

# PHY 521: Stars

Tues/Thurs, 2:30 pm to 3:50 pm

Instructor: Michael Zingale, ESS 452, michael.zingale@stonybrook.edu

Web: <http://bender.astro.sunysb.edu/classes/stars/>

## Course Objectives

To understand the physical properties of stars (their structure, evolution, death) through detailed theoretical reasoning and comparison to observational data.

## Office Hours

TBA

## Grading

- Homework: 80%
- Final Project: 20%

## Texts

There are 2 recommended texts:

- *Stellar Interiors: Physical Principles, Structure, and Evolution, 2nd Edition* by Hansen, Kawaler, and Trimble.
- *Stellar Physics* by Ed Brown. Freely available here:  
<https://github.com/Open-Astrophysics-Bookshelf/stellar-physics-notes>.

We will supplement these with other sources, mostly papers from the astrophysical literature.

## Preliminary Lecture Schedule

class meeting	topic	HKT Ch.
1	general overview	A
2-3	preliminaries	1
4-5	stellar evolution overview	2.1-2.7, 2.9, 2.10
6-7	equation of state	3
8-9	radiative & conductive transfer	4.1-4.6
10-11	convection	5
12-13	stellar energy sources	6
14-18	stellar models	7 + MESA
19-20	structure and evolution of Sun	9
21	structure and evolution of WDs	10
22-24	things that go BOOM	2.8, 2.9, 2.13 + other
25-6	stellar atmospheres	other
27-28	class discussion / project presentations	

The lectures will likely slide around by a week or two depending on how in-depth we decide to go on some topics and also the interests of the class.

## **Exams**

There are no exams in this class.

## **Final Project**

All students will do a final project which counts for 20% of your grade. We will discuss these at the midpoint in class. Some example projects will be given, and may consist of a solving an interesting problem / system computationally. Each student will give a brief (5 minute) presentation on their project in the last class.

## **Homework Policy**

It is understood that students will discuss the homework assignments with one-another, however, when writing your solutions, you must do your own work. Copying will not be tolerated.

Your homework solutions will be submitted electronically on Brightspace by the date / time indicated on the assignment. There will be a 3 day *grace period* during which late assignments will be accepted. After that period, no late homeworks will be accepted and the solutions will be posted.

Homework assignments will be weighted equally in computing your homework average.

## **Student Accessibility Support Center Statement**

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at [sasc@stonybrook.edu](mailto:sasc@stonybrook.edu). They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website:

<https://ehs.stonybrook.edu//programs/fire-safety/emergency-evacuation/evacuation-guide-disabilities>

and search Fire Safety and Evacuation and Disabilities.

## **Academic Integrity**

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Professions, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at

[http://www.stonybrook.edu/commcms/academic\\_integrity/](http://www.stonybrook.edu/commcms/academic_integrity/)

## **Critical Incident Management**

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Student Conduct and Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

## **Electronic Communication**

Email to your University email account is an important way of communicating with you for this course. For most students the email address is 'firstname.lastname@stonybrook.edu'. *It is your responsibility to read your email received at this account.* For instructions about how to verify your University email address see [this](#):

<http://it.stonybrook.edu/help/kb/checking-or-changing-your-mail-forwarding-address-in-the-epo>

If you choose to forward your University email to another account, we are not responsible for undeliverable messages.

## **Religious Observances**

See the policy statement regarding religious holidays at

[https://www.stonybrook.edu/commcms/registrar/calendars/religious\\_holidays.php#2022](https://www.stonybrook.edu/commcms/registrar/calendars/religious_holidays.php#2022)

Students are expected to notify the course professors by email of their intention to take time out for religious observance. This should be done as soon as possible but definitely before the end of the 'add/drop' period. At that time they can discuss with the instructor(s) how they will be able to make up the work covered.