

Behind the Spam: A “Spectral Analysis” of Predatory Publishers

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Abstract. Most researchers today are bombarded with spam email solicitations from questionable scholarly publishers. These emails solicit article manuscripts, editorial board service, and even ad hoc peer reviews. These “predatory” publishers exploit the scholarly publishing process, patterning themselves after legitimate scholarly publishers yet performing little or no peer review and quickly accepting submitted manuscripts and collecting fees from submitting authors. These counterfeit publishers and journals have published much junk science ? especially in the field of cosmology ? threatening the integrity of the academic record. This paper examines the current state of predatory publishing and advises researchers how to navigate scholarly publishing to best avoid predatory publishers and other scholarly publishing-related perils.

Keywords. Scholarly publishing; Scholarly journals;; Predatory publishers; Open-access; Cosmology

1. Introduction

Perhaps no scientific fields have been hit as hard by predatory journals as astronomy and cosmology. These two fields, along with astrophysics, seem to attract many unqualified scholarly authors, and the predatory journals have given these people a publishing platform for their pseudo-scientific ideas that, to the general public, may appear authentic. The result has been a profusion of open-access journals happy and eager to accommodate publication of numerous pseudo-cosmology articles that purport to resolve some of the most important unanswered questions in the field.

2. Publishing Models for Scholarly Journals

We are all familiar with the traditional model of scholarly journals, also called the subscription model. In this model, libraries subscribe to journals and make the content available to their users or individuals subscribe to the journals to access and read them. The internet brought a new innovation to scholarly publishing ? the ability to purchase access to individual articles, sparing one the cost of having to pay the full subscription cost.

The subscription model has multiple strengths, the primary being that submitting authors are generally not charged for their submissions; publishing is free. While some non-profit, scholarly society publishers have imposed modest page charges on authors to defray publishing costs, these have been and remain the exception. Another advantage is the built in validation function of the subscription model. If a journal underperforms or otherwise becomes unsuitable for the subscriber, the subscriber cancels the subscription. Journals want to avoid cancelations, so they are keen to meet the needs of their subscribers and provide high quality content at a reasonable cost to preclude subscription

cancelations. Next, the subscription model spreads out the cost of scholarly publishing among all subscribers. This enables publishers to create and employ many value added features to their published articles; enhancements benefitting both readers and authors. The subscription model also creates an economy of scale. Finally, subscription journals typically limit the number of articles they publish in each issue, performing a filtering function so only the best articles are published from among the many received.

I recognize three publishing models for scholarly open-access journals: gold, platinum, and green. In the gold open-access model, the publishing costs are financed by payments charged to authors upon acceptance of their manuscripts. This model has many major weaknesses. One weakness is that the more papers a journal accepts the more money it makes, thus creating a conflict-of-interest for the publisher. Good journals typically reject many article submissions resulting from recommendations made in the peer review process. However, for-profit journals aim to increase their revenue, a goal that conflicts with the rejection of manuscripts and the revenue they provide. Another weakness is that authors have to pay to publish, yet many lack funds for this, especially in fields where grant funding is uncommon. Finally, unlike subscription journals that spread the costs of scholarly publishing across subscribers, gold open-access journals focus the costs on the authors of each issue.

Another open-access publishing model for scholarly journals is the platinum model. In this model, publishing is free for authors and accessing the articles is free for readers? there are no author fees or subscription charges. The publishing costs are funded benevolently, so usually the sponsors of platinum open-access journals are associations or institutes or universities. Very often, these publishers operate on a limited budget and are not able to offer all the value added benefits to scholarly publishing that larger subscription publishers offer.

For example, many low-budget open-access journals do not offer digital object identifiers (DOIs) and some do not follow best practices in digital preservation, meaning the content is at risk of being lost. In contrast, large publishers offer platforms with many value added features, such as direct importing of citations into citation management software, platforms that add great value to the published content and benefit authors by increasing the visibility of their work. Many academic libraries provide links to these platforms, and they serve as research portals for scholars.

Note that many open-access advocates do not differentiate between platinum open access and gold open access, lumping them together as gold open-access. But because the gold model involves payments from authors and the platinum model does not, the distinction between the two is important and merits distinct terminology.

Finally, the green open-access model refers to authors self-archiving their published works in open-access repositories. This model allows authors to benefit from publishing in high-quality subscription journals while also making a version of their article open-access via a repository. These include institutional repositories, such as those established and managed by academic libraries, and disciplinary repositories, those managed cooperatively by researchers in a particular field of study.

Despite these advantages, green open-access has weaknesses. There is low uptake on this open-access model. Once authors have published their works in subscription journals, few are motivated enough to self-archive them in a repository, a process that can require significant additional effort. Because the author has transferred copyright to the publisher, he or she is subject to conditions the publisher imposes, such as embargo periods before the papers can be mounted, often a year or more. Moreover, only the authors' post-prints can typically be archived, not the publishers' PDFs. The post-print, also called the author's accepted manuscript, is the author's final version of the article

(usually a Word document, or in astronomy and physics, a PDF of a LaTeX document) he or she submits to the journal.

3. Predatory Journals and Cosmology

In the five years plus I have been studying predatory publishers, I have noticed what I believe to be a disproportionate number of junk science articles published in the field of cosmology, articles the predatory publishers are happy to accommodate. Cosmology attracts amateur theorists and theorists from other disciplines who are inspired to dabble in cosmology.

Figure 1 shows a screenshot of one such article. It was published in a questionable journal in 2013. Its title is "Combating Climate Change with Neutrinos." I wrote a blog post about it right after it was published and the publisher removed the article almost immediately. It is no longer a published article, except for a copy on my blog. The publisher did not issue a formal retraction statement when it removed the article, the standard practice in such cases. This non-adherence to established standards is typical of low-quality, open-access journals. Regarding bogus cosmology articles, they are sometimes written in such a way that they cannot be proven or disproven. This is because the articles are speculative and not based on data. Though it is clear the articles are pseudo-science, it's difficult to disprove their theories and assertions because it's more difficult and more time consuming to prove a negative statement (this theory is false) than it is to prove a positive one (this theory is correct).

I have noticed a pattern of articles that purport to "correct" the findings of Einstein. Also, I've observed that in predatory journals, the nature of dark energy and dark matter has been "discovered" many times over. It seems there are many who want to be the hero who discovers the nature of dark energy and dark matter, so the author invents some explanation hoping he might get lucky and stumble on the actual discovery or that some may believe their theories. These authors want to create a shortcut to fame and achievement for themselves.

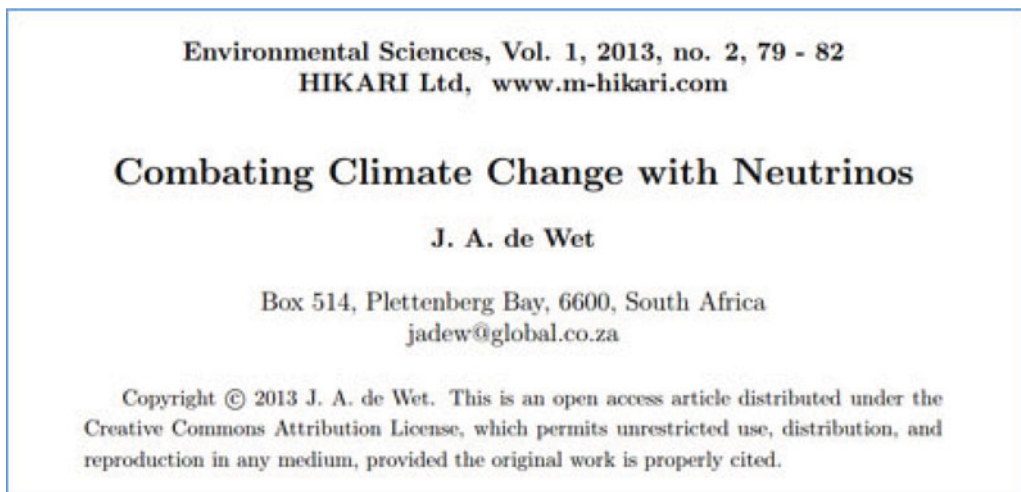


Figure 1. A screenshot of the title page of a now-removed article entitled "Combating climate change with neutrinos." The figure is copied under the terms of the Creative Commons Attribution License. The article was removed from the publisher's website soon after I published a blog post about it.

Interestingly, I have observed that many older men from fields other than cosmology tend to be the ones that attempt to answer cosmology's biggest questions.

As an example there is an article called "The Dark Side Revealed: A Complete Relativity Theory Predicts the Content of the Universe." It's written by Ramzi Suleiman (2013), a professor at the University of Haifa in Israel. I learned of his work because he emailed me recently asking for a recommendation.

He stated he found it easy to publish in the journals on my predatory publisher list, but that the legitimate cosmology journals had all rejected his article submissions. He wrote to ask for advice on an open-access book publisher. I responded to him that he should take the advice of the peer reviewers in cosmology and abandon his work in the field. His response was not favorable.

This university professor is a social psychologist by training, yet he thinks he has the solutions to cosmology's and physics' greatest mysteries; he is not the only one. It seems there are many established professors in fields outside cosmology who write nonsense articles about cosmology. What is the etiology of this pathology? I am at a loss to understand it.

In the abstract, the professor claims that his theory, "yields natural definitions of dark energy and dark matter and predicts the content of the universe with high accuracy" (Suleiman 2013, p. 34). Not surprisingly, his work is completely ignored by mainstream cosmology researchers. I have learned that it takes a Ph.D. to recognize good science in a particular field, but recognizing junk science requires only common sense.

A further example is the article entitled "Mathematical Prediction of Ying's Twin Universes" (Davvaz *et al.* (2014)). It was published in the journal *American Journal of Modern Physics*. I invite readers to access the article and judge its science themselves. I think it is pseudo-science, and the authors' choice of publishing venue – a low-quality journal – adds weight to this belief.

The journal's publisher is Science Publishing Group. I would call it a vanity press, but I think that would be offensive to all the real vanity presses. This publisher will publish anything for money and appears to be a favorite among pseudoscientists. It publishes over one hundred journals.

I have been unable to determine where this publisher is based or who is behind it. It claims to be based at 548 Fashion Avenue in New York City, but that's the address of a mail forwarding service.

These examples show the whole notion of selectivity in scholarly communication is disappearing. Many open-access journals will publish anything for money. Science is not something that should be democratized. It is not something that should be decided by popular vote. Unfortunately, predatory journals are selling the imprimatur of science to anyone with a manuscript and two or three hundred dollars.

4. The Damage to Science

Predatory journals negatively affect science, the communication of science, and scientists in many ways. First, because predatory journals often perform a fake peer review or skip it altogether (despite claiming to do it properly), there is an increased number of scholarly articles being published that contain one or more violations of scholarly publishing ethics. It is easy to find instances of plagiarism, self-plagiarism, salami slicing, and duplicate submission in predatory journals.

Next, as already mentioned, there is much pseudo-science being published in predatory journals, a result of their lax or non-existent peer review combined with their strategy to earn money through payments from authors. There are a number of scholarly indexes

that, in their aim to be comprehensive and cover most scholarly journals, include predatory and low-quality journals. When these journals are indexed, the academic databases also index the junk science that is included in predatory journals. Students who use these indexes but who are unequipped to differentiate sound science from junk science may use junk science articles from search results, treating the papers as real.

Moreover, because research is cumulative, it is possible that some scholarly authors will, when researching and writing literature reviews, mistakenly include articles published in predatory journals, polluting the scholarly record. Citing research published in predatory journals, whether intentional or not, can stigmatize researchers and corrupt the cumulative nature of the progression of science. It may also provide unintended legitimacy to the junk science.

In addition to publishing journals, many questionable publishers are also cashing in on scholarly conferences. They do this by organizing conferences and spamming researchers, inviting them to present their research at the conferences. The venues are frequently in resort cities. Most submitted papers are accepted, and the registration fees are often high. Some conference organizers hold several conferences at the same hotel at the same time, maximizing profits. Some charge an additional fee for publishing abstracts or full papers in the conference proceedings, while others charge a separate fee for publishing the conference presentation as an article in one of their open-access journals.

In the biomedical sciences, some researchers are developing compounds such as nutraceuticals or medicines they hope to sell to a drug company or directly to the public. Before a drug can be marketed, however, medicines need, among other things, research proving their efficacy. Again, because of the fake peer review, predatory journals are the perfect place for an individual wanting to make an ineffectual compound appear effective. One can basically write an article showing 'efficacy' of a particular compound and submit it to a predatory journal, where it will be accepted and published upon payment of the author fee. The published article can then be used to demonstrate the effectiveness of the medicine to companies, investors, and the general public. Those being scammed may be unable to differentiate between predatory journals and authentic publications and are fooled into believing the research is real.

Finally, broadly, predatory open-access journals hurt science by preventing some of the science from being published. The gold (author pays) open-access model effectively silences authors who lack the funds to pay author fees. These authors may include those in developing nations, those in middle-income nations, and retired and emeritus faculty of all nations. Moreover, increasingly, the more respected an open-access journal is, the higher its author fee. Subscription journals, on the other hand, generally do not charge authors and seek to publish the best quality articles

It's no coincidence that the advent of predatory journals has occurred at the same time many are questioning the future of scholarly publishing, peer review, and the scholarly journal itself. Predatory publishers have polluted scholarly communication and threaten the very communication of science itself. Now anyone with a bizarre theory about cosmology, astrophysics, or astronomy can publish in a journal that appears legitimate and scholarly, potentially misleading many into believing that the work represents vetted science.

All reputable researchers need to develop a "scholarly publishing literacy" skill set (Zhao 2014) that enables them to recognize and avoid the increasing number of scholarly publishing scams that continue to appear. Academic librarians can assist with vetting scholarly journals. The future of scholarly communication is at stake, and all researchers must protect themselves from becoming victims of predatory publishers.

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