

FROM STARGAZING TO SCIENCE: THE VALUE OF ASTRO'S "ONOMY" IN TEACHING THE CONTENT AND NATURE OF ASTRONOMY AND SCIENCE.

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Students taking my introductory astronomy course have always expressed an interest in learning about the sky. For most of them this means they want to learn to recognize constellations, to learn “the arrangement of the stars” ... the meaning of the Greek roots *astro* and *nemein* that became the word astronomy. This interest of students, for many years devalued and ignored, actually provides a perfect opportunity to guide them from casual interest to scientific inquiry in a way similar to the progression of western science from the astronomy of the Greeks through the beginnings of physics with Galileo, Kepler and Newton, to modern astrophysics.

I require students to observe and learn the constellations of the season. Initially the constellations are studied as the “political map” of the sky. The students learn the names and myths of the characters or objects they represent, and their prominent stars. To build the bridge to science, however, I also require them to perform the time-honored first step of scientific inquiry of accurately sketching what they see in their journal. Also, they must research and learn the “physical map” of the sky where each constellation outlines a “column” of universe filled with stars, perhaps a planet or two, nebulae, galaxies, quasars and the CBR. Other observing assignments have students watching the moon wax from new to full with nightly observations, watching the motion of the point of sunset along the western horizon, and watching the line from the Big Dipper’s Pointer Stars to Polaris sweep out fifteen degrees per hour as Earth rotates on its axis. With each of these they confront the challenge of accurately conveying on two-dimensional paper what they see in the three-dimensional sky, they develop a habit of looking at the sky and noting positions of familiar objects, and they build a foundation of observing experience upon which the models of the universe that astrophysics offers can be built with some stability.