

**Cosmic Connections:
An Introduction to Astronomy
And
Maine's Magnificent Night Skies**

Midcoast Senior College

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Unit 8

Dwarf Planets, Asteroids, and Comets

Our Solar System

Radius (km):	2,440	6,052	6,371	3,389	69,911	58,232	25,362	24,622
Earth mass:	5.5%	81.5%	100%	10.7%	x317.8	x95.2	x14.5	x17.1
Orbit (earth time):	88days	224.7days	365.25days	1.9yrs	11.9 yrs	29.5yrs	84yrs	164.8yrs

Mercury Venus Earth Mars Jupiter Saturn Uranus Neptune

Luna

Radius (km):	1,737
Earth mass %:	1.2
Orbit (earth days):	27.3

Asteroid Belt

Ceres

Radius (km):	476
Luna mass %:	0.015
Orbit (earth yrs):	4.6

Pluto Haumea Makemake Eris

Radius (km):	1,187	~620	~715	1,163
Earth mass %:	17.8	5.4	?	23
Orbit (earth yrs):	247.7	284.1	309.1	558

← Planets

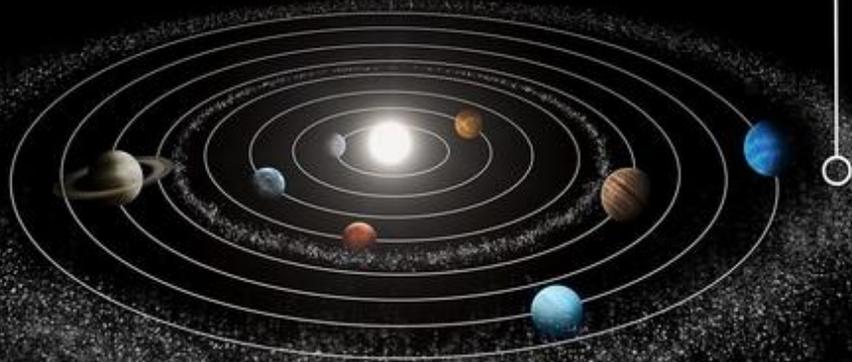
← Dwarf
Planets

Orbit distances from the Sun in billions of km



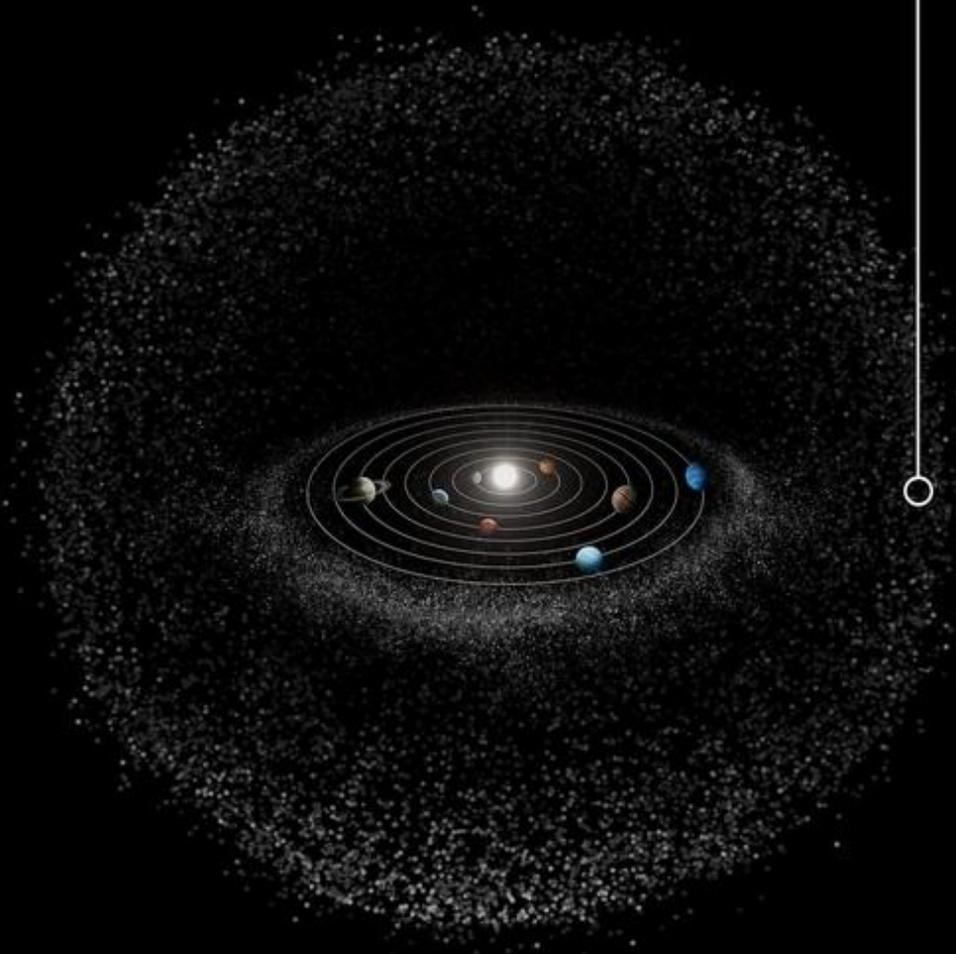
Kuiper Belt

Distance from Sun: 30–50 AU



Oort Cloud

Distance from Sun: 2000–200 000 AU



Largest known trans-Neptunian objects (TNOs)



Eris



Pluto



Makemake



2007OR10



Haumea



Quaoar



Sedna



Orcus

(The dwarf planet Ceres would fit in here.)

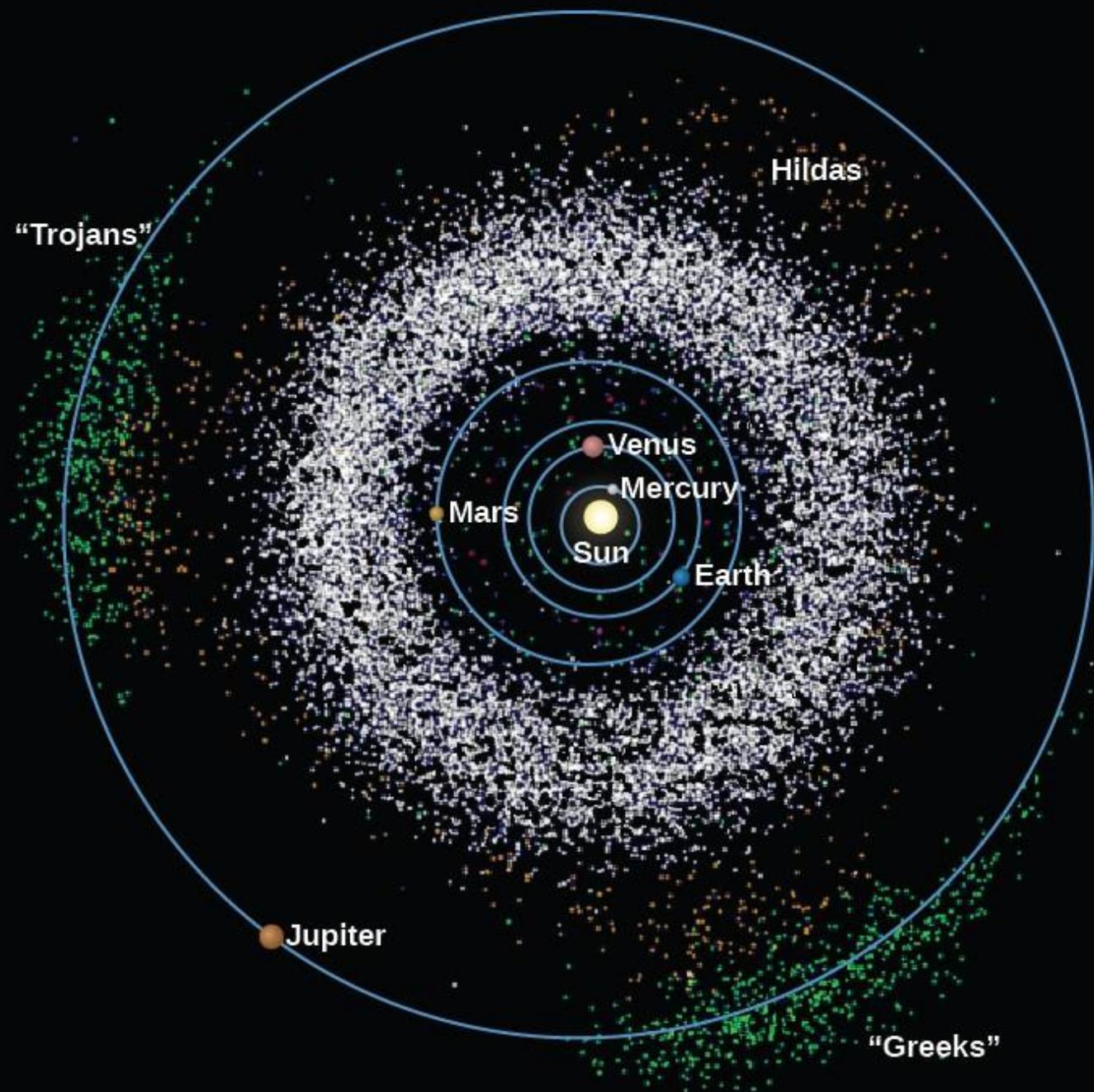


2002MS4



Salacia







Three Broad Classes of Asteroids

C-type, most common

Chondrite

Clay and silicate rocks

S-type

Silicate materials and nickel-iron

M-type

Metallic, nickel-iron



Asteroid Names

<https://www.washingtonpost.com/technology/2023/10/05/asteroid-belt-names/>

James Bond (9007)

Beowulf (38086)

Tomhanks (12818) and Meg Ryan (8353)

Monty Python (13681)

Mr. Spock (2309)

Dollyparton (10731)

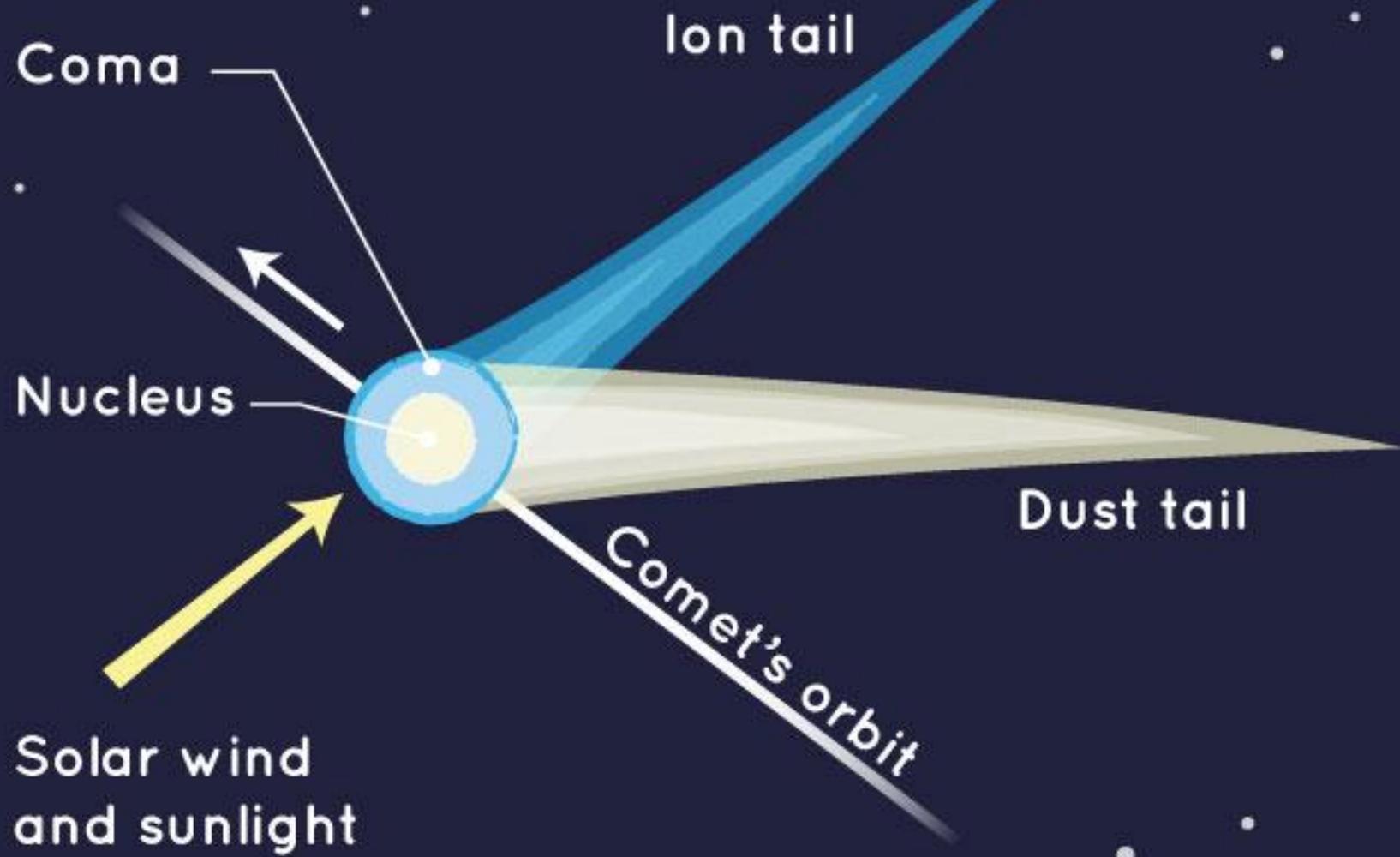
Potato (88705)

Alleven (24680)

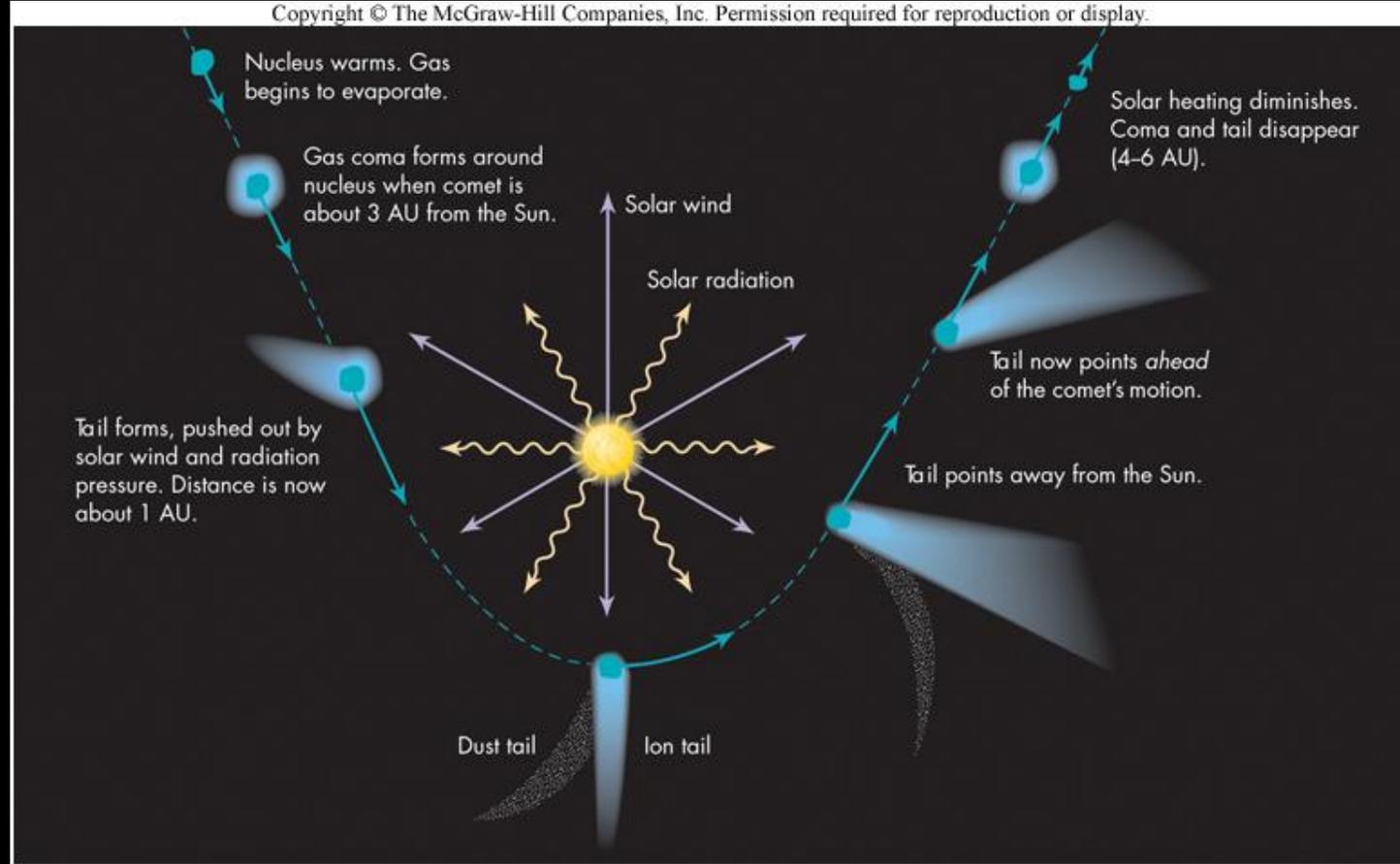
Allodd (13579)

Ocasio-Cortez (23238)





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METEORS, METEORITES & METEORIDS!

METEOROID
(In Space)



METEOR
(In Atmosphere)



METEORITE
(On Earth)

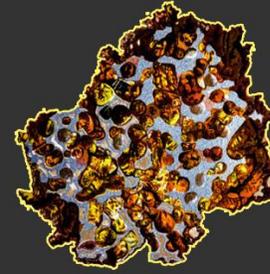


TYPES OF METEORITES



Stony

Stone-like, with small flecks of metal



Stony-Iron

Smooth & glossy, embedded with silicates

Achondrites
No chondrules on the surface

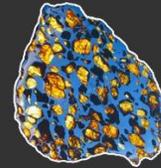


Chondrites
Has Chondrules on the surface



Pallasites

Solid bodies of iron-nickel, with greenish or olive crystals



Mesosiderites

Debris of asteroid collisions, with small silicate crystals



Iron

Has nickel, with Widmanstätten structure

Hexahedrites

Low nickel content (>5.8%), no Widmanstätten structure



Octahedrites

Low-average nickel content (5-10%), with Widmanstätten structure



Ataxites

High nickel content (<18%), no Widmanstätten structure



BEST METEOR SHOWERS 2026

METEOR SHOWER	PEAK	METEORS/HOUR	CONSTELLATION	MOON ILLUMINATION
Quadrantids	January 3-4	80	 Bootes	 99%
Lyrids	April 22-23	18	 Lyra	 38%
Eta Aquariids	May 5-6	50	 Aquarius	 82%
Southern δ -Aquariids	July 30-31	25	 Aquarius	 98%
Perseids	August 12-13	100	 Perseus	 0%
Orionids	October 20-21	20	 Orion	 70%
Leonids	November 17-18	15	 Leo	 55%
Geminids	December 13-14	150	 Gemini	 20%
Ursids	December 21-22	10	 Ursa Minor	 95%