

Astrosociology in the Classroom: Developing a Practical Sociology Course

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Abstract. Astrosociology will progress and develop as a viable multidisciplinary field as well as a potential subfield of sociology more thoroughly and more quickly when a modern college and university level course is developed and offered to students interested in this unique sociological approach. The Introduction to Astrosociology course should present modern sociological issues from the perspective of the impact of space exploration, settlement, and commercialization as they apply to the micro and macro levels of influences on the major institutions of society. The intent of this paper is to outline a syllabus that will address the perspectives, concepts, and theories found in most introductory and applied sociology courses, but with an emphasis on the concepts, definitions, and perspectives of Astrosociology. This presentation outlines a basic topic and subject format for the course syllabus and opens for discussion the need to include or exclude material.

Keywords: Astrosociology, Astrosociology in the Classroom

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INTRODUCTION

During his presidential campaign, Barack Obama made statements supportive of a renewed interest and commitment to the exploration and commercialization of outer space. He said the United States should maintain its international leadership in space while at the same time inspiring a new generation of Americans to dream beyond the horizon. He stated that what President Kennedy said about space more than 45 years ago in a speech at Rice University remains valid today. In essence, Kennedy said the exploration of space was one of the great adventures of all time and would go forward whether the U.S. was part of the effort or not. He said that no nation which expects to be the leader of other nations could stay behind in the race for space, and that the U.S. would be part of space exploration because there was new knowledge to be gained and used for the progress of all people (see: <http://sharp.sefora.org/people/presidential-candidates/barack-obama-presidential-candidate/#Space>).

Recently, President Obama promised to establish a robust and balanced civilian space program, rebuild NASA to inspire the world with both human and robotic space exploration, and to lead in confronting the challenges we face here on Earth. The President is enthusiastic about the scientific and ecological opportunities a renewed approach to space exploration will bring to the US and the international community. In his own words, he says:

My vision will build on the great goals set forth in recent years, to maintain a robust program of human space exploration and ensure the fulfillment of NASA's mission. Together, we can ensure that NASA again reflects all that is best about our country and continue our nation's preeminence in space (<http://sharp.sefora.org/people/presidential-candidates/barack-obama-presidential-candidate/#Space>).

In achieving this vision, President Obama says he will reach out to include international partners, and to engage the private sector to amplify NASA's outreach. Obama believes that revitalized, NASA can help America maintain its innovation edge and contribute to American economic growth.

In light of the renewed initiatives regarding space, the next decade will see many students transition from space enthusiasts to professional space experts. They will seek courses from universities and colleges that offer degrees in aerospace engineering, space science, space operations management, and related degrees. Many will want to learn all they can about this new, challenging, and exciting career field. Some will be visionaries determined to explore the dangerous and ground-breaking venture of space exploration and commercialization. To be academically supported in their efforts, they will need an up-to-date sociological base, a core from which to understand and explore the diverse societal beliefs and issues associated with the future of humanity in space. They will need a comprehensive course in astrosociology.

ASTROSOCIOLOGY: A FOCUS ON THE FUTURE

When the Hubble Space Telescope was launched into space on April 24, 1990, by the space shuttle Discovery, the anticipation throughout the scientific community was electric. We would now be able to see more clearly the hidden miracles of the universe; we would be able to gaze into the wonder of space, like never before..... And we did.

An Eye on Space

The first images that came back from Hubble were fantastic, but the images were unclear. After frantic attempts to figure out what was wrong, and using all the known technology and scientific scholarship of the time, it was found that our eye in space had blurry vision. The multi-million dollar result of the finest minds in the aerospace industry, and a miracle of modern technological advances which was meant to increase our understanding of space and provide a clear look into the vast unknown, was faulty.

The scientific community scrambled and quickly fixed the problem temporarily with software programs, but eventually we had to send astronauts with the hardware of technology to fix it. For many years, the Hubble program seemed to be on the edge of a political and bureaucratic meltdown. However, most recently (and again) we had to send astronauts to the Hubble to update the systems and upload the programs needed to provide society with the images that could be studied by many and enjoyed by all...societies.

A Look to the Past

When we look into space we are seeing what has happened in the past. There is an interesting similarity here because when we look at sociology today we can also see what has happened in the past. We can see what great strides have been made in our discipline. We can see the results of the efforts by social philosophers, the great thinkers who went before us to prepare the road of theoretical and sociological thought. These pioneers of sociology were in turmoil. Their desire to find answers to societal difficulties and issues of their time was motivated-even provoked-by their interaction with one another and by the interpretation of the literature and practice of those who were contemporary and those who had gone before them. In the midst of what seemed like chaos, patterns emerged and hypotheses were formed. New and useful theories were developed amidst the sometimes confusing paradigms of sociological thought. Eventually through the scientific process of that era, various approaches began to take shape, began to make sense, and became reliable, valid, and dependable. As a result, social speculation gave life to sociological perspective. We are fortunate today as critical thinkers and social scientists that those who went before us looked forward to the future of the discipline we know as sociology.

This body of work equips us today to explore and study society through established and credible sociological paradigms. It encourages us to look with hope to the future of our society and to the potential

within the field of sociology so that we may develop and improve our efforts at exploring the sociological implications of all the tangible and intangible aspects our culture accumulated and brought into existence by the plethora of groups in interaction within the global community.

Today, sociology is our telescope and even our microscope as we look through the lenses of macro and micro perspectives to focus on the pertinent issues, the problems, and the social conditions within our society. Through the software of our intellect and the hardware of our practice we can develop our hypotheses, our theories, and our sociological perspectives in an attempt to improve our blurred vision. However, it seems that the sociological community is becoming what the Hubble telescope once was, orbiting in the black hole of bureaucratic and political traditionalism, “boxed in” and confined to a status quo. What is needed is the fresh and new focus known as astrosociology.

This paper assumes astrosociology as a viable approach to the study of society, and a fully established multidisciplinary effort. These assumptions are evidenced by the interest, effort, and support of a multicultural and multidisciplinary membership of scholars who are determined to study the impact that space exploration has had and continues to have on the global societal community.

A Look to the Future: The Need for Astrosociology in the Classroom

Astrosociology is a sociological concept and discipline developed and defined by Pass in his *Inaugural Essays* (Pass, 2004b and 2004c). In another one of his papers, *Educating Astrosociologists*, Pass (2007b) identifies necessary objectives for the development of astrosociology. One of those objectives is to establish astrosociology in the curricula of high schools, colleges, and universities. Another objective is to persuade educators and others to utilize outer space to motivate (excite) students in the classroom and a third objective is to move beyond the STEM model which focuses on science, technology, engineering, and mathematics, and completely disregards the social and behavioral sciences. The first two objectives mentioned are the focus and limitations of this paper, The STEM model objective is further explained by Pass in his work titled, *Enhancing Space Exploration by Adding Astrosociology to the STEM Model* (Pass, 2007a), and can be found in the resources tab on the astrosociology website, at www.astrosociology.org.

Astrosociology will progress and develop more thoroughly and more quickly when a modern college and university level course is developed and offered to students interested in this unique sociological approach. The focus of this paper is the discussion and development of a curriculum that can be presented in the classroom of any college or university that offers sociology as a core or elective course. This paper is meant to be an academic statement of fact to those in support of astrosociology as an independent entity of sociology and to those who oppose astrosociology. Astrosociology will eventually be taught in the college and university and it is irrational if not absurd to think otherwise in light of the sociological and academic evidence. The opposition of some and the total support of others to astrosociology as a discipline, is an interesting contrast, and a true study in itself. Just these differences alone between those who support astrosociology and those who are opposed to it could be studied from the social conflict perspective, a major sociological perspective, or model, which studies the competition and conflict that leads to change in a society.

The truly ridiculous excuses for not recognizing astrosociology as a viable perspective are forged from the ignorance of those who see astrosociology as exploring a “forsaken frontier” (Pass, 2004a). These excuses (so-called reasons) include: (a) space is an illegitimate territory, and to study space is “crazy” because it is an empty vacuum; (b) it is a waste of societal resources, and an “ill conceived idea”, a pseudo science; (c) it is a fragmentation of the discipline; and (d) it is putting the cart before the horse. See *Space: Sociology’s Forsaken Frontier*, by Pass (2004a) for a complete discussion of the arguments.

From an academic view these excuses or so-called “good” reasons, have no basis of fact. Even though these critics refer to the “study of space”, as being the effort of astrosociology, it is not really space that astrosociologist’s explore, rather it is what “space” means to people or groups of people, and the impact it has upon society. It is the meaning given to outer space and its exploration by a global society. If

astrosociology were to focus only on what space meant to people, what meanings societies place on space exploration, and/or on what space commercialization means to people, or what affects space exploration have had on the macro and micro aspects of our society, the effort could not be denied as viable and worth while study by any intelligent thinker. This study, seen just from the point of clarification of “meaning” would qualify as a sociological study (and more accurately an astrosociological study) and would completely fit within the point of view or major sociological perspective we know as symbolic-interaction.

MAIN FEATURES OF ASTROSOCIOLOGY IN THE CLASSROOM

The astrosociology course can be presented in face-to-face classroom sessions or in online distance learning formats. It will include the major theoretical perspectives of sociology as they apply to the subject matter of space exploration and commercialization. It will follow in context the macro impact on the major institutions, groups and organizations of society. The major perspectives will include *ecological theory*, which studies the adaptation and reorganization of a society to its changing environment; the *structural-functional* view, which analyzes any societal phenomenon from the standpoint of organization, purpose, development, maintenance and change; the *social conflict* perspective, which examines societal elements pertaining to the existing, internal, or external competition and conflict that lead to societal change; the *symbolic-interactionist* theory, which examines societal factors with regard to the meaning that is placed upon human interaction, and the symbolic significance of these meanings; the *Social Exchange view*, which studies the social interaction between two or more people, based on the efforts of each person to maximize their rewards and minimize their punishments; and *developmental theory*, which is the study of a dynamic, progressive, and ever changing society and the effects of these changes on individuals, groups and social institutions.

This course will apply the basic sociological paradigms to space exploration, commercialization, and the impact on society. The major theoretical approaches will be woven into each unit to bring the student back to the basic understanding of the concepts and the application of the sociological perspectives. Sociological perspectives and theoretical paradigms are time-tested concepts that have been presented in many different ways in course material and addressed by many different theorists and professors over the years. The focus on space exploration from a sociological approach (astrosociology) is a unique treatment of solid social science concepts and theories applied to the developing understanding of the impact of space exploration and commercialization on society.

Internet site links featuring www.astrosociology.org and other references will be available for home and in-class research by the student and will be cited at the end of each Unit. A combination of short answer essay, small group synthesis papers, and lecture topic application papers will also be featured for assessment. Case study scenarios relevant to the chapter material will be included for class review in each Unit.

This course is initially intended for students of space science, aerospace engineering and space operations management degree programs offered at graduate and undergraduate colleges and universities. Any institution willing to offer a modern approach to sociology can use it as a core or as an elective course. Academic institutions that offer aerospace and space related programs are the primary markets.

This course would also be appropriate as an alternative sociology core course in community colleges, junior colleges, and baccalaureate programs. It could also be used as a primary text in an elective course in all colleges where applied sociology courses are offered. This course will appeal to space enthusiasts, physical, natural, and social scientists, and other interested parties. It is anticipated that other sociologists, practitioners, and students of the social, natural, and physical sciences will use this work as a reference for their own studies to advance understanding of the societal impact of space operations.

SUMMARY OF SYLLABUS UNITS

In the first unit, an introduction to the course will be presented in the first session. Astrosociology and its concepts will be identified, defined, and explained. This session will provide the opportunity for discussion of the science of social behavior and introduce the concepts and theories found in most sociological studies. It will also include a synthesis and integration with concepts of astrosociology.

The second unit of the course will present the sociological perspectives and social institutions. The session will also review the major theoretical paradigms and discuss how these models fit within the discipline of astrosociology and how they can be used to study the relationship between space exploration and the major institutions of society.

In the third unit of the course, the popular reasons for and against the exploration of space will be identified, presented, and explored. An investigation of the rationale for space exploration and the arguments against it from selected societal groups and institutions will be discussed.

In the fourth unit of the course, the impact of space exploration on society from the viewpoint of technological advancement and change will be discussed. The rise of science and technology to the status of a major social institution will be considered and discussed.

In the fifth unit of the course, after a short answer essay mid-term exam, a sociological view of government policy, support, control, and motivation in the space program will be discussed. This session will address the presidential policy mandates from John F. Kennedy Jr., to Barack H. Obama. Congressional and Senatorial hearings on space exploration will be examined and analyzed in light of major and relevant sociological perspectives. The modern space exploration initiative will be outlined.

In unit six of the course, the relationship between science fiction and science fact, the contribution science fiction has made to actual space exploration, and impact both have had on societal thought and meaning will be discussed.

In unit seven, the mass media's interpretation of U.S. and international space efforts and the societal impact and effects the media has had and continues to have will be examined. The session will review the media treatment of space exploration and discuss societal values, beliefs, and attitudes.

Unit eight will begin with a dynamic Power Point presentation titled, *NASA: Starship to Mars or Bureaucratic Dinosaur?* This session will present a sociological study on the efforts of NASA and the future of the commercial space industry. The potential of government supported and private space efforts will be discussed.

Unit nine will explore the social implications of the possible discovery of extraterrestrial intelligence. A theoretical narrative of the impact on the major social institutions of government, education, religion, the economy, and the family will be presented. The session will compare and contrast student attitudes and beliefs regarding the discovery of extraterrestrial life as being a *Scientific Breakthrough or Social Breakdown*.

Unit ten will address and discuss ecological and ethical issues related to space exploration and commercialization. In addition, a basic introduction to and explanation of space law will be presented, with the driving question being - Who owns Space?

The last unit will summarize the main points made during the course and will offer implications and conclusions. Astrosociology resources will be distributed and a final short-answer essay exam will be administered to the students.

APPENDICES: SAMPLE COURSE SYLLABUS

Ken Duffy, Ph.D., MSW, LPC

Any College or University

Sociology Department

SOC 700AS – Sociology of Space Exploration

Semester/Term Year

I. Locator Information:

Instructor: Dr. Ken Duffy
Course # and Name: SMO 5990 - Issues in Space Operations - Astrosociology: Social Issues & Societal Impact of Space Exploration and Commercialization.
Office Location: TBA
Semester Credit Hours: 3
Office hours: TBA
Term, Day and Time: Fall, 2010, Tue/Thurs 6 – 8:55 PM
Office Phone: 910-436-0014
Total Contact Hours for Class: 36
Email address: kenduffy@charter.net

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| <p>Policy on Electronic Mail: This College or University provides to each student, free of charge, an electronic mail account (username@thecollegeoru.edu) that is easily accessible via the Internet. The university has established email as the primary mode of correspondence between university officials and enrolled students. Inquiries and requests from students pertaining to academic records, grades, bills, financial aid, and other matters of a confidential nature must be submitted via email. Inquiries or requests from personal email accounts are not assured a response. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail. Rules and regulations governing the use of email may be found at www.thecollegeoru.edu/PDFs/EmailPolicyFinal.pdf</p> |
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II. Course Description:

SMO 5990 - Issues in Space Operations - Astrosociology: Social Issues & Societal Impact of Space Exploration and Commercialization.

Current and significant issues in space operations are examined. The course focuses on existing theories and practices, with emphasis given to new and emerging topics in the field. Course may be repeated for credit if content differs.

This course will explore the impact of space operations (exploration and commercialization) on society. The concept of Astrosociology is the central focus as it involves the relationships and mutual influences between astrosocial phenomena and non-astrosocial (other social) phenomena.

Prerequisites: Documented approval from academic advisor.

III. Disabled Student Services:

In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability to please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st Floor); 910-672-1203.

IV. Textbook:

Duffy, K.F (2008). *Space Exploration and Commercialization: An Astro-sociological Perspective*, [Manuscript under development and not yet published], Department of Sociology, Fayetteville State University, Fayetteville, NC.

V. Student Learning Outcomes

Upon completion of this course, students will be able to:

1. Understand and apply the major sociological perspectives (Structural, Conflict, and Symbolic) to astrosocial phenomena and the micro/major aspects of society.
2. Understand the concept of astrosocial phenomena and the impact on society through discoveries, new technology, policy, and social/cultural change.
3. Understand the concept of non-astrosocial forces (including norms and values) and how these combine to influence astrosocial phenomena in terms of direction, priority, and other aspects of social change.
4. Understand how astrosocial activities and non-astrosocial forces are organized and pursued by individuals, organizations, social institutions, and global societies.
5. Understand how social interactions (cooperation, accommodation, and conflict) between the astrosocial and non-astrosocial sectors contribute to various forces of social change

VI. Course Activities, Requirements and Evaluation Criteria

Brief lectures and presentations by the course instructor will be combined with small group and large group discussions and collaborative exercises on assigned topics and lecture material. Students will be required to write activity, interpretation and synthesis papers related to the course material, lectures, and group discussions. Mid-term and final exams will consist of short answer essay questions.

1. Active Attendance and Participation: 20 points
2. Group Discussion/Activities/Paper: 20 points
3. Mid Term Exam (MTX) – 20 points
4. Class Lecture Interpretation and Synthesis Paper – 20 points
5. Final Exam (FX) – 20 points

VII. Course Outline and Assignment Schedule

- Unit One – Introduction to the Course - Introductions and Expectations - Syllabus Review, Terms and Concept Definitions - Lecture: Introduction to Astrosociology
- Unit Two – Astro-Sociological Perspectives and Social Institutions - Lecture: The Major Sociological/Theoretical paradigms and their relationship to space exploration and the concept of Astrosociology. Small Group Topic Consensus – Large Group Topic Discussion
- Unit Three – The Final Frontier – Oh, really...Why? - Lecture: The reasons for and against the exploration of space from various societal groups and institutions. - Small Group Topic Consensus – Large Group Topic Discussion
- Unit Four – Technology – The Rise of a Social Institution - Lecture: The impact of space exploration on society from the viewpoint of technological advancement and change. - Small Group Topic Consensus – Large Group Topic Discussion
- Unit Five – Presidential Mandate – Congressional Debate: From JFK Jr. to GWB - Lecture: A sociological view of government policy, support, control, and motivation in the Space program. - Small Group Topic Consensus – Large Group Topic Discussion – Mid Term Exam (MTX).
- Unit Six – From Science Fiction to Science Fact: The societal need to make it real. - Lecture: The sociological significance and relationship of science fiction to science fact and the

- contributions to the reality of space exploration. - Small Group Topic Synthesis/Consensus – Large Group Topic Discussion
- Unit Seven – Star Trek and Star Travel: The Media Spin from Captain Kirk to Captain Archer - Lecture: The Media’s interpretation of space exploration efforts and the impact/effect they have on society. - Small Group Topic Consensus – Large Group Topic Discussion
- Unit Eight – NASA: Starship to Mars or Bureaucratic Dinosaur? - Lecture: A sociological study of the National Aeronautics and Space Administration (NASA), and the commercial space industry.- Small Group Topic Consensus – Large Group Topic Discussion
- Unit Nine – SETI: Scientific Breakthrough or Social Breakdown? - Lecture: Discussion of the social implications in the event of the discovery of extraterrestrial intelligence. A theoretical narrative of the impact on the major social institutions of government, education, religion, the economy, and the family will be presented
- Unit Ten – Ecological Issues, Ethical Issues, and Space Law - Lecture: Who Owns Space? Implications – Conclusions – Course Summary - Astrosociology Resources – Astrosociology.org website – Final Exam (FX).

VIII. Teaching Strategies

Brief lectures with large and small group collaborative exercises will be combined with short answer essay testing at the mid term and final sessions, small group presentations, and topic/subject synthesis papers.

REFERENCES

- Pass, Jim, “Enhancing Space Exploration by Adding Astrosociology to the STEM Model,” presented at *AIAA Space 2007*, Long Beach, CA, September 20, (2007a).
- Pass, Jim, “Educating Astrosociologists: The Need to Bring Outer Space into Social Science Classrooms,” presented at *PSA 2007*, Oakland, CA, (2007b).
- Pass, Jim, “Space: Sociology's Forsaken Frontier,” presented at *California Sociological Association (CSA) Conference*, Riverside, CA, October 16, (2004a).
- Pass, Jim, “Inaugural Essay: The Definition and Relevance of Astrosociology in the Twenty-First Century; Part 2: Relevance of Astrosociology as a New Subfield of Sociology,” presented at the *California Sociological Association (CSA) Conference*, Riverside, CA, October 16, (2004b).
- Pass, Jim, “Inaugural Essay: The Definition and Relevance of Astrosociology in the Twenty-First Century; Part 1: Definition, Theory and Scope,” discussed at the *American Sociological Association (ASA) Annual Meeting*, August, (2004c).