

THE SUN AND THE SOLAR SYSTEM**TR 12:45-2:00 pm in EPS 108 (lecture)****TR 8:00-10:00 pm in AJM 120 (lab)**

- Instructor:** Jiong Qiu
Office: 221 EPS, phone: 994-7253
Email: qiu@physics.montana.edu
Office hours: MW 11:00-12:00 (tentative) or by appointment
- Lab & TA:** Gary Lowe (Lab will start in the second week.)
- Text:** *Universe, 8th edition*, by R. A. Freedman & W. J. Kaufmann
- Web:** <http://solar.physics.montana.edu/qiu/phys311> where you will find weekly reading assignments, lecture notes, reviews, homework solutions etc.
- Description:** This course provides an introduction to the solar system astronomy and physics of the Sun. Students will study the motion, structure, atmosphere, energy, and magnetism of the Sun, planets, and satellites. The major themes include: the role of gravity in shaping the solar system, the energy balance of the planets, and physics of light and colors. Importantly, students will learn to *reason* out of observational facts using basic physics knowledge. In this course, students will be updated with new discoveries and emerging scientific topics with societal impact. Students will also learn basic astronomical methods from lectures and lab.
- Prerequisite:** PHYS 205, 211 or equivalent
- Homework:** Problem sets are given every Tuesday, due the following Tuesday at the class. Answers will be posted on Thursday. Homework turned in after due date but before the answers are posted will receive 50% credit.
- Project:** Students will conduct a group project to research “Life in the solar system and beyond”. The final presentation will be given in mid-November.
- Exams:** There will be two midterm exams given in class, the first on **Thursday, October 2**, and the second on **Thursday, November 6**. Final exam will be given at **12:00-1:50 on Tuesday, December 16, in EPS 108**.
- Grading:**
- | | |
|---------------------|--------------|
| Midterms: | 30% = 15% x2 |
| Final exam: | 25% |
| Homework + Project: | 25% |
| Laboratory: | 20% |

COURSE OUTLINE: (tentative)

Topics	Dates
PART I: INTRODUCTION TO ASTRONOMY	
1. Introduction	9/2
2. Astronomical Distances	9/4
3. The Nature of Light	9/9, 11
4. Optics and Telescopes	9/16
PART II: PLANETS AND MOONS	
1. Our Solar System: Overview	9/18
2. The Earth, Moon, and Eclipses	9/23, 25, 30 ^a
3. Terrestrial Planets	10/7, 9
4. Global Change	10/14
5. Jovian Planets and Their Satellites	10/16, 21
6. Vagabonds of the Solar System	10/23
7. Motions of the Planets	10/28, 30 ^b
8. Origin of the Solar System	11/13
9. Life in the Solar System and Beyond	11/18
PART III: OUR STAR: THE SUN	
1. The Standard Solar Model	11/20
2. The Sun's Interior and Helioseismology	11/25
3. The Sun's Atmosphere	12/2, 4
4. The Solar Cycle	12/9
5. The Active Sun and Space Weather	12/11

a: midterm exam I on 10/02, Thursday

b: midterm exam II on 11/06, Thursday