Syllabus for AST 7939
Classic Papers in Astrophysics
Fall 2020

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Office Hours: Tuesday 1-2pm
Class Periods: T7, R7-8

Course Content

The objective of this course is to explore classic papers of the 20th and 21st centuries that have revised our understanding of the Universe and strongly influenced the course of research in astronomy and astrophysics. Rather than presenting just the results of these papers, as is normally summarized in textbooks, we will be reading the original literature so that you can see both the insights and shortcomings of these papers and place them in context with the state of the field at the time. Having this perspective will help you in identifying current trends and gain better understanding where the field of astrophysics is headed.

Course Goals

By the end of this course, students should

- Understand the fundamental concepts underpinning assorted subfields of astrophysics, and through this broader understanding help you improve your ability to select compelling research projects to explore.
- Be skilled in reading and critically evaluating scientific literature.
- Have a better sense of the history of the field, and how scientific research proceeds.
- Be able to find, efficiently read, and communicate scientific literature.

Course & Grading Information

There will be no exams for this course. Each student will be expected to complete the assigned readings in advance of class and actively participate in discussions, which will generally be student-led. For each paper there will be two students assigned to lead the discussion. In addition to the two students leading the discussion, two additional students will be assigned to each identify and read a modern paper that cites in a meaningful way the main paper under discussion, and will be expected to be prepared to discuss this paper to give present day context for the state of that field. Every student will be expected to come to class with questions and comments on the papers to be discussed. Your grade will be based upon the combination of participation (40%), your preparation and efforts leading the discussions when it is your turn (40%), and assignments associated with the readings (20%).

Details regarding UF grading policies can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

The grading scale is as follows:

Letter Grade	% Points	GPA	Letter Grade	% Points	GPA	Letter Grade	% Points	GPA
A	93-100	4.0	B-	80-83	2.67	D+	67-69	1.33
A-	90-92	3.67	C+	77-79	2.33	D	64-66	1.0
B+	87-89	3.33	C	74-76	2.0	D-	60-64	0.67
B	84-86	3.0	C-	70-73	1.67	E	< 60	0

Your actual final grade will be no lower than on this scale, which may be curved based upon the overall performance of the class.

Class Expectations

There will be reading assignments that must be completed in advance of each class period. You are expected to be ready to actively participate in class – come prepared with questions based upon your reading (minimum of two, ideally more) as well as notes on anything you found of particular interest about the paper. As examples, consider:

- Is the topic for which the paper is widely acknowledged the main goal of the paper?
- Was there an insight in the paper that it is surprising could be gleaned from the data on hand?
- Was this work uniquely revolutionary, or would these results have likely been obtained by someone else soon thereafter? Why wasn't this discovered before?
- Was there anything in the paper that was clearly wrong?

When it is your turn to lead the discussion, you should be prepared to discuss not only the paper itself, but also the context in which the research was conducted and the impact that it had on the field. A good typical roadmap would be along the following lines, but styles can vary

- Set the historical context for the paper. In addition to placing the work in context for the state of the field at the time, a *brief* biography of the author(s) may be appropriate. You are encouraged to do a bit of background reading of other articles referenced in this paper so that you can give a better sense of what is known at the time.
- Start off the discussion with a synopsis of the key points of the paper. When relevant, you may also wish to present a more modern derivation of key results if this leads to greater clarity.
- Give your own thoughts on what you found intriguing, surprising, or notable.
- Guide discussion of the group. This course is not expected to be a monologue by those leading discussions, but rather a true discourse.
- Hand off discussion to those who are charged with reading more recent papers on the topic.

When it is your turn to read modern texts associated with a given paper, the goal is to give the rest of the class a sense of the state of the art in the field. Thus, you should select a paper that is directly rather than tangentially related. You are not expected to read the modern paper in detail, but rather treat it the way that you would a paper for astro-ph. Understand it sufficiently that you can convey the main points and describe the main plots, and more broadly put the paper in context. Be prepared to answer questions from the rest of the class.

Communications: Any class announcements will be made through Canvas and archived under the Announcements page. If you need to contact me, email is the most efficient method. During the day on weekdays, I will normally respond within a few hours (often sooner).

Class Comportment: A challenge we will have is that without the visual cues that exist for in-person conversations, it can be difficult to join a conversation without accidentally speaking over someone else. To best facilitate participation from everyone in the class, we will use the hand-raising feature in zoom and either I or the student leading a discussion will moderate the conversation. Finally, while I do not expect this to be an issue, all class discussion should remain civil.

Required Reading and Other Course Materials: There is no required textbook for this class. We will instead be relying exclusively on original journal articles. All journal articles are accessible through the ADS library linked from Canvas. This library includes some articles that are not required. The required readings can be found in the weekly course schedule.

Required Technology: Students will need access to zoom, a web browser, a high-speed internet connection, and a pdf viewer. Access to a printer is recommended (as articles are easier to annotate on paper than online) but not required.

Plan for Course

The reading will be divided up over the course of the semester by topic, with the main topics being as follows:

- Stars and Accretion [Weeks 1-3]
- Interstellar Medium and Radiative Processes [Week 4]
- Stellar Systems [Weeks 5-7]
- Cosmology [Weeks 7-10]
- Extreme Objects (e.g. white dwarfs, neutron stars, and black holes) [Weeks 10-12]
- Planetary Systems [Weeks 12-14]

The relative emphasis on different topics may be adjusted based upon the interests of the class.

UF Policies

Academic Honesty Policy
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (sccr.dso.ufl.edu/process/student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Contact Hours: "Contact Hours" refers to the hours per week in which students are in contact with the instructor, excluding office hours or other voluntary contact. The number of contact hours in this course equals the number of credits the course offers.

Workload: As a Carnegie I, research-intensive university, UF is required by federal law to assign at least 2 hours of work outside of class for every contact hour. Work done in these hours may include reading/viewing assigned material and doing explicitly assigned individual or group work, as well as reviewing notes from class, synthesizing information in advance of exams or papers, and other self-determined study tasks.

Accommodation for Student with Disabilities: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. This class supports the needs of different learners; it is important for students to share their accommodation letter with their instructor and discuss their access needs as early as possible in the semester.

Statement Regarding Evaluations: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available from the Gatorevals website (Links to an external site.). Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via the evaluation system. (Links to an external site.) Summaries of course evaluation results are available to students at the public results website (Links to an external site.).

Statement Regarding Course Recording: Our class sessions may be audio visually recorded for students in the class to refer back to and for use of enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to

consent to have your profile or video image recorded, keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate verbally are agreeing to have their voices recorded. If you are unwilling to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Student Feedback

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.