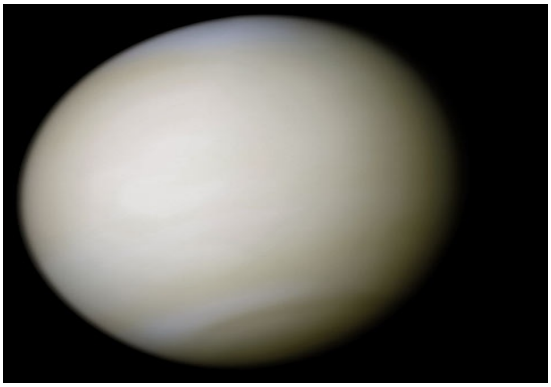
Terrestrial planets /Dad

Earth

Terrestrial planet
The earliest undisputed life on Earth arose at least 3.5 billion years ago.
71% of Earth's surface is covered with water.

Albedo	0.367
Radius (km)	6371.0
Mass (kg)	5,973.6x10+24
Density (g/cm3)	5.514
Gravity (m/s2)	9.807
Orbital period (days)	365.256
Orbital speed (km/s)	29.78
Temperature (K)	288
Discovery date	NA

Terrestrial planets /Mom

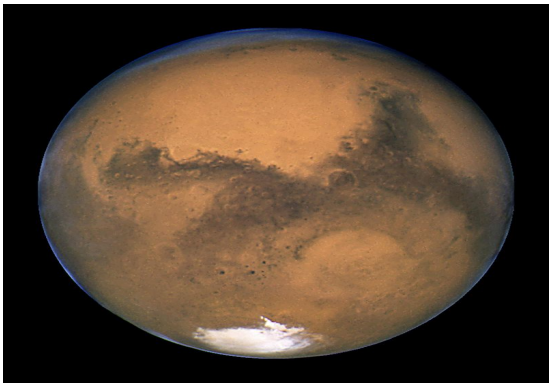


Venus

Terrestrial planet
Bright enough to be seen in a midday clear sky.
In 1966 the Venera 3 probe crash-landed on Venus, the 1st spacecraft to reach the surface of another planet

Albedo	0.67
Radius (km)	6051.8
Mass (kg)	4,868.5x10+24
Density (g/cm3)	5.243
Gravity (m/s2)	8.872
Orbital period (days)	224.701
Orbital speed (km/s)	35.02
Temperature (K)	737
Discovery date	1600 BC (Babylon)

Terrestrial planets /Son

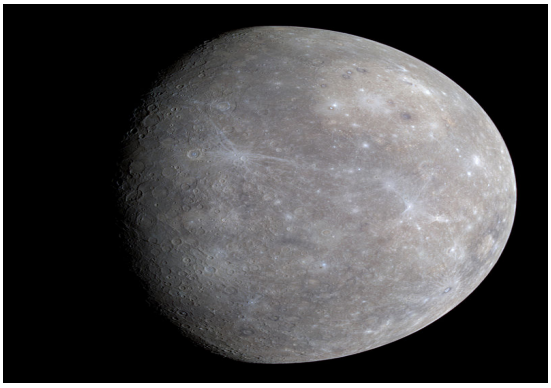


Mars

Terrestrial planet
The red-orange appearance is caused by rust
It consists of minerals containing silicon, oxygen...
Olympus Mons is roughly 3x the height of Mt Everest

Albedo	0.15
Radius (km)	3389.5
Mass (kg)	6.417x10+23
Density (g/cm3)	3.9335
Gravity (m/s2)	3.7
Orbital period (days)	686.971
Orbital speed (km/s)	24.077
Temperature (K)	210
Discovery date	1534 BC (Egypt)

Terrestrial planets /Daughter



Mercury

Terrestrial planet
The smallest planet in the Solar System
An observer on Mercury would see only one day every two years.

Albedo	0.142
Radius (km)	2,439.7
Mass (kg)	330.11x10+23
Density (g/cm3)	5.427
Gravity (m/s2)	3.7
Orbital period (days)	87.969
Orbital speed (km/s)	47.362
Temperature (K)	200->340
Discovery date	1300 BC (Assyria)

Terrestrial planets /Dog

Moon

Moon of Earth
The Moon is exceptionally large relative to Earth.
There are estimated to be roughly 300,000 craters
wider than 1 km on the Moon's bright side only.

Albedo	0.12
Radius (km)	1,737.1
Mass (kg)	7.342×10+22
Density (g/cm3)	0.0123
Gravity (m/s2)	3.3464
Orbital period (days)	27.322
Orbital speed (km/s)	1.022
Temperature (K)	150->220
Discovery date	1.800.000BC

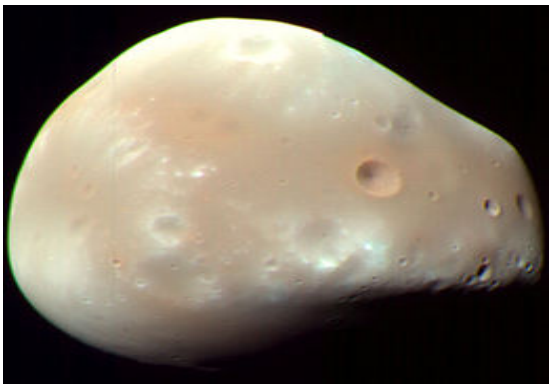
Terrestrial planets /Bird

Phobos

Moon of Mars
It sets and rises 2x each Martian day
It is predicted that in 30 to 50 million years it will
collide with the planet or break up into a planetary ring.

Albedo	0.071
Radius (km)	11
Mass (kg)	1.660x10+16
Density (g/cm3)	1.87
Gravity (m/s2)	0.006
Orbital period (days)	0.319
Orbital speed (km/s)	2.138
Temperature (K)	233
Discovery date	1877 (A. Hall)

Terrestrial planets /Cat

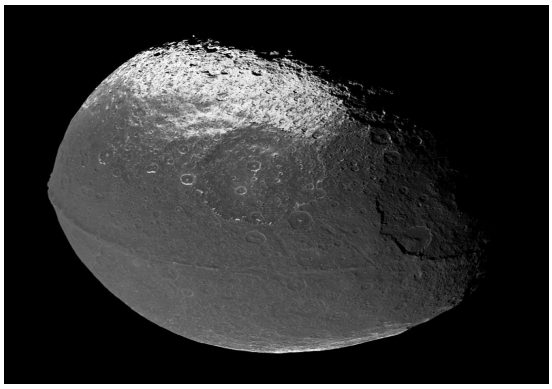


Deimos

Moon of Mars
In Greek mythology, Deimos was the twin brother
of Phobos and personified terror.
No landings on Deimos have been made yet.

Albedo	0.068
Radius (km)	6.2
Mass (kg)	1.476x10+15
Density (g/cm3)	1.471
Gravity (m/s2)	0.003
Orbital period (days)	1.263
Orbital speed (km/s)	1.351
Temperature (K)	233
Discovery date	1877 (A. Hall)

Gas giants/Dog

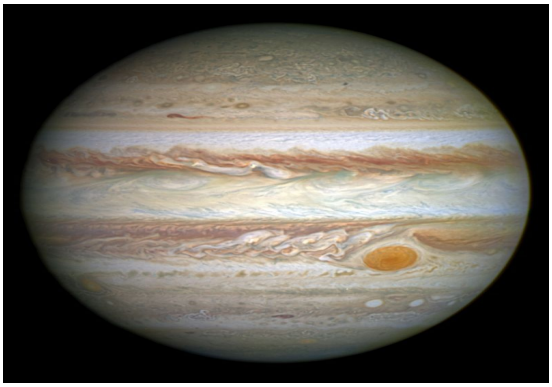


Iapetus

Moon of Saturn
Best known for its dramatic two-tone coloration.
Its equatorial ridge (20km high) give Iapetus
a walnut-like appearance.

Albedo	0.05-0.5
Radius (km)	734.5
Mass (kg)	1.805x10+21
Density (g/cm3)	1.088
Gravity (m/s2)	0.223
Orbital period (days)	79.321
Orbital speed (km/s)	3.26
Temperature (K)	90+>130
Discovery date	1671 (G. Cassini)

Gas giants/Mom

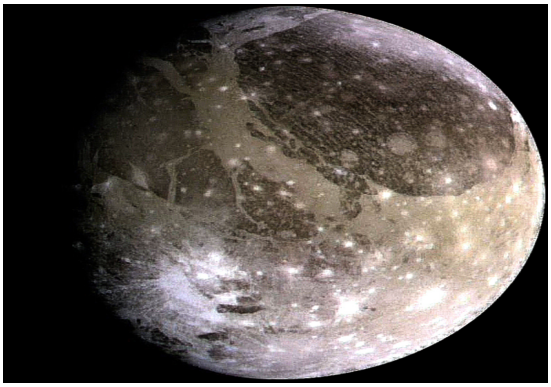


Jupiter

Gas giant
Primarily composed of hydrogen and some helium.
It lacks a well-defined solid surface
Jupiter has at least 67 moons.

Albedo	0.52
Radius (km)	69,911
Mass (kg)	1.899×10+27
Density (g/cm3)	1.326
Gravity (m/s2)	24.79
Orbital period (days)	4,332.59
Orbital speed (km/s)	13.07
Temperature (K)	165
Discovery date	800 BC (Babylon)

Gas giants/Cat

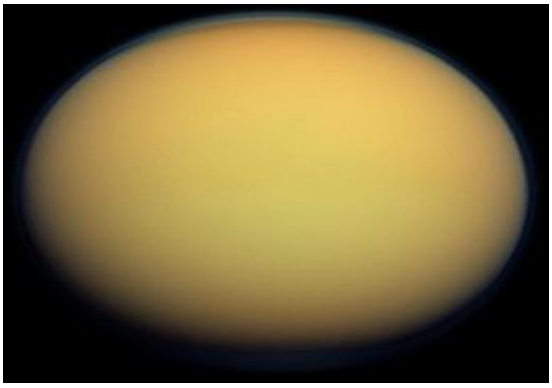


Ganymede

Moon of Jupiter
The most massive planetary satellite.
It is the only moon known to have a magnetosphere.

Albedo	0.43
Radius (km)	2634.1
Mass (kg)	1.481x10+23
Density (g/cm3)	1.936
Gravity (m/s2)	1.428
Orbital period (days)	7.155
Orbital speed (km/s)	10.880
Temperature (K)	110
Discovery date	1610 (G. Galileo)

Gas giants/Dad



Titan

Moon of Saturn
The only satellite known to have a dense atmosphere.
Primarily composed of water ice and rocky material.
Its surface can rise by up to 10 metres during each orbit

Albedo	0.22
Radius (km)	2,576
Mass (kg)	1.345x10+23
Density (g/cm3)	1.8780
Gravity (m/s2)	1.354
Orbital period (days)	15.945
Orbital speed (km/s)	5.57
Temperature (K)	93.7
Discovery date	1655 (Ch. Huygens)

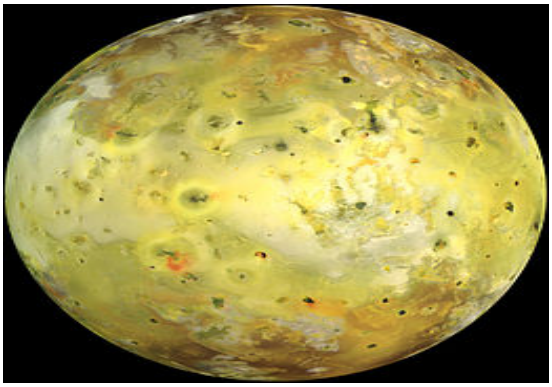
Gas giants/Daughter

Callisto

Moon of Jupiter
Its surface is the oldest and most heavily cratered in the Solar System. The likely presence of an ocean leaves open the possibility that Callisto could harbor life.

Albedo	0.22
Radius (km)	2,410.3
Mass (kg)	1.075x10+23
Density (g/cm3)	1.8344
Gravity (m/s2)	1.236
Orbital period (days)	16.689
Orbital speed (km/s)	8.204
Temperature (K)	134
Discovery date	1610 (G. Galileo)

Gas giants/Son

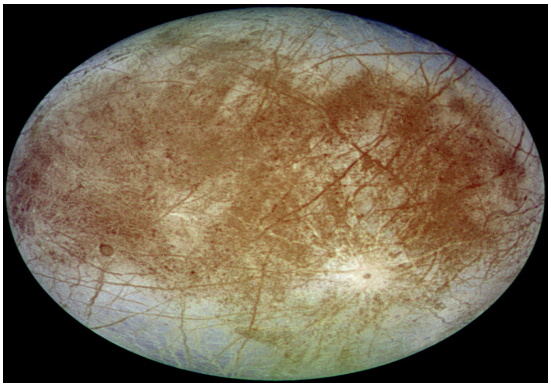


Io

Moon of Jupiter
The driest known object in the Solar System
With over 400 active volcanoes, Io is the most geologically active object in the Solar System

Albedo	0.63
Radius (km)	1,821.6
Mass (kg)	89.3x10+22
Density (g/cm3)	3.528
Gravity (m/s2)	1.797
Orbital period (days)	1.769
Orbital speed (km/s)	17.334
Temperature (K)	110
Discovery date	1610 (G.Galileo)

Gas giants/Bird

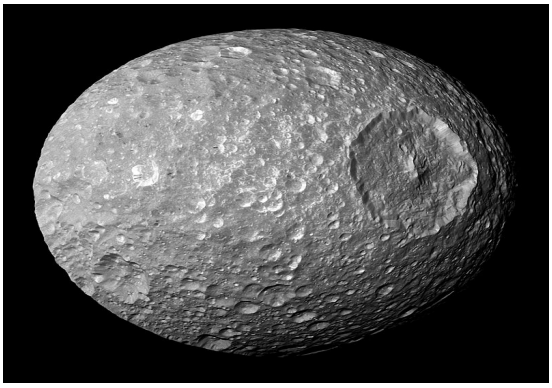


Europa

Moon of Jupiter
Exploration of Europa began in 1973 (Pioneer).
It has the smoothest surface of any known solid object in the Solar System.

Albedo	0.67
Radius (km)	1560.8
Mass (kg)	4.799x10+22
Density (g/cm3)	3.013
Gravity (m/s2)	1.316
Orbital period (days)	3.551
Orbital speed (km/s)	13.740
Temperature (K)	102
Discovery date	1610 (G. Galileo)

Gas giants 2/Son



Mimas

Moon of Saturn
The smallest astronomical body that is known to be rounded in shape because of self-gravitation.
From certain angles, Mimas resembles the Death Star.

Albedo	0.962
Radius (km)	198.2
Mass (kg)	3.749x10+19
Density (g/cm3)	1.148
Gravity (m/s2)	0.064
Orbital period (days)	0.942
Orbital speed (km/s)	14.28
Temperature (K)	64
Discovery date	1789 (W. Herschel)

Gas giants 2/Bird

Enceladus

Moon of Saturn
Enceladus is geologically active today.
Enceladus is the primary source for Saturn s E Ring
It is losing mass at a rate of 200 kg/second.

Albedo	1.375
Radius (km)	252.1
Mass (kg)	1.080x10+20
Density (g/cm3)	1.609
Gravity (m/s2)	0.113
Orbital period (days)	1.370
Orbital speed (km/s)	12.6
Temperature (K)	75
Discovery date	1789 (W. Herschel)

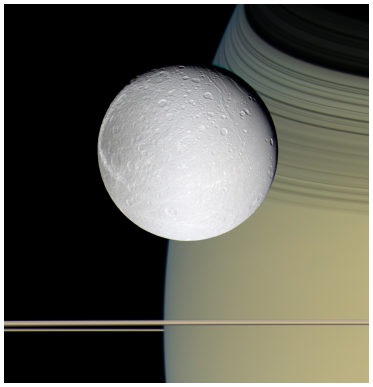
Gas giants 2/Cat

Tethys

Moon of Saturn
Its surface is one of the most reflective in the Solar System. Its extremely water-ice-rich composition remains unexplained.

Albedo	1.229
Radius (km)	531.1
Mass (kg)	6.174x10+20
Density (g/cm3)	0.984
Gravity (m/s2)	0.146
Orbital period (days)	1.887
Orbital speed (km/s)	11.35
Temperature (K)	86
Discovery date	1684 (G. Cassini)

Gas giants 2/Daughter

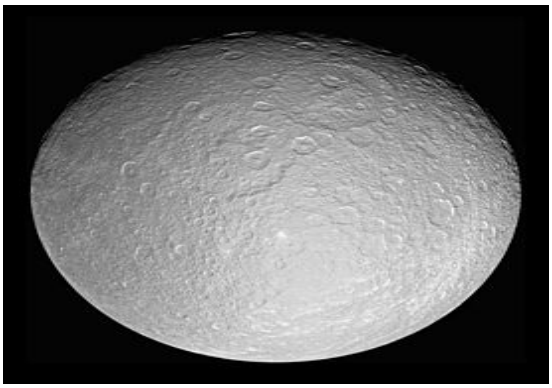


Dione

Moon of Saturn
Originally named Sidera Lodoicea by its discoverer Giovanni Cassini to honor king Louis XIV.
Dione has two co-orbital, or trojan, moons.

Albedo	0.998
Radius (km)	561.4
Mass (kg)	1.095x10+21
Density (g/cm3)	1.478
Gravity (m/s2)	0.232
Orbital period (days)	2.737
Orbital speed (km/s)	10.027
Temperature (K)	87
Discovery date	1684 (G. Cassini)

Gas giants 2/Dad



Rhea

Moon of Saturn
Rhea has a rather typical heavily cratered surface. In 2010, NASA announced the discovery of an atmosphere, an exosphere coposed of oxygen and carbon dioxide.

Albedo	0.949
Radius (km)	763.8
Mass (kg)	2.307x10+21
Density (g/cm3)	1.236
Gravity (m/s2)	0.264
Orbital period (days)	4.518
Orbital speed (km/s)	8.48
Temperature (K)	53->99
Discovery date	1672 (G. Cassini)

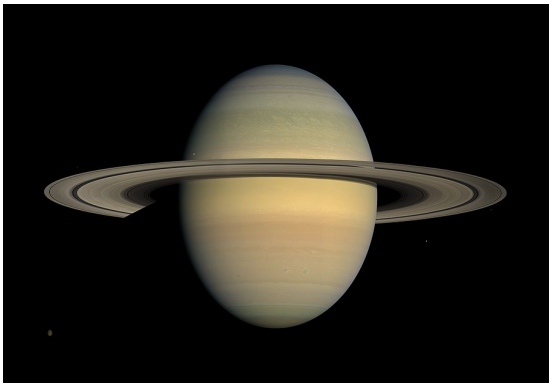
Gas giants 2/Dog

Phoebe

Moon of Saturn
It was the first satellite to be discovered photographically.

Albedo	0.06
Radius (km)	106.5
Mass (kg)	8.292x10+18
Density (g/cm3)	1.638
Gravity (m/s2)	0.038
Orbital period (days)	550.567
Orbital speed (km/s)	-1.71
Temperature (K)	73
Discovery date	1899 (W. Pickering)

Gas giants 2/Mom

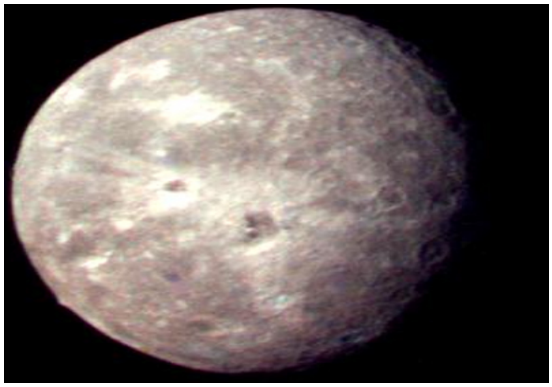


Saturn

Gas giant
The ring system consists of 9 continuous main rings and 3 discontinuous arcs. The only planet of the Solar System that is less dense than water.

Albedo	0.47
Radius (km)	58,232
Mass (kg)	5.683x10+26
Density (g/cm3)	0.687
Gravity (m/s2)	10.445
Orbital period (days)	10,759.22
Orbital speed (km/s)	9.69
Temperature (K)	134
Discovery date	1200 BC (Babylon)

Ice giants/Daughter

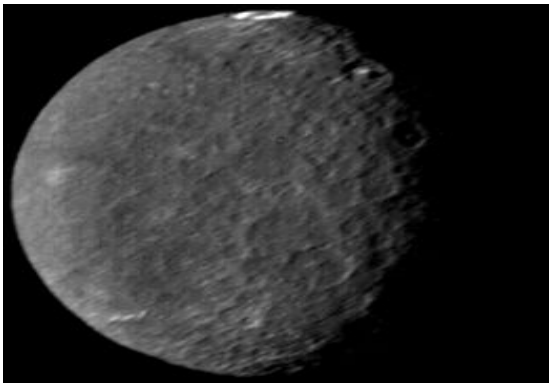


Oberon

Moon of Uranus
Oberon was discovered by William Herschel
Named after a character created by W. Shakespeare.
No mission to Oberon planned in the foreseeable future.

Albedo	0.31
Radius (km)	761.4
Mass (kg)	3.014x10+21
Density (g/cm3)	1.63
Gravity (m/s2)	0.346
Orbital period (days)	13.463
Orbital speed (km/s)	3.15
Temperature (K)	70-80
Discovery date	1787 (W. Herschel)

Ice giants/Dad

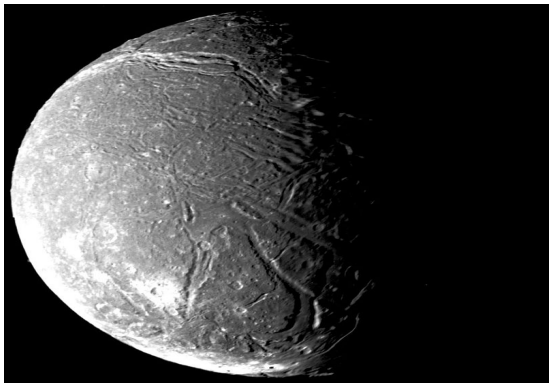


Umbriel

Moon of Uranus
Covered by numerous impact craters reaching 210 km in diameter. Since the Voyager 2 flyby (1986) no other spacecraft has ever visited Uranus or Umbriel.

Albedo	0.26
Radius (km)	584.7
Mass (kg)	1.172x10+21
Density (g/cm3)	1.39
Gravity (m/s2)	0.2
Orbital period (days)	4.144
Orbital speed (km/s)	4.67
Temperature (K)	75
Discovery date	1851 (W. Lassell)

Ice giants/Dog

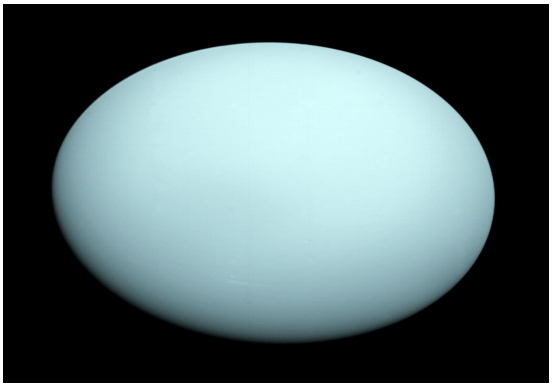


Ariel

moon of Uranus
Except for water, the only other compound identified on the surface of Ariel is carbon-dioxide (CO2), concentrated mainly on its trailing hemisphere.

Albedo	0.53
Radius (km)	578.9
Mass (kg)	1.353x10+21
Density (g/cm3)	1.592
Gravity (m/s2)	0.269
Orbital period (days)	2.52
Orbital speed (km/s)	5.51
Temperature (K)	-213
Discovery date	1851 (W. Lassell)

Ice giants/Mom

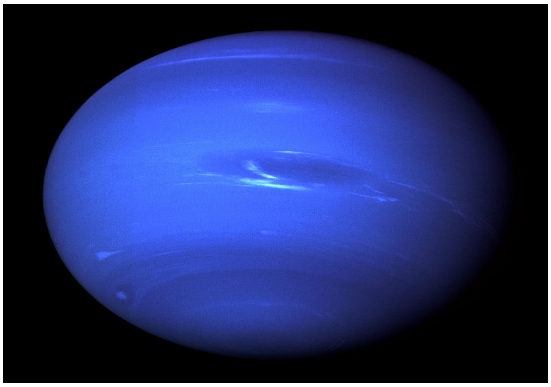


Uranus

Ice giant
The interior of Uranus is composed of ices and rock.
Wind speeds can reach 250 m/s (900 km/h, 560 mph)
It is the first planet discovered with a telescope.

Albedo	0.51
Radius (km)	25,362
Mass (kg)	8.681x10+25
Density (g/cm3)	1.27
Gravity (m/s2)	8.87
Orbital period (days)	30,688.5
Orbital speed (km/s)	6.80
Temperature (K)	76
Discovery date	1781 (W. Herschel)

Ice giants/Son



Neptune

Ice giant
Only planet in the Solar System found by mathematical prediction rather than by empirical observation.
Recorded wind speeds can be as high as 2100km/s.

Albedo	0.41
Radius (km)	24,622
Mass (kg)	1.024x10+26
Density (g/cm3)	1.638
Gravity (m/s2)	11.15
Orbital period (days)	60,182
Orbital speed (km/s)	5.43
Temperature (K)	72
Discovery date	1845 (U. Le Verrier)

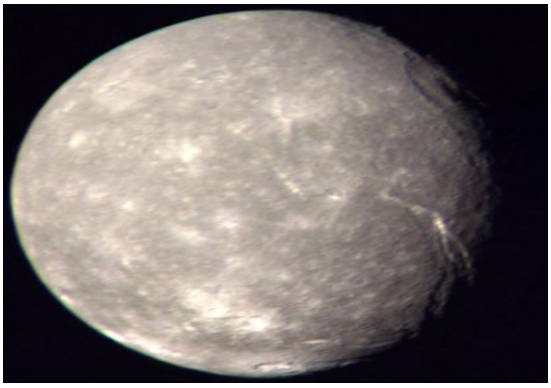
Ice giants/Bird

Triton

Moon of Neptune
Only 40% of Triton's surface has been observed.
Triton's atmosphere has clouds of condensed nitrogen that lie between 1 and 3 km from its surface.

Albedo	0.76
Radius (km)	1,353.4
Mass (kg)	2.14x10+22
Density (g/cm3)	2.061
Gravity (m/s2)	0.782
Orbital period (days)	-5.876
Orbital speed (km/s)	4.39
Temperature (K)	38
Discovery date	1846 (W. Lassell)

Ice giants/Cat



Titania

Moon of Uranus
It is subject to an extreme seasonal cycle. Both northern and southern poles spend 42 years in a complete darkness, and another 42 years in continuous sunlight.

Albedo	0.35
Radius (km)	788.4
Mass (kg)	3.526x10+21
Density (g/cm3)	1.711
Gravity (m/s2)	0.378
Orbital period (days)	8.706
Orbital speed (km/s)	3.64
Temperature (K)	70
Discovery date	1787 (W. Herschel)

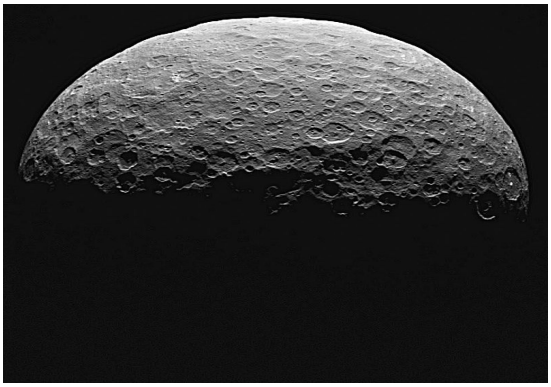
Dwarf planets/Son

Charon

Moon of Pluto
a very large moon in comparison to its parent body
Charon is the ferryman of the dead in Greek mythology.

Albedo	0.2-0.5
Radius (km)	606
Mass (kg)	1.586x10+21
Density (g/cm3)	1.707
Gravity (m/s2)	0.288
Orbital period (days)	6.387
Orbital speed (km/s)	0.21
Temperature (K)	53
Discovery date	1978 (J. W. Christy)

Dwarf planets/Cat

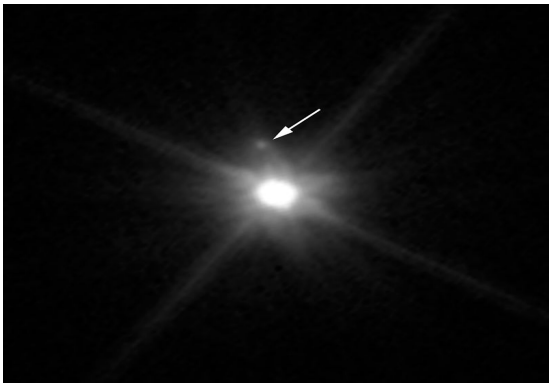


Ceres

Dwarf planet
Ceres is the only object in the asteroid belt known to be rounded by its own gravity. Ceres was the first asteroid discovered.

Albedo	0.09
Radius (km)	473
Mass (kg)	9.393x10+20
Density (g/cm3)	2.161
Gravity (m/s2)	0.28
Orbital period (days)	1678.6
Orbital speed (km/s)	17.882
Temperature (K)	168
Discovery date	1801 (G. Piazzi)

Dwarf planets/Daughter

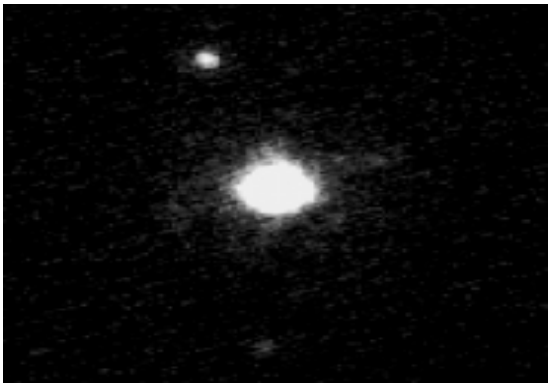


Makemake

Dwarf planet
Perhaps the largest Kuiper belt object. Its surface is covered with methane, ethane and nitrogen ices
A mission to Makemake could take just over 16 years.

Albedo	0.81
Radius (km)	715
Mass (kg)	4.4x10+21
Density (g/cm3)	1.4
Gravity (m/s2)	0.5
Orbital period (days)	112,897
Orbital speed (km/s)	4.419
Temperature (K)	40
Discovery date	2005 (Ch. Trujillo)

Dwarf planets/Dad

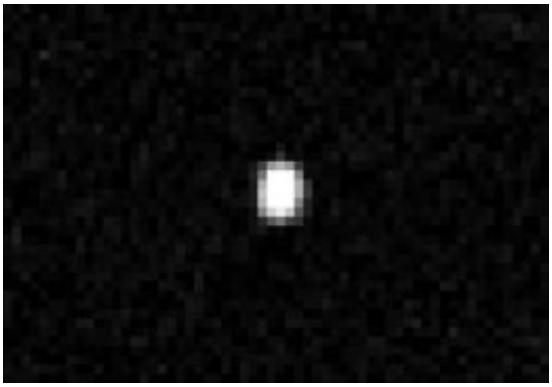


Haumea

Dwarf planet
Haumea is spinning so fast that if it spun much faster its equatorial bulges would distort into a dumbbell shape and split the planet in two.

Albedo	0.804
Radius (km)	620
Mass (kg)	4.006x10+21
Density (g/cm3)	2.6
Gravity (m/s2)	0.63
Orbital period (days)	103,774
Orbital speed (km/s)	4.531
Temperature (K)	50
Discovery date	2004 (M. E. brown)

Dwarf planets/Dog

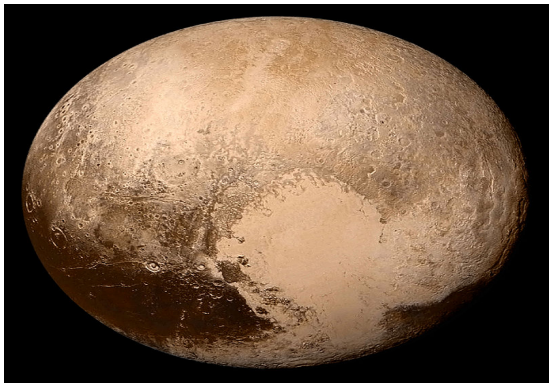


Quaoar

Kuiper belt dwarf-planet
Quaoar has one known satellite, Weywot
It was named after the Tongva creator deity.
Quaoar is about as massive as Charon.

Albedo	0.19
Radius (km)	380
Mass (kg)	1.4x10+21
Density (g/cm3)	2.2
Gravity (m/s2)	0.24
Orbital period (days)	104,334
Orbital speed (km/s)	4.52
Temperature (K)	43
Discovery date	2002 (Ch. Trujillo)

Dwarf planets/Mom

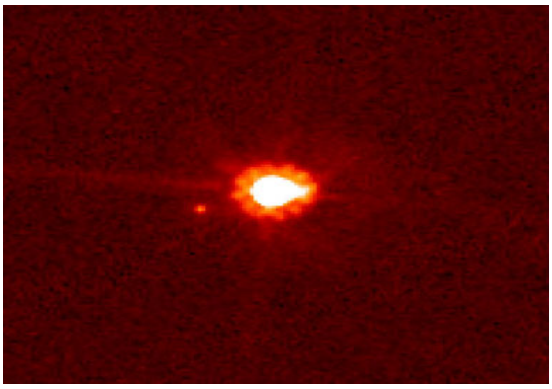


Pluto

Dwarf planet
Originally considered the ninth planet from the Sun.
On July 14, 2015, the New Horizons spacecraft
became the first spacecraft to fly by Pluto.

Albedo	0.44-0.61
Radius (km)	1,186
Mass (kg)	13.105x10+22
Density (g/cm3)	1.87
Gravity (m/s2)	0.61
Orbital period (days)	90,581
Orbital speed (km/s)	4.67
Temperature (K)	44
Discovery date	1930 (C. Tombaugh)

Dwarf planets/Bird

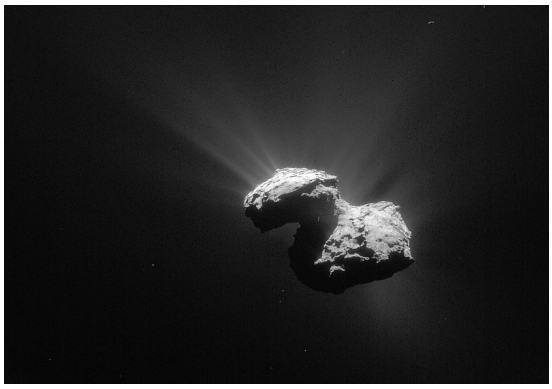


Eris

Dwarf planet
Because Eris appeared to be larger than Pluto, NASA
initially described it as the Solar System s tenth planet
Since August 24, 2006, Eris is considered a dwarf planet.

Albedo	0.96
Radius (km)	1,163
Mass (kg)	1.66x10+22
Density (g/cm3)	2.52
Gravity (m/s2)	0.659
Orbital period (days)	203,830
Orbital speed (km/s)	3.434
Temperature (K)	42.5
Discovery date	2005 (M. E. Brown)

Others/Son

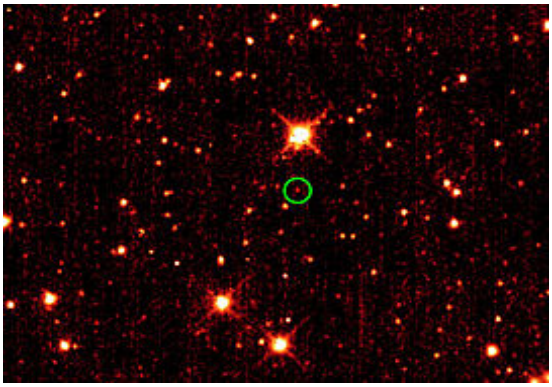


Churyumovâ??Gerasimenko

Jupiter-family comet
It was the destination of the Rosetta mission,
launched in 2004. On 12 November 2014
Philae probe landed on the comet.

Albedo	0.06
Radius (km)	4.3
Mass (kg)	1.0x10+13
Density (g/cm3)	0.533
Gravity (m/s2)	0
Orbital period (days)	2351
Orbital speed (km/s)	38
Temperature (K)	180
Discovery date	1969 (S. Geramienko)

Others/Bird



2010 TK7

Asteroid
The first Earth trojan discovered
50 more distant from Earth than the Moon.

Albedo	0.1
Radius (km)	0.3
Mass (kg)	Unknown
Density (g/cm3)	Unknown
Gravity (m/s2)	0.0005
Orbital period (days)	365.1
Orbital speed (km/s)	9.1
Temperature (K)	Unkown
Discovery date	2010 (WISE)

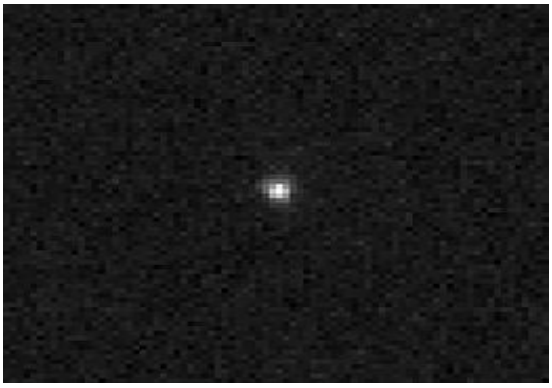
Others/Cat

(225088) 2007 OR10

Trans-neptunian object
Largest known body in the Solar System without a name.
2007 OR10 is among the reddest objects known.

Albedo	0.089
Radius (km)	750
Mass (kg)	1.3x10+21
Density (g/cm3)	Unknown
Gravity (m/s2)	Unknown
Orbital period (days)	199,978
Orbital speed (km/s)	Unknown
Temperature (K)	31
Discovery date	2007 (D. Rabinowicz)

Others/Daughter

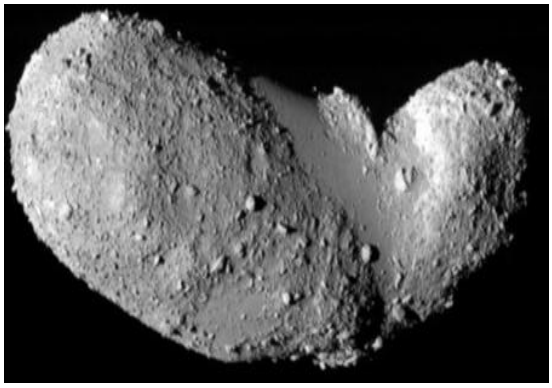


Sedna

Scattered object

Albedo	0.32
Radius (km)	480
Mass (kg)	Unknown
Density (g/cm3)	Unknown
Gravity (m/s2)	Unknown
Orbital period (days)	4,162,140
Orbital speed (km/s)	1.04
Temperature (K)	12
Discovery date	2003 (D. Rabinowicz)

Others/Dad

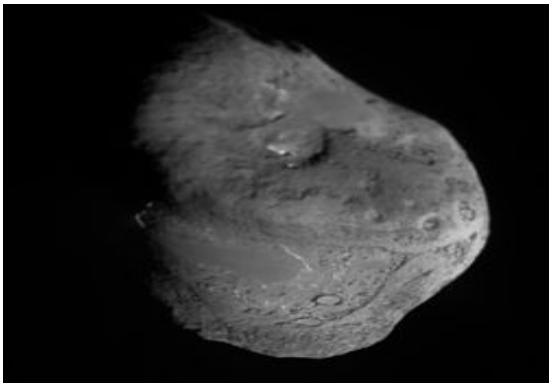


25143 Itokawa

Apollo and Mars-crosser asteroid
The 1st asteroid to be the target of a sample return mission. On 25 November 2005, Hayabusa mission landed on the asteroid and returned a sample to Earth.

Albedo	0.53
Radius (km)	0.5
Mass (kg)	3.51x10+10
Density (g/cm3)	2.9
Gravity (m/s2)	0.00001
Orbital period (days)	556.355
Orbital speed (km/s)	Unknown
Temperature (K)	206
Discovery date	1998 (LINEAR)

Others/Dog



Tempel 1

Periodic Jupiter-family comet
In 2005, Tempel 1 was deliberately struck by one component of the NASA Deep Impact Probe
This was the first landing on a comet.

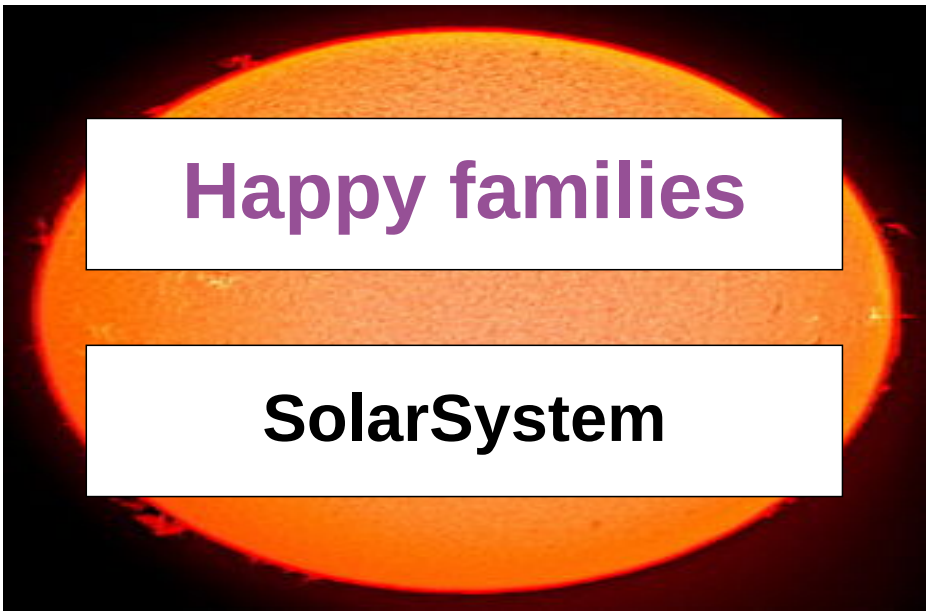
Albedo	0.04
Radius (km)	3.8
Mass (kg)	7.2x10+13
Density (g/cm3)	0.62
Gravity (m/s2)	Unknown
Orbital period (days)	2016.85
Orbital speed (km/s)	Unknown
Temperature (K)	Unknown
Discovery date	1867 (W. Tempel)

Others/Mom

Sun

Its mass accounts for about 99.86% of the total mass of the Solar System. The Sun is roughly middle aged and has not changed dramatically for over four billion years.

Albedo	NA
Radius (km)	696,342
Mass (kg)	1.988x10+30
Density (g/cm3)	1.408
Gravity (m/s2)	274.0
Orbital period (days)	NA
Orbital speed (km/s)	251
Temperature (K)	1,000,000
Discovery date	NA



Happy families

SolarSystem