

# ASTR1110H - INTRODUCTION TO ASTRONOMY

The Solar System

Fall 2009

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Class Hours: Tuesday and Thursday 9:30 AM – 10:45 PM in Physics 221  
Office Hours: Tuesday and Thursday 11:00 AM – noon & 1:00 PM – 2:00 PM (or by appointment)  
Preceptor for Galileo Game: Rebecca Parker

Textbooks:

*The Copernican Revolution (CR)* – Thomas S. Kuhn

*The Trial of Galileo (TG)* – Frederick Purnell, Jr., Michael S. Pettersen, Mark C. Carnes

*Destiny or Chance (DC)* – Stuart Ross Taylor

Grading: 3 short essays (10-12 pages) due during the course of the semester (each worth 15% of your grade – total of 45%). 1 exam during the semester: 15%. Class participation during the Reacting part of the class: 5%. 4 Homework sets during the course of the semester: 10%. Final Exam: 25%.

Final Exam - December 15<sup>th</sup>, 2009

Make-up exams are scheduled only with a valid excuse.

You are responsible for attending class to find out exactly when the mid-term, homeworks, and essays are due. The schedule on the second part of the syllabus is a *tentative* schedule. The date and time of the final exam are scheduled by the University.

The course is divided into 3 parts:

- 1) Ancient and Medieval Astronomy – looks at how the ancient Greeks devised a model of the Solar System culminating in the Ptolemaic model, and how Copernicus and Kepler changed this model into the modern view. (6 classes)
- 2) The Trial of Galileo – We will enact a “Reacting to the Past” game dealing with the problems Galileo faced in the beginning of the 17<sup>th</sup> century as he tried to prove that the Copernican model of the Solar System was correct. We will break up into 3 factions and debate the merits and faults of Galileo following the historical sequence of events. More on this below. (11 classes)
- 3) The Modern Solar System – A look at our modern view of the Solar System including the latest theories and images from spacecraft exploration during the last 4 decades. (10 classes)

The first and third parts of the course are very traditional in that they will consist of me lecturing on the topics (see second part of the syllabus for tentative schedule). The second part of the course may be new to you. It involves a pedagogy called “Reacting to the Past”. Basically, the students re-enact an important event or sequence of events by assuming the roles of some of the participants in these events. The re-enactment takes the form of a game with rules and objectives and criteria for winning. You can read more on this pedagogy at:

<http://www.barnard.edu/reacting/>

We will re-enact the two trials of Galileo during the beginning of the 17<sup>th</sup> century. I quote below from the website what the basic idea of this game is:

In *The Trial of Galileo* the new science, as brilliantly propounded by Galileo Galilei, collides with the elegant cosmology of Aristotle, Aquinas, and medieval Scholasticism. The game is set in Rome in the early decades of the seventeenth century. Most of the debates occur within the Holy Office, the arm of the papacy that supervises the Roman Inquisition. At times action shifts to the palace of Prince Cesi, founder of the Society of the Lynx-Eyed that promotes the new science, and to the lecture halls of the Jesuit Collegio Romano. Some students assume roles as faculty of the Collegio Romano and the secular University of Rome, the Sapienza. Others are Cardinals who seek to defend the faith from resurgent Protestantism, the imperial ambitions of the Spanish monarch, the schemes of the Medici in Florence, and the crisis of faith throughout Christendom. Some embrace the “new cosmology,” some denounce it, and still others are undecided. The issues range from the nature of faith and the meaning of the Bible to the scientific principles and methods as advanced by Copernicus, Kepler, Tycho Brahe, Giordano Bruno, and Galileo. Central texts include Aristotle’s *On the Heavens* and *Posterior Analytics*; Galileo’s *Starry Messenger* (1610), Letter to Grand Duchess Christina (1615) and *Dialogue on the Two Chief World Systems* (1632); the declarations of the Council of Trent; and the Bible.

I will break up the class into the three factions (Conservatives, Moderates, Progressives) and we will play the game as described in the Trial of Galileo Book. Two of the essays that are required for this course will be done during the course of the game, and there is a participation component in this phase of the course that will contribute 5% to your final grade. I will judge how many points (out of 5) to give you based on your participation level during the game.

For the rest of your grades, there will be another essay (due on September 22<sup>nd</sup>), a midterm exam (on October 29<sup>th</sup>), 4 homework sets, and a Final Exam. Thus, your total grade will be based on 3 essays, contributing 45% of your total grade or 45 points out of 100, homework consisting of 10 points out of 100, class participation in the Galileo game consisting of 5 points out of 100, a mid-term exam contributing 15 points out of 100, and the final exam contributing 25 points out of 100. Once your total numerical grade is determined, a letter grade will be assigned using the following scale: A is for a score of

93.00 or above, A- is for the range 90.00 – 92.99, B+ is for 87.00 – 89.99, B is for 83.00 – 86.99, B- is for 80.00 – 82.99, C+ is for 77.00 – 79.99, C is for 73.00 – 76.99, C- is for 70.00 – 72.99, D is for 60.00 – 69.99, and F is for any average below 60.00.

If you have any questions or concerns about this syllabus, please contact me.