

Astronomy 405: Solar System and the ISM

Spring 2013

(MWF 11:00-11:50am, 134 Astronomy Bldg.)

Instructor:

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Office Hours: Th 12:30-1:30pm. 3:30-4:30pm

Textbooks:

Carroll and Ostlie, An Introduction to Modern Astrophysics, 2nd ed. (Addison-Wesley)
Osterbrock and Ferland, Astrophysics of Gaseous Nebulae and Active Galactic Nuclei, 2nd ed.
(Univ. Science Books)
Dyson and Williams, The Physics of the Interstellar Medium (Institute of Physics Publishing)
** The latter two are optional. Lecture notes on the ISM will be posted on the class web page.*

Course Description:

Introduction to astrophysical problems; fundamentals of solar system astrophysics, star formation, and interstellar medium. About 1/2 of the lectures cover the solar system and star formation, and the other 1/2 the interstellar medium.

Course Requirements, % of Grade:

reading and lecture attendance
12 homeworks, 50%
1 hour exam, 20%
final (cumulative), 30%

Homework and due dates:

There are 12 homework assignments in the semester. Each homework is assigned a week before the due date, and is due at the class on the due date. Each homework consists of 6 ± 2 problems. Late homeworks will have 10% deducted for each day they are late. You are allowed to drop two homeworks with the lowest grades.

Exams:

There will be one mid-term hour exam and a final exam accounting for 20% and 30% of the final grade, respectively. The exams will be close-book, but you may bring a crib sheet.

Schedule (Spring 2013)

Date			Lecture & Reading
January	14	(M)	Overview
	16	(W)	CO-19.1 Physical Processes in the Solar System, A Brief Survey
	18	(F)	CO-19.2 Tidal Forces
	23	(W)	CO-19.3 The Physics of Atmospheres
	25	(F)	CO-20.1 Mercury (HW-1 due)
	28	(M)	CO-19.2 Venus
	30	(W)	CO-20.3 Earth
February	1	(F)	CO-20.4 The Moon (HW-2 due)
	4	(M)	CO-20.5 Mars
	6	(W)	CO-21.1 The Giant Planets
	8	(F)	CO-21.2 The Jovian Moons (HW-3 due)
	11	(M)	CO-21.3 Ring Systems
	13	(W)	CO-22.1 The Pluto-Charon System
	15	(F)	CO-22.2 Comets (HW-4 due)
	18	(M)	CO-22.3 Asteroids
	20	(W)	CO-22.4 Meteorites
	22	(F)	CO-22.5 The Formation of the Solar System (HW-5 due)
	25	(M)	CO-23.1 Characteristics of Extrasolar Planetary Systems
	27	(W)	CO-23.2 Planetary System Formation and Evolution
March	1	(F)	Star Formation and Star Formation Regions (HW-6 due)
	4	(M)	Star Formation and Star Formation Regions
	6	(W)	Interstellar Medium - What Is Diffuse Matter?
	8	(F)	Microscopic Processes in the ISM (HW-7 due)
	11	(M)	Microscopic Processes in the ISM
	13	(W)	Hour Exam
	15	(F)	Energy Levels and Notations
	18	(M)	Spring Break
	20	(W)	Spring Break
	22	(F)	Spring Break
	25	(M)	Photoionization Equilibrium
	27	(W)	Photoionization Equilibrium
	29	(F)	Photoionization Equilibrium (HW-8 due)
April	1	(M)	Thermal Equilibrium
	3	(W)	Thermal Equilibrium
	5	(F)	Comparison of Theory with Observations (HW-9 due)
	8	(M)	Comparison of Theory with Observations
	10	(W)	Comparison of Theory with Observations
	12	(F)	Gas Dynamics (HW-10 due)
	15	(M)	Gas Dynamics
	17	(W)	Dynamical Effects of Massive Stars on the ISM
	19	(F)	Dynamical Effects of Massive Stars on the ISM (HW-11 due)
	22	(M)	Dynamical Effects of Massive Stars on the ISM
	24	(W)	Multi-phase Interstellar Medium
	26	(F)	Interstellar magnetic fields (HW-12 due)
May	29	(M)	Interstellar Dust
	1	(W)	Interstellar Dust
	6	(M)	FINAL EXAM, 7:00-10:00pm