STELLAR ASTROPHYSICS
Physics 3021 – Fall 2021

Instructor: J. R. Sowell

Time: 2:00 to 2:50pm MWF Howey Lecture Room 5

Office: W102 Physics Building (404) 385-1294

Office Hours: Anytime but especially MWF 10:30 – 11:00 and 1:30 – 2:00

Email: jim.sowell@physics.gatech.edu

Web Page: http://www.astronomy.gatech.edu

Text: Suggested but not required (purchase cheap ones)

Introductory Astronomy & Astrophysics, 4th ed
Zeilik & Gregory, Brooks/Cole – Thompson Learning, 1998

Journey from the Center of the Sun
Zirker, Princeton University Press, 2002

COURSE POLICY

Objectives: The objective of this course is for the student to acquire a working knowledge of stellar astronomy (photometry and spectroscopy) and astrophysics (stellar interiors, structure, evolution, and nucleosynthesis). Lectures will not necessarily cover all of the material on which the student is tested – the student is responsible for the material indicated by the instructor.

Attendance: Each student should be aware of the regulations that are listed in the Student Handbook. The class attendance policy, which the Georgia Tech regulations say shall be at the discretion of the instructor, will be as follows: There will be no prescribed maximum number of unexcused absences for this class. However, if it is apparent that lack of attendance at class may be impairing a student's performance in the course, the instructor may require that the student not miss more classes, under the penalty of failing the course.

Attendance for all lectures is strongly encouraged. This is a Residential Course.

Materials: The student will need a **non-programmable scientific** calculator, with trigonometric functions in particular. **Programmable calculators cannot be used for the tests.**

Homework: Astronomy is based on math and physics; physics is a problem-solving subject, so to be able to apply the principles of physics, you should work as many problems as possible. **Some problems will be graded**. Solutions to all of the problems will be made available after the problems have been turned in. If you have difficulty with problems, ask about them in class.

Homework will be 15% of the course grade. It is expected that each student's submitted homework be based on an individual understanding of the relevant material. Note that this does not rule out working on homework with other students, but any "collaboration" should involve the sharing of understanding, not answers. (Further guidelines regarding collaborative work can be found in the Honor Code Guidelines.) Copying answers from peers or solution manuals is not only a violation of the Honor Code, but will not provide the level of understanding necessary to succeed on the tests. Keep in mind that 60% of your grade will be based upon your test-taking ability. Do not short-change yourself by cutting corners on homework assignments.

NO HOMEWORK WILL BE ACCEPTED AFTER 2 PM ON THE DATE IT IS DUE UNLESS APPROVED IN ADVANCE BY THE INSTRUCTOR.

HOMEWORK PROBLEMS SHOWING ONLY AN ANSWER WILL NOT BE GRADED.

Projects: A Stellar Project/Paper will be produced during the second half of the semester. It is a combination of many problems, written in a paper format that includes excellent plots and beautiful pictures. A detailed description of the project/paper will be provided *at a later date* (near the middle of the semester). The Project/Paper is worth 20%.

Tests: There will be three 50-minute tests during the semester. They will be given on the dates listed on the Schedule and will cover the material presented since the previous test. The lowest score of Tests 1, 2 and 3 is worth 10%, whereas the other two are each worth 15%. The three tests comprise 40% of the final grade. The final exam will cover material since the third test, but it will also have several comprehensive questions. The final exam test score will be 20% of the final grade.

If you miss a test, contact me by telephone or email as soon as possible so that arrangements can be made to take the test PRIOR to the NEXT LECTURE. If you know in advance of a conflict, the test can usually be given prior to the scheduled time.

If you miss a test for a valid reason (i.e., you were too ill to take the test, had a serious family illness, etc.), then you must **SUBMIT A WRITTEN STATEMENT** from the Dean of Students or the Student Health Center, with supporting documentation, as to the cause of the absence to the instructor **ON THE FIRST DAY YOU RETURN TO CLASS**. If the reason is acceptable, your grade will be determined at the instructor's discretion. If you do not submit an acceptable excuse for missing a test, you will receive a "0" for that test. If you miss two tests for any reason whatsoever, you must initiate a conference with the instructor. Failure to do so will result in a "0" for the second test regardless of the reason for the absence.

Observatory Visit: Georgia Tech has an Observatory on the roof of the Physics Building. There will be several nights when it will be exclusively available for students from this class. Students must visit the Observatory at least once during the semester, but the visit can be ANY night the Observatory is open. Opening of the Observatory is not a guarantee – it is weather dependent. **Do not procrastinate.**

Grading: The total grade consists of (a) GT Observatory visit (5%), (b) homework (15%), (c) Stellar Project/Paper (20%), (d) 3 one-hour tests (40% total), and (d) the Final Exam (20%). Also, extra credit (2%) can be obtained by following the instructor's guidelines regarding a visit to the Fernbank Observatory.

Grading Scale: 90 – 100 = A; 80 – 89 = B; 70 – 79 = C; 60 – 69 = D; 0 – 59 = F
For those taking the course pass/fail, a C or better is considered passing.

Extra Credit: Visiting the Fernbank Planetarium and Observatory is not mandatory, but highly encouraged – **assuming the facility is open**. The Observatory is usually open on Thursday and Friday nights. **Extra credit** can be obtained if (1) You see the planetarium show (1 possible point); (2) You look through the telescope at a celestial object (1 possible point), and (3) You submit a **typed**, one-paragraph summary of (a) the planetarium show and/or (b) the objects viewed with the telescope (i.e., describe their appearance). Scan the Planetarium Ticket receipt, which has been SIGNED by the astronomer working there that night, and include it as an attachment with your Visit Report. **Fernbank Observatory Visit Reports are due no later than 2pm on the last day of class**.

Unexpected Problems: If a snow and/or ice storm (or any other cause for the Institute to close) occurs on a day scheduled for a test, the test will be given on the first day that the class resumes. Check the instructor's web pages for information.

Academic Integrity: Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit http://www.catalog.gatech.edu/policies/honor-code/ or http://www.catalog.gatech.edu/rules/18/. Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Regulations regarding cheating and general classroom dishonesty will be strictly enforced.

Accommodations for Students with Disabilities**:** If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404) 894-2563 or http://disabilityservices.gatech.edu/, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Statement of Intent for Inclusivity: As a member of the Georgia Tech community, I am committed to creating a learning environment in which all of my students feel safe and included. Because we are individuals with varying needs, I am reliant on your feedback to achieve this goal. To that end, I invite you to enter into dialogue with me about the things I can stop, start, and continue doing to make my classroom an environment in which every student feels valued and can engage actively in our learning community.

Student-Faculty Expectations Agreement: At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See http://www.catalog.gatech.edu/rules/22/ for an articulation of some basic expectation that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Campus Resources for Students

In your time at Georgia Tech, you may find yourself in need of support. Below you will find some resources to support you both as a student and as a person.

Academic Support

- Center for Academic Success http://success.gatech.edu
    - 1-to-1 tutoring http://success.gatech.edu/1-1-tutoring
    - Peer-Led Undergraduate Study (PLUS) http://success.gatech.edu/tutoring/plus
    - Academic coaching http://success.gatech.edu/coaching
- Residence Life's Learning Assistance Program
    https://housing.gatech.edu/learning-assistance-program
    - Drop-in tutoring for many 1000 level courses
- OMED: Educational Services (http://omed.gatech.edu/programs/academic-support)
    - Group study sessions and tutoring programs
- Communication Center (http://www.communicationcenter.gatech.edu)
    - Individualized help with writing and multimedia projects
- Academic advisors for your major
    http://advising.gatech.edu/

Personal Support

Georgia Tech Resources

- The Office of the Dean of Students: http://studentlife.gatech.edu/content/services; **404-894-6367**; Smithgall Student Services Building 2nd floor
    - You also may request assistance at https://gatech-advocate.symplicity.com/care_report/index.php/pid383662?
- Counseling Center: http://counseling.gatech.edu; **404-894-2575**; Smithgall Student Services Building 2nd floor
- Students' Temporary Assistance and Resources (STAR): http://studentlife.gatech.edu/content/need-help
    - Can assist with interview clothing, food, and housing needs.
- Stamps Health Services: https://health.gatech.edu; **404-894-1420**
    - Primary care, pharmacy, women's health, psychiatry, immunization and allergy, health promotion, and nutrition
- OMED: Educational Services: http://www.omed.gatech.edu
- Women's Resource Center: http://www.womenscenter.gatech.edu; 404-385-0230
- LGBTQIA Resource Center: http://lgbtqia.gatech.edu/; 404-385-2679
- Veteran's Resource Center: http://veterans.gatech.edu/; 404-385-2067
- Georgia Tech Police: 404-894-2500