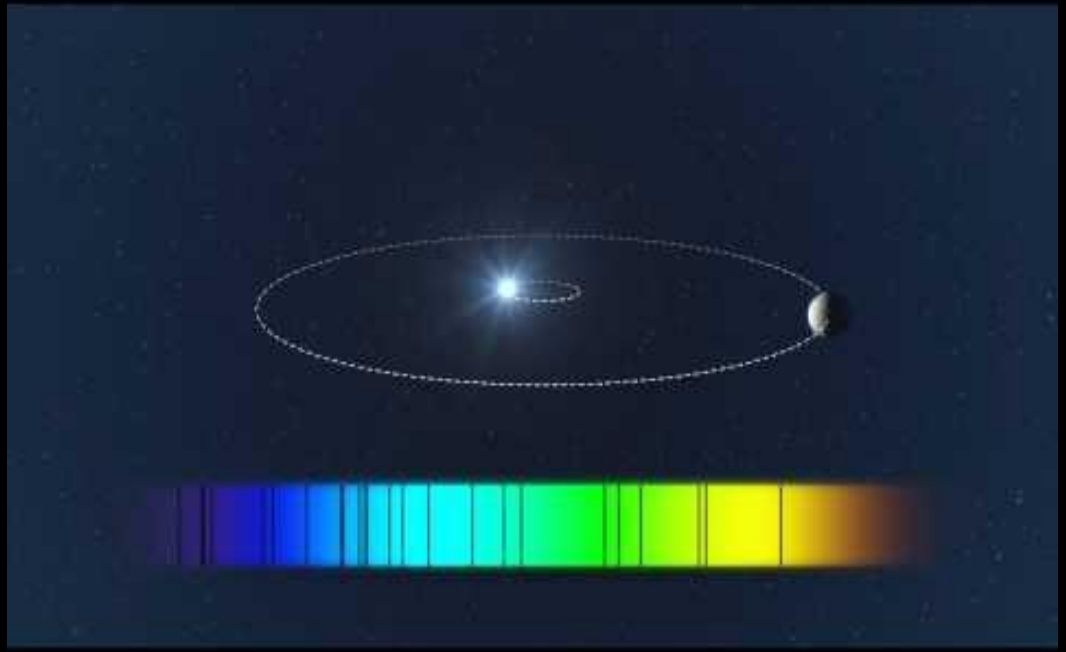
Geneva Observatory, 51 Chemin des Maillettes, CH-1290 Sauverny, Switzerland

The presence of a Jupiter-mass companion to the star 51 Pegasi is inferred from observations of periodic variations in the star's radial velocity. The companion lies only about eight million kilometres from the star, which would be well inside the orbit of Mercury in our Solar System. This object might be a gas-giant planet that has migrated to this location through orbital evolution, or from the radiative stripping of a brown dwarf.

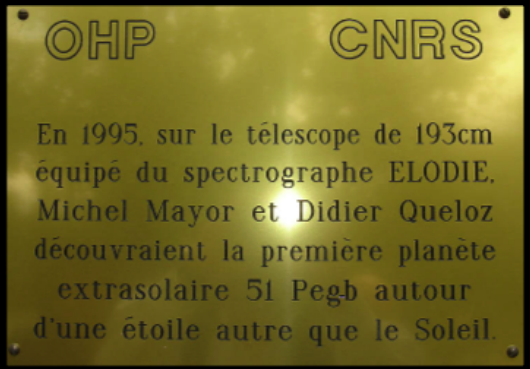
Los exoplanetas pueblan nuestro cielo



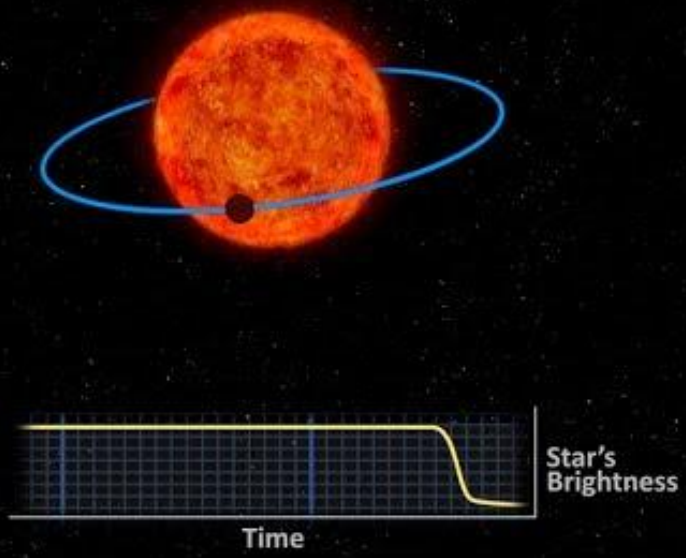
¿Cómo se detecta 51 Peg b? Velocidades Radiales



=> masa mínima + Periodo Orbital



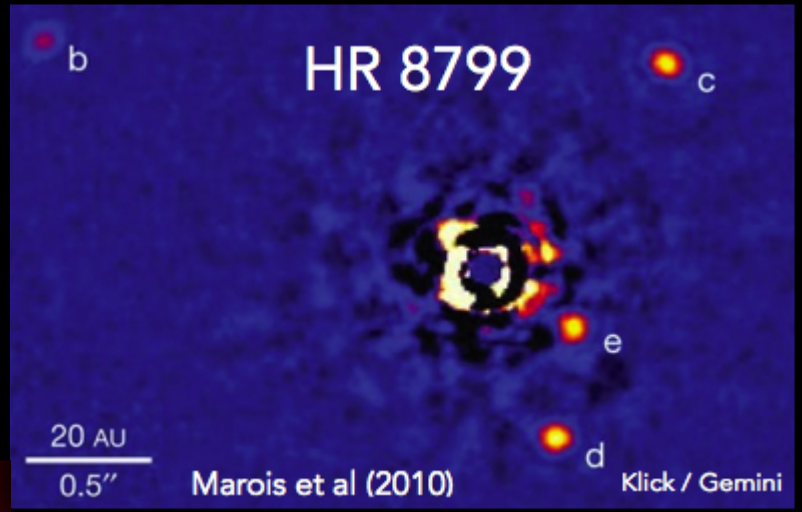
Método de tránsitos, The Kepler Revolution

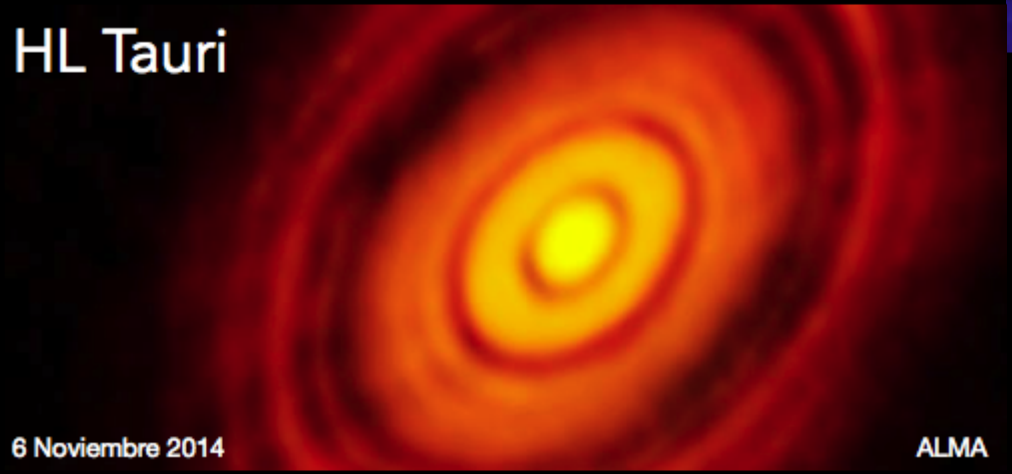


1,000 Alien Planets! NASA's Kepler Space Telescope Hits Big Milestone

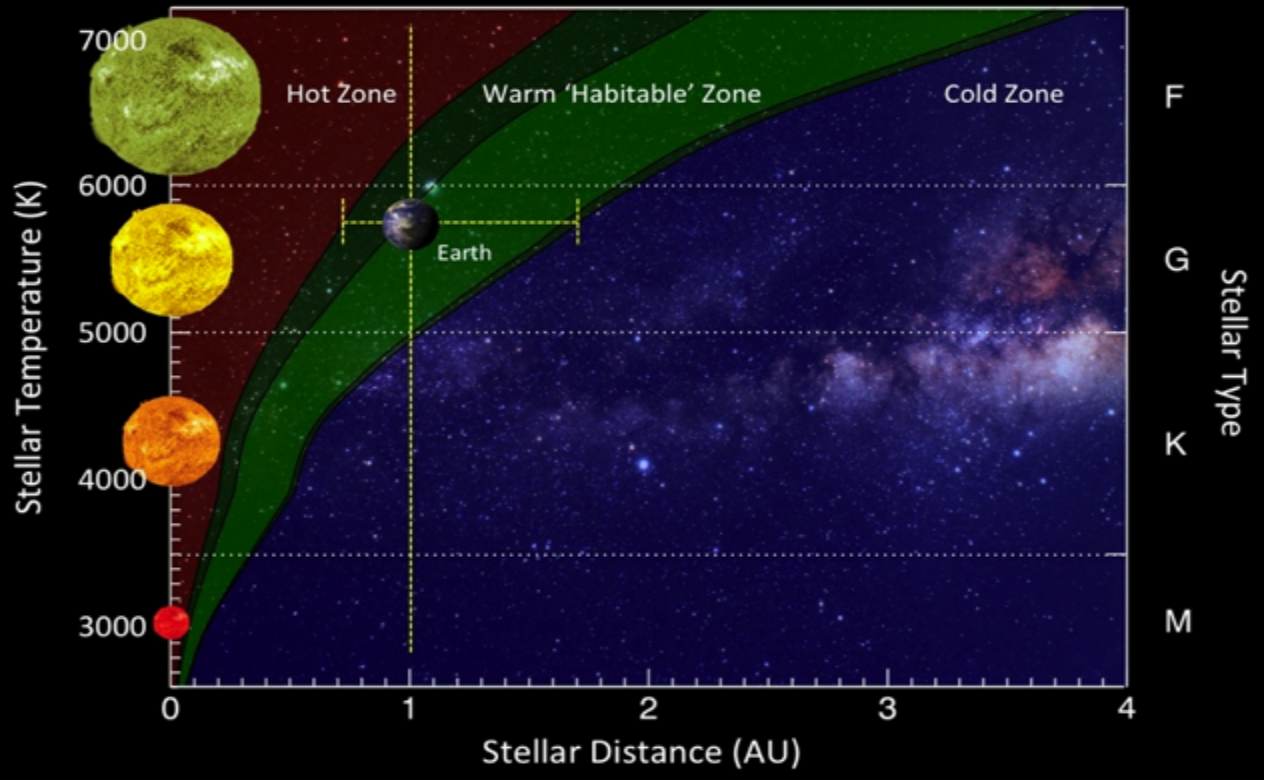
by Mike Wall, Space.com Senior Writer | January 06, 2015 02:00pm ET

También podemos verlos





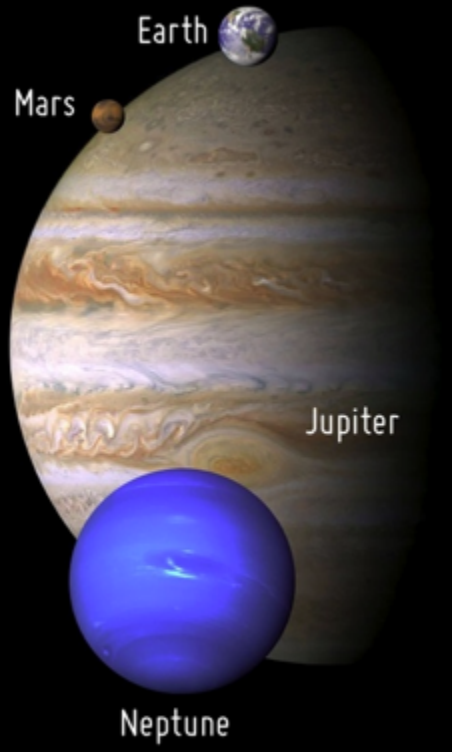
¿Por dónde empezamos a buscar vida? Zona de habitabilidad



CREDIT: PHL @ UPR Arecibo

Candidatos prometedores

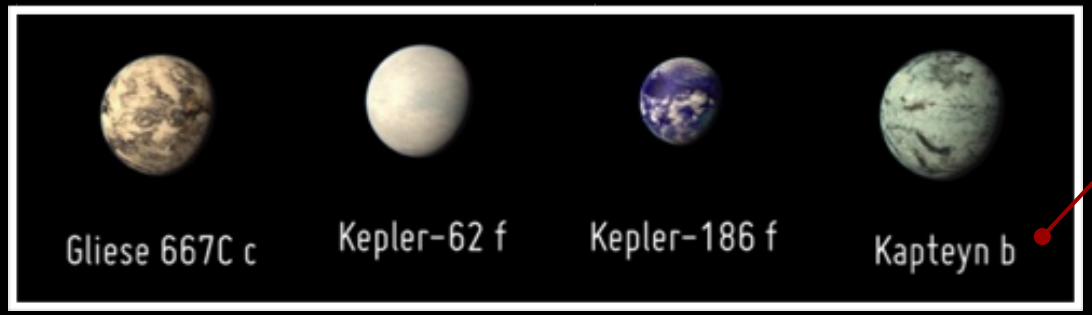
¡ 29 !



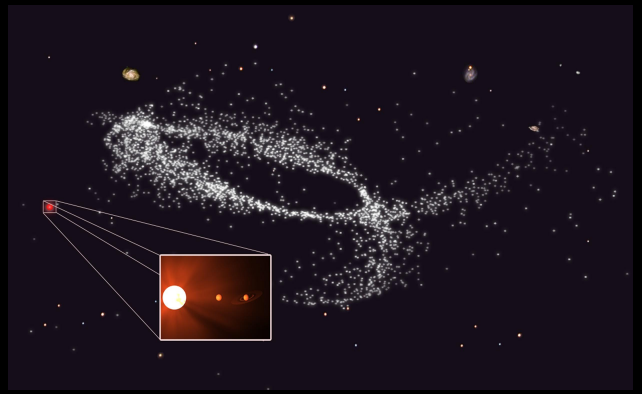
Artistic representations. Earth, Mars, Jupiter, and Neptune for scale. Distance is between brackets. Planet candidates indicated with asterisks.

CREDIT: PHL @ UPR Arecibo (phl.upr.edu) January 16, 2015

Candidatos aún más prometedores



Kapteyn b, ¿un planeta realmente viejo?

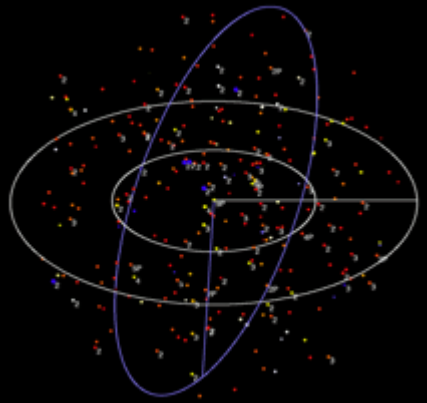


Monthly Notices of the ROYAL ASTRONOMICAL SOCIETY
MNRASL 443, L89–L93 (2014) doi:10.1093/mnrasl/slu076

Two planets around Kapteyn's star: a cold and a temperate super-Earth orbiting the nearest halo red dwarf

G. Anglada-Escudé,[1,2★] P. Arriagada,[3] M. Tuomi,[4,5] M. Zechmeister,[2] J. S. Jenkins,[4] A. Ofir,[2] S. Dreizler,[2] E. Gerlach,[6] C. J. Marvin,[2] A. Reiners,[2] S. V. Jeffers,[2] R. P. Butler,[3] S. S. Vogt,[7] P. J. Amado,[8] C. Rodríguez-López,[8] Z. M. Berdiñas,[8] J. Morin,[2,9] J. D. Crane,[10] S. A. Shectman,[10] I. B. Thompson,[10] M. Díaz,[5] E. Rivera,[7] L. F. Sarmiento[2] and H. R. A. Jones[5]

Un poco de estadística



Vecindario Solar

34 años luz

132 - 160

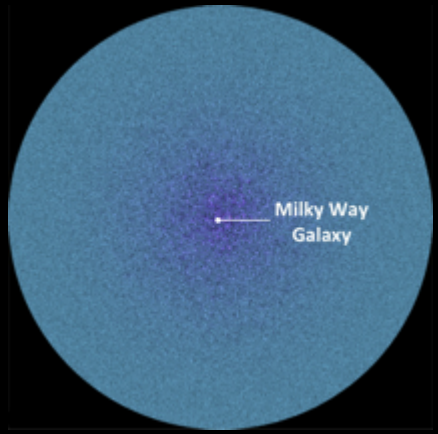
planetas habitables

Vía Láctea

111000 años luz

40000 - 49000

millones



Universo Observable

46000 millones años luz

4.2 - 5.3

billones

Wanderers es la visión de Erik Wernquist sobre la exploración humana del Sistema Solar. Basado en conceptos e ideas científicas, nos impulsa a soñar como será nuestro futuro en el espacio, si esto ocurre algún día...