

## *JINS 362 Extraterrestrial Life*

When I look at thy heavens, the work of thy fingers,  
the moon and the stars which thou hast established;  
What is man that thou art mindful of him,  
and the son of man that thou dost care for him?

*Psalms 8: 3-4*

*Glendower:* I can call spirits from the vasty deep.  
*Hotspur:* Why, so can I, or so can any man,  
but will they come when you do call for them?

Shakespeare  
*Henry IV, Part I*  
*Act 3 scene i*

The eternal silence of these infinite spaces frightens me

Blaise Pascal (1546-1601)

Sometimes I think we're alone. Sometimes I think we're not. In  
either case, the thought is staggering.

Buckminster Fuller (1895 -1983)

Where is everybody?

Enrico Fermi (1901-1954)

If 1 percent of civilizations can survive technological  
adolescence, ... the number of extant civilizations in the  
Galaxy is in the millions.

Carl Sagan (1934-1996)

Extraterrestrial intelligent beings do not exist.

Frank J. Tipler, 1981

# JINS 362 Extraterrestrial Life

BT202A, TTh, 10:30-11:50

Instructor: Dr. Peter Ramberg

3082 Magruder Hall

x4620, ramberg@truman.edu

Office Hours: T 1-3, F 9:30-11:30, by chance, or by appointment

## Introduction

One of the most pervasive beliefs of the modern world is that life on the earth is not unique. The search for extraterrestrial life and exobiology (or astrobiology) are legitimate subdisciplines within astronomy and biology, and images of imagined extraterrestrials permeate popular culture in books, television, and movies. Yet, despite the near universality of the belief in extraterrestrial life, we actually do not know, in fact, if life exists in any form outside of the earth. In this course, we will look at the issue of extraterrestrial life from a variety of perspectives, in particular many of the arguments for and against its existence. Because the debate is open-ended (we haven't yet met or heard from any extraterrestrials—at least that we know of!), there remains much room for continued debate on the issue.

## Textbooks:

Michael J. Crowe. *The Extraterrestrial Life Debate: Antiquity to 1915: A Sourcebook*, unpublished manuscript, 2005 (used by kind permission of Dr. Crowe of the University of Notre Dame).

Steven J. Dick. *Life on Other Worlds: The 20th-Century Extraterrestrial Life Debate*. Cambridge: Cambridge University Press, 1998.

Iris Fry. *The Emergence of Life on Earth: a Historical and Scientific Overview*. New Brunswick, NJ: Rutgers University Press, 2000.

William Whewell. *Of the Plurality of Worlds*. Edited by Michael Ruse. Chicago: University of Chicago Press, 2001.

Stephen Webb. *If the Universe Is Teeming with Aliens-- Where Is Everybody? Fifty Solutions to the Fermi Paradox and the Problem of Extraterrestrial Life*. New York: Copernicus Books, 2002.

Michael Harvey. *The Nuts and Bolts of College Writing*. Indianapolis, IN: Hackett, 2003.

There is a course reader, and some readings will also be available electronically on JSTOR.

## Course Objectives:

The primary objective of the course is the production of a major position paper on the issue of extraterrestrial life. Throughout the semester, we will be encountering arguments for and against the existence of extraterrestrial life or intelligence from historical, scientific, philosophical, and

theological perspectives. Your goal is to evaluate each of these arguments, choose those which you find most compelling and compose your own position on the existence of extraterrestrial life.

## **Course Mechanics:**

*Readings:* This course will have a significant amount of reading, but there will be no exams and no outside research projects to add to it. Treat the course as a research project in which your topic and the relevant readings are all chosen, and all that remains is reading and evaluating them. Some works will be based on physics, astronomy, or biology. Don't panic, read them primarily for the overall arguments contained in them, and we will discuss the specifics in class, if necessary.

*Writing Assignments:* During the first week of class, you will write a one-page statement paper outlining your initial thoughts on the existence of extraterrestrial life. Throughout the semester, you will then write four papers (about 1500 words each) treating various approaches to the issue of extraterrestrial life. Your fellow students will edit two of these drafts and I will edit the other two drafts for content and argument. The fifth and last paper will be a longer essay (about 3500 words) stating your "final" statement on extraterrestrial life, in which you will be expected to extensively revise and rewrite your initial papers, and not simply correct them.

*Attendance/Participation:* In order to keep track of attendance and the progress in your reading, there will be periodic (random) in-class writing assignments based on the assigned reading for the day (at least one per week). These will be turned in, but not rigorously graded—I will look primarily at whether you read the material or not. The class will be a mixture of lecture and discussion. Please feel free to participate by asking questions, answering questions, or raising points at any time during class.

*Student Presentations:* You will be required to present to the class a written and oral summary of an optional reading related to the topic of the assigned reading for the day. More specific information will be forthcoming.

### **Grading Scheme (There is a total of 1000 points):**

Initial Statement Paper: 50 points  
Drafts of Paper: 320 points (80 points each)  
Peer reviews: 80 points (40 points each)  
In-class presentation: 150 points  
Final Paper: 200 points  
Participation: 200 points

### **Tentative Due Dates on Papers**

Each paper will be due in class shortly after we complete each portion of the course. Exact dates will be determined later. The final paper will be due on May 9, at the scheduled time of the final exam.

## Tentative Schedule

Topics listed here are general and subject to change. Reading assignments for each day will be given on separate handouts.

Date	Subject
Jan. 18, 20	Introduction Ancient and Medieval concepts of plurality
Jan. 25, 27	The Copernican Principle, 1543-1700
Feb. 1, 3	Extraterrestrials in the eighteenth century Extraterrestrials in the eighteenth century (con.)
Feb. 8, 10	<b>Discussion: Paper 1 due in class</b> The early nineteenth century
Feb. 15, 17	William Whewell and the denial of plurality Pluralism defended: the late nineteenth century
Feb. 22, 24	Alfred Russel Wallace The rise and fall of the canals on Mars
March 1, 3	<b>Discussion: Paper 2 due in class</b> Mars meets the space age
March 8, 10	The <i>Viking</i> landers, 1976 Martian meteorites in the Antarctic, 1996
March 15, 17	<b>Spring Break, no class</b>
March 22, 24	The Search Continues, 1997-2004; Falsifiability and verifiability Exobiology and Panspermia
March 29, 31	<b>Discussion: Paper 3 due in class</b> The Oparin-Haldane Hypothesis and Organic Soups
April 5, 7	The Biologists speak Is Life by Design, Chance, or Miracle?
April 12, 14	Is Life by Design, Chance, or Miracle? <b>Student Research conference, No class April 14</b>
April 19, 21	<b>Discussion: Paper 4 due in class</b> The SETI Program—optimists and pessimists
April 26, 28	The Fermi Paradox: Where is Everybody?
May 3, 5	The Fermi Paradox (con.);The Anthropic Principle Is the principle of plenitude defensible?
May 9	Papers due at time of final exam (9:30 AM), Final discussion and conclusion

## Books on reserve

Crowe, Michael J. *The Extraterrestrial Life Debate, 1750-1900: The Idea of a Plurality of Worlds from Kant to Lowell*. Cambridge: Cambridge University Press, 1986. (two copies)

David W. Deamer, ed. *Origins of Life: The Central Concepts*. Boston, 1994.

Dick, Steven J. *Plurality of Worlds: The Origins of the Extraterrestrial Life Debate from Democritus to Kant*. Cambridge: Cambridge University Press, 1982.

Dick, Steven J. *The Biological Universe: The Twentieth-Century Extraterrestrial Life Debate and the Limits of Science*. New York: Cambridge University Press, 1996. (two copies)

Steven J. Dick. *Life on Other Worlds: The 20th-Century Extraterrestrial Life Debate*. Cambridge: Cambridge University Press, 1998. This is an abridged version, without footnotes, of *The Biological Universe*

Donald Goldsmith. *The Quest for Extraterrestrial Life: A Book of Readings*. Mill Valley, Calif.: University Science Books, 1980.

Guthke, Karl Siegfried. *The Last Frontier: Imagining Other Worlds, from the Copernican Revolution to Modern Science Fiction*. Translated by Helen Atkins. Ithaca, N.Y.: Cornell University Press, 1990.

Stephen Webb. *If the Universe Is Teeming with Aliens-- Where Is Everybody? Fifty Solutions to the Fermi Paradox and the Problem of Extraterrestrial Life*. New York: Copernicus Books, 2002.

William Whewell. *Of the Plurality of Worlds*. Edited by Michael Ruse. Chicago: University of Chicago Press, 2001.