

# Lesson 9 - The Formation of Planetary Systems / Life in the Universe

## READING ASSIGNMENT

- Chapter 15.1: Modeling Planet Formation
- Chapter 6.7: How Did the Solar System Form?
  - More Precisely 6-2: Angular Momentum
- Chapter 15.2: Terrestrial and Jovian Planets
- Chapter 15.3: Interplanetary Debris
- Chapter 14.1: Asteroids
- Chapter 14.3: Beyond Neptune
- Chapter 14.2: Comets
- Chapter 15.4: Solar System Regularities and Irregularities
- Chapter 14.4: Meteoroids
  - Discovery 14-1: What Killed the Dinosaurs?
- Chapter 15.5: Searching for Extrasolar Planets
- Chapter 15.6: Is Our Solar System Unusual?
- Chapter 28.1: Cosmic Evolution
  - Discovery 28-1: The Virus
- Chapter 28.2: Life in the Solar System
- Chapter 28.3: Intelligent Life in the Galaxy
- Chapter 28.4: The Search for Extraterrestrial Intelligence

## SUMMARY OF DWARF PLANET PHYSICAL DATA

	Dwarf Planet	Equatorial Radius (Moon = 1)	Mass (Moon = 1)	Average Density (kg/m <sup>3</sup> )	Surface Gravity (Moon = 1)	Escape Speed (km/s)
Asteroid Belt	Ceres	0.28	0.013	2080	0.17	0.51
Kuiper Belt	Pluto	0.66	0.178	2000	0.41	1.2
	Haumea	≈ 0.43	0.055	≈ 3000	≈ 0.30	≈ 0.85
	Makemake	≈ 0.41	≈ 0.04	≈ 2000	≈ 0.2	≈ 0.7
	Eris*	0.67	0.227	2500	≈ 0.51	1.4

\* Scattered Disk

**Table 1**

## SUMMARY OF INTERPLANETARY DEBRIS

Object	Composition	Size
Asteroid	Mostly rocky	> 100 m
Meteoroid	Mostly rocky	< 100 m
Comet	Mostly icy	≈ 1 – 10 km

**Table 2**

## MATH NOTES

- There are no additional math notes for Lesson 9: This material is more qualitative.
- However, in Homework 9, you will apply Lesson 6's math notes<sup>1</sup> as you compare dwarf planets and interplanetary debris to the terrestrial planets.

## HOMEWORK 9

Download Homework 9 from WebAssign. Feel free to work on these questions together. Then submit your answers to WebAssign individually. Please do not wait until the last minute to submit your answers and please confirm that WebAssign actually received all of your answers before logging off.

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<sup>1</sup>../lab\_6/manual.html#mathnotes