

# Plan

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

# The Sun and its Planets

## ASTR 201 - Fall 2016

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Time: Tu Th 10:0-11:15 AM

Room: Sears 480

Textbook

*The Cosmic Perspective*

*The Solar System*

Seventh edition

Bennett, Donahue, Schneider, & Voit



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## Syllabus

- [Course Description](#)
- [Lecture Schedule](#) including links to pdf files of lecture slides
- [Learning Outcomes](#)
- [Grades](#)
- [Assignments and Exams](#)
- [Homework](#)
- [PDF syllabus](#)

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

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## Course News

Timely informational items will be posted here.

I DO NOT USE  
BLACKBOARD

## Miscellany

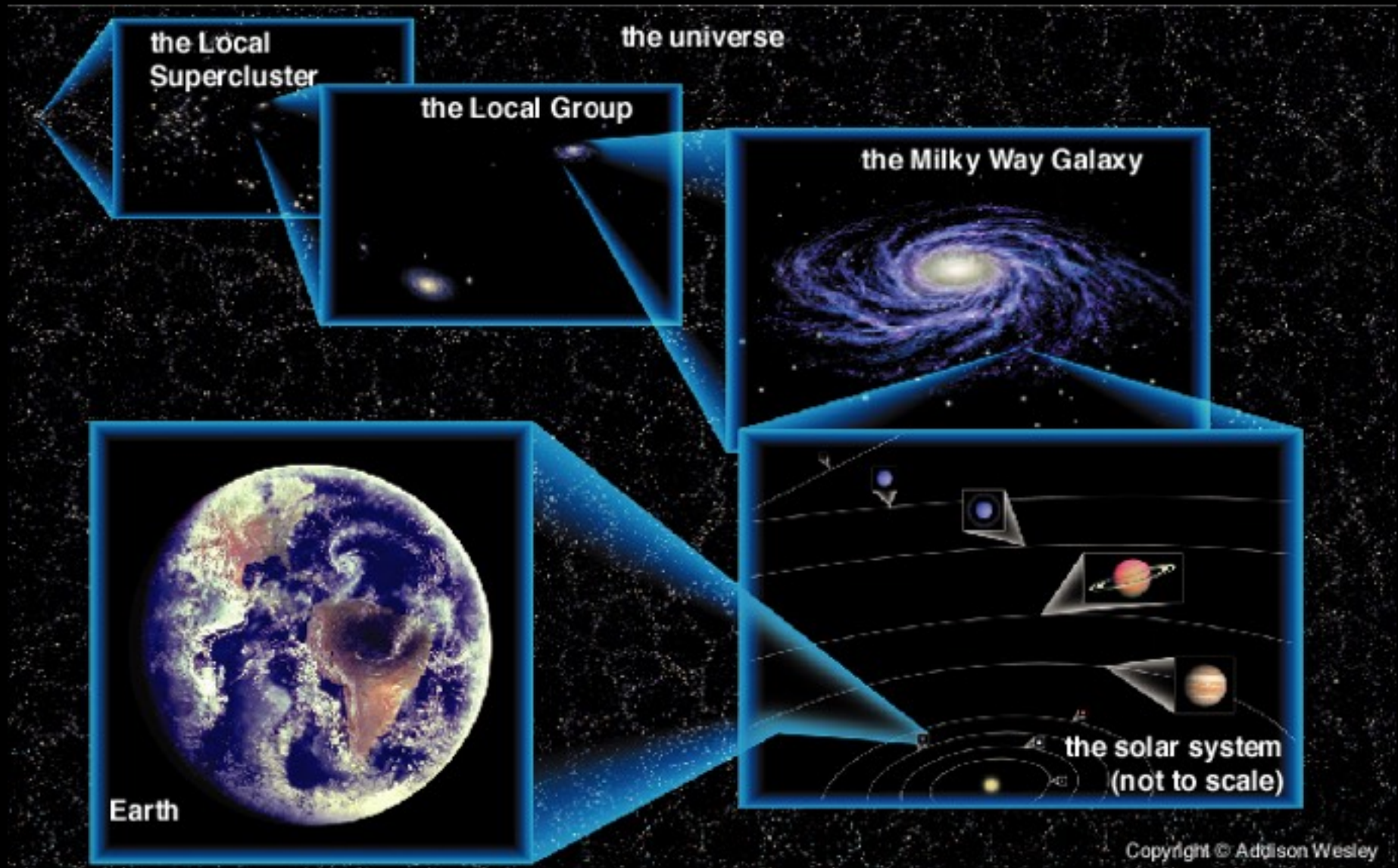
[Tips for the successful student](#)

[Glossary of Astronomy terms](#)

[Stellarium freeware \(as seen in lecture!\)](#)

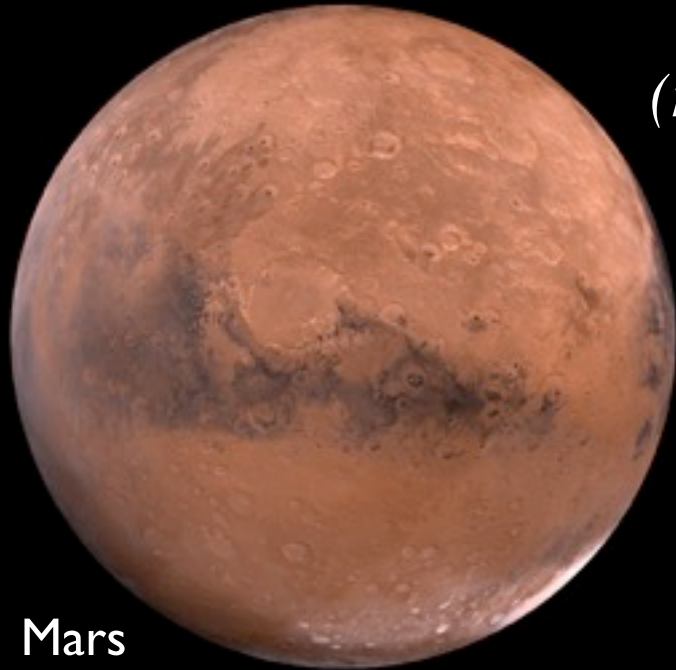
# What is our place in the universe?

## Our “Cosmic Address”



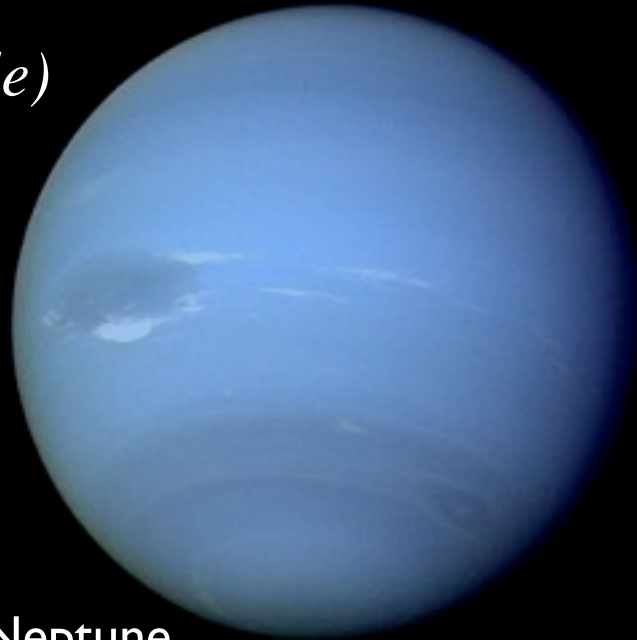


# Planet



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.

Sky to West-Southwest after sunset this week

## Dusk, Sept 2–4

*20 minutes after sunset*



**Looking West-Southwest**

New moon Thursday Sept. 1

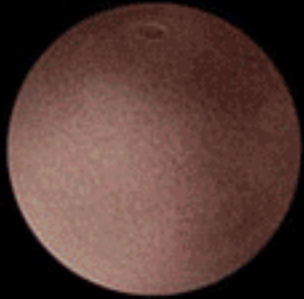
# Dwarf Planet



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

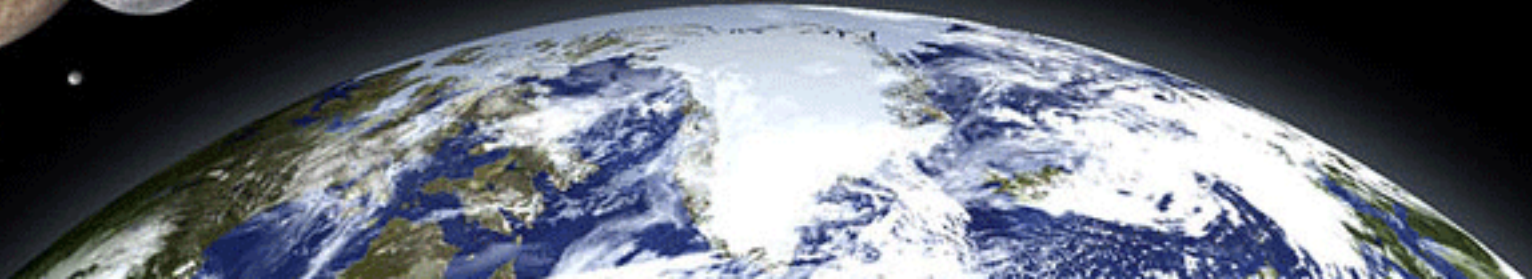


Ceres



Earth

Pluto





# Moon (or satellite)

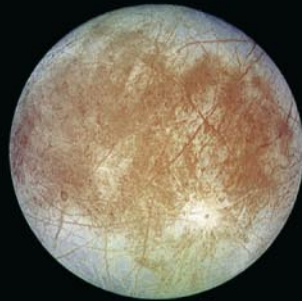
An object that orbits a planet.

## Moons of Jupiter

1000 km



Io



Europa



Ganymede



Callisto

# Selected Moons of the Solar System, with Earth for Scale

**Earth**

**Mars**

**Asteroid  
Ida**

**Jupiter**

**Saturn**

**Uranus**

**Neptune**

**Pluto**

**Eris**

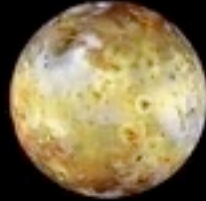


**Moon**

**Phobos**

**Deimos**

**Dactyl**



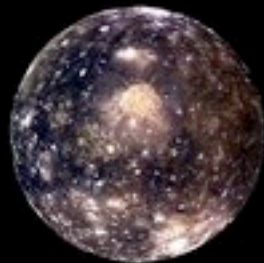
**Io**



**Europa**



**Ganymede**



**Callisto**

**Mimas**

**Enceladus**



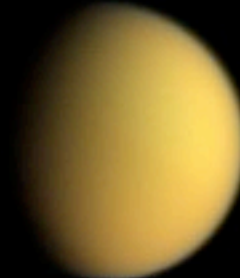
**Tethys**



**Dione**



**Rhea**



**Titan**

**Hyperion**



**Iapetus**

**Phoebe**

**Puck**

**Miranda**



**Ariel**



**Umbriel**



**Titania**



**Oberon**

**Proteus**



**Triton**

**Nereid**



**Charon**

**Dysnomia**



**Earth**

Scale: 1 pixel = 25 km

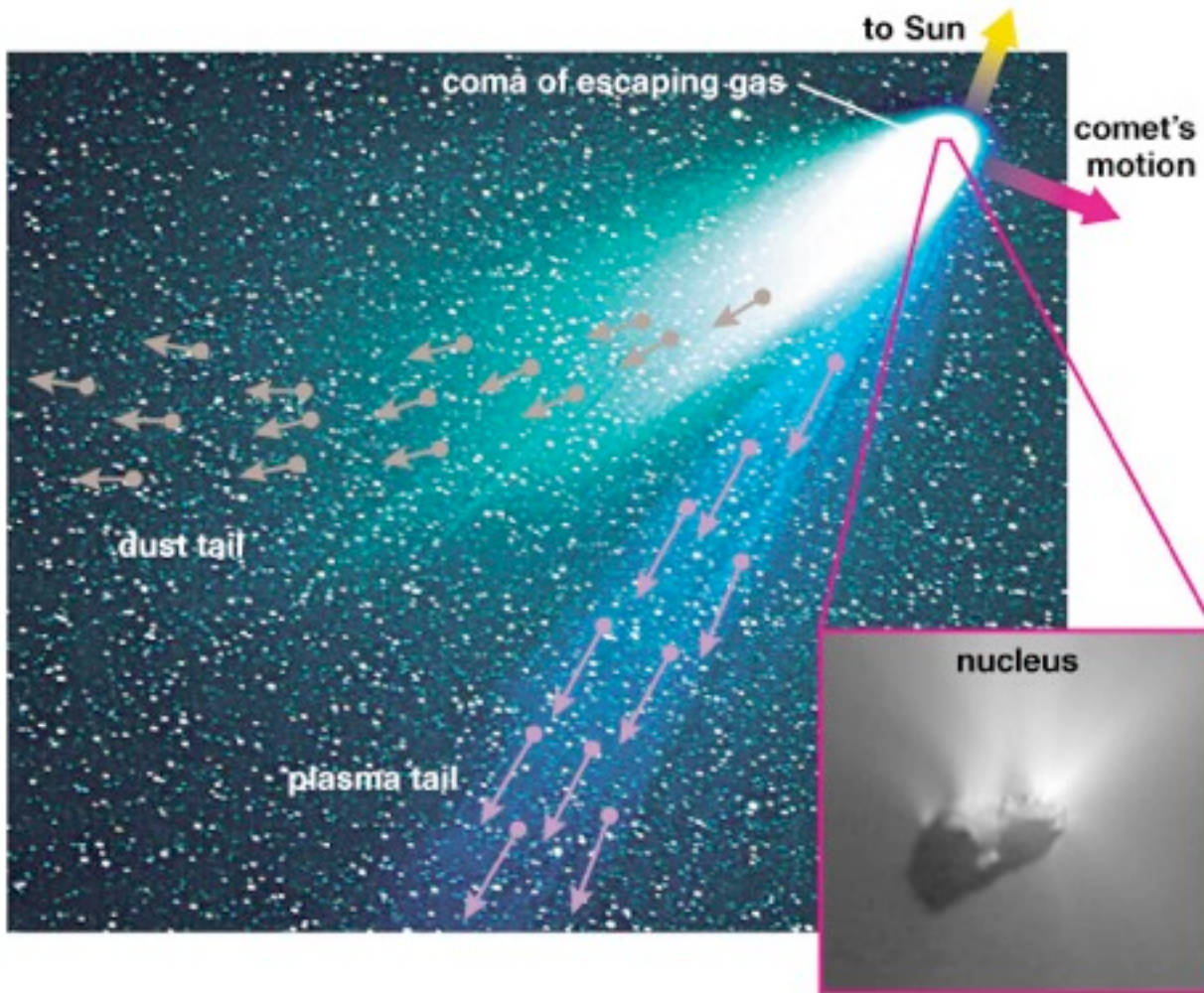
# Asteroid

A relatively small  
and rocky object  
that orbits a star.

Ida



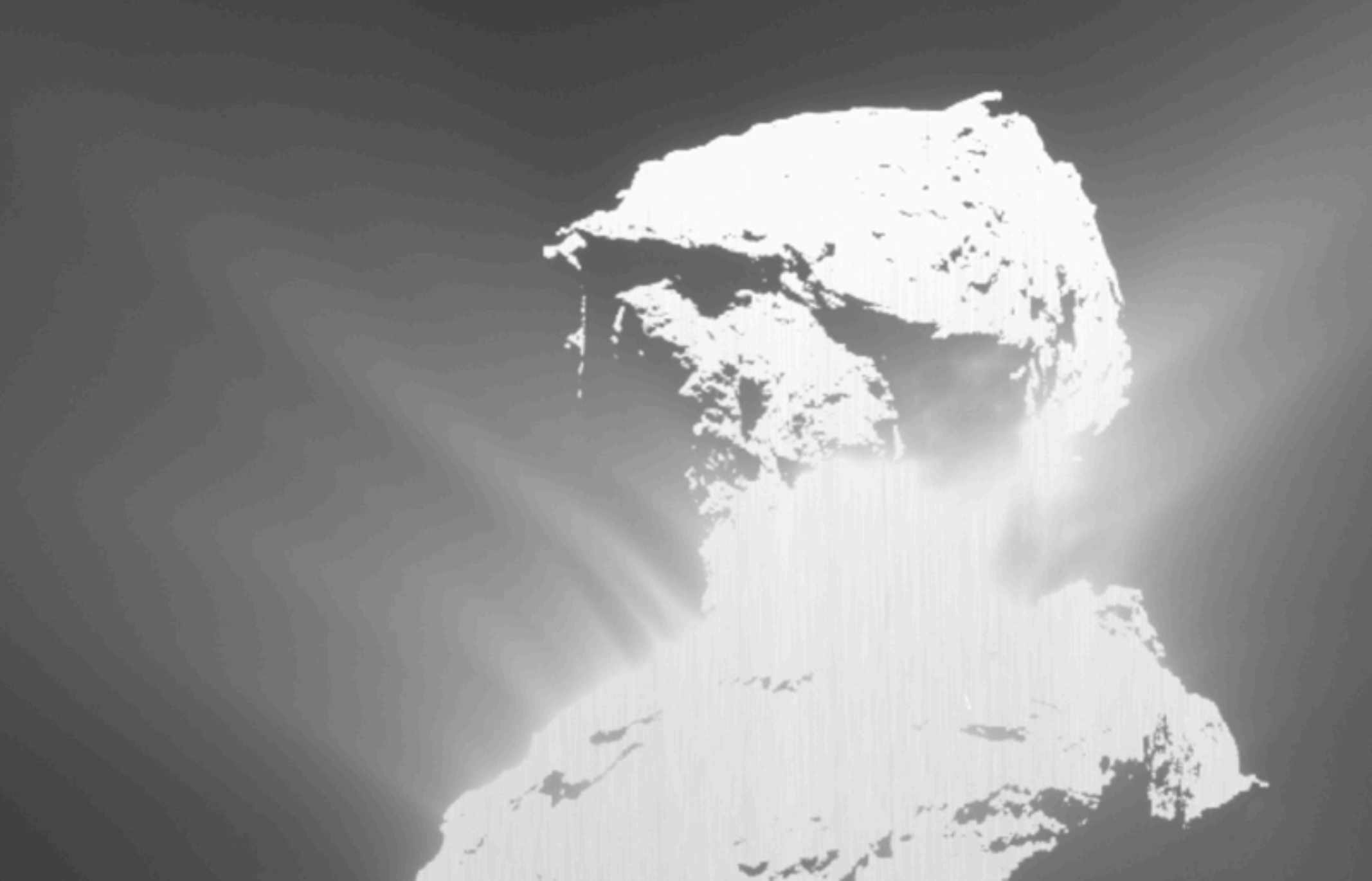
# Comet



A relatively small and icy object that orbits a star.

# Comet Lovejoy

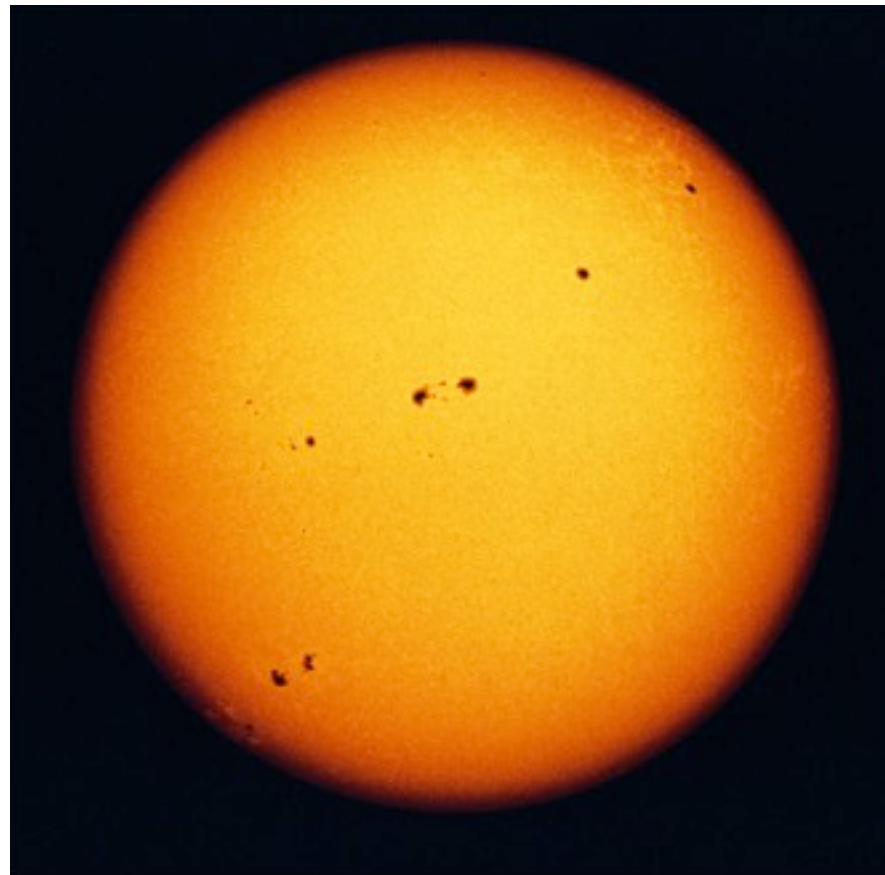




Comet 67P  
Outburst imaged by Rosetta last week.

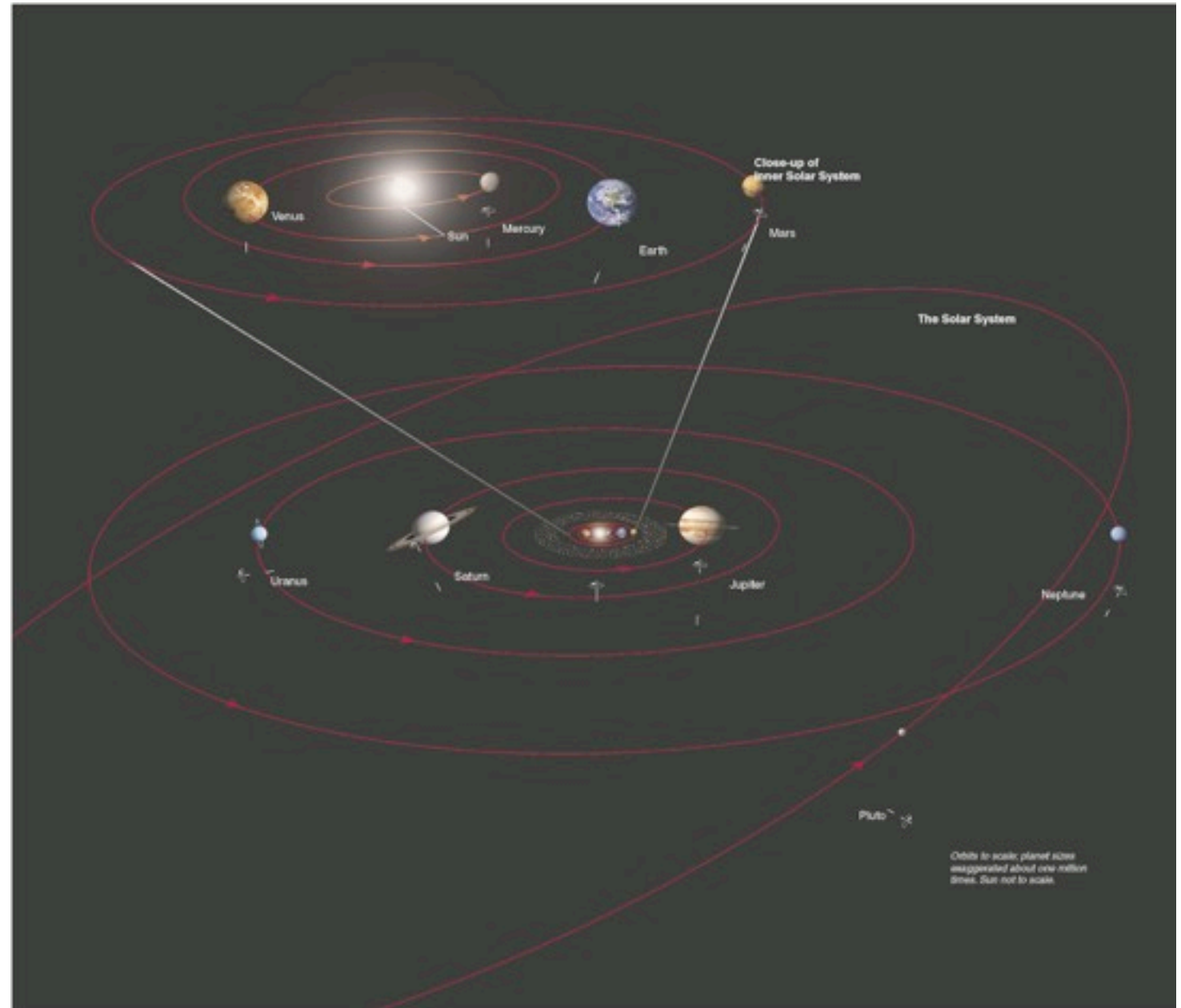
# Star

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



# Solar (Star) System

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





# Nebula

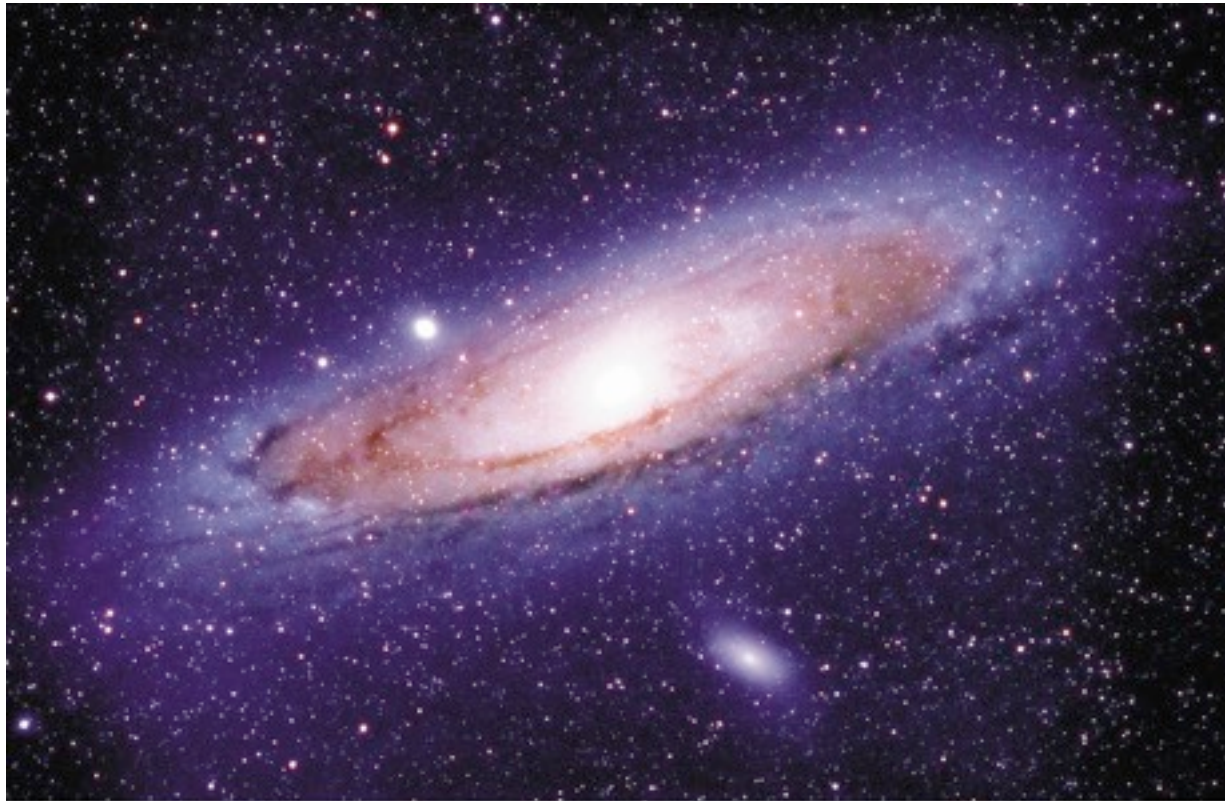


An interstellar cloud  
of gas and/or dust

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>



IF THE  
MOON  
WERE ONLY  
**1** PIXEL

A TEDIOSLY ACCURATE SCALE MODEL OF THE SOLAR SYSTEM

Scroll to explore 

[http://joshworth.com/dev/pixelspace/pixelspace\\_solarsystem.html](http://joshworth.com/dev/pixelspace/pixelspace_solarsystem.html)