Astronomy 220A
Stellar Structure and Evolution
Fall 2014 Quarter, MWF 2-3:10 pm, ISB 356

Instructor:
Jonathan Fortney, Associate Professor
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Office hours: Whenever you like

Class Web Site:
www.ucolick.org/~jfortney/220A.htm

Required Text:
Stellar Structure and Evolution, *2nd edition*, by Kippenhahn, Weigert, & Weiss, 2012.

Additional texts that may be helpful:
Stellar Interiors: Physical Principles, Structure, and Evolution (2nd ed), C. J. Hansen, S. D. Kawaler, and V. Trimble, 2004.
Principles of Stellar Evolution and Nucleosynthesis, D. D. Clayton, 1983
An Introduction to the Theory of Stellar Structure and Evolution (2nd ed), Dina Prialnik, 2009

Structure of the course:
Review of Observational Data
Fundamental Physics and Equations
Energy Transport in Stellar Interiors
Properties of Stellar Matter
Energy Generation
Building Models: Equations, Boundary Conditions, Numerical Methods
Polytropes!
Early Stellar Evolution
Chemical Evolution on the Main Sequence
Pulsations, Helioseismology, and Asteroseismology
Late Stellar Evolution and Nucleosynthesis
Brown Dwarfs and Giant Planets
Compact Objects

I will be out of town:
October 15, 17, 27, 29 (Lectures will be made up or guest-lectured)

Grading:
There will be four problem assignments, roughly every other week (*40% of grade*)
You will need to construct a stellar structure model and write up the results by the end of the quarter (*40%*). Details will be given in a separate handout.
A 15-minute in-class presentation on a stellar / planetary structure paper from the literature, which will likely be in the last week of class, Dec 8, 10, 12 (*20%*). You will choose from a list of papers that I provide.
Exams: We'll try it without a final again this quarter