

ASTR 8850: Planetary Sciences

Fall 2022 ★ Tue/Thu 11:00 AM – 12:15 PM ★ 25 Park Place / Room 628

Instructor: Professor Todd Henry
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research: nearby stars, stellar masses, exoplanets, astrobiology

Office Hours: by appointment

Prerequisite: ASTR 6000 or equivalent

Textbook: *Planetary Sciences* by de Pater and Lissauer (1st or 2nd edition)

Course Objectives: To expose graduate students to the study of Planetary Sciences. Topics will include Solar System formation, dynamics, planetary atmospheres, surfaces, and interiors, energy sources, and life in the Universe. Special emphasis will be placed on Earth, Mars, Europa, Enceladus, and Titan, and relatively new classes of objects — Trans-Neptunian Objects and extrasolar planets. The nascent field of Astrobiology, the search for and study of extraterrestrial life forms, will be explored.

Grades (approximate):

Research Paper	40%
Presentation	20%
Homework Assignments	20%
In-Class Participation	20%

How to Do Well in This Class: The following are highly recommended: (1) showing up to class on time, (2) being an active participant during class, (3) doing the homework, and (4) getting an early start on the primary component of the course, the research paper. Students are expected to do their own work. Certainly, discussions of more difficult problems with other students is acceptable (and encouraged), but work that is turned in must be your own. Under no circumstances will duplication on assignments or plagiarism in the research paper be tolerated.

Dates to Remember:

NOV 29 — Research Papers Due at 5PM Tuesday.

DEC 02 — Reviews Due at 5PM Friday.

Lecture Topics: The following is an approximate list of topics for the course. Changes will likely occur, but this is the map for our quest across the Solar System ... and beyond ...

Dates	Lecture Topics	Chapters
AUG 23	Solar System Overview I	1
AUG 25	Solar System Overview II	1
AUG 30	Solar System Formation I	13
SEP 01	Solar System Formation II	13
SEP 06	Dynamics I	2
SEP 08	Dynamics II	2
SEP 13	Solar Heating	3
SEP 15	Energy Transport	3
SEP 20	Atmospheres I	4
SEP 22	Atmospheres II	4
SEP 27	Atmospheres III	4
SEP 29	Surfaces I	5
OCT 04	Surfaces II	5
OCT 06	Surfaces III	5
OCT 11	Interiors I	6
OCT 13	Interiors II	6
OCT 18	Earth Climate Change I – Andrew Couperus	
OCT 20	Earth Climate Change II – Andrew Couperus	
OCT 25	Minor Bodies out to Jupiter – TJH remote	9
OCT 27	Minor Bodies beyond Jupiter – TJH remote	9, 10
NOV 01	Titan, Earth, Europa, Enceladus, Mars I	various
NOV 03	Titan, Earth, Europa, Enceladus, Mars II	various
NOV 08	Life on Earth	—
NOV 10	Life Not on Earth	—
NOV 15	Student Presentations	—
NOV 17	Student Presentations	—
NOV 22	TURKEY BREAK	no class
NOV 24	TURKEY BREAK	no class
NOV 29	RESEARCH PAPERS DUE (Tuesday)	—
DEC 02	REVIEWS DUE (Friday)	—