

Astronomy 102/104: Our Solar System MWF 11:15-12:05P, Uris Auditorium Spring 2008 Course Syllabus

The past few decades have seen incredible advances in the exploration of our solar system. In this course students learn about the current state and past evolution of the Sun and its family of planets, moons, asteroids, and comets. The course emphasizes images and other data obtained from current and past NASA space missions and how these data provide insights about the important processes that have shaped the evolution of solar system objects. General astronomical concepts relevant to the study of the solar system are also discussed. Critical focus is on developing an understanding of the Earth as a planetary body and discovering how studies of other planets and satellites influence models of the climatic, geologic, and biologic history of our home world. Other topics covered include energy production in stars, global warming, impact hazards, the search for life in the solar system and beyond, and future missions.

Instructors:

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Teaching Assistants:

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ASTRO 102/104 website:

<http://www.astro.cornell.edu/courses/a102/>

Astronomy 102/104: Our Solar System
Prof. Jean-Luc Margot and Prof. Steven Squyres
SPRING 2008, MWF 11:15-12:05, Uris Auditorium

Readings indicated are chapters from:

Bennet et al., The Cosmic Perspective: The Solar System (5th edition).

Lec/Prof	Date	Topic	Reading	Extra
1/J	M Jan. 21	Course Intro & Outline	Preface, 1	
PART 1: General Concepts About the Solar System				
2/S	W Jan. 23	The Sky; Historical Astr.	2.1, 2.4, 3	
3/J	F Jan. 25	Orbits and Gravity	4	
4/S	M Jan. 28	Earth, Moon, and Sky I	2.2 and S1	
5/S	W Jan. 30	Earth, Moon, and Sky II	2.3	
6/J	F Feb. 1	Radiation and Spectra I	5	
7/S	M Feb. 4	Radiation and Spectra II	5	
8/J	W Feb. 6	Astron. Instrumentation	6	
9/J	F Feb. 8	Solar System Survey I	7, 9.1	
10/J	M Feb. 11	Solar System Survey II	7, 9.1	Exam Q&A
	W Feb. 13	EXAM #1		
PART 2: The Inner Solar System				
11/J	F Feb. 15	Earth Geology and Interior	9.1, 9.2, 9.6	
12/J	M Feb. 18	Earth Atmosphere & Climate	10.1,10.2,10.6	
13/J	W Feb. 20	Moon Surface	2.3, 9.3, 10.3	
14/J	F Feb. 22	Moon Origin	8.4, 9.3	
15/S	M Feb. 25	Mercury	7.1, 9.3, 10.3	
16/??	W Feb. 27	Venus Overview	7.1, 9.5, 10.5	
17/S	F Feb. 29	Venus Surface	9.5	
18/S	M Mar. 3	Venus Atmosphere & Climate	9.5, 9.6, 10.5, 10.6	
19/S	W Mar. 5	Mars Overview	7.1, 9.4, 10.4	
20/S	F Mar. 7	Mars Surface	9.4	

21/S	M Mar. 10	Mars Atmosphere & Climate	10.4	Exam Q&A
	W Mar. 12	EXAM #2		
PART 3: Small Bodies and the Outer Solar System				
22/S	F Mar. 14	Asteroids	12.1	
	March 15-23	Spring Break		
23/S	M Mar. 24	Meteorites	12.1	
24/S	W Mar. 26	Comets	12.2	
25/S	F Mar. 28	Impacts	12.4	
26/S	M Mar. 31	Jupiter	7.1, 11.1	
27/J	W Apr. 2	Saturn	7.1, 11.1	
28/J	F Apr. 4	Uranus	7.1, 11.1	
29/S	M Apr. 7	Neptune	7.1, 11.1	
30/J	W Apr. 9	Satellites and Rings I	11.2, 11.3	
31/J	F Apr. 11	Satellites and Rings II	11.2, 11.3	
32/J	M Apr. 14	Trans-Neptunian Region	12.3	Exam Q&A
	W Apr. 16	EXAM #3		
PART 4: Origins				
33/J	F Apr. 18	Solar System Origin I	8	
34/J	M Apr. 21	Solar System Origin II	8	
35/S	W Apr. 23	The Sun	14	
36/S	F Apr. 25	Extrasolar Planets	13	
37/S	M Apr. 28	Exobiology I	24.1 – 24.3	
38/S	W Apr. 30	Exobiology II	24.1 – 24.3	
39/S	F May 2	Life in the Universe	24.4 – 24.5	Final Q&A
	F May 9	FINAL EXAM 2-4 pm		

ASTRONOMY 102/104 SECTION SCHEDULE

NOTE: Students enrolled in Astronomy 102/104 attend discussion sections every week.
Sections begin on **MONDAY, JANUARY 21, 2008**

<u>DAY</u>	<u>TIME</u>	<u>SEC</u>	<u>TA</u>	<u>ROOM</u>	<u>DAY</u>	<u>TIME</u>	<u>SEC</u>	<u>TA</u>	<u>ROOM</u>
Monday	1:25	1	Shoshana	SS 105	Wednesday	1:25	7	Shoshana	SS 105
Monday	2:30	2	Ryan	RF 112	Wednesday	2:30	8	Carl	RF 102
Monday	3:35	3	Matipon	RF 112	Wednesday	3:35	9	Carl	RF 102
Monday	7:30	4	Matipon	RF 110	Wednesday	7:30	10	Rick	RF 110
Tuesday	2:30	5	James	RF 110	Thursday	2:30	11	Melissa	RF 110
Tuesday	3:35	6	James	RF 112	Thursday	3:35	12	Melissa	RF 231

OFFICE HOURS AND CONTACT INFO

Ryan Anderson	T & Th 1:30-3:00	SS 406	255-4709	randerson@astro.cornell.edu
Shoshanna Cole	M & T 3:00-4:30	SS 110	255-6307	shoshe@astro.cornell.edu
Carl Ferkinhoff	M & F 1:30-3:00	SS 220	255-6307	cferkinh@astro.cornell.edu
Richard Kipphorn	T & Th 11:35-1:00	SS 518	255-6472	rkipphorn@astro.cornell.edu
Melissa Rice	T 1:30-3:30, W 10:00-11:00	SS 406	255-4709	mrice@astro.cornell.edu
Matipon Tangmatiatham	T & Th 3:00-4:30	SS 110	255-6307	pon@astro.cornell.edu
James Wray	Th & F 1:30-3:00	SS 425	255-5830	jwray@astro.cornell.edu
Jean-Luc Margot	M & F 3:00-4:30	SS 304	255-1810	jlm@astro.cornell.edu
Steve Squyres	by appointment	SS 428	255-3508	squyres@astro.cornell.edu

DROP/ADDS, REGISTRATION QUESTIONS OR PROBLEMS WITH ENROLLMENT

Sherry Falletta, SS 610; 255-6920

Office Hours for Sherry Falletta: 8:30 - 11:00 and 1:00 - 3:30 Monday-Friday

ASTRONOMY 104 LABORATORY SCHEDULE

NOTE: Students enrolled in Astronomy 104 attend laboratory exercises.
Labs begin on **Wednesday January 30, 2008**

Laboratory Exercises

- | | |
|-----------------------|--------------------------------------|
| I. Radioactive Dating | IV. Rotation of Saturn and Its Rings |
| II. Planetary Orbits | V. Introduction to the Spring Sky |
| III. Cratering | |

You must complete all **FIVE** laboratory exercises I to V. Lab V will be done at the Fuertes Observatory on the first clear evening of a day when your lab is scheduled to meet. If you are scheduled for an evening lab and your lab has not already completed V, call the Fuertes Observatory (5-3557) after 6:30 p.m. for a recorded message. If you are scheduled for an afternoon lab and have not completed V, attend your regularly scheduled afternoon session. If that evening is suitable, there will also be an observing session for your lab. Call the Observatory after 6:30 p.m. for instructions. If your lab has completed exercises I to IV and the weather does not cooperate on the day of your last scheduled lab meeting, you should go to Fuertes to do Lab V, regardless of the weather. **Other labs meet in Clark 132.**

Lab	Time	TA	<u>DATES</u>				
			<u>WEEK #1</u>				
1	M 2:00	cancelled					
2	W 2:00	Rick	Jan. 30,	Feb. 13,	Feb. 27,	Mar. 12,	Apr. 2
			<u>WEEK #2</u>				
3	M 7:30 p.m.	Ryan	Feb. 4,	Feb. 18,	Mar. 3,	Mar. 24,	Apr. 7
4	T 7:30 p.m.	Matipon	Feb. 5,	Feb. 19,	Mar. 4,	Mar. 25,	Apr. 8

NO LABS will meet the week of March 17-21 (Spring Break).

MAKEUP POLICY: Because labs are offered 4 times each semester, students should be able to complete all five exercises during the regular 10-week lab period. If you anticipate being unable to attend your regular lab session, you may do the lab in another section, *with permission of the TA*. If you miss a lab, you must report the reason for your absence to your lab TA within one week of missing the lab. At the end of the semester, make-up labs will be offered ONLY to those students with EXCUSED ABSENCES

ASTRO 102-104 SPRING 2008 GRADING

ASTRO 102 (without labs) is a three-credit course. ASTRO 104 (with labs) is a four-credit course. The various elements of the course will be weighted as follows:

	<u>A102</u>	<u>A104</u>
Participation	5%	5%
In-class Exams (best 2 of 3)	40%	30%
Final Exam	35%	25%
Sections/Homework	20%	20%
Labs	--	20%

REQUIRED TEXT AND CLICKER

J. Bennett et al, *The Cosmic Perspective: The Solar System*. Pearson AW.

We will use the 5th edition (the 4th edition is very similar).

This is the only text you need to buy. The additional material packaged with the textbook sold at the campus store is **not required**.

The textbook comes with a planetarium program on CDROM and with a login/password to access the web site <http://www.masteringastronomy.com>. The web site contains instructive material including animated figures, tutorials, and quizzes. Use of the web site and other learning tools is encouraged but not required for this course.

Personal response systems (“clickers”) will be used to promote active learning and participation during lectures. A clicker manufactured by i-clicker is required.

OTHER REFERENCES

(some may be available in the Physical Sciences Library, Clark Hall)

Beatty et al, *The New Solar System* (4th Ed., 1999). Sky Publishing.

Many excellent articles and pictures.

Sagan, *The Demon-Haunted World* (1996). Ballantine.

Good discussion of critical thinking and the scientific method. Highly recommended.

Goldsmith and Owen, *The Search for Life in the Universe* (3rd Ed., 2001). Addison-Wesley.

Very readable; good discussion of origins and life elsewhere.

Hartmann, *Moons and Planets* (5th Ed., 2004). Brooks Cole.

Difficult in places, but especially good on early solar system processes.

Morrison and Owen, *The Planetary System* (3rd Ed., 2002). Addison-Wesley.

Good text, used for A102/104 in the 20th century.

Pasachoff, *Astronomy: From the Earth to the Universe* (6th Ed., 2002). Brooks Cole.

This textbook covers general astronomy at the level of ASTRO 101.

Seeds, *Horizons: Exploring the Universe* (10th Ed., 2007). Brooks Cole.

This textbook covers general astronomy at the level of ASTRO 101.