

ASTR 430: The Solar System - Spring 2022

Time: W/F 2:00-3:15 pm

Lecture Room: ATL 1113

Office Hours (ATL 1207F): Weds 3:30-4 & by appt.

Course Website: ELMS ASTR430 Site (elms.umd.edu)

Professor: Jessica Sunshine

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Required Textbook: *An Introduction to the Solar System, Revised: Rothery, McBride, and Gilmour*, Cambridge University Press, ISBN-13: 978-1108430845, **3rd Edition. You must use the 2018 edition** (*The 2011 version is VERY out of date*). Available at UMD Bookstore, Amazon, and Abe Books New ~\$50

Prerequisites: ASTR121 and PHYS270/PHYS271 or PHYS273 are prerequisites for this course. **If you have not taken these courses (or their equivalent), please see me right away.**

Communication: Announcements will be made via ELMS "Announcements" and messaging. It is YOUR responsibility to make sure that ELMS and the registrar have your proper email address. As ELMS messaging can be flakey, **the best way to reach me is by email: jsunshin@umd.edu** (NOTE there is no "E" at the end of my name in the email address). **Emails must use "ASTR430" in the subject line.**

General Course Policies: This course will follow the policies relevant to Undergraduate Courses see details at <http://ugst.umd.edu/courserelatedpolicies.html>. This website is meant to simplify and provide clear guidance on rights and responsibilities on policies including academic integrity, student and instructor conduct, accessibility and accommodations, attendance and excused absences, grades and appeals, copyright, and intellectual property.

Course Description

This course is intended for juniors and seniors who are majoring in astronomy or related science and engineering disciplines. ASTR430 will provide a scientific foundation to help answer fundamental questions about our Solar System by studying rocky and icy bodies throughout the Solar System. The emphasis of this course is physical reasoning and will use information from astronomy, geology, geochemistry, and physics. Your challenge will be to master this diverse and extensive body of knowledge to understand the processes that affect the origin and evolution of our Solar System.

Solar System courses and their textbooks often march methodically from the innermost objects to the outermost: *Chapter 1: Mercury, Chapter 2: Venus*, etc. Instead, we will consider important geologic, physical, and chemical processes *across* the Solar System as manifested on planets, moons, and small bodies. We will consider historical ideas that have failed, been modified, and/or survived over the centuries, as well as discuss modern controversies, and the most current data.

In addition to traditional textbook reading and lectures, this course will also develop several of the key skills required to be a successful professional: critical reading, writing, and oral presentation. These skills are important to your future life whether you go on to a career in academia, industry, teaching, Wall Street, or Silicon Valley. Thus, in addition to your textbook, you will be expected to read papers from the scientific literature covering major discoveries in planetary science. **All students are expected to participate in online and in-class discussions of all papers, and to lead discussions and write a term paper on one of these "Special Topics".**

Course Expectations

Attendance: **Show up to class, twice a week, yes this includes every Friday afternoon!** You are expected to attend all lectures as they will, by definition, emphasize material *not* in the textbook. Your

grade also depends on in-class participation. For classes that involve student led Special Topics/journal papers, discussion is particularly critical. This is an upper-level science course and you are expected to contribute meaningfully to these discussions.

Preparation: I expect you to be ready to work. We are covering some fascinating topics, which span a significant amount of material. Rather than problem sets, the **bulk of your work for this course will be READING and THINKING** about what you read from your textbook and from journal papers. You will only learn this material if you **read the textbook AHEAD of lectures** and you can only participate in the discussions of Special Topics if you have **READ the papers ahead** of time. Since there will be only occasional other assignments (either in- or out of class) most of your work for this course will be **READING**. Thus **READING**, I think you now understand, **is fundamental to ASTR430**.

In all cases, as you read, be aware of what you don't understand so you can come to class with useful questions. It is also helpful to peruse your class notes sometime before the next lecture to make sure that everything is clear.

Discussions: I strongly encourage you to **ask questions** in class, via email, or during office hours. Each Special Topic we will have a specific discussion thread. Sometimes the best way to understand something (or check that your understanding is correct) is to try to explain it to someone else. I encourage collaboration. During class, you are expected to participate by asking and answering questions. This includes interrupting (politely of course) lectures for clarifications and actively engaging in discussion of journal papers and Special Topics.

Other Classroom Rules: In short, show respect to your fellow students, to yourself, and to me

- **N95, KN95, or KF94 Masks are mandatory in ASTR430 at all times.** UMD President Pines has provided clear expectations <https://today.umd.edu/vaccine-booster-negative-test-required-for-students-faculty-staff> to the University about the wearing of masks for students, faculty, and staff. Proper masks (NOT cloth, surgical, bandanas or gaiters) covering both the nose and mouth are required. There are no exceptions. Students not wearing a mask or not wearing one correctly in ASTR430 will be given a warning or may be asked to leave the room immediately. Students who have additional issues with the mask mandates after their first warning will be referred to the Office of Student Conduct for failure to comply with a directive of University officials.

- Arrive on time. The beginning of class is when I make important announcements and clarify material from the last class.

- Please, please turn off all cell phones, tablets, laptops etc., or risk ridicule by me. No outside reading either. Your neighbors and I can tell when you are texting, surfing, or reading your email and it's very distracting. **Please restrain from connecting with the world during class.** (If I could shut off connectivity in the classroom I would!). **I will deduct points for those who cannot abide by this simple rule.**

- **If you need your laptop to take notes, discuss it with me**

- No unauthorized chatting in class. If you have a question – ask me, not your neighbor.

Course Work

Special Topics/Journal Articles

A major portion of this class consists of Special Topics, which will have semester-long components. It will culminate in a Term Paper, which will be revised after comments. In addition, each student will present and then lead a discussion of a Journal article related to this topic. **All students will be expected to read the journal articles, participate in on-line discussions prior to the oral presentations, and actively engage in in-class discussions during the presentations.** Topics and further details will be

discussed in class.

Participation/Assignments

In addition to discussions related to the Special Topics, we will have discussions of issues presented in the text and in lectures. Occasionally I may also assign a short assignment or quizzes. Each will have its own instructions on when and how they are to be completed (in-class, online, uploaded, on paper; DO NOT email me your homework under any circumstances) and will have a specific deadline. **There is no way to turn in late work**; that is what is meant by a "deadline."

Final Exam

The final exam will be cumulative, *i.e.*, will cover all the material presented during the semester, the textbook, lectures, and in the Special Topics. The exact format will be defined at a later date.

Grading

Grades are based on weighted percentages as shown:

Class Weighting	Participation/Assignments/Quizzes	Term Paper	Oral Presentations	Revised Paper	Final Exam	Total
Percentage	30%	15%	20%	15%	20%	100%

Letter grades will be assigned based on your cumulative score. I reserve the right to adjust the following based on class averages; however, any adjustment will make it *easier* to get a given grade, never more difficult. Here is a rough guide on how percentages relate to final grades. Plus/minus modifiers will be used on the final grade. Please note if you skip class, an assignment, or minimize your effort in any aspect of your work, it really will affect your final grade.

Percentage	90%-100%	80%-90%	70%-80%	60%-70%	<60%
Letter Grade	A	B	C	D	F

Please note, by its nature, the grading in this course is unavoidably back heavy with key assignments (e.g., the paper and the final exam) near the end of the semester. Furthermore, rather than a cumulative mid-term, the course has several smaller quizzes earlier in the semester. You should therefore **approach these quizzes seriously and evaluate your results critically** as an indication of your standing in ASTR430. Please talk to me personally if your quiz results are concerning.

There is **no extra credit**, but you can always improve your grade through participation!

Absence Policy

If campus is closed for any reason, scheduled material/deadlines will be delayed to the next lecture or moved to Zoom (only if you receive a specific notice as such from me).

This course follows the University's policy on Attendance (<http://www.president.umd.edu/sites/president.umd.edu/files/documents/policies/V-1.00G.pdf>)

If missing a class is **UNAVOIDABLE**, be sure to see if you can borrow another student's notes and that you understand what was covered. If not, please come to office hours. However, any class period likely includes a participation of some type, which can't be made up.

Your Special Topic oral presentation, term paper, revised term paper, and the Final Exam are Major Grading Events. If you are not able to be present for these events and have a **VALID EXCUSE** you may take a make-up for the final (which may take a different form, *i.e.* an oral exam) and will be given a one-week extension on your Special Topic work. However, you must:

- 1. Contact me by email or phone before you miss the major event if physically possible**
- 2. Submit a valid written excuse for your absence within one week after the regularly scheduled test (by US Postal mail if necessary!).**

There is rarely an excuse for not being able to at least call me and leave a message (email is preferred). Once again, the official University policy on how to deal with absences is at:

<http://www.ugst.umd.edu/courserelatedpolicies.html>.

Please note, the ability to self-excuse one absence due to illness specifically does NOT apply to Major Grading Events or even assignment due dates.

For excused absences known far in advance (*e.g.*, religious observance or participation in activities at the request of University authorities, graduate school visits), you must notify me and present appropriate documentation as soon as you know and no later than two weeks before the event. **IF the absence will occur during a Major Grading Event (related to your Special Topic or the FINAL) please, please, tell me right away!**

Overwhelmed?

If you are experiencing difficulties in keeping up with the academic demands of this course please see me as soon as possible. Also please contact the Learning Assistance Service, 2202 Shoemaker Building, **301-314-7693**. Their academic coaches can help with time management, reading, math learning skills, note-taking, and exam preparation skills. All their services are free to UMD students.

Accessibility & Disability Accommodations

Students with documented disabilities who require academic accommodations must **contact me within the first two weeks of the semester or as soon as possible after new accommodations are known**. It is **your responsibility** to ensure that you **request accommodations** through Accessibility & Disability Service (ADS) for the final **at least 3 working days** (not counting weekends) **in advance** through the Accessibility and Disability Service (ADS) Testing Office.

If you suspect you might require such accommodations in this class or any, please feel free to discuss this with me or talk with the Disability Service Support Office for more information:

<https://www.counseling.umd.edu/ads/>

Course Evaluations

CourseEvalUM (see ELMS) will be open for evaluations later in the semester. This is YOUR chance to anonymously evaluate this class. **It is expected that all studies will complete a course evaluation.** I very much wish to improve future courses based on your constructive criticism.

Copyright Issues

Class lectures and other materials used in ASTR 430 (including but not limited to powerpoint presentations, tests, outlines, notes, recordings) are exclusively copyrighted to *Prof. Jessica M. Sunshine*. Selling, posting, or distributing copies or modified copies of course materials and lecture notes, being paid to take lecture notes (except under UMD sponsorship), or assisting another person or entity in selling or distributing those materials is a violation of the University Code of Student Conduct. **You may not, nor may you allow others, to reproduce or distribute course materials publicly, whether or not a fee is charged, without my expressed written consent.**

Last Modified: J. Sunshine, January 2022, subject to change.