Cosmos: A Personal Voyage

이명현
facebook.com/easy2537
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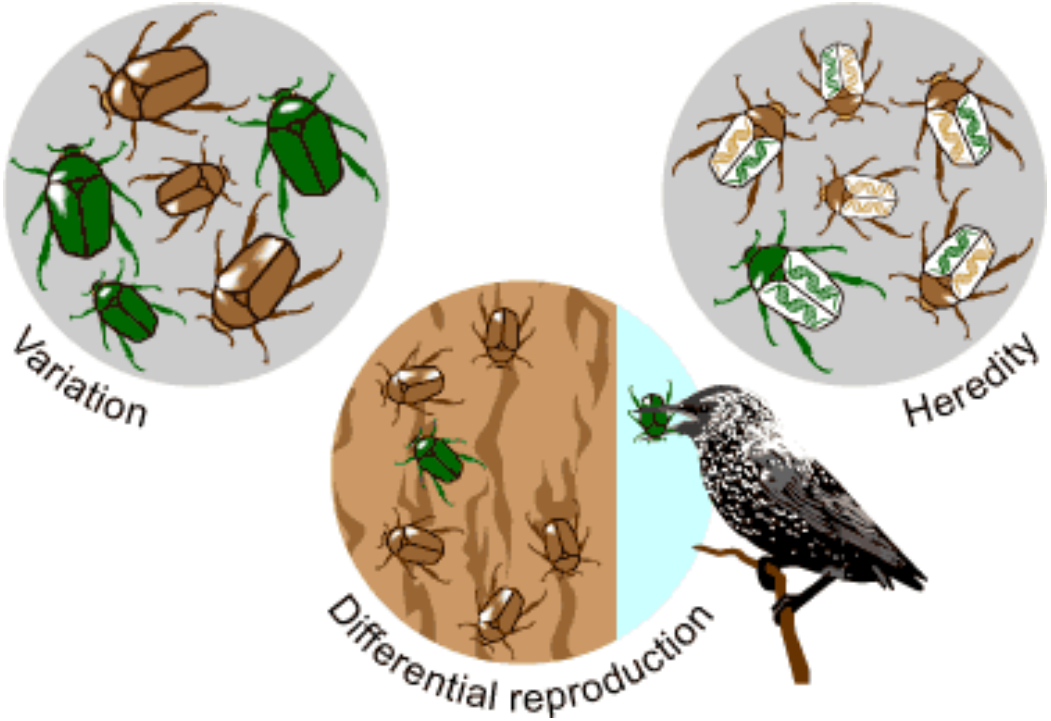
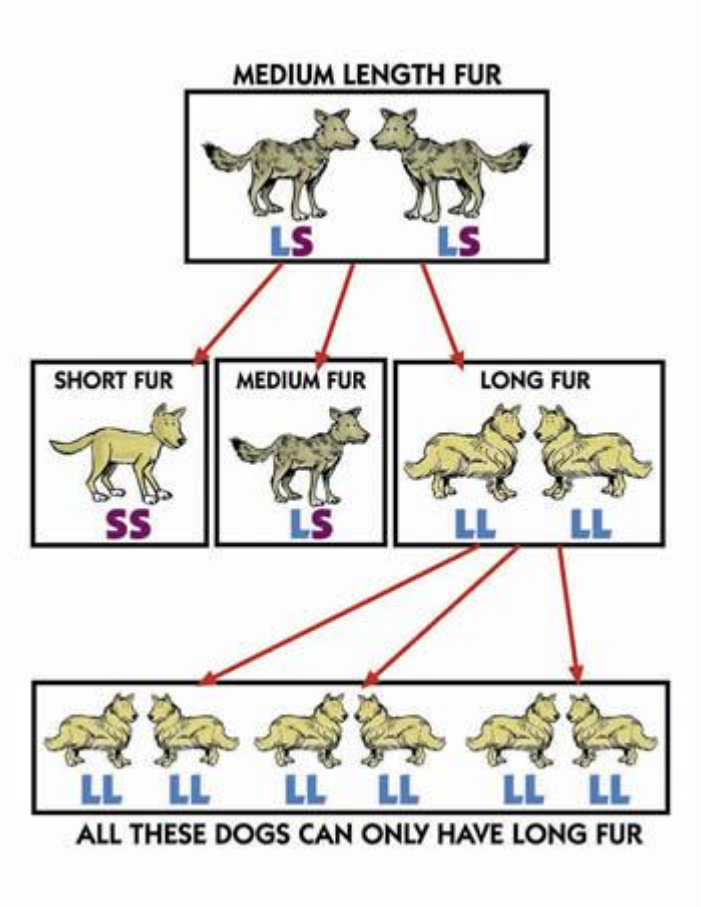
Jack Wolfskin

자연선택


Variation
Heredity
Differential reproduction

인위선택


MEDIUM LENGTH FUR
LS
LS
SHORT FUR
SS
MEDIUM FUR
LS
LONG FUR
LL
LL
LL
LL
LL
LL
LL
LL
ALL THESE DOGS CAN ONLY HAVE LONG FUR

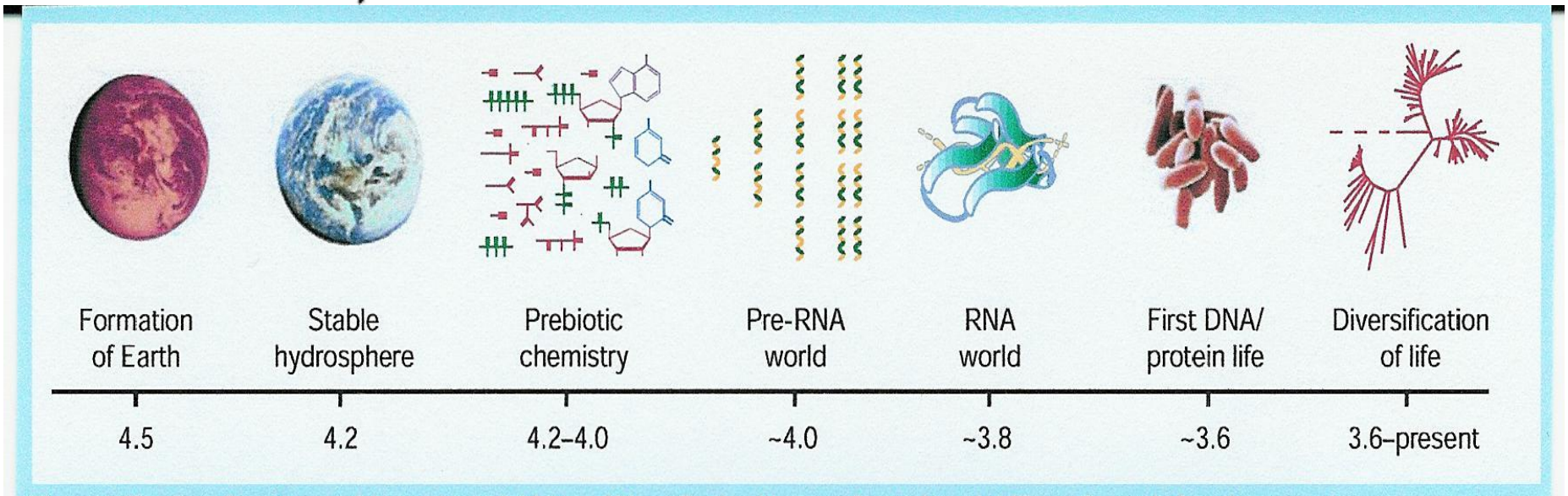
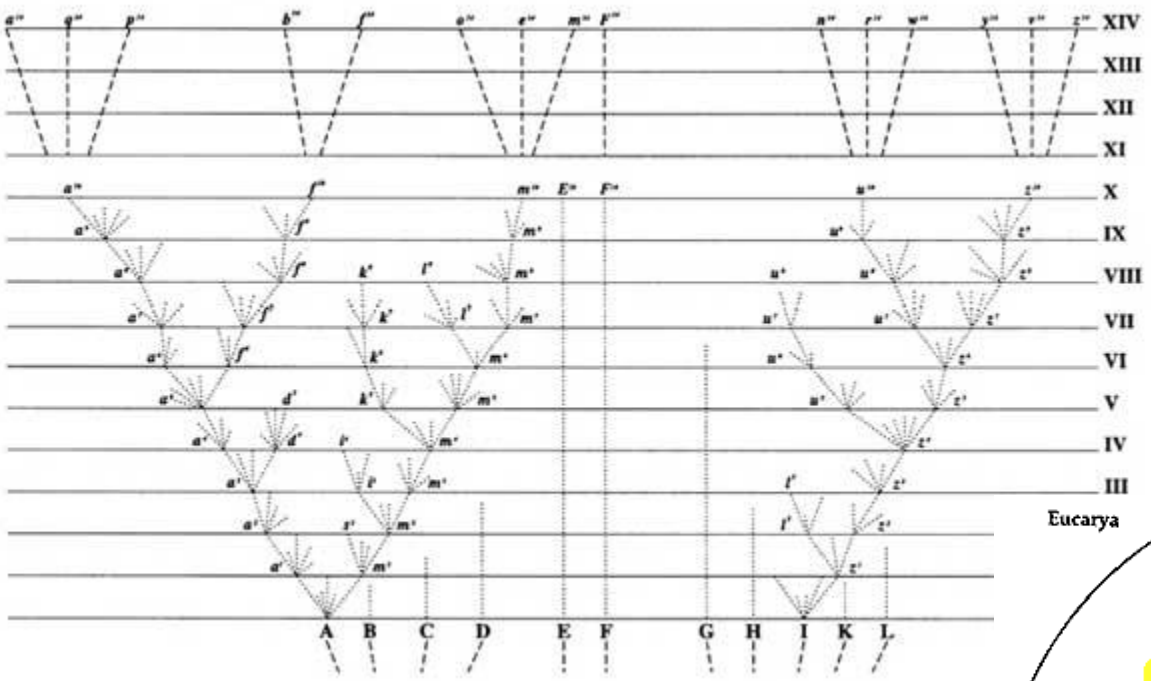


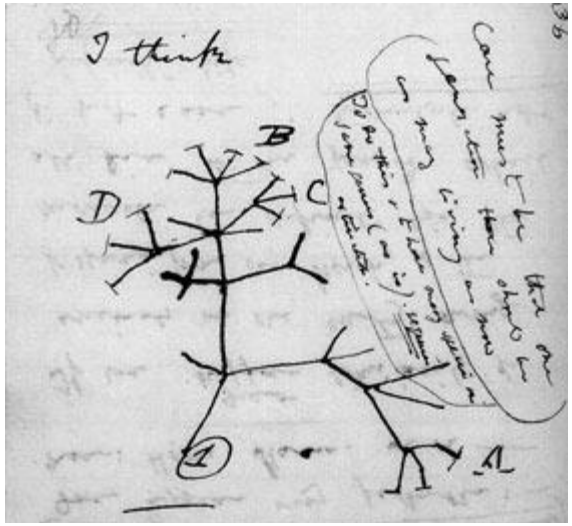
Figure 1 Timeline of events pertaining to the early history of life on Earth, with approximate dates in billions of years before the present.

Joyce 2002

생명의 나무 Trees of Life



1859



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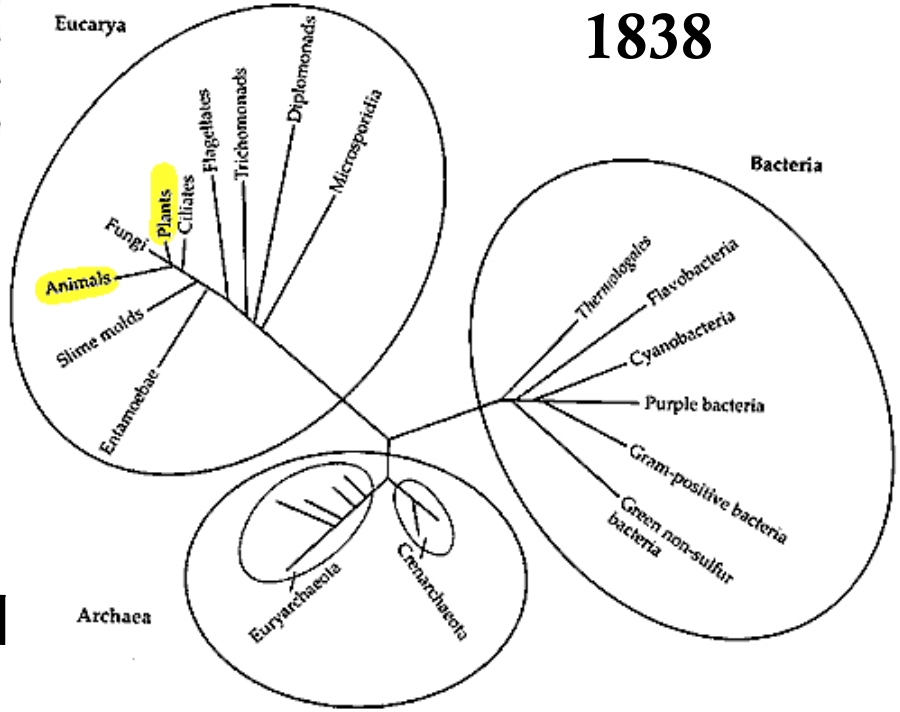
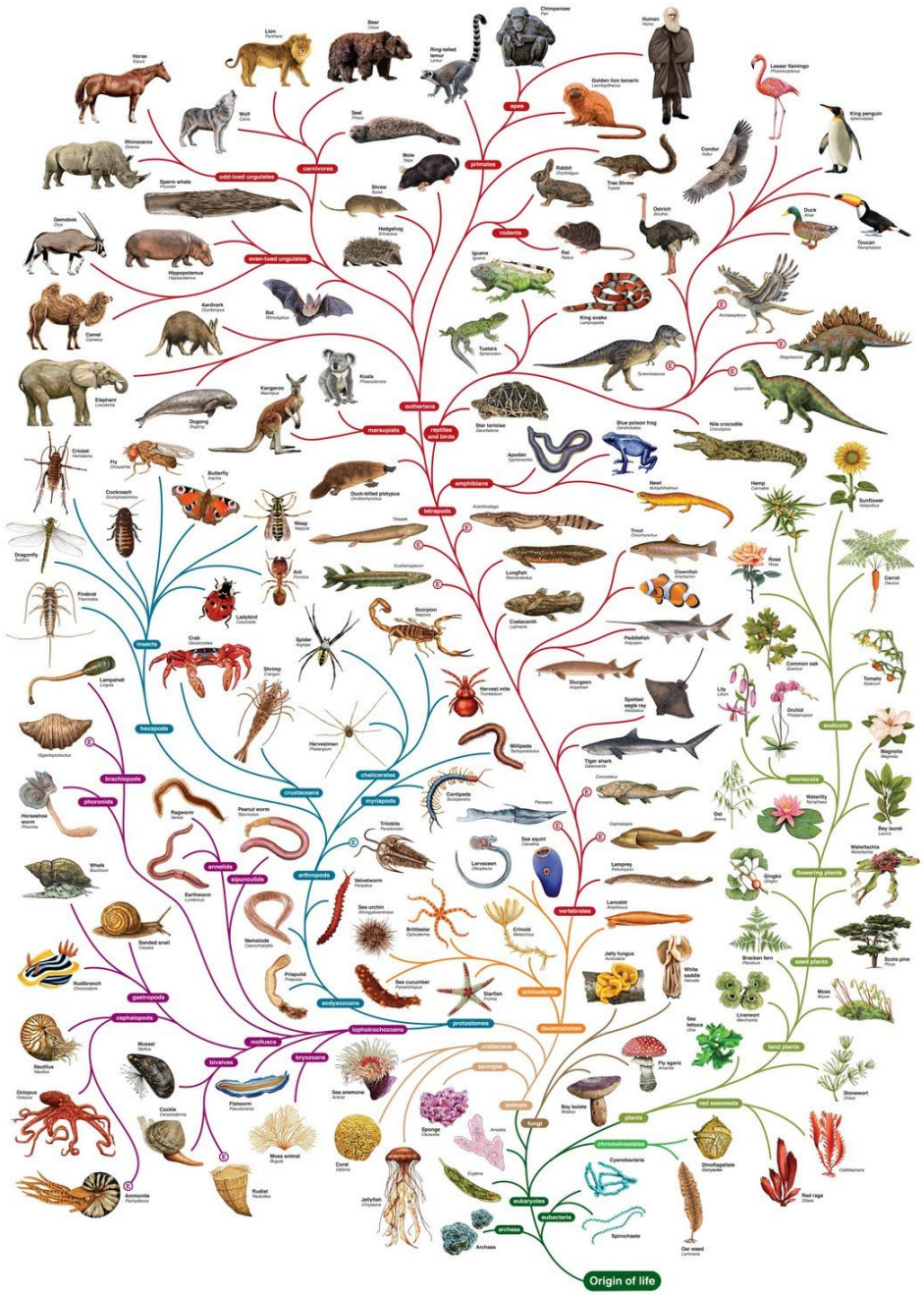


40억년의 역사

현재


Horse
Equus
Lion
Panthera
Bear
Ursus
Ring-tailed lemur
Lemur
Chimpanzee
Pan
Human
Homo
Lesser flamingo
Phoeniconaias
Golden lion tamarin
Leontopithecus
King penguin
Aptenodytes
Wolf
Canis
Seal
Phoca
apes
Rhinoceros
Diceros
carnivores
Mole
Talpa
primates
Condor
Vultur
odd-toed ungulates
Sperm whale
Physeter
Shrew
Sorex
Rabbit
Oryctolagus
Tree Shrew
Tupaia
Ostrich
Struthio
Duck
Anas
Toucan
Ramphastos
Gemsbok
Oryx
Hedgehog
Erinaceus
rodents
Rat
Rattus
Iguana
Iguana
even-toed ungulates
Hippopotamus
Hippopotamus
Bat
Rhinolophus
King snake
Lampropeltis
Archaeopteryx
Aardvark
Orycteropus
Camel
Camelus
Tuatara
Sphenodon
Tyrannosaurus
Stegosaurus
Iguanodon
Koala
Phascolarctos
Kangaroo
Macropus
Elephant
Loxodonta
Dugong
Dugong
eutherians
marsupials
reptiles and birds
Star tortoise
Geochelone
Blue poison frog
Dendrobates
Nile crocodile
Crocodylus
Apodan
Typhlonectes
Cricket
Hemidema
Fly
Drosophila
Butterfly
Inachis
Cockroach
Gromphadorhina
Duck-billed platypus
Ornithorhynchus
amphibians
Newt
Notophthalmus
Hemp
Cannabis
Sunflower
Helianthus
tetrapods
Wasp
Vespula
Tiktaalik
Acanthostega
Trout
Oncorhynchus
Dragonfly
Aeshna
Ant
Formica
Eusthenopteron
Lungfish
Neoceratodus
Clownfish
Amphiprion
Rose
Rosa
Carrot
Daucus
Firebrat
Thermobia
Ladybird
Coccinella
Scorpion
Vaejovis
Coelacanth
Latimeria
Paddlefish
Polyodon
insects
Crab
Decapoda
Spider
Argiope
Lampshell
Lingula
Shrimp
Crangon
Harvest mite
Trombidium
Sturgeon
Acipenser
Spotted eagle ray
Aetobatus
Lily
Lilium
Common oak
Quercus
Tomato
Solanum
Orchid
Phalaenopsis
hexapods
Harvestman
Phalangium
Millipede
Tachypodoiulus
Tiger shark
Galeocerdo
eudicots
Magnolia
Magnolia
Gigantostraticulum
chelicerates
brachiopods
phoronids
crustaceans
Centipede
Scolopendra
myriapods
Oat
Avena
monocots
Waterlily
Nymphaea
Horseshoe worm
Phoronis
Ragworm
Nereis
Penal worm
Sipunculus
Trilobite
Paradoxides
Pterygotus
Cephalaspis
Bay laurel
Laurus
Whale
Balaenoptera
annelids
arthropods
Larvacean
Oikopleura
Sea squirt
Ciona
Langray
Pteroplatytrygon
Welwitschia
Welwitschia
Ginkgo
Ginkgo
flowering plants
Earthworm
Lumbricus
alpuncoulids
Velvetworm
Peripatus
vertebrates
Lancelet
Amphioxus
Sea urchin
Strongylocentrotus
Brittlestar
Ophiodermis
Crinoid
Metacrinus
Banded snail
Cepaea
Nematode
Caenorhabditis
Jelly fungus
Auricularia
Bracken fern
Pteridium
seed plants
Scots pine
Pinus
Nudibranch
Chromodoris
Priapulid
Priapulus
Sea cucumber
Parastichopus
Starfish
Pisaster
echinoderms
White saddle
Amanita
Liverwort
Marchantia
Moss
Bryum
gastropods
ecdysozoans
deuterostomes
Sea lettuce
Ulva
cephalopods
lophotrochozoans
protostomes
cnidarians
land plants
Nautilus
Nautilus
mollusks
Mussel
Mytilus
bivalves
bryozoans
sponges
Fly agaric
Amanita
Stonewort
Chara
Octopus
Octopus
Cockle
Ceratoderma
Flatworm
Pseudoceros
Sea anemone
Actinia
protists
Bay bolete
Boletus
plants
red seaweeds
Sponge
Clionaster
fungi
Amoeba
Moss animal
Bugula
Coral
Diploria
chromalveolates
Dinoflagellate
Gonyaulax
Cyanobacteria
Euglena
Rudist
Radiolites
Jellyfish
Chrysaora
eukaryotes
eubacteria
Spirochaete
Red raga
Stoea
Ammonite
Parkinsonia
Archaea
archaea
Oar weed
Laminaria
Cattleyhania
Origin of life

January	February	March	April	May	June	July	August	September	October	November
New Year's Day: The Big Bang		Mily Way forms					Sun and planets form	Oldest known life.(single celled).		First multi-celluar organisms

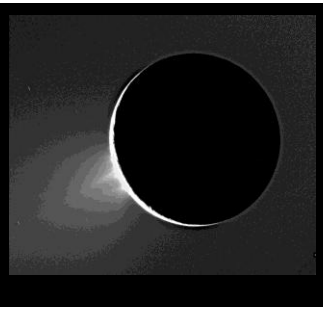
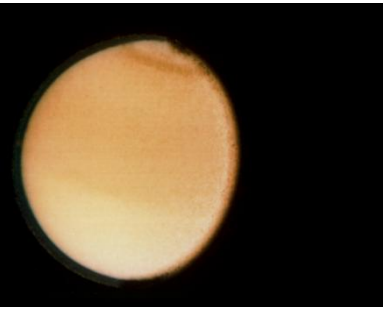
December

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15 Cambrian Explosion (burst of new life forms)	16	17 Emergence of first vertebrates	18 Early land plants	19	20 First four-limbed animals	21 Variety of insects begin to flourish
22	23	24 First dinosaurs appear	25 First mammalian ancestors appear	26	27 First known birds	28
29 Dinosaurs wiped out by asteroid or comet	30	31				

31

10:15am	Apes appear
9:24pm	First human ancestors to walk upright
10:48pm	Homo erectus appears
11:54pm	Anatomically modern humans appear
11:59:45pm	Invention of writing
11:59:50pm	Pyramids built in Egypt
1 second before midnight:	Voyage of Christopher Columbus

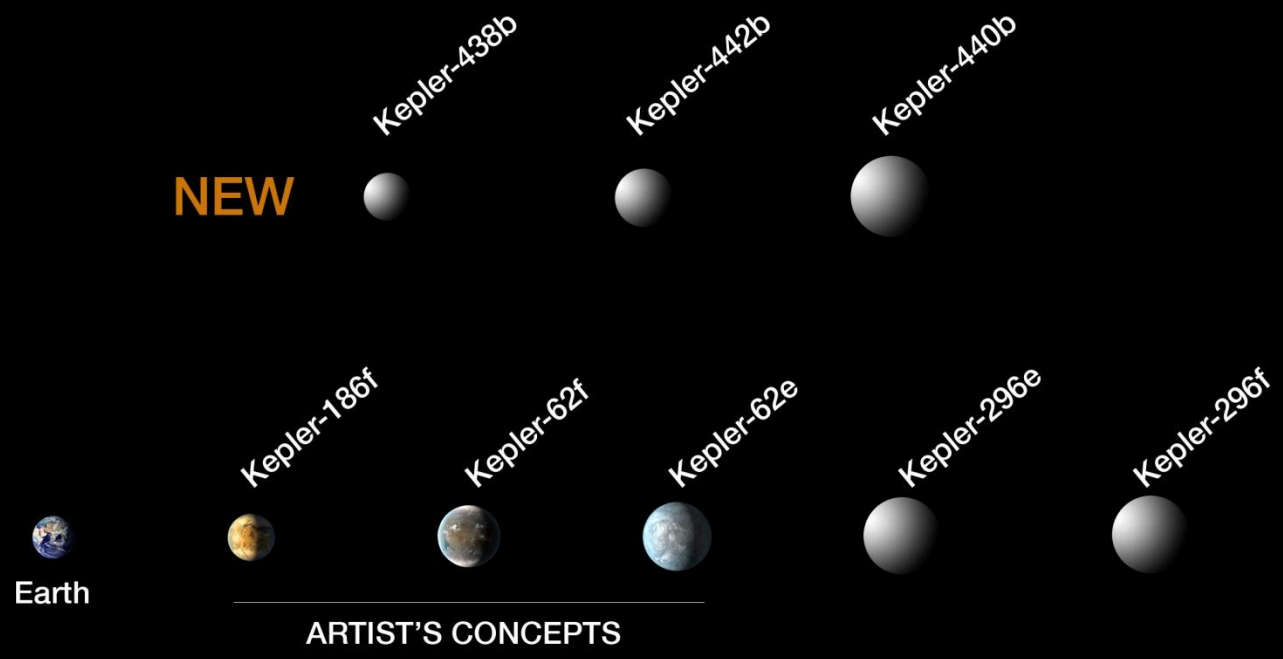
Other worlds with liquids

Mars	Europa	Enceladus	Titan
			
Past water CO_2 and N_2 Cold preservation Organics?	Ocean under ice Surface organics?	H_2O jet Organics N_2 Energy Liquid water?	Liquid CH_4 Organics Energy Active cycles Life?

NASA Kepler's Hall of Fame:

Small Habitable Zone Planets

As of January 2015



하나 → 둘 = 여럿 = 보편성

귀엽고 감동적인 애니