

Time/place

Tuesday & Thursday 12:30-1:45 pm, Duane E126

Instructor

Ann-Marie Madigan

Office hours: 10-11 am Tuesday & Thursday, A-903 JILA

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Aims

The overall goal of this class is to provide a fundamental understanding in the theories of planet formation and dynamics, such that you can read the literature and follow colloquia on these topics. It will also give you the opportunity to do your own research and practice giving presentations.

Outline

1. Observational overview of the solar system and detection methods of exoplanetary systems
2. Structure and evolution of protoplanetary disks
3. Planet formation from dust to terrestrial and giant planets
4. Planet dynamics: migration, resonances, secular torques, stability

Textbooks

Though no textbook is required in this course, I recommend:

1. Astrophysics of Planet Formation (Philip J. Armitage, Cambridge University Press)
Most of the technical material in this book is covered in Phil's lecture notes which you can find online:
<http://arxiv.org/abs/astro-ph/0701485>.
2. Exoplanets (edited by Sara Seager, University of Arizona Press)
A great set of review articles covering planet formation and dynamics, planet detection and planetary structure.
3. Solar System Dynamics (Carl Murray and Stan Dermott)
For the more dynamically inclined student, this is a classic.

Absences

I will occasionally be away during the semester for colloquia and conferences. Classes will either be covered by guest lecturers or we will make up the time later in the semester. Known absent days so far (this list may expand):

- Thursday Sept 1
- Tuesday Sept 27

Evaluation/grading

There will be seven homework assignments throughout the course, each worth $\sim 10\%$ of the final grade (I will specify the exact amount on each homework sheet), and a final oral exam for the remaining 30% (dates provisionally set for the week of December 5-9 2016).

Electronics

Studies have shown that we learn more effectively when we write notes by hand (e.g., [Mueller & Oppenheimer, 2014](#)). For this reason, I encourage all students to **turn off electronics** – not just mute (in the case of phones) — and take hand-written notes.

Feedback

We cannot change what we are not aware of, and once we are aware, we cannot help but change.

Sheryl Sandberg

At the end of each class, please take the opportunity to write down some notes on what you've learned so far and your suggestions for improvements. I will provide the forms. If you feel more comfortable submitting anonymous feedback, please type (or write using your non-dominant hand?) a note and leave it in my mailbox at the JILA reception.

University policies

If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671, Center for Community, N200, and <http://www.colorado.edu/disabilityservices>.

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, just inform me of any potential conflict.

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, color, culture, religion, creed, politics, veteran's status, sexual orientation, gender, gender identity, and gender expression, age, disability, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records.

The University of Colorado at Boulder Discrimination and Harassment Policy and Procedures, the University of Colorado Sexual Harassment Policy and Procedures, and the University of Colorado Conflict of Interest in Cases of Amorous Relationships Policy apply to all students, staff, and faculty. Any student, staff, or faculty member who believes s/he has been the subject of sexual harassment or discrimination or harassment based upon race, color, national origin, sex, age, disability, creed, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303- 492-2127, or the Office of Student Conduct (OSC) at 303-492-5550. Information about the ODH, the above referenced policies, and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at <http://www.colorado.edu/odh>.