

## **A Resource Guide for Debunking Astronomical Pseudo-Science**

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**Abstract.** Many of us who do public programs for the International Year of Astronomy are likely to meet people who have questions or want to challenge us about pseudo-scientific topics related to astronomy. Perhaps they have heard about the claim that the moon landings were a hoax, or have seen a light in the sky which puzzled them. Even those of us who have extensive training in astronomy often are not prepared for tackling such questions. To deal with such situations, here is a concise guide to printed and web resources that offer rational examination of some of these “fiction science” claims.

This is not a complete list, but a “first defense” for beginners. A fuller version can be found at: <http://www.astrosociety.org/education/resources/pseudobib.html>

### **1. General Readings**

**Frazier, Kenneth, ed.** *Paranormal Borderlands of Science*. 1981, Prometheus Books. *Science Confronts the Paranormal*. 1986, Prometheus Books. *The One Hundredth Monkey and Other Paradigms of the Paranormal*. 1991, Prometheus Books. Anthologies of articles from *The Skeptical Inquirer* magazine.

**Hines, Terence** *Pseudoscience and the Paranormal*, 2nd ed. 2003, Prometheus Books. An overview.

**Kurtz, Paul, ed.** *Skeptical Odysseys*. 2001, Prometheus Books. Essays by leading skeptics.

**Sagan, Carl** *The Demon-Haunted World*. 1995, Random House. Eloquent, impassioned, informed analysis.

**Shermer, M.** *Why People Believe Weird Things*. 1997, W. H. Freeman. Heartfelt ode to skeptical thinking.

**Stein, Gordon, ed.** *The Encyclopedia of the Paranormal*. 1996, Prometheus Books. Mammoth reference.

**Fraknoi, A.** “Dealing with Astrology, UFOs, and Faces on Other Worlds: A Guide to Addressing Astronomical Pseudoscience in the Classroom,” *Astronomy Education Review*, vol. 2, p. 150 (2004): <http://aer.noao.edu/cgi-bin/article.pl?id=70>

## 2. General Websites

**CSICOP** (Committee for the Scientific Investigation of Claims of the Paranormal) <http://www.csicop.org>  
Best site: many articles from *Skeptical Inquirer*, links, activities for young people, and much more.

### The Skeptic's Dictionary

<http://www.skeptdic.com>

An excellent source of brief reviews, references, and links on dozens of areas of pseudo-science. Especially good for beginners or students.

### The Bad Astronomy Site

<http://www.badastronomy.com>

Astronomer Phil Plait criticizes movies and TV shows with bad science, and has several responses to pseudoscience.

### Robert Schaeffer's Debunker Pages

<http://www.debunker.com>

Has lots of good information on UFO's and other pseudo-science. Some of the pages deal with political issues, however.

### Longer version of this list

<http://www.astrosociety.org/education/resources/pseudobib.html>

## 3. About Astrology

**Culver, Roger & Ianna, Philip** *Astrology: True or False*. 1988, Prometheus Books. The best skeptical book about astrology, full of useful information.

**Fraknoi, A.** "Your Astrology Defense Kit" in *Sky & Telescope*, Aug. 1989, p. 146. Intro with skeptical questions. (<http://www.astrosociety.org/education/astro/act3/astrology3.html#defense>)

### Astrology and Science Website

<http://www.astrology-and-science.com>

Ivan Kelly and others keep some of the best articles and research studies on this crowded site.

## 4. About UFO's

**Clancy, Susan** *Abducted: How People Come to Believe They Were Kidnapped by Aliens*. 2005, Harvard U. Press. Revealing psychological analysis: people who believe they were abducted.

**Frazier, Kenneth, et al., eds.** *The UFO Invasion*. 1997, Prometheus Books. A fine collection of skeptical articles, with especially good sections on the Roswell crash and crop circles.

- Klass, Philip** *UFO's Explained*. 1974, Vintage paperback. *UFO's: The Public Deceived*, 1983, Prometheus Books. *UFO Abductions: A Dangerous Game*. 1988, Prometheus. Klass was leading UFO investigator.
- Peebles, Curtis** *Watch the Skies: A Chronicle of the Flying Saucer Myth*. 1994, Smithsonian Institution Press.
- Shaeffer, Robert** *The UFO Sightings: The Evidence*. 1998, Prometheus Books. Thorough, responsible review by a respected investigator; a good source book for skeptics.
- Gleick, J.** "The Doctor's Plot" in *The New Republic*, 24 May 1994. A New York Times reporter examines the work of John Mack on UFO abductions and critiques the whole (<http://www.around.com/abduct.html>)
- Goldsmith, D. & Owen, T.** "Visitors to Earth: A Skeptics's Guide to UFO's" in *Mercury*, Jul/Aug. 1992, p. 135 and Sep/Oct. 1992, p. 155. A well-written overview.
- Jaroff, L.** "Did Aliens Really Land" in *Time*, June 23, 1997, p. 68. A skeptical analysis of the Roswell incident. (Many good Roswell articles can also be found on the CSICOP website.)
- Klass, P.** "A Field Guide to UFO's" in *Astronomy*, Sep. 1997, p. 39. Natural explanations for UFO's.

**Ian Ridpath UFO Skeptic Page**

<http://www.ianridpath.com/ufo/ufoindex.htm>

British science writer investigates and explains UFO reports, and discusses astronomical causes of UFO sightings.

**James Oberg's Space Age Myths**

<http://www.jamesoberg.com/ufo.html>

Veteran space journalist Oberg explains a number of UFO cases, including those involving astronauts and cosmonauts.

**5. About Crop Circles and the Face on Mars**

- Nickell, J.** "Circular Reasoning" in *Skeptical Inquirer*, Sep/Oct. 2002, p. 17. A concise review, by a skeptical investigator (<http://www.csicop.org/si/2002-09/crop-circles.html>).
- Schnabel, Jim** *Round in Circles*. 2003, Prometheus Books. A science writer gives the history and explores the fascination different kinds of people have for crop circles.
- Morrison, D.** "MGS Photographs 'Face on Mars' " in *Skeptical Inquirer*, Jul/Aug. 1998, p. 23.
- Posner, G.** "The Face Behind the Face on Mars: A Skeptical Look at Richard Hoagland" in *Skeptical Inquirer*, Nov/Dec. 2000, p. 20. The full story of the writer who has spread the myth.

**Posner, G.** “Putting a Better Face on the ‘Face’ on Mars” in *Skeptical Inquirer*, May/June 2001, p.65. Update.

**NASA Educational Discussion of “Face”**

[http://science.nasa.gov/headlines/y2001/ast24may\\_1.htm](http://science.nasa.gov/headlines/y2001/ast24may_1.htm)

**6. About the Full Moon and Lunacy, and the “Moon Hoax”**

**Culver, R., et al.** “Moon Mechanisms and Myths: A Critical Appraisal of Explanations of Purported Lunar Effects on Human Behavior” in *Psychological Reports*, vol. 62, p. 683 (1988).

**Moonstruck**

<http://faculty.washington.edu/chudler/moon.html>

An overview of the many lunacy studies.

**Phil Plait’s response to “Moon Hoax”**

<http://www.badastronomy.com/bad/tv/foxapollo.html>

**Hoax Comments by astronomer Jim Scotti**

[http://pirlwww.lpl.arizona.edu/~jscotti/NOT\\_faked/](http://pirlwww.lpl.arizona.edu/~jscotti/NOT_faked/)

**Science at NASA discussion of hoax**

[http://science.nasa.gov/headlines/y2001/ast23Feb\\_2.htm](http://science.nasa.gov/headlines/y2001/ast23Feb_2.htm)

**7. About Astronomical Aspects of Creationism and Intelligent Design**

**An Ancient Universe** How Astronomers Know the Vast Scale of Cosmic Time

<http://www.aas.org/education/ancientuniverse.html>

**National Center for Science Education**

<http://www.ncseweb.org>

Best website for keeping up with issues.

**Bobrowsky, M.** “Teaching Evolutionary Processes to Skeptical Students” in *Physics Teacher*, Dec. 2000, p. 565. Includes a list of creationist arguments and science teacher responses.

**Bobrowsky, M.** “Dealing with Disbelieving Students on Issues of Evolutionary Processes & Long Time Scales” *Astronomy Education Review*, vol. 4, #1, pp. 95: <http://aer.noao.edu/cgi-bin/article.pl?id=143>

**Talk.Origins Archive**

<http://www.talkorigins.org>

Full of resources, discussions, and links.

## 8. Miscellaneous

### **Phil Plait on Naming Stars for Money**

<http://www.csicop.org/si/2006-05/stars.html>

**Hale, A.** “Hale-Bopp Comet Madness” in *Skeptical Inquirer*, Mar/Apr. 1997, p. 25. On a cult that saw a spaceship behind the comet (<http://www.csicop.org/si/9703/hale.html>).

### **Velikovsky Affair (w/ comments by D. Morrison)**

<http://www.jerrypournelle.com/science/velikovsky.htm>

**Frazier, K.** “Was the ‘Rare Earth’ Hypothesis Influenced by a Creationist?” in *Skeptical Inquirer*, Nov/Dec. 2001, p. 7. University of Washington astronomer who was secretly a creationist.