All your results are good results!

THE ALL RESULTS JOURNALS

Issue 1, Volumen 1, ***2011****, 1-3*

Editorial

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Dear readers of The All Results Journals: Phys,

We are pleased to introduce to you The All Results Journals: Phys (correctly abbreviated as "*All Res. J. Phys*"), a unique journal that publishes articles and reviews with negative results in the field of Physics. This journal represents the first total open access source for research concerning negative results and will be a valuable resource for researchers all over the world; experts and those new to the field alike.

The All Results Journals: Phys immediate goal is to provide scientists with responsible and balanced information in order to advance faster, improve experimental designs and global decisions. Many journals skew towards only publishing "positive" data; that is, data that successfully proves a hypothesis. *The All Results Journals: Phys* is the home for negative or "secondary" data: experimental documentation of hypotheses that turn out not to be true, or other experiments that do not lead to an advance of a specific hypothesis but are, nevertheless, a true rendering of that experiment. For example, if a researcher set up a fusion experiment and the experiment did not work in a particular set of conditions, it would be very useful for other researchers to know this (to avoid time and money wasting and better planning).

Impact of publishing negative results in Physics

It is well known among all physicists and rest of scientific community that publishing only positive results and hiding negative or secondary results increases the chances of being published in high impact journals.[1, 2] This is why normally all those results remain unpublished and the discoveries (though negative) never come out. From our point of view, it is necessary a change of mentality, a change of thinking in the scientific society to a situation in which those results are considered valuable and the scientists publishing them may obtain the necessary recognition for contributing to the scientific knowledge. The created and unpublished knowledge can be really beneficial for other researchers that work in similar fields and can avoid the waste of time and money in routes or approaches doomed to failure. We need to change the concept that negative results are bad science; in fact, there are a lot of works that have been rigorously done during several years with an appropriate scientific method, but didn't obtain the desired results due maybe to variables not considered, hypothesis different to the real ones, mathematical inaccuracies or some other unknown factors. In addition, publishing those results not only helps other scientists to choose a different approach, but also it can help the authors of the paper to obtain some feedback from readers who discover why the desired results weren't obtained.

The negative results in physics not always get lost. Sometimes they remain as part of a group know-how and eventually get published somewhere together with other more positive data in the supporting information of a peer-review journal, other times they appear published in a doctoral thesis and other times in a pre-print or directly in a web page. However, there are a lot of cases where the results get completely lost such as certain works made by one or two-years post-docs in which the time to get positive results was not enough or made by PhD students who finished their thesis time without too bright results. In the last case, at least, the results are expressed in the form of a thesis book that, on the other hand, doesn't obtain too much spreading and finally gets forgotten in the dusty shell of a forgotten university library. A common way in which the results can get diffusion, specially used in physics and mathematics, is if they are published in pre-print or e-print journals such as arXiv. The problem associated with this is that pre-print journals are normally not peer-review and the articles published there are considered less or not considered at all when the authors are, for example, applying for a new job or for a certain grant or fellowship. It is here where this new journal, *All Res. J. Phys*, will help the researchers that haven't obtained the expected results to publish their negative or secondary results and get some recognition for exploring those routes and share their knowledge with the rest of scientific society. This journal is also born to get the maximum spreading of the results: it is a totally online peer-review journal and totally open-access so institutions with fewer resources may as well have access and publish without repercussion on their budget.

The scope of this journal is quite broad, and it is suitable for all the fields in physics either experimental or theoretical physics. In biophysics for example, one might publish a simulation approach for protein folding that doesn't reach high levels of accuracy, or how certain charge transfer measurements in synthetic membranes doesn't fit to the charge transfer data in cell membranes; in condensed physics,

electronic or magnetic properties and also, structure-property relationships data are not published because the materials studied don't show superconductivity, the electron mobilities aren't high enough or some nanoparticles don't show superparamagnetism. Those negative results could help others to use materials with different composition or crystallographic structure or may propose a different physical mechanism. In nuclear physics is well known, for example, all the expectation created by the cold fusion, and the long time that took to publish the negative results that didn't show the expected efficiency. In astrophysics, it could be a new method that doesn't detect new planets because some mathematical problems; in theoretical physics some theory that shows a non-logic result. High energy physics, quantum physics, relativity, string theory, optics, soft matter and many more branches of physics are suitable to publish here the thousands of negative results obtained, that will help the rest of physicists and speed up the advancement of Science.

On this issue

This issue's article provides a fantastic example of negative results that can be helpful for other physicists working in a similar area. The author addresses one of the mathematical problems found in the manipulation of the data of the Cosmic Microwave Background (CMB). The anisotropy of the CMB gives us information of the early stage in the development of the universe dealing with one of the hot topics in physics "How was the origin of the universe?" The analysis of the anisotropy of the CMB is a computationally difficult problem, and it requires the use of the spherical harmonic transforms together with the subtraction of noise and foreground sources. At this point, to be able to deal with the big CMB maps, it is necessary to perform a fast spherical harmonic transform.

In this paper, the author proposes an algorithm to perform a spin spherical harmonic transform. They look for an algorithm that is exact (no approximations), fast (low complexity) and stable (reliable results). In the paper, the authors made a good description of the problem and provide the mathematical tools necessary to understand their explications, and that make the reading much easier especially for readers who are not too familiar with this problem; unfortunately, the transformation was not stable for high band-limits, but it still can result useful in the scientific community as all the negative results do.

The proposed algorithm consists on several steps. First a recasting of the spin transform on the two-sphere S^2 as a Fourier transform on the two-torus T^2. After that, the fast Fourier transform is used to compute the Fourier coefficients that are related to spherical harmonic coefficients through a linear transform. The resulting algorithm has a complexity of $O(L^3)$, where L is the harmonic band-limit, obtained a slightly worst scenario than the $O(L^2\log_2{}^2 L)$ previously proposed in the literature but without the necessity of approximations and without band limit restrictions. To check the stability the authors ran a random test function on the sphere. With this function, they made an inverse spherical harmonic transform and a forward spherical harmonic transform and compared the original harmonic coefficients with the obtained after the two transformations. They found that for bandwidths bigger than L=32 the error was too big to be a reliable transformation, that is, the system was unstable above this limit.

These negative results can clearly help other researchers working in this field to choose a different path to solve this mathematical and computational problem. In addition they can find a solution for the source of instability problems of this algorithm that, according to the authors, would be the poorly conditioned linear system relating Fourier and spherical harmonic coefficients.

Our vision

As a born-digital publication, *The All Results Journals: Phys* has made, and will continue, making full use of enhanced web technologies. Our online-only presence affords us flexibility in the number of papers we publish and the schedules in which they are made available. We have also structured our website to provide an intuitive browsing experience. Articles may as well be commented in an open way, to foster debate in the physics community.

We strongly believe that the total Open Access format of the new journal has clear benefits for science and the general public: First, all articles are freely and universally accessible online, and so an author's work can be read by anyone at no cost. The journal is also being indexed by major scientific search engines (Scirus, Web of Knowledge, Google Scholar, etc.) that increases the visibility of the articles. The easy and widespread availability of articles significantly enhances reading and citation of the results. Second, all accepted articles are immediately published with no delay and therefore, allow particularly rapid dissemination of new results. Third, *The All Results Journals: Phys* allows interactive discussion and annotation of articles providing an online tool for open discussion of data. Fourth, there is no size restriction for articles and no publication charges to authors. Authors hold copyright for their work and grant anyone the right to reproduce and disseminate the article, provided that it is correctly cited. These are the principles of open access publishing, to which *The All Results Journals: Phys* and its publisher, SACSIS, are committed.

Until now, supporters of the open access movement have not had a top rank physics journal to publish negative results in. *The All Results Journals: Phys* aims to be such a journal. It will be published primarily online, where each research paper will always be freely available to all, from the day it is published. Scientists spend much of their time doing work that never gets published. The time and money spent to produce such data (that we like to call them "secondary data") are essentially wasted. Should we not make an effort to increase our society's return on its investment? *The All Results Journals: Phys* is doing it. Our goal is to establish a free online medium for the publication of the negative results that otherwise may be lost. Now, we request the collaboration of researchers to succeed.

References

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2. Alcantara, D., Prado-Gotor, R. *All Res. J. Chem* **1**, 1-3 (2010).