HOMEWORK ASSIGNMENTS AST 102IN STARS, GALAXIES, UNIVERSE

for textbook edition 11
Spring 2012 and after

***NB*: The letter "N" following the number of an assignment connotes that this assignment is to be done by the due date, but is Not actually handed in for scoring. Material included in the "N" assignments is testable as with the material in all other assignments.**

On problems requiring calculations, you must show the calculation setups. The calculations themselves may be done with a calculator.

Chapters start with "Guideposts". Read them, even if the assignment says to start with Section 1. For example, Ass't. 3 says to read Ch. 2.1. You start with the Guidepost. Also: Read every "How Do We Know"

Reading part of assignments is given in left column.
Written part of assignments is given in right column.

At the ends of chapters:
Review Questions: "Q"
Discussion Questions: "DQ"
Problems: "P"
Definitions: "D"

Foundational Assignment

Due date: _____

Introductory Course Note Set	question sheets (download from Course Downloads page, if not handed out.)

Assignment 1

Due date: _____

"Study Tips: How to Study Astronomy" (handout)	question sheet (download)
Sagan article: "Why We Need to Understand Science" (handout)	question sheet (download)
How/know? 1.1: "...Scientific Method, p. 8	list significant points
How/know? 2.1: "Scientific Models", p. 17	list significant points
How/know? 2.4: "Sci Arguments", p. 28	list significant points
What Are We?: "Basic Scientists", p. 522	list significant points

Assignment 2

Due date: _____

How/know? 2.3: "Evidence...Foundation", p. 27	list significant points
How/know? 4.2: "Hyp., Theory, & Law", p. 66	distinguish between the three
How/know? 5.2: "Testing...by Prediction", p. 89	list significant points
How/know? 8.1: "Scientific Confidence", p. 153	list significant points
How/know? 18.2: "A System of Knowledge" p. 380	list significant points + optional personal response
How/know? 19.2: "Courteous Skeptics", p. 419	list significant points
How/know? 2.2: "Pseudoscience", p. 25	list significant points + optional personal response

Assignment 3

Due date: _____

Ch. 2.1, "The Stars" and 2.2, "The Celestial Sphere", pp. 11-16	Q. 1,2; P. 1,2,4 (HINT: Get answers from Table 2.1 on p.16.); D. celestial sphere
Ch. 6.1, "Radiation: Info from Space", pp. 98-101	P. 2; D. nanometer, Angstrom, cosmic rays
Ch. 7.1, "Starlight", pp. 122-125; sub-section "Lum., Radius, and Temp." in Ch. 9.3, pp. 173-174 "Kirchhoff's Laws" back in Ch. 7, p. 132	Q. 8; P. 1-4
Focus on Fundamentals: "Temp, Heat, Thermal Energy", p. 128	List significant points

TEST 1 Date: _____

Assignment 3N

Due date: _____

Ch. 7.2, "Interactions...Light & Matter" to end of Chapter, pp. 126-140, skip Kirchhoff's Laws on p. 132	Q. 2,5,11; P. 6-9; D. molecule
How/know? 22.1: "Data Manipulation", p. 469	list significant points
How/know? 21.1: "How...Unify the Details", p. 448	list significant points
How/know? 8.1: "Scientific Confidence, p. 153	list significant points
How/know? 8.2: "Confirmation+Consolidation," p. 160	list significant points
Ch. 6.2, "Optical Telescopes" to end of chapter, pp. 101-119	Q. 1,4,7; D. seeing, CCD

Assignment 4

Due date: _____

Ch. 1, "The Scale of the Cosmos", pp. 1-9	Q. 2,4,5,6; P. 7,8 (use 100,000 ly for the MW's diameter)
Ch. 9, "The Family of Stars", pp. 167-173 up to Sub-section, "Lum, Radius, Temp" of Sec 9.3 (Covered in Ass't. 3)	Q. 1,6; P. 1 (skip AU),3 (distance & parallax columns only),5-8,10 (You may use Table 2.1 on page 16 and Table 9.1 on page 172) D. proper motion

TEST 2 Date: _____

Assignment 5

Due date: _____

Ch. 9.4, "The Masses of Stars", pp. 178-185	Q. 7; P. 11
Ch. 9.5, "A Survey of Stars", pp. 185-189	P. 15
"Stellar Populations," in Ch. 15.5, p. 319,322 including Fig. 15.22 and Table 15.1, pp. 322	
Ch. 10, "The Interstellar Medium", pp. 192-207	Q. 5; P. 2; D. emission nebula, reflection nebula, dark nebula
Ch. 11, "The Formation of Stars", pp. 210-229	Q. 8,10; P. 11; D. neutrino (See glossary.)
How/know? 9.1: Chains of Inference, p. 180	list significant points
How/know? 10.1: "Facts from Hypotheses", p. 202	list significant points

Assignment 6

Due date: _____

Ch. 12, "Stellar Evolution", pp. 232-252	Q. 1,2,5,8-12; P. 2 (ages in <u>years</u>); D. open (or "galactic") clusters
How/know? 12.1: "Mathematical Models", p. 235	list significant points
How/know? 23.2: "Who Pays for Sci?", p. 534	list significant points
How/know? 24.1: "Sci Discoveries", p. 528	list significant points

Assignment 6N

Due date: _____

NOTE: The problems only in this assignment may be handed in for extra credit.

Ch. 13, "The Deaths of Stars", pp. 255-276	Q. 1-3,6,8,9,11; P. 1,4; D. Chandrasekhar limit, supernovas of both Types I and II
Ch. 14, "Neutron Stars & Black Holes", pp. 279-299	Q. 2,7,17; P. 1 (HINT: C=2πR),7; D. black hole, event horizon, R_S, time dilation, gravitational red shift
How/know? 11.1: "Theories & Proof", p. 215	list significant points
How/know? 14.1: "Fraud in Science", p. 295	list significant points
How/know? 26.1: "Nature of Sci Explanation," p. 583	list significant points + optional personal response

TEST 3 Date: _____

Assignment 7

Due date: _____

Ch. 26, subsection "Life in Other Planetary Systems" to end," p. 594-600	Q. 10-13,17; P. 4 (ignore textbook hints; just estimate answer to nearest subclass from info given in Table 12.2, p. 239) ,5 (Here's how: calculate volume, then multiply by # of stars per volume); D. life habitable zone, SETI
How/know? 25.1: "Selection Effects", p. 555	list significant points
How/know? 18.1: "Reasoning/Analogy", p. 372	list significant points

Assignment 8

Due date: _____

Ch. 15, "The Milky Way", (except "Stellar Pops", covered in Ass't. 5), pp. 302-327	Q. 1,2,6 P. 2 (Note: $A=\pi r^2$ and compare the two areas), 9
Ch. 16, "Galaxies", pp. 330-352	Q. 1,5,6,8; P. 6
How/know? 7.1: "Quantum Mechanics", p. 125	list significant points

Assignment 8N

Due date: _____

Ch. 17, "Galaxies w/Active Nuclei," pp. 355-366	Q. 2,5,6,9; P. 1 (Note: express "*c*" in m/s)
How/know? 17.1: "Statistical Evidence", p. 357	list significant points
Ch. 18, "Cosmology", pp. 369-393	Q. 4,5,8,9;14; D. flatness

TEST 4 Date: _____

Assignment 9

Due date: _____

"Afterword", pp. 615,616	list significant points—hand in with Test 4

"Never regard study as a duty but as an enviable opportunity to learn...for your personal joy and to the profit of the community to which your later works belong."

— Albert Einstein