

Dünya Dışı Yaşam



17. Ulusal Gökyüzü Gözlem Şenliği
31 Temmuz - 3 Ağustos 2014
Saklıkent, ANTALYA

Ömür ÇAKIRLI

Ege Üniversitesi
Astronomi Bölümü, İzmir
omur.cakirli@gmail.com



Evrende yalnız mıyız?



UFO #1



UFO #2

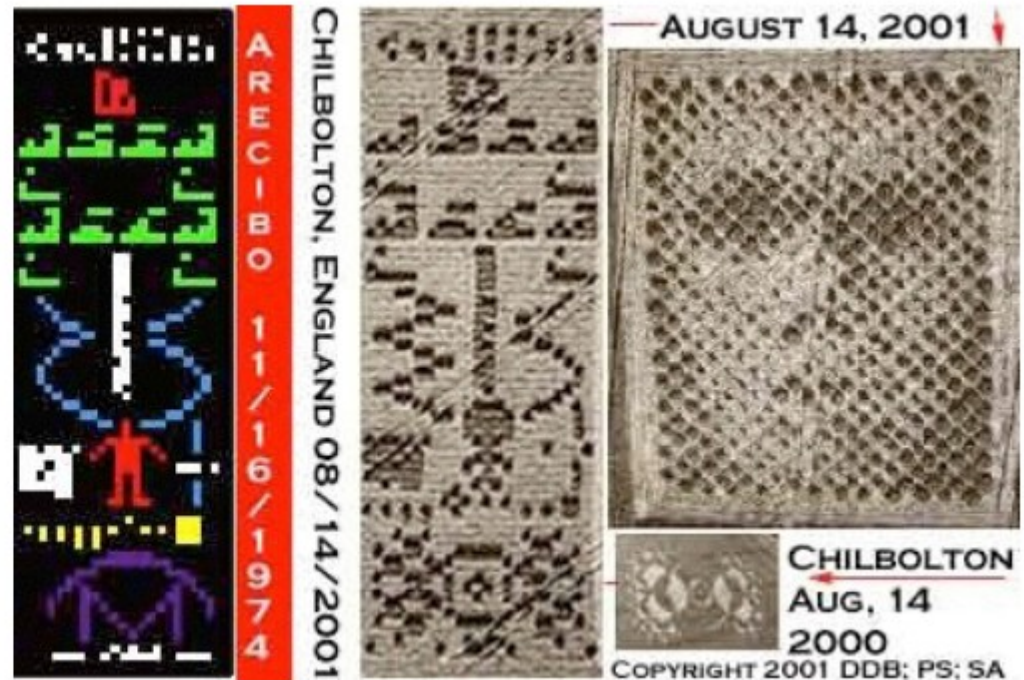
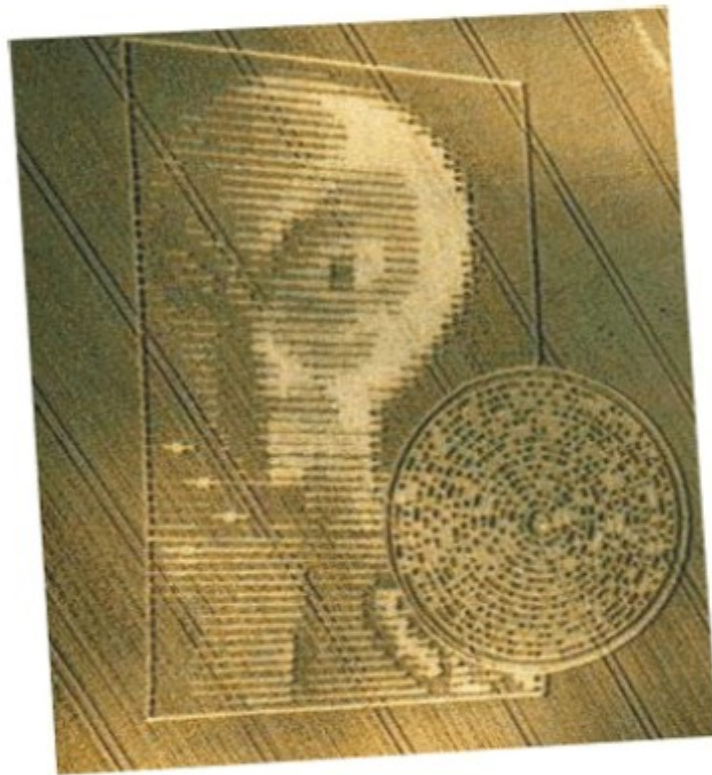


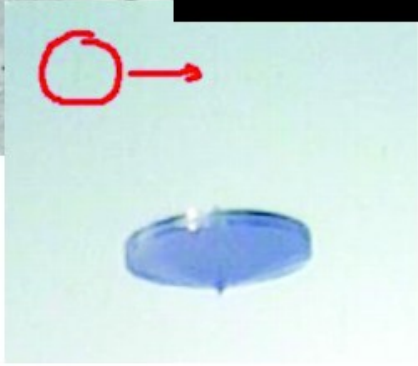
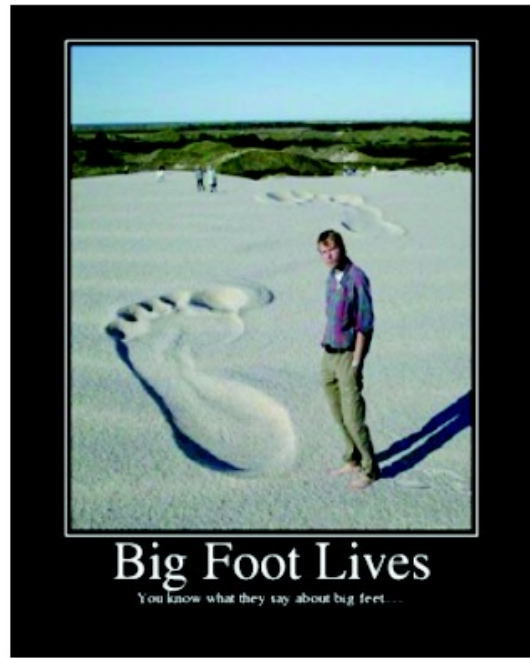
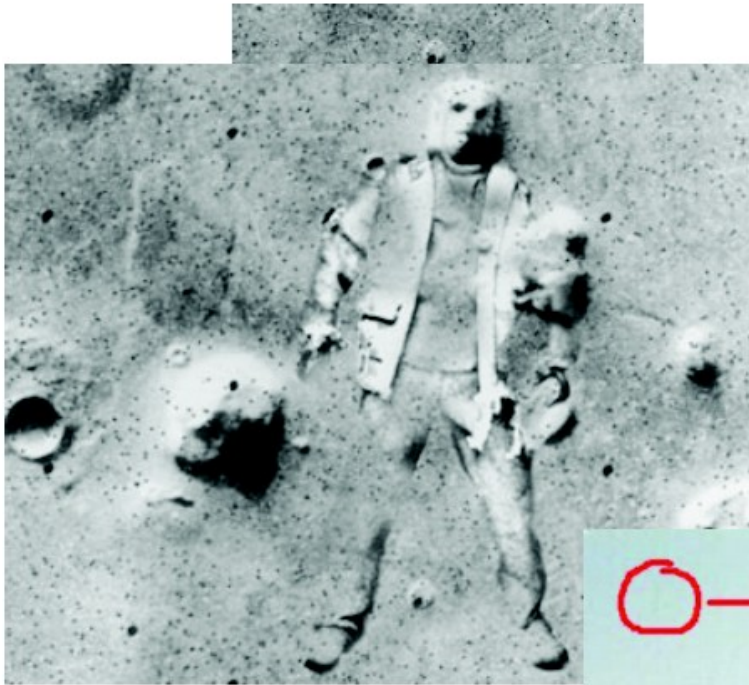
UFO #3



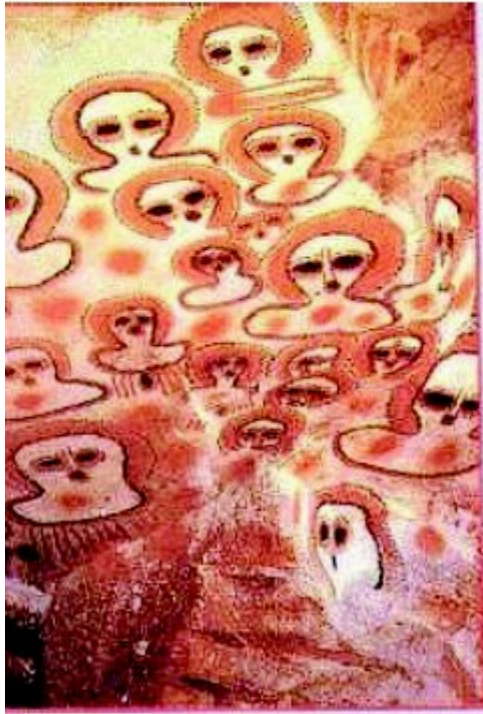


Garip Şekiller





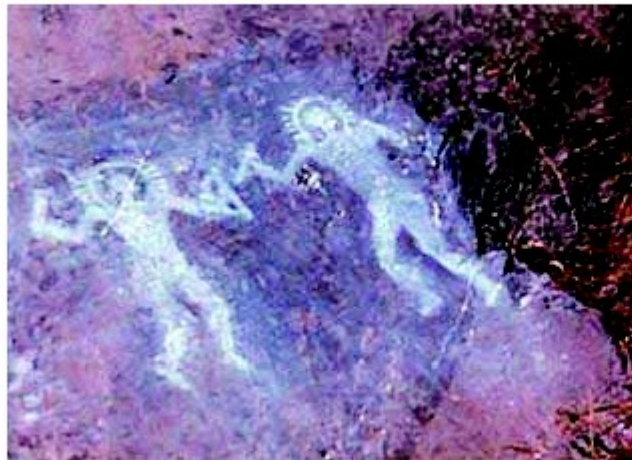
Mağra resimleri



Australia (5000BP)

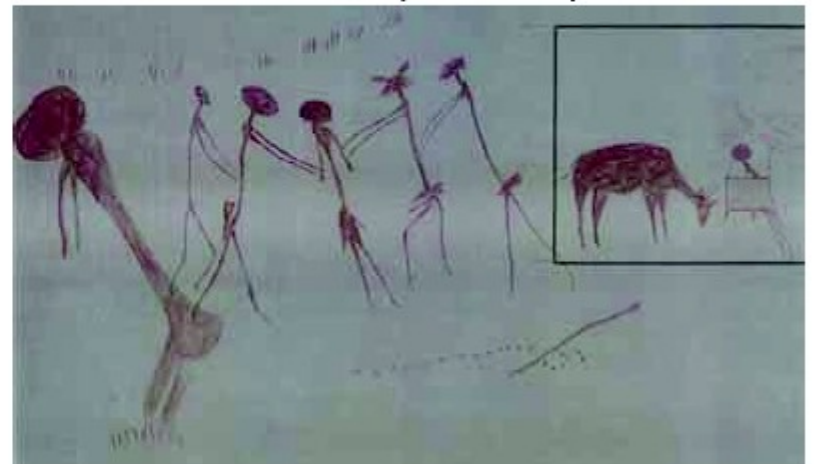


Utah (7500BP)



Italy (12,000BP)

Tanzania (29,000BP)



DRAKE Denklemi

Frank
Drake



$$N = R_* \times f_p \times n_e \times f_l \times f_i \times f_c \times L$$

Gökadamız
içersinde
iletişim
kurabileceğimiz
medeniyet sayısı

Yeni
yıldız
oluşum
hızı

Oluşan
yıldızların
gezegenli
olma oranı

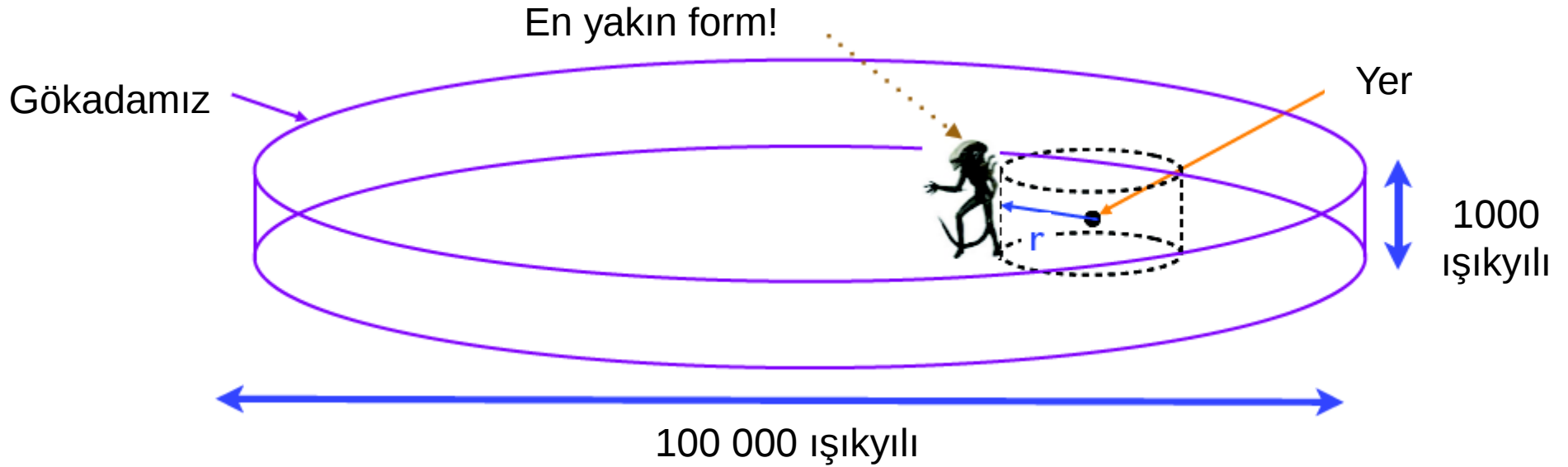
Dünya
benzeri
gezegen
sayısı

Medeniyet
olma
olasılığı

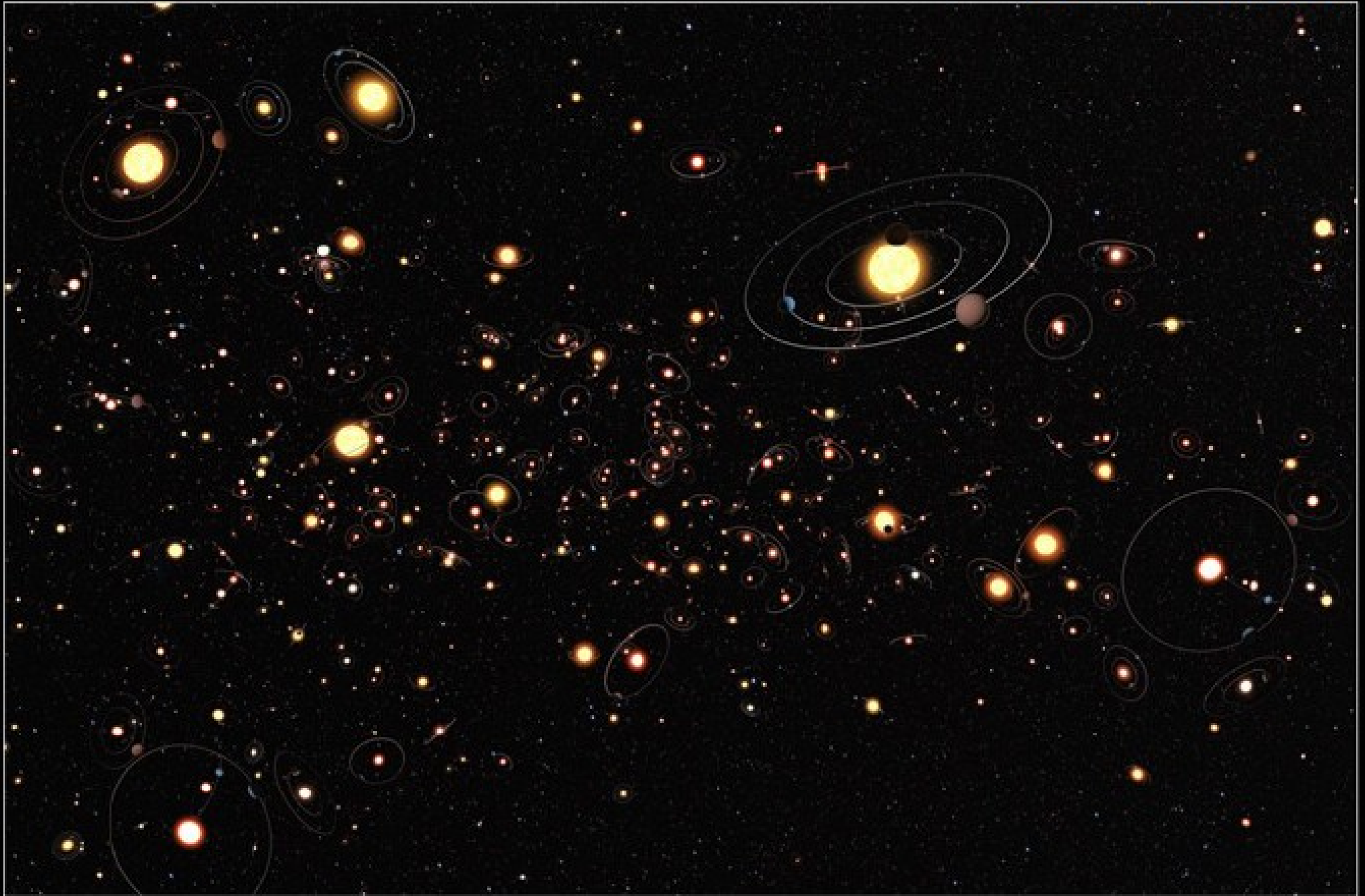
Akıllı
canlılar!

İletişime
geçebilme
olasılığı
Medeniyet
süresi...

Drake denklemini kullanarak bir hesap yapacak olursak... en yakın yaşam formu (akıllı olanı tercihen) 2 ışık yılı yakınıımızdadır...



> 10^8 Planets

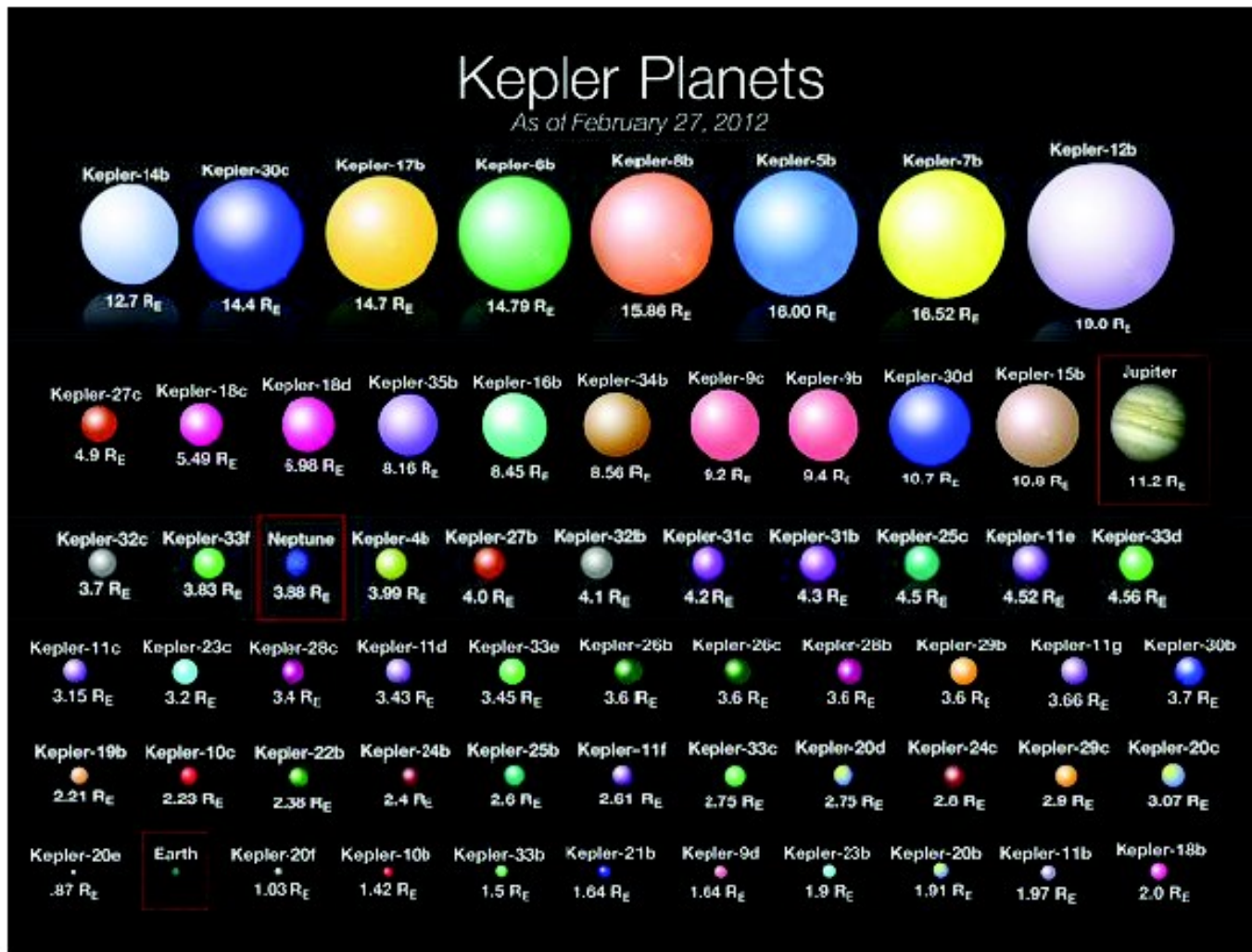


Artistic Impression of Extrasolar Planetary Systems

NASA, ESA, and M. Kornmesser (ESO) ■ STScI-PRC12-07

Kepler:

Yer-benzeri gezegenler



Kepler-22 System

Solar System

Habitable Zone



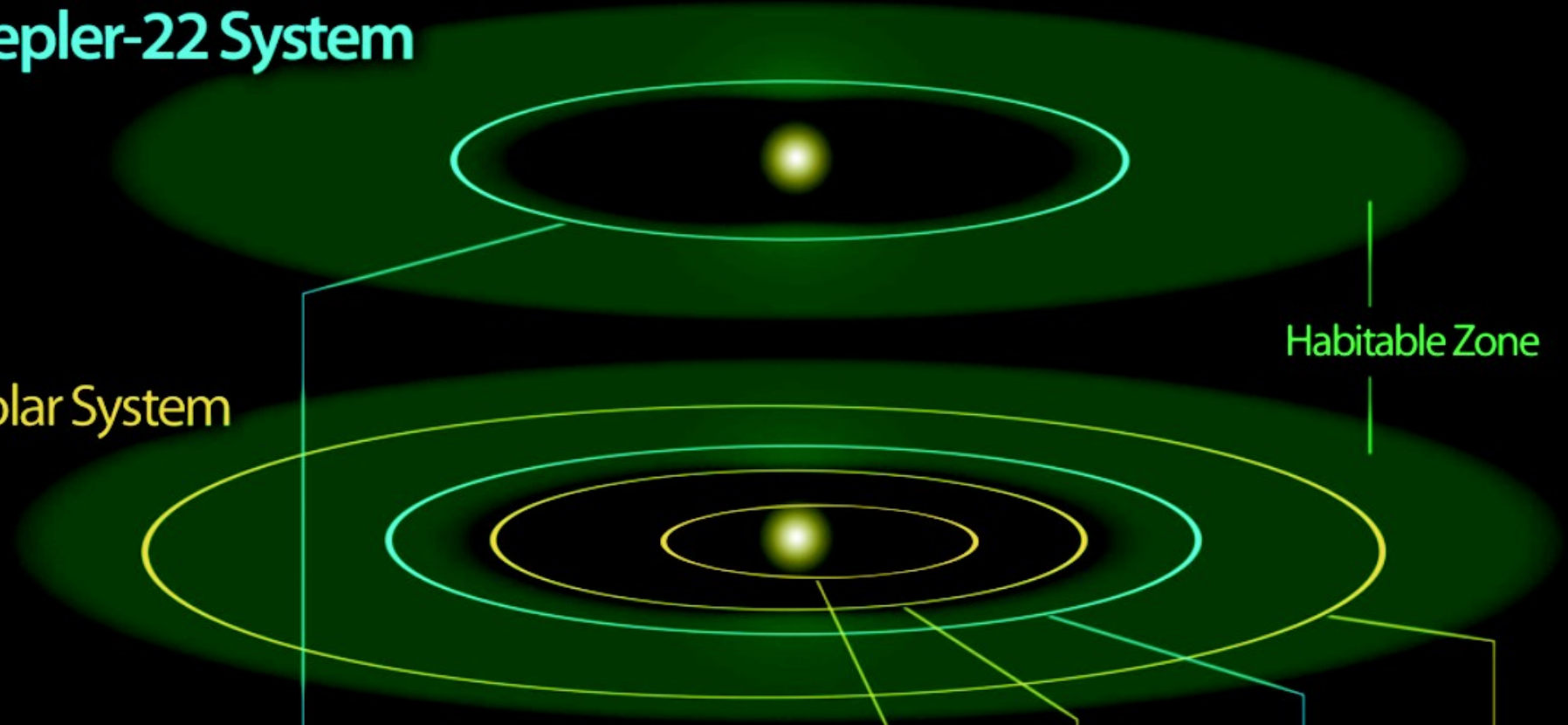
Kepler-22b

Mercury

Venus

Earth

Mars



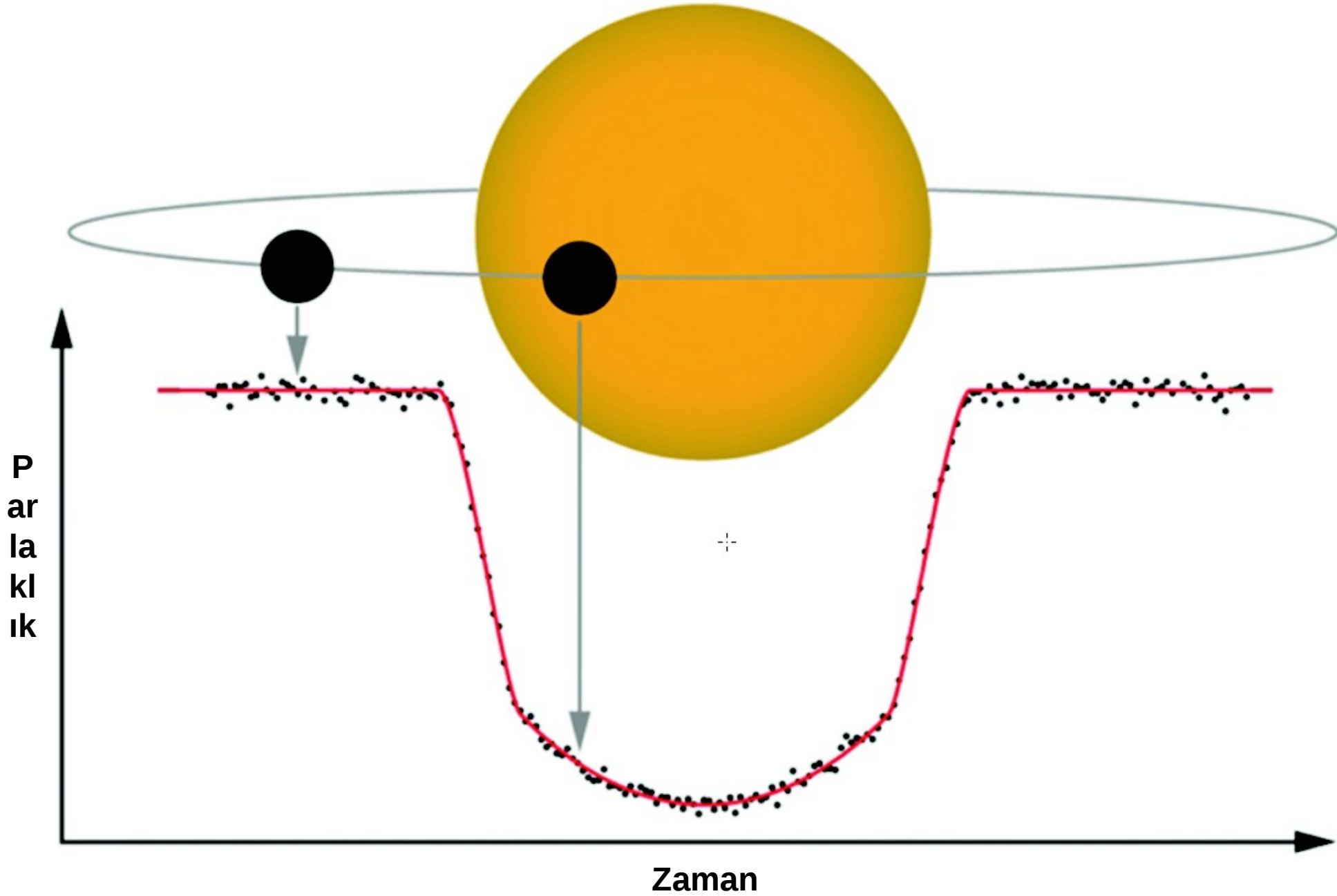
786

GEZEĞEN

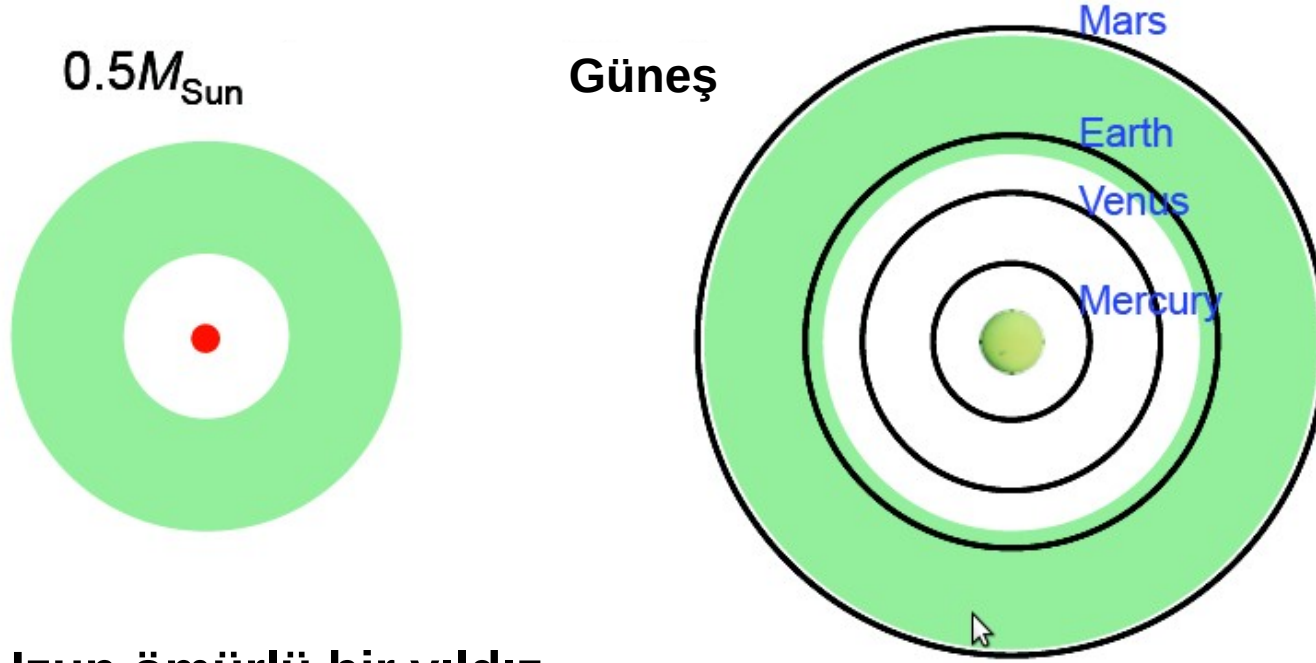
Güneş sistemi

Boyutlar güneş
sistemindeki
gezegen
boyutlarıyla
ölçeklendirilmiş..

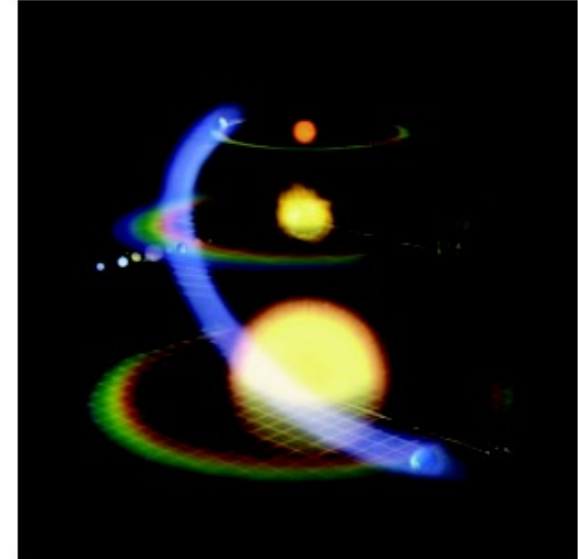
Örtme-Örtülme Yöntemi



Yaşanabilir Alan



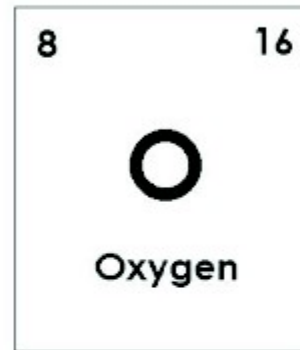
- Uzun ömürlü bir yıldız
- Sabit yörüngelerinde dolanan gezegenleri olmalı
- SIVI SU
- Ağır eleentler; CNO
- UV ışınımından korunmalı



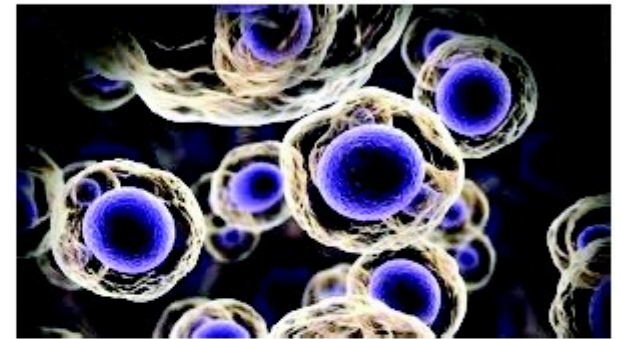




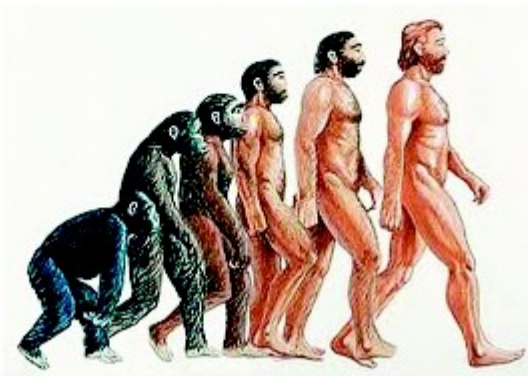
Microbial Life:
(3.5-4 Billion years ago)



(~2 Billion years ago)

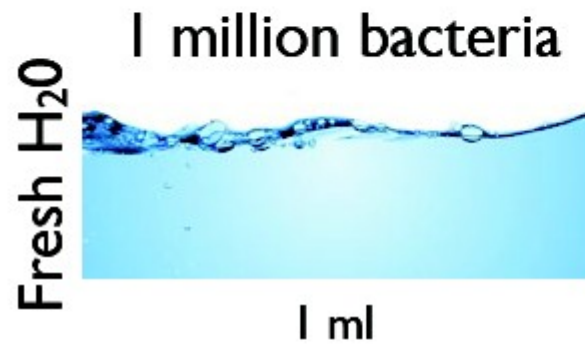


Multi-celled Life:
(~1 Billion years ago)



(~ 5 Million years ago)

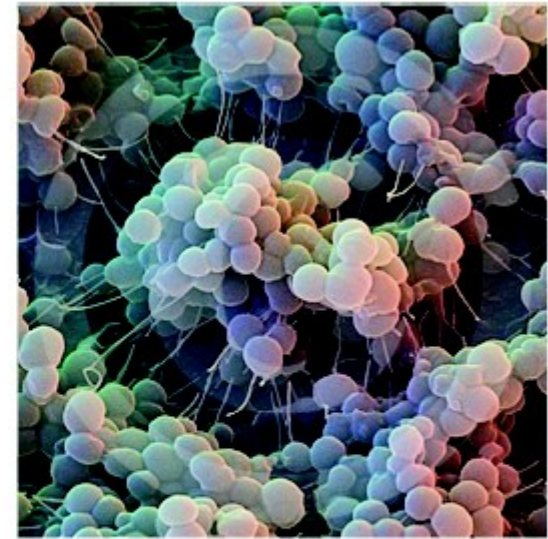
Bacteria



40 million bacteria



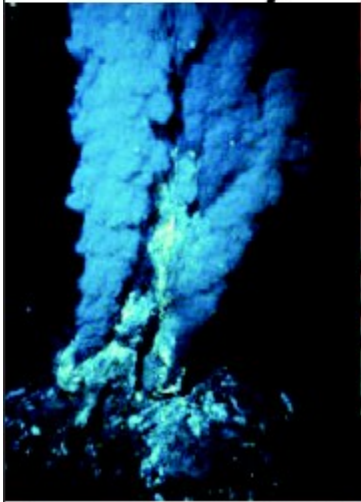
1 gm



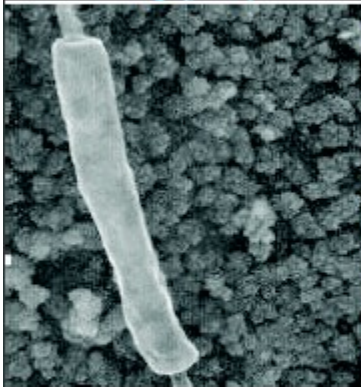
~ 5 Nonillion (5×10^{30})

Extremophiles

Hydrothermal Vents



Tubeworms

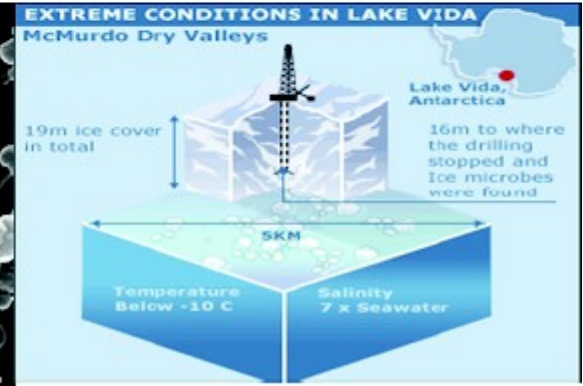


Thermophilic
bacteria



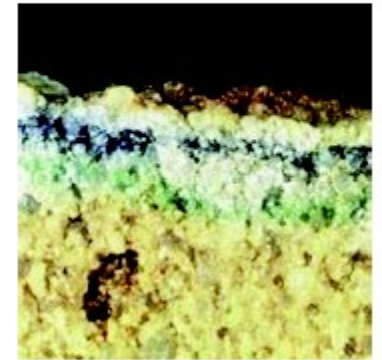
Hot Springs

Antarctic Lakes



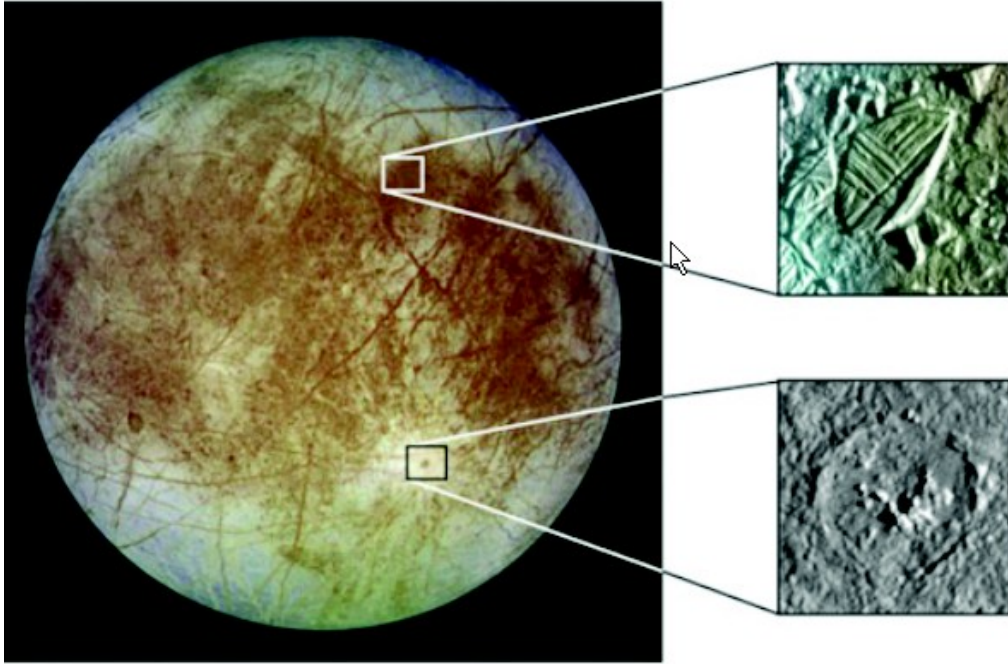
Bacteria in aphotic, anoxic, acidic

Antarctic Dry Valley

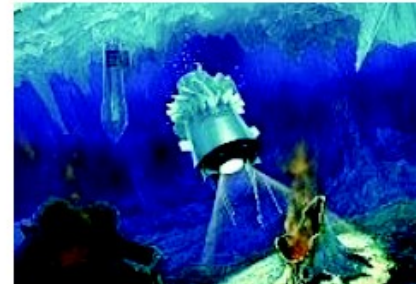


Cryptoendoliths

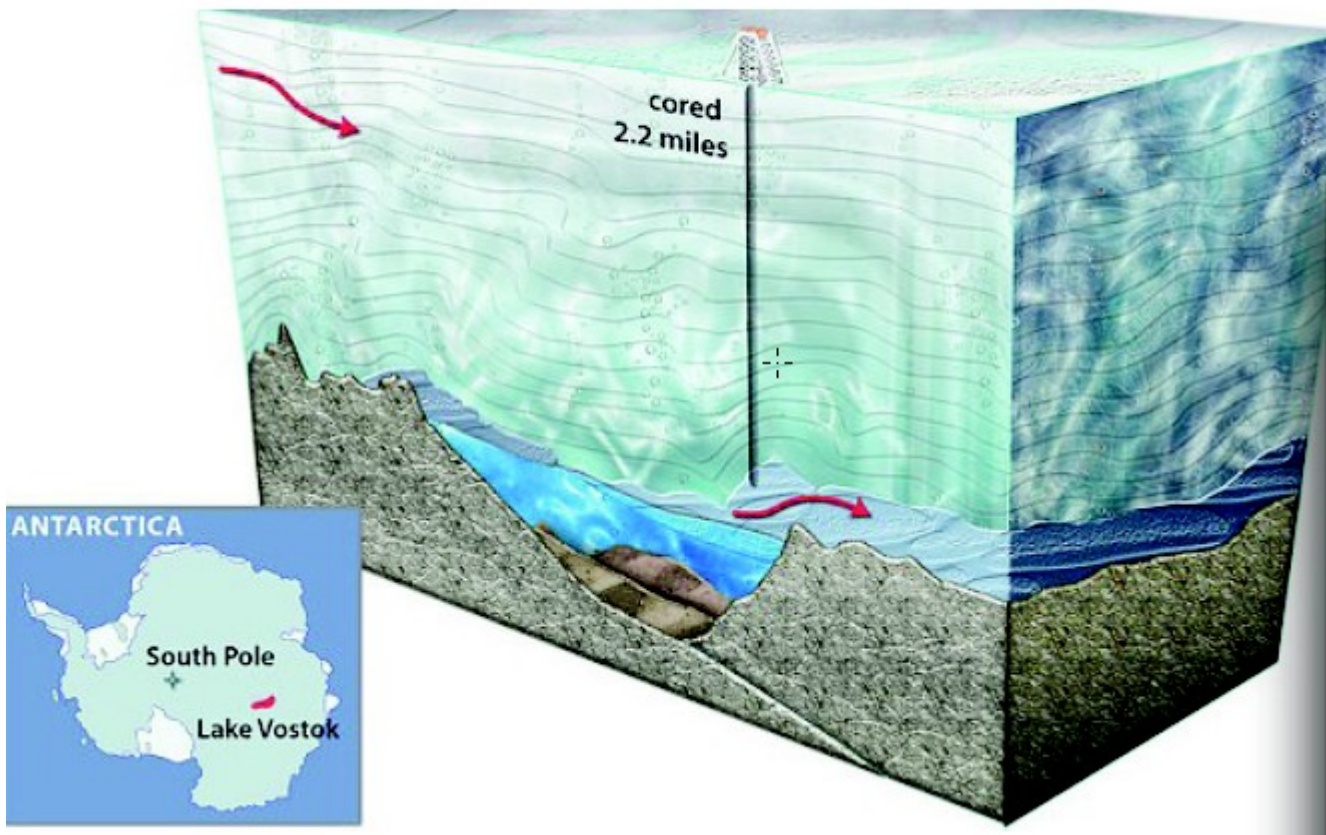
Europa



Sıcak su kaynakları!



- **Buz kalınlığı 5 km**
- **Okyanus derinliği 50 km**



Antartikada bulunan bir göktaşı; Mars göktaşı



***Ağustos 1996
3 Milyar yıl yaşında***



***Microscopik
vermiküller,
Fosil nano bakteriler
ya da kimyasal
etkileri?***

Bilinen 14 Mars göktaşı var...



**250
milyon
yıl önce**



**230
milyon
yıl önce**



**200
milyon
yıl önce**



**65
milyon
yıl önce**



**28 milyon
yıl önce**



**8 - 6
milyon
yıl önce**

Yeryüzündeki yaşam nasıl son bulabilir?



Supervolcano



Megatsunami



Impact



Ejection from SS



Cosmic Hordes

Top 10: *Kozmik felaketler*



- *Göktaşları*
- *Güneş*
- *Süpernova*
- *Gama-ışın patlamaları*
- *Karadelik*
- *Gökada çarpışmaları*
- *Kuazarlar*
- *Uzaylı yaratıklar*

Asteroid Impact



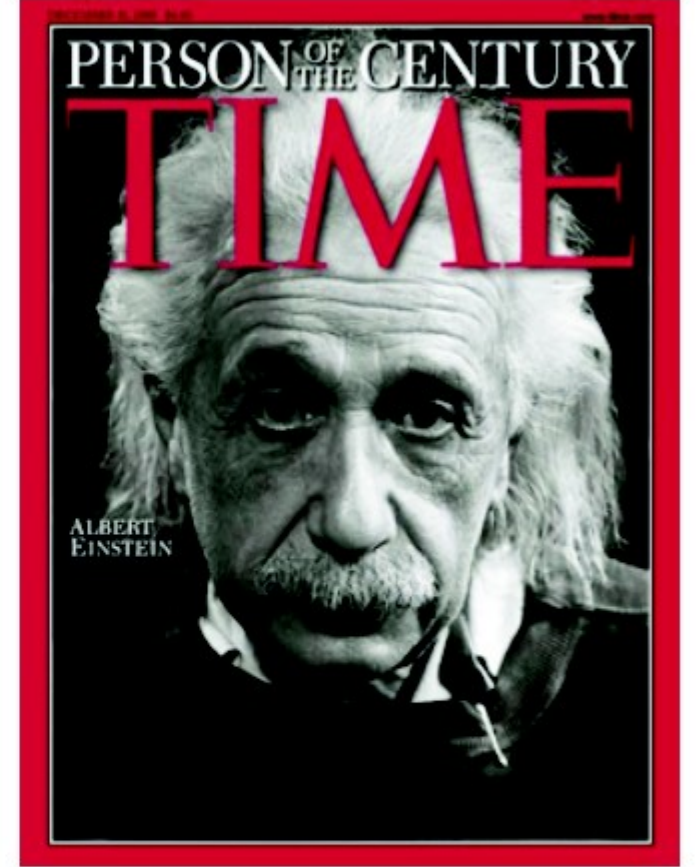
Egoist



**Tüm evren benim
etrafımda döner!**

+

Scientist



Evren genişliyor...