A PHYSICS 100, class# 8072: Contemporary Astronomy—
The Cosmic Connection, Spring 2017 (3 units course credit)

MWF 11:30 AM-12:25 PM  Physics Bldg., Rm 225 (1 day online, default Friday, NOT a vacation day but synchronous online activity, with instructor logged in)

Professor Matthew Szydagis, mszydagis@albany.edu, Physics 312, albany.edu/physics/mszydagis.shtml, with TA Yang Yu, yyu9@albany.edu
Office Hours: 10:30-11:30 AM MWF or by appointment, Room 312 + online

Text: None. The detailed lecture notes (PDF presentation slides) will be provided on-line, and real world articles, historical and cutting-edge research, will be assigned (an internet connection is required).

Course Description: Modern developments in astronomy, the birth and death of stars, solar and planetary science, neutron stars and black holes, galactic structure, cosmology, and theories of the origin and future of the universe. This is also a blended learning course, which means there will be activities both online and in the classroom. Activities include interactions with fellow students, face-to-face and online.

Course Goals: A student completing this course will have learned to

1. Apply the scientific method to a novel situation, after assessing examples online and in class face-to-face.
2. Judge and critique a scientific article in the popular press according to criteria from class.
3. Recognize and classify a theory/model or claim as being scientific vs. pseudo-scientific or neither.
4. Summarize the properties of different astronomical phenomena for an inquisitive non-scientist.
5. Outline the impacts physics and astronomy have on daily life, producing a list of concrete examples.

Your grades will be calculated according to this rubric:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Description</th>
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<tbody>
<tr>
<td>The Final Exam</td>
<td>25%</td>
<td>Both a traditional exam, plus a final report on case studies</td>
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<tr>
<td>Midterm Exam</td>
<td>25%</td>
<td>A test in class along with an essay turned in online</td>
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<tr>
<td>Class Participation</td>
<td>25%</td>
<td>Online chat/discussions are 15% plus in class activity is 10%</td>
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<tr>
<td>Homework+Quiz</td>
<td>25%</td>
<td>Answering the reading-based questions due nightly at 12am</td>
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Extra Credit: You can earn bonus points by participating in telescopic observing with the UAlbany Astronomy Society (UAAS). Opportunities to do so will be announced on https://www.facebook.com/UalbanyAstronomy?ref=hl irregularly throughout the semester. The amount of credit is 1% per evening, but only up to 5% of your final grade.

University policy on absence: http://www.albany.edu/health_center/medicalexcuse.shtml
Grades will be determined according to: 90-100 is A, 80-90 B, etc. (+/-'s added as well)
The following is a tentative course plan:

Weeks 1-2: Unit 1, Thinking like a Scientist and Observing like an Astronomer
Weeks 3-4: Unit 2, Planetary Science
Weeks 5-7: Unit 3, Stars and Stellar Evolution
Week 8: Spring Break, No Classes; followed by Weeks 9-10: The History of Cosmology
Week 11: Galaxies
Weeks 12-14: Astrophysics and Astroparticle Physics
Week 15: Modern Cosmology
Week 16: Astronomy and Cosmology in Popular Culture / Science Fiction

Purpose of Blended Format: It is Beneficial to YOU!
* Debate & discussion including on potentially controversial topics, without fear/shyness
* Online quizzes ensure that you are reading and absorbing content, while in class you get better clarification from instructor in person: continue confronting your misconceptions
* Best of both worlds: verbal interaction+internet, connecting aspects but sans redundancy
* No more snow days, getting behind on syllabus (Class follows syllabus but goes online)
* F2F v. online complementary: F2F utilized for demos and questions, online for read+quiz

Strategies for Success:
* Be responsible for your own learning: focus on gaining knowledge rather than on scores
* Respect the midnight (11:59 pm) deadlines for quizzes. See below for late policy.
* Treat the online portion, including the simultaneous activities with your classmates, seriously, as though this were just more in-room class-time as in a “traditional” course
* Ask questions both in person and online of the instructor, whichever you are more comfortable doing
* Talk to each other during online time and learn from yourselves, not instructor, who will be there mostly as observer initially at least
* Get to know your group discussion activity teammates inside and outside the classroom
* Remember that due on is NOT “do on.” Quizzes time-stamped and NEVER accepted late. Make-up tests only if a valid excuse is secured – you are responsible for contacting Jeanette Altarriba, the Vice Provost (for Student Affairs) at jalaltarriba@albany.edu to get one.
* Retake quizzes until you get right (in Week 1, all quizzes have full-credit 2nd, 3rd chances)

Specific Skills You Will Be Cultivating:
1. Ability to recognize the steps, along with their proper order, in the scientific method, as used in astronomy
2. Focused close reading skill that filters for the most relevant, significant material: key sentences related to 1.
3. Capability to gather evidence for comparing and contrasting two or more competing notions/ideas.
4. Ability to evaluate an argument based on the level and type of evidence given (see also 5 for evidence).
5. Recognition of what scientists especially astronomers consider evidence & what tools they use to gather it.
6. Making connections between lack of evidence and pseudoscience, when evidence claimed, vs. non-science.
7. The focus and discipline to read a long article instead of just the beginning, ending, and figures.
8. Capability to identify basic astronomical phenomena and celestial bodies and their fundamental properties.

Lastly, please note that the discussions and debates are NOT about being “right.” Credit is given for participation and justification of your reasoning. Arguments must be rationally explained, supported by logic, reasoning, and best of all, *evidence*.