

University of Notre Dame
University Seminar PLS 180H-01
The Extraterrestrial Life Debate:
A Historical Perspective

Autumn, 2004: 3:30–4:45 Tues./Thurs.—925 Flanner
Revised Syllabus

Professor Michael J. Crowe—516 Flanner—1-6212—crowe.1@nd.edu
Office Hours: Wednesday 1:30 to 3 (I'm around most afternoons)

Required Materials

1. M. J. Crowe, *The Extraterrestrial Life Debate—Antiquity to 1915: A Source Book* (Poverty Publishing Company). This is available as course packet 37 at the LaFortune Copy Shop.
2. Charles Van Doren, *History of Knowledge: Past, Present, and Future* (New York: Ballantine Books, 1991).
3. Monica Grady, *Astrobiology* (Washington, D.C.: Smithsonian Institution Press, 2001).

Recommended Books

1. 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).
2. Michael J. Crowe, *The Extraterrestrial Life Debate 1750–1900: The Idea of a Plurality of Worlds from Kant to Lowell* (Mineola, New York: Dover, 1999).

Books on Reserve in the Reserve Book Room in Hesburgh Library

Bartholomew, Robert, and George Howard, *UFOs and Alien Contact: Two Centuries of Mystery* (Amherst, New York: Prometheus Books, 1998). Professor Howard is a member of Notre Dame's Department of Psychology.

Bennett, Jeffrey, Seth Shostak, and Bruce Jakosky, *Life in the Universe* (San Francisco: Addison Wesley, 2003). This is one of two leading texts for science courses on astrobiology.

Brownlee, Donald, and Peter D. Ward, *Rare Earth: Why Complex Life Is Uncommon in the Universe* (New York: Copernicus, 2000).

Crowe, Michael J., *The Extraterrestrial Life Debate 1750–1900: The Idea of a Plurality of Worlds from Kant to Lowell* (Cambridge, England: Cambridge Univ. Press, 1986); (Mineola, New York: Dover, 1999). Two copies on reserve.

Crowe, Michael J., *Reader Regarding the Extraterrestrial Life Debate*.

Darling, David, *The Extraterrestrial Encyclopedia: An Alphabetical Reference to All Life in the Universe* (New York: Three Rivers Press, 2000).

Dick, Steven J., *Life on Other Worlds: The 20th-Century Extraterrestrial Life Debate* (Cambridge, England: Cambridge Univ. Press, 1998). To some extent, this is an abridged version of Dick's *Biological Universe*. Provides a brief but useful bibliography.

Dick, Steven J., *The Biological Universe: The Twentieth-Century Extraterrestrial Life Debate and the Limits of Science* (Cambridge, England: Cambridge Univ. Press, 1996). This is the most thorough study of the twentieth-century ET debate.

Goldsmith, Donald, *The Quest for Extraterrestrial Life: A Book of Readings* (Mill Valley, Cal., 1980). Among the 58 selections in this anthology, nearly all are from the twentieth century.

Goldsmith, Donald, and Tobias Owen, *The Search for Life in the Universe* (3rd edition) (Sausalito, CA: University Science Books, 2002). This is one of two leading texts for science courses on astrobiology.

Gonzalez, Guillermo, and Jay Wesley Richards, *Privileged Planet: How Our Place in the Cosmos Is Designed for Discovery* (Washington, D.C.: Henry Regnery, 2004). Gonzalez is an astronomer, Richards a philosopher.

Grady, Monica, (Washington, D.C.: Smithsonian Institution Press, 2001), A judicious, thorough, and brief survey of what is presently known in astrobiology.

Guthke, Karl S., *The Last Frontier: Imagining Other Worlds from the Copernican Revolution to Modern Science Fiction* (Ithaca: Cornell Univ. Press, 1990). A fine presentation of the history of ideas of extraterrestrial life.

- Hennessey, Roger, *Worlds without End: The Historic Search for Extraterrestrial Life* (Stroud, England: Tempus Publishing Ltd., 1999). Among the brief histories of the ET debate, this seems to me to be the best.
- Lamb, David, *The Search for Extraterrestrial Intelligence: A Philosophical Inquiry* (New York and London: Routledge, 2001).
- Moffitt, John F., *Picturing Extraterrestrials: Alien Images in Modern Mass Culture* (Amherst, New York: Prometheus Books, 2003). The author is an art historian at the Univ. of New Mexico, who is also very knowledgeable about claims regarding UFOs, alien abduction, and ideas of extraterrestrial life. He draws effectively on his background in art history for some perspectives that are not to be found elsewhere.
- Regis, Edward (ed.), *Extraterrestrials: Science and Alien Intelligence* (Cambridge: Cambridge Univ. Press, 1985). Edited by a philosopher and with philosophical orientation.
- Ross, Hugh, Kenneth Samples, and Mark Clark, *Lights in the Sky and Little Green Men: A Rational Christian Look at UFOs and Extraterrestrials* (Colorado Springs: Navpress, 2002).
- Webb, Stephen, *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). Webb is a British scientist at the Open University.
- Whewell, William, *Of the Plurality of Worlds*, ed. by Michael Ruse (Chicago: Univ. of Chicago Press, 2001). This is a new edition of the classic volume published anonymously in 1854 by Whewell.

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Some Websites Relevant to the Extraterrestrial Life Debate

Note: This is a small sample. Students finding others that seem excellent or finding that any of these no longer exists or are not reliable are encouraged to email me.

Astrobiology Magazine	http://www.astrobio.net/
Astrobiology Society of Britain	http://www.astrobiologysociety.org/
Astrobiology Web	http://www.astrobiology.com/
Astronomy Place	http://www.aw-bc.com/astronomyplace/
Australian Center for Astrobiology	http://aca.mq.edu.au/
Marsbugs: The Electronic Astrobiology Newsletter	http://www.lyon.edu/projects/marsbugs/
NASA Astrobiology Institute	http://nai.arc.nasa.gov/
Planetary Society	http://www.planetary.org/
SETI Institute	http://www.seti.org/
SETI League	http://www.setileague.org/

Subsection on the Search of Extrasolar Planets:

Carnegie and California Site on Exoplanet Search	http://exoplanets.org/
Extrasolar Planets Encyclopaedia	http://www.obspm.fr/encycl/encycl.html
NASA Site Regarding Search for Exoplanets	http://planetquest.jpl.nasa.gov/index.html

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Class Schedule

1. Aug. 24 **Introductory Materials, e.g., Goals of the Course, ET Debate, Nature of History, Methodology of Science, etc.**

Ancient and Medieval Period

2. Aug. 26 **The Ancient Period**

Read: *History of Knowledge*, Chs. 1–3. (Do your best with this long assignment; if you cannot read it in time, finish it over the weekend.)

At this class, students will select the topic for their reports. Look over the list given below carefully.

3. Aug. 31 **The ET Debate Begins**

Read: *Source Book*, Preface and Ch. 1, Chiefly Aristotle and the Atomists; *History of Knowledge*, Chs. 4.

For this class, write a 2–page paper reflecting on the question “What is history?” In this paper, you should deal with such issues as the nature and method of history, its various forms and level of

certainty attained, its functions and limitations, and what significance it has. You may also wish to comment on your relations to history as an intellectual discipline.

4. Sep. 2 **ET Debate and the Medieval World**

Read: *Source Book*, Ch. 2 Chiefly Augustine, Aquinas, Oresme, Vorilong, and Cusa, and *History of Knowledge*, Chs. 5.

Intellectual Developments from 1450 to 1700

5. Sep. 7 **Renaissance, Reformation, and Scientific Revolution**

Read: *History of Knowledge*, Chs. 6–8.

Student report on the meaning of the terms “Renaissance,” “Reformation,” and “Scientific Revolution.”

6. Sep. 9 **The Opening of the ET Debate in the Modern World**

Read: *Source Book*, Ch. 3 Chiefly Copernicus and Bruno, and Ch. 4, Chiefly Galileo, Kepler, Descartes, and Pascal

Student report on Giordano Bruno.

7. Sep. 14 **Growing Acceptance of Extraterrestrials**

Read: *Source Book*, Ch. 5 Fontenelle and Huygens and Ch. 6 Newton, Bentley, and Derham

Write a 2 page paper reflecting on the question “What is science?” In this paper, you should deal with such issues as the nature and method of science, its various forms and level of certainty attained, its functions and limitations, and what significance it has. You may also wish to comment on your relations to science as an intellectual discipline.

The Enlightenment

8. Sep. 16 **The Nature of the Enlightenment**

Read: *History of Knowledge*, Ch. 9.

Student report: Carl Becker, *The Heavenly City of the Eighteenth-Century Philosophers*.

9. Sep. 21 **Extraterrestrials and the Astronomers**

Read: *Source Book*, Ch. 7 Chiefly Wright, Kant, Lambert, Ferguson, and William Herschel.

10. Sep. 23 **New Phases in the ET Debate**

Read: *Source Book*, Ch. 8 Chiefly Voltaire, Pope, Gray, Young, Coleridge, Wordsworth, Franklin, Adams, Rittenhouse, Swedenborg, and Paine

11. Sep. 28 **First In-class Debate.**

Submit in this class a **four-page paper** in which you take a stance in the extraterrestrial life debate limiting your arguments to information available before 1800. Your essay should show careful reading of the materials up to this point. It should not, however, simply be a repetition of the arguments, but rather should advocate a specific position on such matters as whether ETI’s exist, whether religious issues are involved, and what this tells us about humanity, the universe, God, etc. We will devote this class to discussing the arguments presented in these essays.

Nineteenth-Century World

12. Sep. 30 **Movements of Thought in the Nineteenth Century**

Read: *History of Knowledge*, Ch. 10.

13. Oct. 5 **Extraterrestrials and Religious Thought in the First Half of the Nineteenth Century Part 1**

Read: *Source Book*, Ch. 9 Chiefly Shelley, Chalmers, Dick, and R. A. Locke.

Note: Part of this class will consist of a presentation entitled “The Great Moon Hoax Was Not a Hoax.”

14. Oct. 7 **Extraterrestrials and Religious Thought in the First Half of the Nineteenth Century Part 2**

Read: *Source Book*, Ch. 10 Chiefly John Herschel, Whewell, Tennyson, Comte, Emerson, Smith, and White.

15. Oct. 12 **Presentation on “The Surprising History of Ideas of Life on the Sun (and Stars)”**

16. Oct. 14 **The Attack on the Extraterrestrials Launched from Trinity College, Cambridge, and the Counterattack**

Read: *Source Book*, Ch. 11 Chiefly Whewell, Brewster, and John Herschel.

Student report on Whewell’s book.

Fall Break

17. Oct. 26 **Extraterrestrials in the Latter Half of the Nineteenth Century**

Read: *Source Book*, Ch. 12 Chiefly Huggins, Proctor, and Flammarion and Ch. 13 Chiefly Hardy, Tennyson, Dostoyevsky, Twain, and Wallace.

Student report on the theory of evolution, A. R. Wallace, and extraterrestrials,

18. Oct. 28 **The Canals of Mars Controversy**

Read: *Source Book*, Ch. 14 Chiefly Schiaparelli, Lowell, Maunder, and Antoniadi

The Extraterrestrial Life Debate since 1915.

19. Nov. 2 **Twentieth-Century World**

Read: *History of Knowledge*, Ch. 11–14 (note: Ch. 15 is not required).

20. Nov. 4 **Relevant Developments in Astronomy in the Twentieth Century: Galactic System, Expanding Universe, Radio Astronomy, Extra-Solar Planetary Systems.**

Read: Handout on ET Debate Since 1915; The Drake Equation: Presentation on Web¹ and begin reading Monica Grady, *Astrobiology*.

Student report on extra-solar planetary systems.

21. Nov. 9 **Methodological Issues**

Read: Handout on the Hypothetico-Deductive Method and Roy Mash, “Big Numbers and Induction in the Case for Extraterrestrial Intelligence,” *Philosophy of Science*, 60 (1993), 204–222.² Also available in *Reader*.

Student report on André Kukla, “SETI: On the Prospects and Pursuitworthiness of the Search for Extraterrestrial Intelligence,” *Studies in History and Philosophy of Science*, 32 (2001), 31–67.

22. Nov. 11 **UFOs: Have the Extraterrestrials Come to (for) Us?**

Readings: Steven J. Dick, *Life on Other Worlds: The Twentieth-Century Extraterrestrial Life Debate*, Ch. 5, “The UFO Controversy and the Extraterrestrial Hypothesis,” pp. 137–168. On reserve.

Student report on Bartholomew and Howard, *UFOs and Alien Contact: Two Centuries of Mystery* and on either

(1) Moffit, *Picturing Extraterrestrials: Alien Images in Modern Mass Culture*, or

(2) Ross, Samples, and Clark, *Lights in the Sky and Little Green Men: A Rational Christian Look at UFOs and Extraterrestrials*.

23. Nov. 16 **The Question of Extraterrestrial Intelligent Life as Related to Evolutionary Theory and to Theories Regarding the Origin of Life**

Note: Professor Phillip Sloan will be a guest teacher for this class.

Read: Stephen Jay Gould, “Mind and Supermind” and “SETI and the Wisdom of Casey Stengel” in Gould’s *The Flamingo’s Smile: Reflections in Natural History* (New York: Norton, 1985), pp. 392–402, 403–413. Available in *Reader*.

24. Nov. 18 **Religious Issues: Davis, O’Meara, George, and Tanzella-Nitti**

Read: 1. Charles Davis, “The Place of Christ,” in *Reader*.

2. Thomas O’Meara, “Christian Theology and Extraterrestrial Intelligent Life,” in *Reader*.

3. Marie I. George, “The Catholic Faith, Scripture, and the Question of the Existence of Intelligent Extra-terrestrial Life” in *Faith, Scholarship, and Culture in the 21st Century*, edited by Alice Ramos and Marie I. George. Washington: The Catholic University of America Press, 2002.³ Also available in *Reader*

4. Giuseppe Tanzella-Nitti, “Extraterrestrial Life” in *Interdisciplinary Encyclopedia of Religion and Science*, 7-22-2003.⁴ Also available in *Reader*.

Student report on the position of C. S. Lewis in the ET debate, including his space trilogy.

25. Nov. 23 **The Present State of Astrobiology**

Read: By this date, you should have finished reading Monica Grady, *Astrobiology*.

¹Available at <http://www.astrobio.net/news/article610.html>

²Available on the web at

<http://links.jstor.org/sici?sici=0031-8248%28199306%2960%3A2%3C204%3ABNAIIT%3E2.0.CO%3B2-8>

³Available on the web at <http://www.unav.es/cryf/georgemaritain.html>

⁴Available on the web at <http://www.disf.org/en/Voci/65.asp>

Student report on Brownlee and Ward, *Rare Earth*.

Student report on Gonzalez and Richards, *Privileged Planet*.

26. Nov. 30 **Optimists versus Pessimists: Sagan, Tipler, Brownlee and Ward, Naeye**

Visit the SETI website (<http://www.seti.org/>), and follow your interests somewhat, but definitely go to “SETI Institute/Space.com Articles” and for the date 6/19/03 read: Jill Tarter’s “SETI Today: A Branch of Astrobiology.” (See <http://publish.seti.org/general/articles.php?id=128>)

Read (all are in the *Reader*): Frank Tipler, “A Brief History of the Extraterrestrial Intelligence Concept,” and his “Extraterrestrial Intelligent Beings Do Not Exist,” and Robert Naeye, “Are We Alone in the Universe.”⁵

Student report on Carl Sagan’s advocacy of extraterrestrials.

Student report on Stephen Webb, *Where Is Everybody?*, Ch. 1, “Where Is Everybody?”, Ch. 2, “Of Fermi and Paradox, and Ch. 3, “They Are Here” (pp. 1–60).

Student report on Webb, Ch. 4: “They Exist but Have Not Yet Communicated” (pp. 61–140).

Student report on Webb, Ch. 5: “They Do Not Exist” (pp. 141–232).

27. Dec. 2 **Second In-Class Debate**

Submit in this class a **six-page paper** in which you take a stance in the extraterrestrial life debate. Your essay should show careful reading of the materials up to this point. It should not, however, simply be a repetition of the arguments, but rather should advocate a specific position on whether extraterrestrial life, especially extraterrestrial intelligent life, exists. Your essay should provide evidence for the position you support. We will devote this class to discussing the arguments presented in these essays.

28. Dec. 7 **Conclusion**

Student Report Topics

Note: Each student will be expected to make one in-class report. The reports as presented verbally should be about 15 minutes in length. The written submission should be about 6 pages in length. Because these reports are a key feature of the learning experience for this class, students are to prepare one copy of the report for each member of the class. Because other matters will be scheduled for the same class, the timing on these reports is very important. Consequently, it will be wise to time and to practice your presentation before the class.

1. Report on various medieval philosophers and theologians, e.g., Thomas Aquinas, Nicole Oresme, and Nicholas of Cusa who discussed issues relating to extraterrestrials.
2. Report on the meaning of the terms “Renaissance,” “Reformation,” and “Scientific Revolution.”
3. Report on Giordano Bruno.(1548–1600). Bruno was an early advocate of extraterrestrials and was also burned at the stake by the Catholic Inquisition. He is sometimes portrayed as a martyr for extraterrestrials, but there is also evidence against this.
4. Book report on Carl Becker, *The Heavenly City of the Eighteenth-Century Philosophers*. This is a classic text in intellectual history and an engaging assessment of the Enlightenment.
5. Report on William Whewell and his *Of the Plurality of Worlds: An Essay* (1853), one of the classic books in the ET debate.
6. Report on Alfred Russel Wallace’s views on extraterrestrials. Wallace is known as the co-discoverer with Darwin of the theory of evolution by means of natural selection. Wallace also published some interesting and controversial views regarding ETIs.
7. Report on the discovery of extra-solar planets and the significance of this discovery for the ET debate. In 1995, the first planet outside of our solar system, i.e., orbiting another star, was discovered. Now astronomers have discovered over one hundred and twenty extra-solar system planets, but these planets seem in the vast majority of cases to be very different from the Earth. This raises questions as to whether these discoveries support belief in ETIs or go against it.
8. Report on methodological issues in the ET debate: see Roy Mash, “Big Numbers and Induction in the Case for Extraterrestrial Intelligence,” *Philosophy of Science*, 60 (1993), 204–222, which is available in pdf format on the web⁶ and André Kukla, “SETI: On the

⁵Available on the web at <http://www.xtec.es/recursos/astronom/mars/vidae.htm>

⁶See on the web

<http://links.jstor.org/sici?sici=00318248%28199306%2960%3A2%3C204%3ABNAIT%3E2.0.CO%3B2-8>

- Prospects and Pursuitworthiness of the Search for Extraterrestrial Intelligence,” *Studies in History and Philosophy of Science*, 32 (2001), 31–67.
9. Report on Robert Bartholomew and George Howard, *UFOs and Alien Contact: Two Centuries of Mystery* (Amherst, NY, 1998). Professor Howard teaches in Notre Dame’s department of psychology. The book offers an explanation of many of the sightings of UFOs and reports of alien abductions.
 10. Report on John F. Moffitt, *Picturing Extraterrestrials: Alien Images in Modern Mass Culture* (Amherst, New York: Prometheus Books, 2003), e.g., on his views regarding how ET ideas are presented in the media.
 11. Report on Hugh Ross, Kenneth Samples, and Mark Clark, *Lights in the Sky and Little Green Men: A Rational Christian Look at UFOs and Extraterrestrials* (Colorado Springs: Navpress, 2002). Ross holds a Ph.D. in astronomy, Clark in political science, and Samples was trained in philosophy and religion. Their presentation seems to come from the evangelical perspective.
 12. Report on the position of C. S. Lewis in the ET debate, including his famous space trilogy: *Out of the Silent Planet*, which focuses on Mars, *Perelandra*, which focuses on Venus, and *That Hideous Strength*, which is set on Earth, and the theological ideas incorporated in them.
 13. Report on Peter D. Ward and Donald Brownlee, *Rare Earth: Why Complex Life Is Uncommon in the Universe* (New York: Copernicus, 2000). Perhaps the most thorough and widely respected presentation of the idea that extraterrestrial intelligent life is quite rare.
 14. Report on Guillermo Gonzalez and Jay Wesley Richards, *Privileged Planet: How Our Place in the Cosmos Is Designed for Discovery* (Washington, D.C.: Henry Regnery, 2004).
 15. Report on Carl Sagan’s advocacy of extraterrestrials. Sagan until his death was the best known advocate of extraterrestrials during the latter half of the twentieth century.
 16. Report on Chapters 1–3 of 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).
 17. Report on Chapter 4 of Stephen Webb, *Where Are They?*
 18. Report on Chapter 5 of Stephen Webb, *Where Are They?*

Final Exam Essay (To be submitted at the time of the final exam):

Write a four-page essay on one of the following (Subject to change):

1. The extraterrestrial life debate has involved a number of religious issues. What are the most important of these issues? You may if you wish include your views on how one or more of these issues can be resolved.
2. It is sometimes maintained that various myths are associated with the extraterrestrial life debate, i.e., the widespread beliefs about the debate are in fact incorrect. List six such myths and build a case for the claim that they are myths and only myths.
3. The extraterrestrial life debate has involved a number of methodological issues. For example, we have seen that it involves the problem of forming inferences from a single instance (Earth), debates over whether the issue of the existence of ETI is primarily a scientific, metaphysical, or religious issue, how “Big Number” arguments are to be analyzed, the validity of analogical arguments, etc. Discuss some of these issues.
4. We have witnessed many of the developments in the history of the extraterrestrial life debate. In the course of this history, have scientific, philosophical, or religious ideas been most central? What patterns have you seen in the history of this debate?
5. It would seem possible to argue that whereas the various readings we have encountered about extraterrestrials tell us very little about ETs, for example, even whether they exist, these readings do tell us a good deal about humanity. What characteristics of humans emerge from these readings?
6. It is frequently claimed that the discovery of extraterrestrial intelligent life would have far reaching effects in our civilization. It is less often recognized that ideas of ETI have already become widespread in our culture and exerted significant influence. Illustrate this last claim.
7. We have encountered perhaps two dozen poets from Lucretius through Alice Meynell who have discussed extraterrestrial life ideas. Write an essay discussing the writings of some of these or other poets who have taken up issues relating to ETI.
8. Write an essay discussing how the course materials regarding extraterrestrials fit under the designation or relate to intellectual history. For example, have your readings given you insights into the thought or spirit of the middle ages or Enlightenment? You may also wish to comment on

whether the course materials can be seen as falling under a single discipline, e.g., the history of astronomy, or are they part of a much larger whole, e.g., history of biology, philosophy, theology, literature, etc.

Student Papers and Tentative Weighting of Assignments

Note: It is a requirement for all University Seminars that each student must complete 24 pages of writing during the course. Because the number of words per page can differ greatly, depending on font, font size, spacing, top, bottom, and side margins, etc., I have defined one page of type as about 450 words. What I am above all concerned about, however, is content. You should feel free to run over that length assigned for a paper.

What Is History? Paper 2 pages	7%
What Is Science? Paper 2 pages	7%
First Debate Paper 4 pages	11%
Second Debate Paper 6 pages	20%
Student Report Paper 6 pages	25%
Final Exam Paper 4 pages	15%
Class participation	<u>15%</u>
Total	100%

Policy on Absences

Because this class is a seminar in which class participation is central, it is very important that students be in attendance. Enrollment will be taken each day. Three lates will count as one absence. Your attendance record will play a role in your class participation grade.