

The Sun and its Planets

ASTR 201 - Fall 2017

Prof. Stacy McGaugh

stacy.mcgaugh [at] case.edu

Sears 573

368-1808

TA Joe Curro jjc188 [at] case.edu

Sears 561

368-3896

Time: Tu Th 11:30 AM - 12:45 PM

Room: Sears 480

Textbook

21st Century Astronomy

The Solar System (5th edition)

Kay, Palen, Blumenthal

Digital Content



Syllabus

- Course Description
- Lecture Schedule including links to pdf files of lecture slides
- Learning Outcomes
- Grades
- Assignemnts and Exams
- Homework
- PDF syllabus

<http://astroweb.case.edu/ssm/astr201/>

Course News

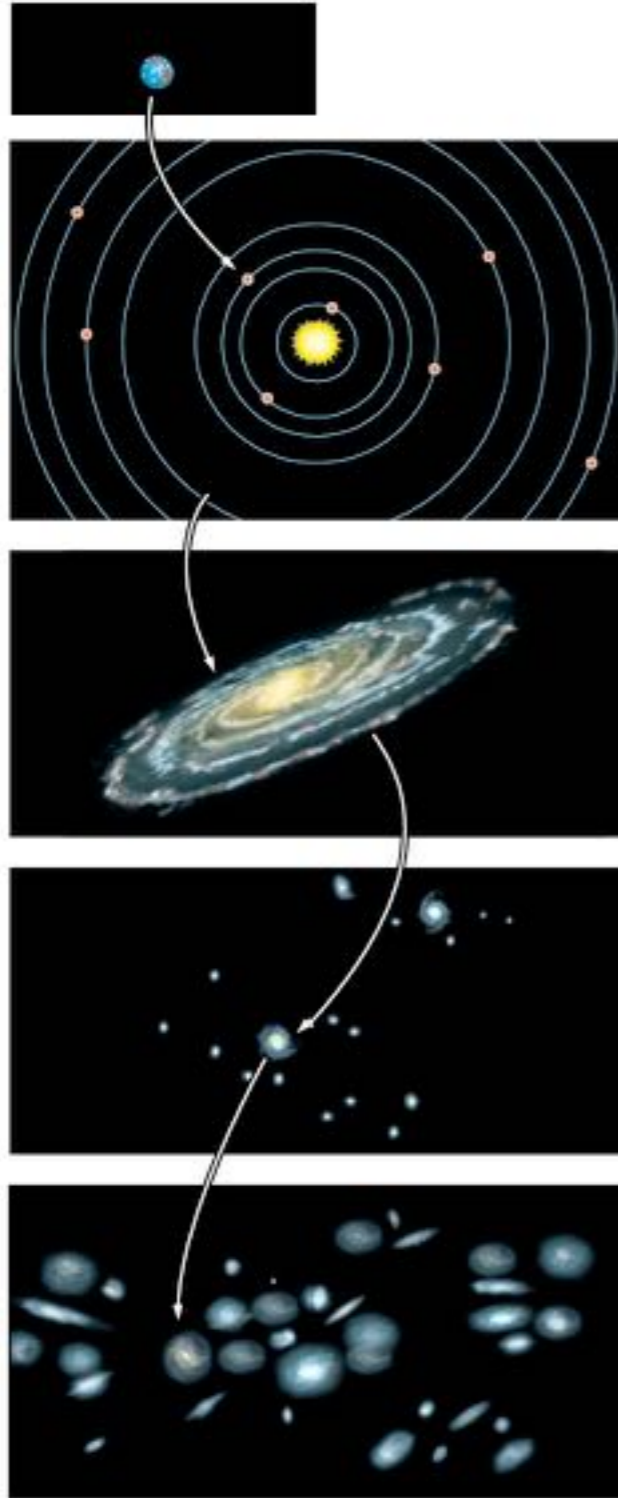
News and Notices will appear in this space.

Miscellany

Plan

- Questions?
- Syllabus; administrative details
- Some Definitions
- An Idea of Scale

Our Place in the Universe



Earth is a small planet,

orbiting a medium-sized star,

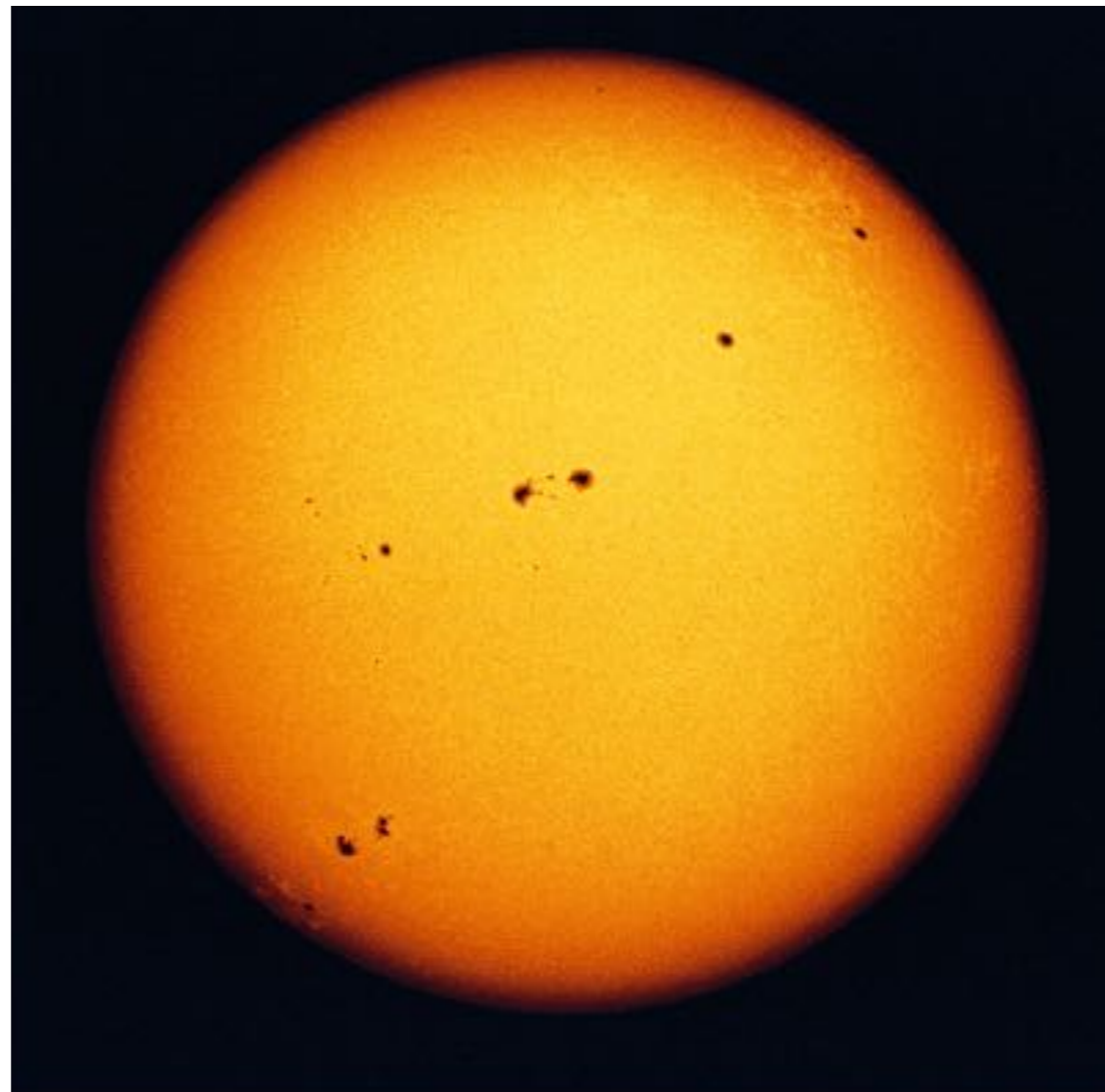
in a galaxy of 100 billion stars,

which is just one of billions of galaxies,

in a universe that is ~14 billion years old.

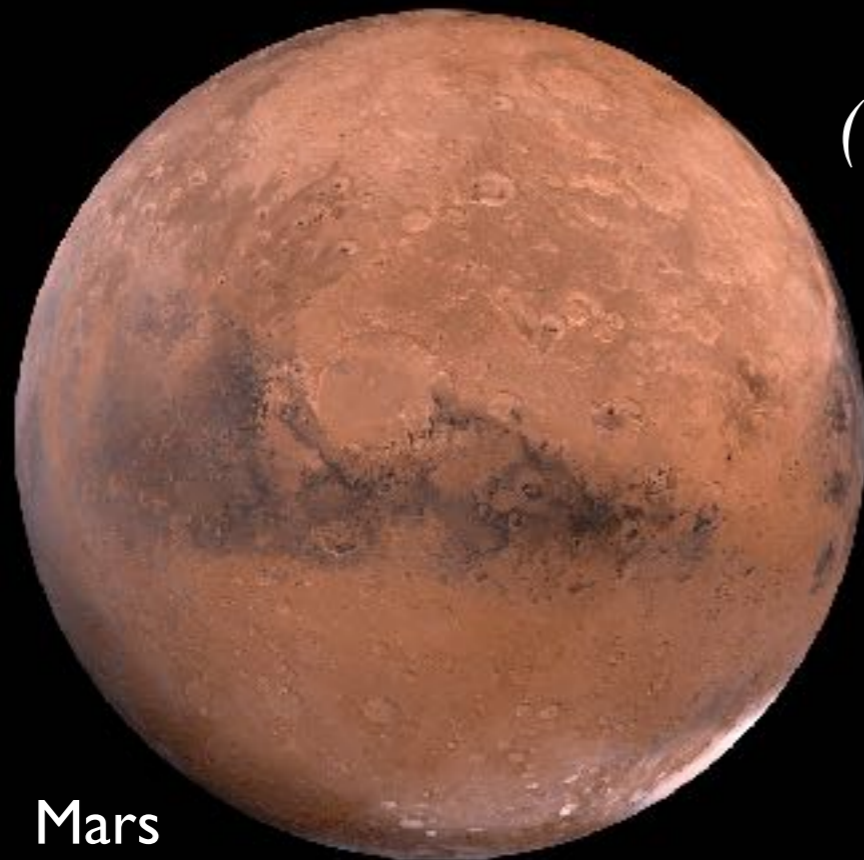
Star

A large, glowing ball of gas that generates heat and light through nuclear fusion



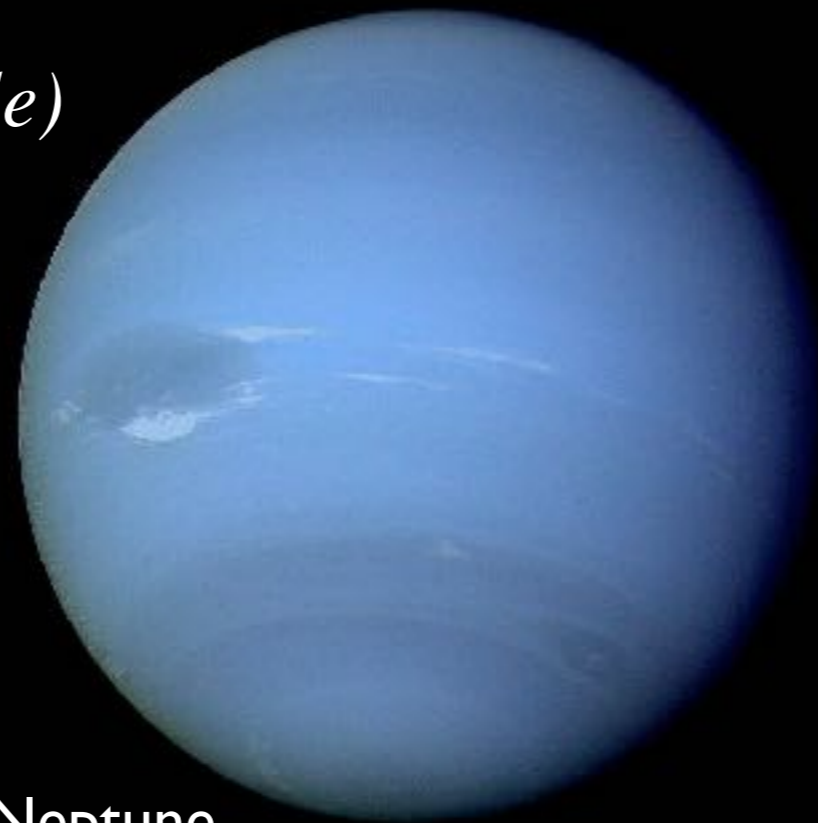
The sun releases more energy every second than a billion H-bombs

Planet



Mars

(not to scale)



Neptune

A moderately large object that orbits a star that has cleared its orbit of similar objects.

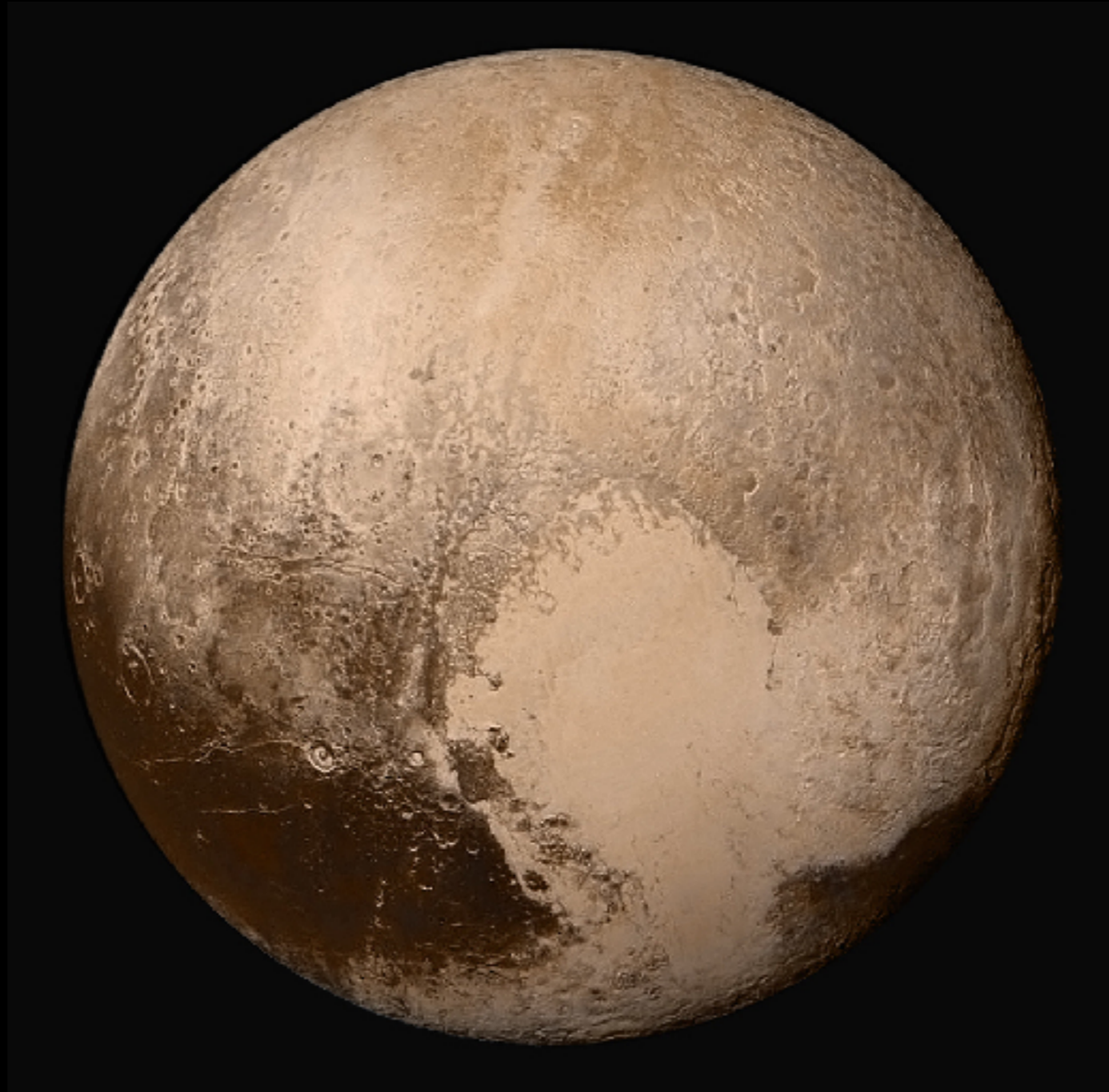
It shines by reflected light. Planets may be rocky, icy, or gaseous in composition.



Jupiter low in the West-Southwest

Sky to South-Southwest after sunset this week

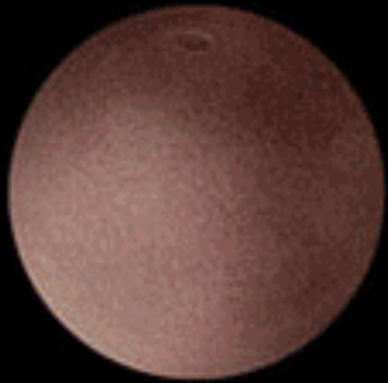
Dwarf Planet



A moderately small object that orbits a star.
It has not cleared similar objects out its orbit.

A few dwarf planets to scale

Makemake



Dysnomia



Eris



Luna



Charon



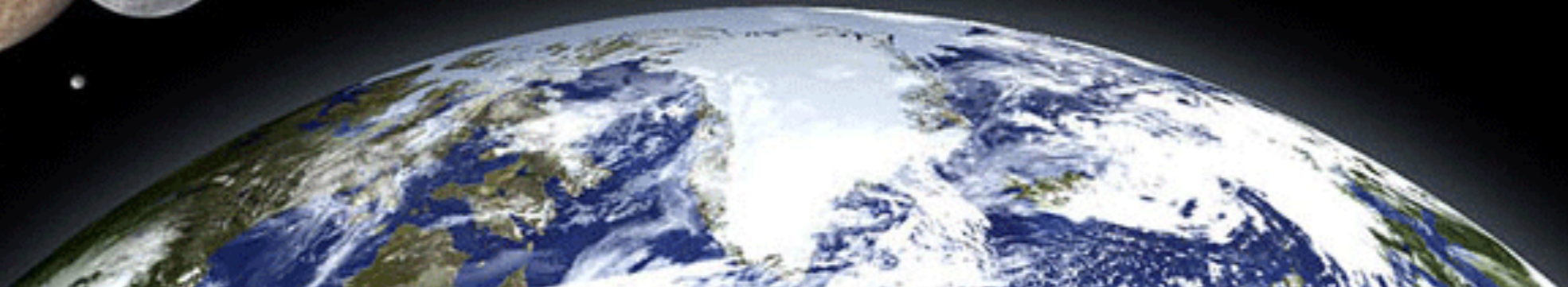
Ceres



Earth



Pluto



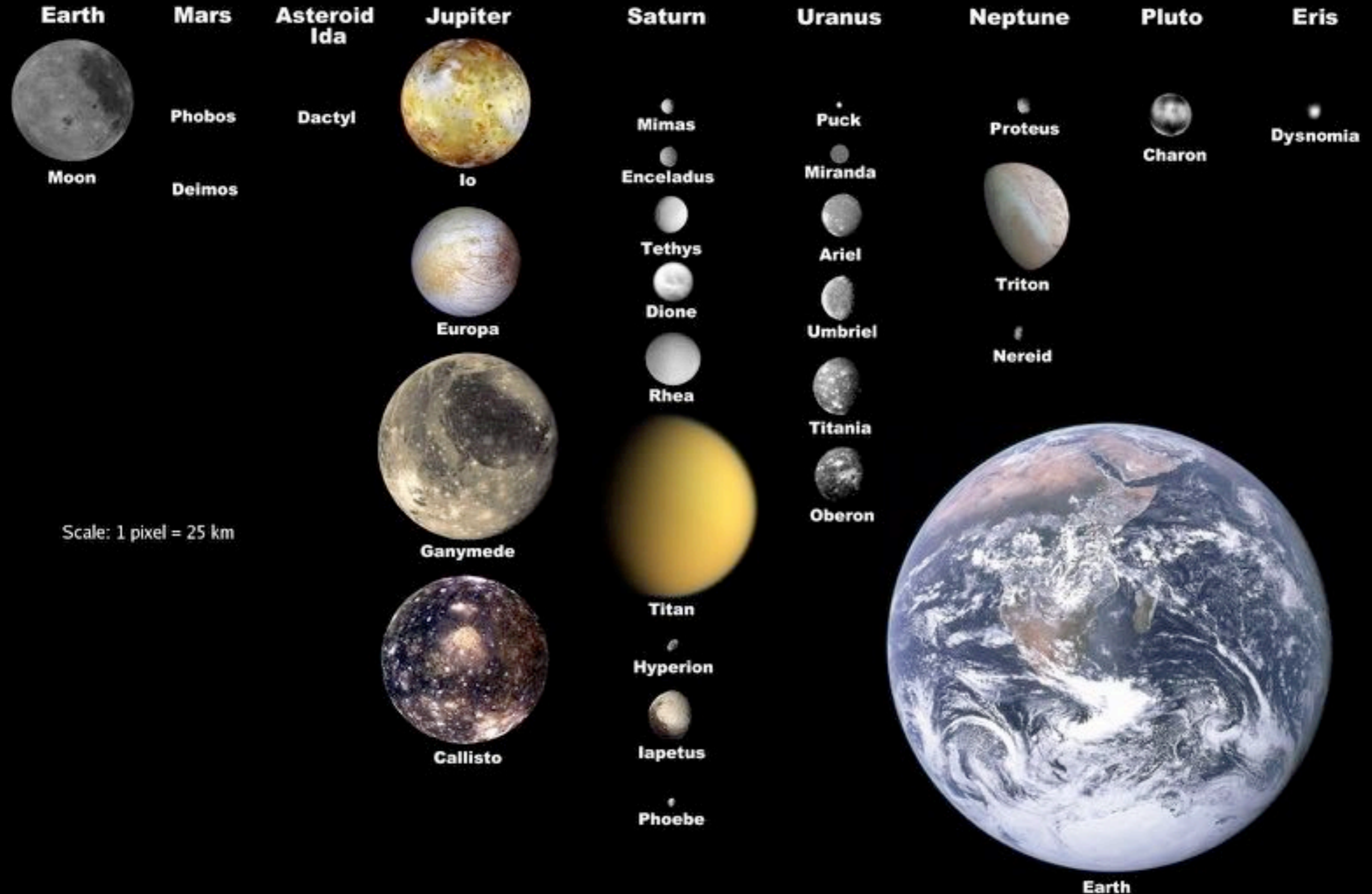
Moon (or satellite)

An object that orbits a planet.

Moons of Jupiter



Selected Moons of the Solar System, with Earth for Scale



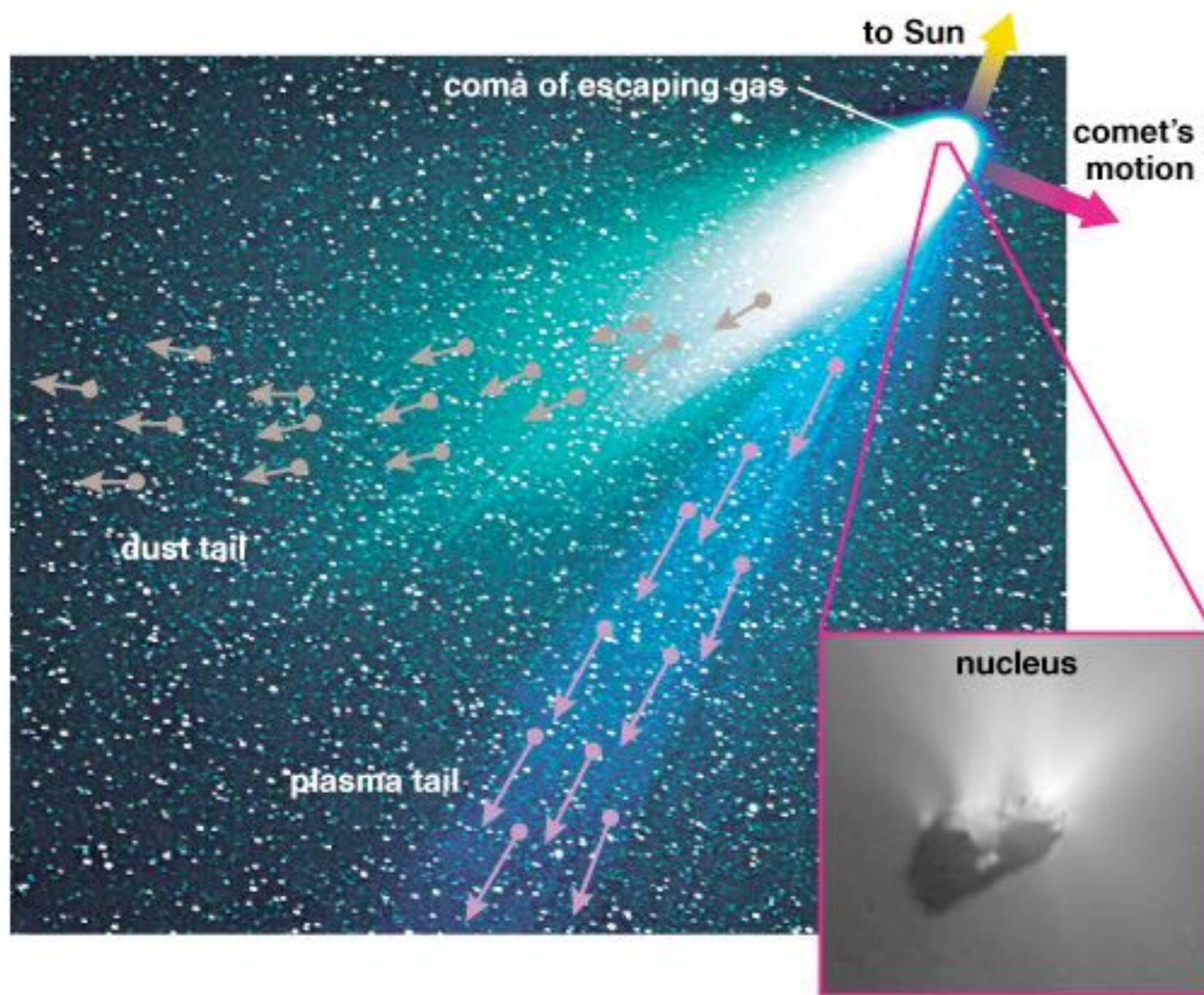
Asteroid

A relatively small and rocky object that orbits a star.

Ida



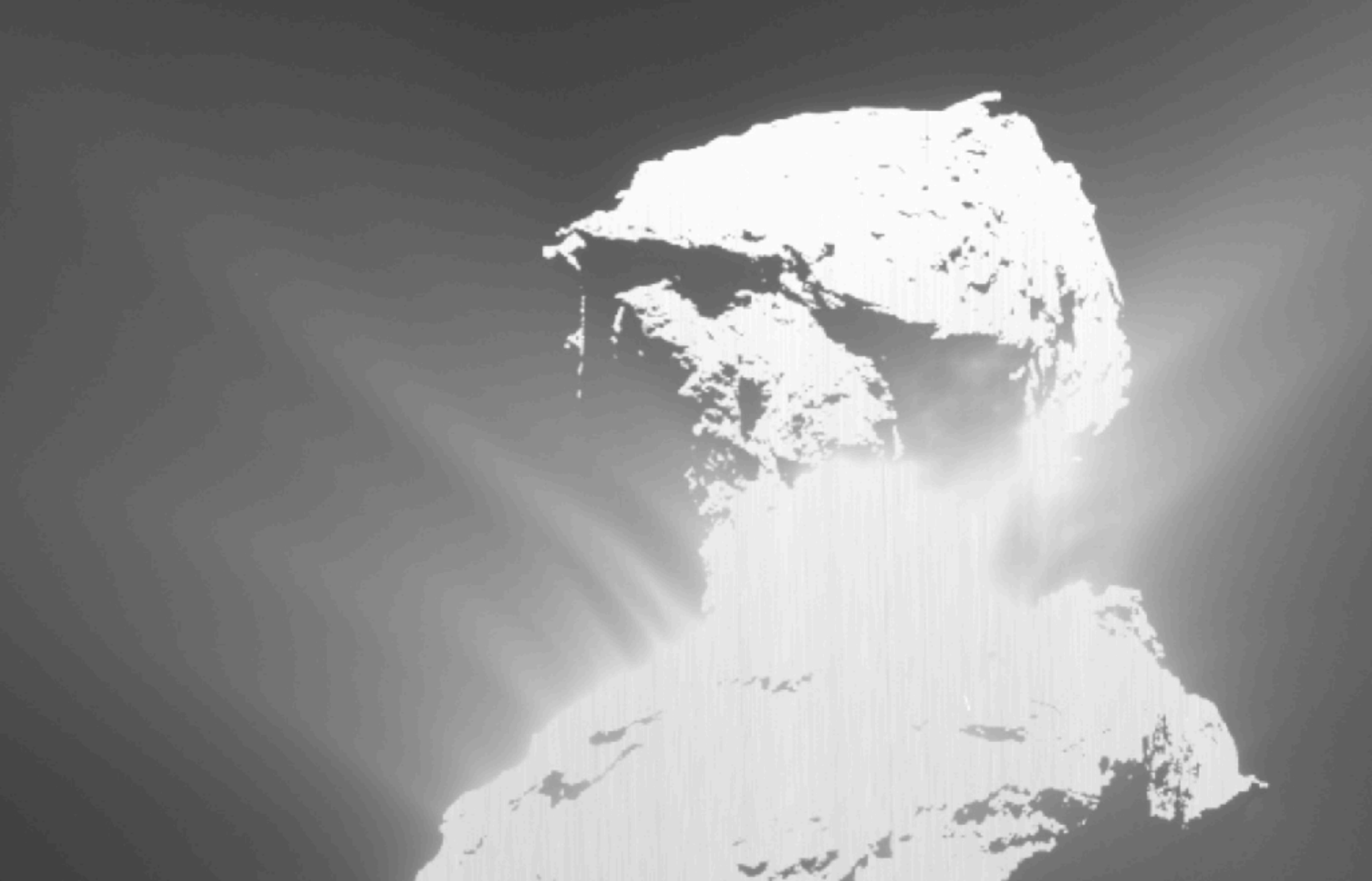
Comet



A relatively small and icy object that orbits a star.

Comet Lovejoy





Comet 67P
Outburst imaged by Rosetta last year.

The sun as seen through the 9.5" telescope atop A.W. Smith during the partial eclipse Monday August 21, 2017

Sunspots are magnetic storms on the surface of the sun that appear dark because they're not quite as hot as the surrounding gas.



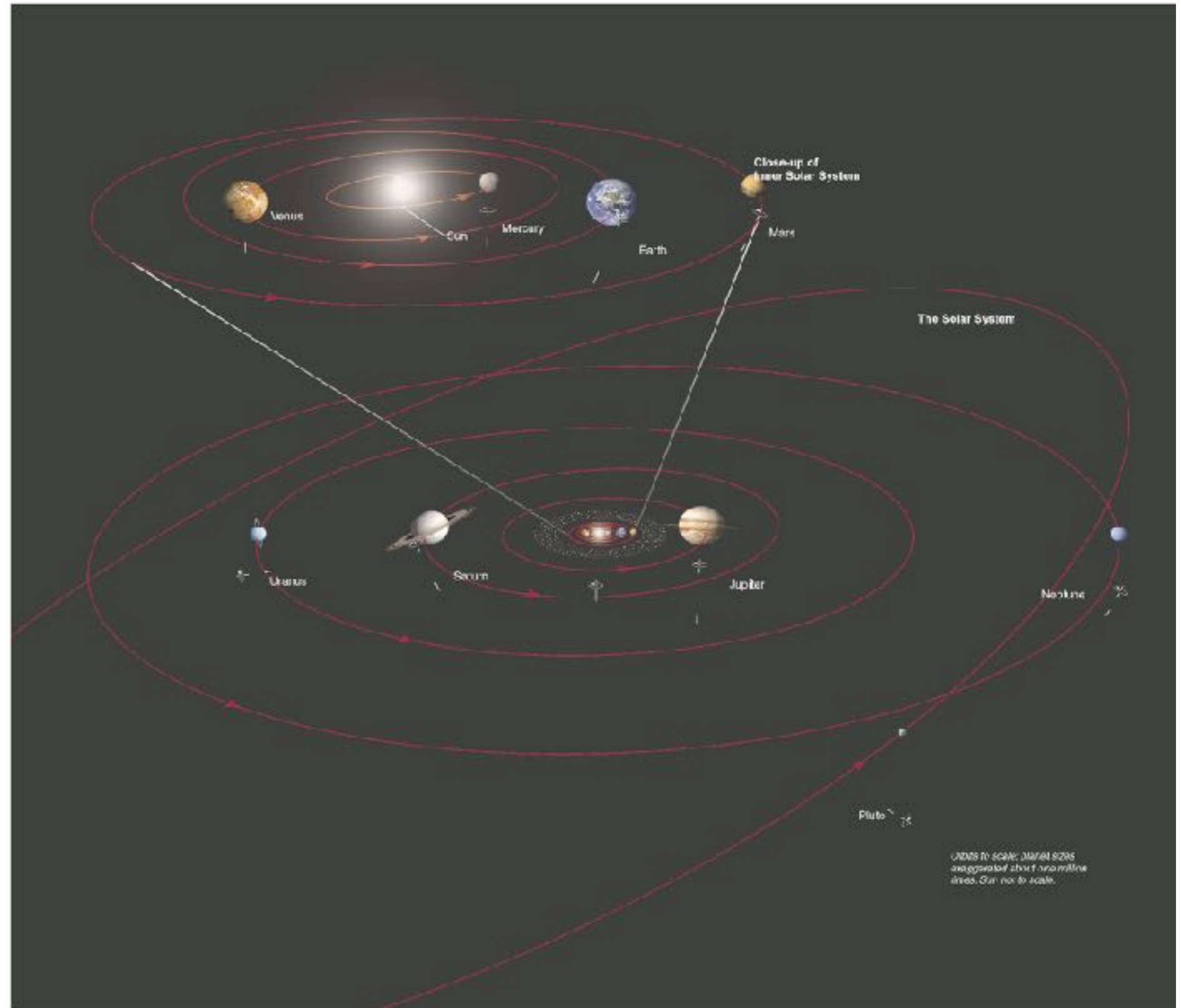
Sun

sunspots

moon

Solar (Star) System

A star and all the material that orbits it, including its planets and moons



Nebula

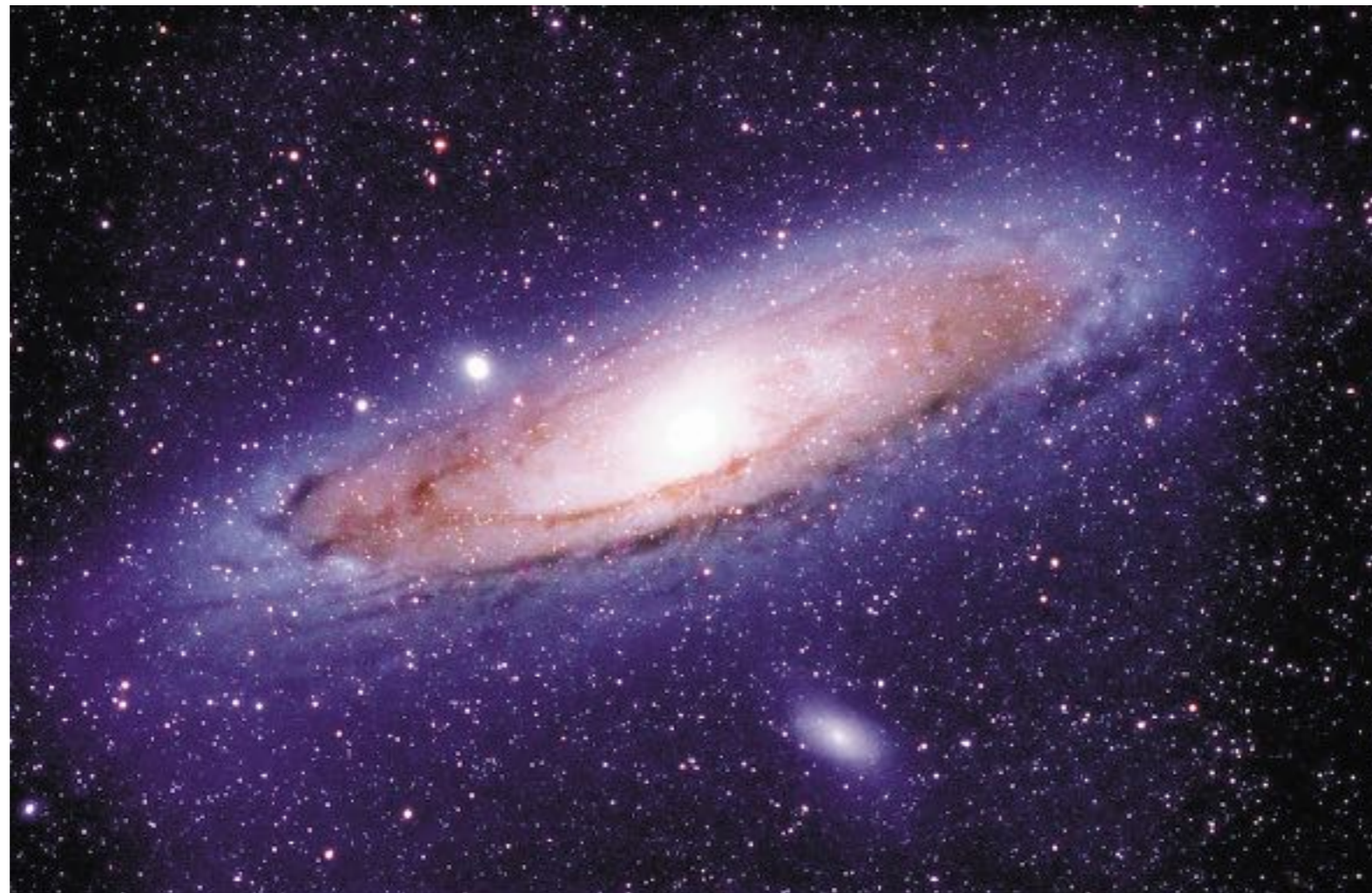


An interstellar cloud
of gas and/or dust

Typically larger than the solar system - may contain many stars

Galaxy

A great island of stars in space, all held together by gravity and orbiting a common center



100s of billions of stars

Universe

The sum total of all matter and energy;
that is, everything within and between
all galaxies

100s of billions of galaxies...
in the observable portion of the universe

Powers of Ten video

<https://www.youtube.com/watch?v=0fKBhvDjuy0>

