

Astronomy 201 - Critical Paper

In your life you will hear many claims of fantastic things. It is important that you be skeptical of any such claim. In many cases, the author(s) of the claim may want something from you... your faith... your support... your vote... your money. Frequently, the author doesn't want you to think about their claims very hard. You're not supposed to ask. You're not supposed to think. Just believe. Just buy.

The word "critical" has several meanings. In this assignment the word critical means "characterized by careful evaluation". You are to be a critic — a skeptic — as you evaluate a fantastic statement, story, or claim that has some connection to astronomy.

This process should have five parts.

First, find a fantastic claim that has some relation to astronomy. This should be something that someone is seriously trying to claim is true. The internet is a sea of such claims, and would be a good source. Start your paper with a summary of the claim. Try to explain the claim in the author's words. If possible, quote the author exactly. Do not alter or belittle the claim. Try to state it in a way that the author would approve.

Second, carefully scan the claim, looking for logical fallacies. Here are some common ones to look for: (The examples that follow are made up)

- Argument from Authority
 "General Smith believes we have been visited by aliens"
- Argument that something is correct just because the notion is Old
 "Alien abduction stories have been around for thousands of years"
- Argument that something is correct just because the arguer is rich
 "Bill Gates believes in alien abductions"
- Argument that something is correct just because the arguer is poor or common
 "The Hermit on Mt. Fudge knows all about the alien visitations." "Even Farmer Brown believes in alien abductions"
- Attacking the Man
 "Joe Fudge doesn't believe in alien abductions, but he's a drunk."
- Un-testable Claims
 "Aliens are among us, but they look and act exactly like us and there's no way to tell them apart."
- Appeal to faith
 "Is it so impossible to believe? Can't you just accept that we're being visited?"
- Threat of Dire Consequences
 "We'd better wake up and accept that Aliens are visiting us before they mass their strength and take over the Earth."
- Begging the question - stating the argument as though it were fact.
 "The government is interested in alien spacecraft because we'll need new sources of power when fossil fuels run out."
- Proof from no disproof
 "Aliens must be landing on Earth regularly because no one has proven that they aren't."

- Selective observations/memory
“The Horoscope predicted I would have an accident and I did!” The previous 50 predictions were all wrong, but that goes unsaid or unremembered.
- Non sequitor (it does not follow) — The conclusion cannot logically be drawn from any prior statement.
“Since Stonehenge is made of rocks that seem impossibly heavy to move, it must have been made by aliens”
- Post hoc, ergo propter hoc (A cause is assumed simply because it came before)
“We detonated nuclear bombs and now we have diseases like aids...”
- Meaningless, impossible, or unanswerable question
“If aliens could stop time, why couldn’t they travel the great distances between the stars?”
- Red herring — throwing in something to divert your attention
“The government is covering up what they know about aliens... look at how they used those poor soldiers for Guinea pigs — injecting them with LSD and then covering up the whole episode.”
- Using tricky statistics — having a very small number of samples, having biased samples, or generally preying on the public’s poor understanding of statistics
“66% of the scientists we interviewed believe in alien abductions” ...of course they only interviewed three and it was at a “scientists for alien abduction” conference.
- Straw man — intentionally over-simplifying the opposing argument to make it seem silly and easy to attack.
“Carl Sagan says there are no aliens because I can’t bring one to his office and take him for a ride in a flying saucer...”
- Cause-and-effect confusion
“People who are abducted by aliens are often left psychologically disturbed by the experience.” Isn’t it more plausible that psychologically disturbed people are more likely to believe they have been abducted?
- Half-truths — leaving out important information
“Joe Fudge saw the flying saucer, and he was a professor of physics.” They left out that he was a professor of physics before he had his nervous breakdown, and that he now regularly converses with Isaac Newton and Pythagoras.
- Consider only the extremes
“You might not believe in flying saucers, but I can’t believe we are the only life forms in this huge universe.” This attitude only considers the extreme cases of either A) we are being visited by aliens regularly, or B) there are no other life forms in the Universe. It doesn’t consider the middle ground of other life forms existing, but not visiting us in flying saucers.
- Undefined terms
“Aliens can easily travel between the stars using luminiferous tachyons as a propellant.”
- Circular argument — the claim is assumed to be true as part of the argument
“Aliens traveled to Earth to conduct experiments on us humans. Naturally they would want to check on their experiments, so that proves aliens travel to Earth.”
- Complex question
“Are you still a close-minded jerk who refuses to consider the possibility that UFOs are real?”

- Quick generalization
“Several people who claim to have seen flying saucers are pilots, therefore, pilots believe in flying saucers.”
- Denial of Antecedent — If A then B. It does *not* follow that if not A, not B.
“If a flying saucer took me to Mars it would prove that extraterrestrial life existed. No flying saucer has taken me to Mars though, so extraterrestrial life doesn’t exist.” This is the “flip side of the next fallacy...”
- Affirmation of the consequent — If A then B. It does *not* follow that if B then A.
“If flying saucers landed on Earth they would leave marks on the ground like crop circles. The fact that we have crop circles proves we have been visited by flying saucers.”
- Anecdotal evidence
“I heard of a woman who was abducted by aliens in Louisiana, and when she got back she had an odd looking baby nine months later.”

Look for the above fallacies or any others you can identify. Make a list of any fallacious arguments you find, and, if possible, identify the fallacy by name from the above list.

Third, answer each of these questions:

1) Is the author’s claim fully open to analysis, or is it somehow hidden or unclear? Is the author secretive about anything? Has the author willingly taken part in a scientific investigation? Is the evidence purely their story, or is there any tangible evidence.

2) Could the claim be a simple mistake?

3) Could the claim be a psychological aberration of the author? It’s becoming clear that some so-called “repressed memories” are false. They can be created by well-meaning psychologists and other authorities who unwittingly “reward” their patients during therapy when the patients “recall” certain things. Could this explain the claim? (If so, the author would absolutely believe their claim is true.) Does the author, deep down, *want* the claim to be true? People often see what they want to see.

4) Could the claim be a hoax? What would it take to create this hoax? Does the author of the claim have anything to gain if the claim becomes accepted? Money? Fame? Power? Attention? A good laugh?

Fourth, what do other critics, if any, say about this claim?

Finally, what do you personally believe is the truth? Do you believe the claim? One of the explanations above? Something else?