

ASTR 1000 Descriptive Astronomy

Part IV Project

Purpose

Demonstrate your knowledge of stars, their characteristics, their development from formation to cessation of fusion, and the types and properties of their remnants.

What it is

Your project is a formal way to demonstrate that you understand the content covered in Part IV of the course. It should thoroughly fulfill two of the unit objectives.

Part IV learning objectives

34. Describe the structure, composition, features, and processes of the different layers of the Sun's interior, surface, and atmosphere, and their interactions.
35. Describe the interior processes maintaining structure and size of the Sun and other stars.
36. Explain and apply the method of ascertaining stellar distances by annual parallax.
37. Describe, explain, and apply the stellar magnitude scale. Distinguish and relate absolute and apparent magnitude scales.
38. Describe the stellar spectral classes, their sub-classes, and luminosity classes.
39. Describe the Hertzsprung-Russell diagram and related plots. Identify features and properties of stars categorized by their positions therein.
40. Describe the formation of stars from their origin in a nebula until they exhaust core hydrogen.
41. Describe and explain what happens to low-mass ($< 8 M_{\odot}$) stars after they consume their core hydrogen.
42. Describe and explain what happens to high-mass stars after they consume their core hydrogen.
43. Describe and explain processes involving stellar remnants, such as pulsars, magnetars, novae, type Ia supernovae, and x-ray bursters.

Possible projects

These are some ideas for a project. You are free to suggest others. I will approve of projects that demonstrate your mastery of two unit objectives.

- A set of obituaries for stars of different types, written in the style of a newspaper obituary.
- A star "trading card" deck describing specific stars. Should contain representatives from all major regions of the Hertzsprung-Russell diagram.
- A stellar remnant field guide describing different types of remnants, how they are detected, their distinguishing characteristics, and how they appear in "the field."
- A poster comparing and contrasting core-collapse and Type Ia supernovas.

- A slide presentation explaining the behaviors of different stellar remnants in close binary systems.
- A concept map describing the ends of stars of different masses.
- A concept map describing the nuclear processes occurring in stars, from hydrogen fusion to core collapse and neutron star mergers.
- A poster describing the interior structures of main sequence stars of different masses.
- A poster describing the interior structures of post-main sequence stars.
- A comic strip describing the evolution of a star from stellar nebula to final remnant, including internal structure and position on the H-R diagram at each stage.
- Quiz questions are acceptable, BUT
 - You must officially sign up on the sheet, and
 - No two students may write questions about the same objective.

Components

Sign up: Select a project. Describe succinctly what form your project will take, and which of the unit objectives it will cover.

Rough Draft: Your project itself. The more complete it is, the more useful feedback your classmates and instructor can provide.

Rough draft feedback: Feedback to your classmates on how you see the project addressing the objectives.

Final Project: The completed project.

Final project feedback: Summarize what the project teaches about its objectives.

Dates and Deadlines

Apr 4	Claim ideas (sign-up)
Apr 13	Rough drafts due
Apr 15	Rough draft feedback due
Apr 22	Project due
Apr 24	Final project feedback

Scoring

Rough Draft (10 points)

This is the full project, but not polished.

10	Contains all parts of the project, addressing all of the specified objective.
6	Submission lacks substantial portions of the project.

Rough Draft feedback (10 points)

For each draft that you review, explain how the project addresses its learning objectives.

10	Summarizes what each draft does to cover its learning objectives.
proportional	Misses assigned drafts or associated objectives.

Final Report (30 points)

This is graded by the student, with the instructor having veto power.

Is it easy to understand? Does it communicate the objective clearly, correctly, and completely?

Is it creative and appealing?

Final report feedback (10 points)

Summarize what each project that you review teaches about its learning objectives.

10	Summarizes what each project teaches about its learning objective.
proportional	Misses assigned projects or associated objectives.