

AST 309 - The Birth of Stars and Planets

Course Description and Syllabus - Fall 2012

Instructor: Dr. Keely Finkelstein
Dept. of Astronomy
Office: RLM 16.228
Email: keelyf@astro.as.utexas.edu

Unique Number: 47758
Lecture Time: MWF 2 - 2:50 PM
Lecture Location: CPE 2.218

Required Textbook: "The Birth of Stars & Planets"
by Bally & Reipurth

Other Required Materials: Calculator

Course Website: <http://gaudior.as.utexas.edu/keely/ast309.html>
We will also use the course **Blackboard site** for this class.

Course TA: Hyunbae Park
Email: hcosmosb@astro.as.utexas.edu

Course Description:

AST 309 is a one semester class on the specific topic of star and planet formation. AST 301, 302, or 303 is a prerequisite for this course. This course will present a study of how stars and planets form. Stars form out of giant clouds of gas and dust, locked in a battle between gravity and pressure. Gravity eventually wins and stars and planets form in the resulting disk of material. This course will study this process including results from state of the art extrasolar planet searches, discussing implications on the formation of our own solar system. We will use high school algebra in this class.

Course Requirements:

In-Class Participation - this class will be structured with a combination of shorter lectures as well as interactive lessons and activities. These in-class participation activities are an important of the course, therefore attendance and participation is required, and they will count as a part of your grade. There will also be a few short unannounced Reading Quizzes throughout the semester. The interactive material and discussions will help to reinforce the concepts in the class, as well as assisting you in completing your homework assignments and preparing you for the exams. In-class participation, including Reading Quizzes, Interactive Activities, and Lecture Tutorials, will make up 20% of your course grade.

Some of the in-class materials will be collected to establish your participation grade. These assignments or questionnaires will not be given letter grades or a numeric grade, rather you will be given credit for what you complete on an all or nothing basis and your in-class participation grade will be established on the following grading scheme:

- 80% or more of participations points - A
- 70% - 79% of participation points - B
- 60% - 69% of participation points - C
- 50% - 59% of participation points - D
- 49% or less of participation points - F

Homework - There will be a few short (~ 4) HW assignments that will be assigned throughout the semester. You are encouraged to discuss the homework and work on it together, however each student must write up and turn in their own work. **Late homework will not be accepted.** Reading assignments in the textbook should be completed by the start of the Lecture period of the date specified. Homework will make up 15% of your course grade, the lowest homework assignment will be dropped.

Exams - There will be 3 in-class midterm exams. These exams will emphasize the material discussed in lecture, and on the HWs, and in-class discussions or lecture tutorials, as well material covered in the assigned textbook chapters. All exams will be closed-book, closed-notes. You will be allowed to drop the lowest of your three mid-term exams. The mid-term exams will make up 40% of your course grade.

Final Exam (Saturday Dec. 15, 2012, 2 - 5 PM). The Final Exam cannot be dropped and will make up 25% of your course grade. The final will also be closed-book, closed-notes.

Grades - Grades will be based on:

- 1.) Three mid-term exams (drop lowest) 40%
- 2.) Final Exam (cannot drop) 25%
- 3.) Homework 15%
- 4.) In-class participation 20%

93 - 100	A	73 - 76.9	C
90 - 92.9	A-	70 - 72.9	C-
87 - 89.9	B+	67 - 69.9	D+
83 - 86.9	B	63 - 66.9	D
80 - 82.9	B-	60 - 62.9	D-
77 - 79.9	C+	< 59.9	F

Collaboration - The interactive component of this class is designed around student collaboration, with activities such as Voting/Peer Discussions, In-Class activities, and Lecture Tutorials. For some of the group in-class assignments your group will turn in one collective assignment and each member of the group will receive the same amount of participation credit. You are also encouraged to study and work on HW assignments with other students and to get help during office hours. *However, your work must be your own.* If you copy someone else's homework or let someone copy yours, both students will receive zero credit. Cases of cheating and plagiarism may also be reported to the Office of the Dean of Students.

Course Outline & Reading Assignments (subject to change):

Dates	Topics	Reading & HW Assign.
Week 1 - Aug. 29/31	Intro/Review / Review Star Clusters HR Diagrams	Ch 1; Ch2
Week 2 - Sept. 5/7	Review Black Body Radiation Intro to ISM / Giant Molecular Clouds, Dust & Chemistry	Ch3
Week 3 - Sept. 10/12/14	(In)Stability of GMCs & Virial Theorem / Stages of Star Formation / Protostars	Ch4 (p. 45-57) Ch 4 (p. 57 - 61)
Week 4 - Sept. 17/19/21	Initial Mass Function / Review for Exam 1 / Exam 1 (Sept. 21st)	HW 1 due Monday 9/17
Week 5 - Sept. 24/26/28	Binary Stars / Outflows & Jets in Protostars	Ch 5 Ch 6
Week 6 - Oct. 1/3/5	YSOs / Disks / Hayashi tracks	Ch 7
Week 7 - Oct. 8/10/12	Clusters / Star Forming regions / HII regions (Blister HII regions)	Ch 8
Week 8 - Oct. 15/17/19	Massive Stars / Triggered SF / Low- Mass Stars	Ch 9
Week 9 - Oct. 22/24/26	Review for Exam 2 / Exam 2 (Oct. 24th) / Intro to Planet Formation	Ch 10
Week 10 - Oct. 29/31/ Nov. 2	Planetesimals / Gas Accretion / Giant Planet Formation	Ch 10
Week 11 - Nov. 5/7/9	Terrestrial Planets / Our Solar System	Ch 11
Week 12 - Nov. 12/14/16	Roadblocks to Planet Formation / Search for other worlds	Ch 12
Week 13 - Nov. 19/21/ No Class Friday	Exoplanets / Detection Methods / Variety of Exoplanet systems / Comparing our Solar System	Ch 13
Week 14 - Nov. 26/28/30	Review Exam 3 / Exam 3 (Nov. 28th) / Star Formation in Galaxies	Ch 15
Week 15 - Dec. 3/5/7	Star Formation in Galaxies / Review	Ch 15; Ch 16
Final Exam	Saturday Dec. 15th - 2:00-5:00 PM	

Course Conduct:

Please silence cell phones before you enter the classroom, no texting or using your cell phone during class. No cell phones may be present during any exam. Also, please do not pack up or leave class early unless you have talked to me in advance, as a consideration to me and your fellow students. If you bring a laptop computer, don't surf. If I see inappropriate laptop behavior, I will have to amend these rules. Be respectful of others especially during in-class peer discussion times, even if you disagree with them.

The course webpage and/or Blackboard will be updated with course announcements, reading assignments, and deadlines. **It is your responsibility to check these on a regular basis.** Please come to class prepared, having read the required reading assignments, also please be prepared to participate in in-class discussions and activities, this is for your benefit.

Academic Dishonesty:

University of Texas Honor Code:

The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Standards for Academic Integrity are posted at http://deanofstudents.utexas.edu/sjs/acint_student.php

Plagiarism:

As a research university, the University of Texas at Austin takes plagiarism very seriously. Do not risk getting involved in a plagiarism infraction - the consequences simply aren't worth it. Always cite your sources, and when in doubt consult a professor or librarian. You may also read more about plagiarism at the Student Judicial Services website: <http://deanofstudents.utexas.edu/sjs/academicintegrity.html>

Documented Disability Statement

Please notify me of any modification/adaptation you may require to accommodate a disability-related need. The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact Services for Students with Disabilities at 471-6259 (voice) or 232-2937 (video phone) or <http://www.utexas.edu/diversity/ddce/ssd>

Email - email is recognized as an official mode of university correspondence; therefore you are responsible for reading your email for university and course-related information and announcements. Please check your email regularly and frequently.

Additional Information - Attend an Astronomy Department Viewing Night

The department offers weekly public viewing nights at on the roof of RLM (Wednesday nights) and at Painter Hall (Friday & Saturday nights). Observing nights dependent on weather, so check the website for viewing times and for updated info on any weather cancellations. <http://outreach.as.utexas.edu/public/viewing.html>