Experience of publishing in open research notes journal IOP SciNotes

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1. INTRODUCTION

In 2020 the Institute of Physics launched a new *open access journal*, IoP SciNotes, whose purpose is to publish brief pieces not appropriate for a full-length article but which would otherwise be lost to the research record. The remit includes *preliminary results*; *reproduced results*; *descriptions of a new method, protocol or data*; *negative results*; or *registered methodologies for a planned piece of research*.

I wanted to support this new journal and had an idea based on some recent work (see right hand side of poster) in which a small modification to a computer code would allow it to calculate something interesting and unintended in the original code: a "new method" in the remit list.

2. METHODS

I prepared a manuscript for this new journal, trying to make it as accessible as possible, especially since the journal is open to readers and authors across all sciences (except astronomy!).

With reference to the existing published code, the minor amendments necessary to make the new kind of calculation were documented, along with a simple example that readers / users could test.

The journal is fully open access, but for an initial period (now finished) all submissions would have their article processing charges waived. My submission fell within the initial free period.

3. RESULTS

The paper was refereed, with some minor comments, and subsequently published 😀: P. D. Stevenson, *IOP SciNotes* **1**, 025201 (2020), 10.1088/2633-1357/ab952a.

Has the paper been widely read and cited? Probably not widely read. The journal is unknown because it is new, and its field remit is so very broad that few people will be in the habit of browsing it. The author really needs to advertise the existence of the paper. In the absence of going to conferences in the Covid years, I have tried to advertise on social media, and sending the paper to potentially-interested colleagues. It has been cited once so far!

Has the journal been a success? Hard for me to tell. It's a new journal, with not much of a track record to look at. It's not clear how all the work published in it fits within the stated remit, and I think both editors and reviewers may need time to settle into the journal's style. From my point of view, I am pleased that this small piece of work, probably insufficient to be published elsewhere except as a section of a putative future paper that may or may not have got written, made it out into the permanent research record & permanently free to access.

4. CONCLUSIONS & OUTLOOK

- After the initial APC-free period, there is now an APC to publish in IoP SciNotes (£500 before any discounts). For University of Surrey corresponding authors, publication is currently free (to the authors) under a transformative agreement.
- The ability to publish shorter notes, negative results, descriptions of new methods, preliminary results etc. in a reputable place is very welcome to me & I will consider publishing here again.
- Authors need to actively promote any research published here to the intended audience

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Some gory details

The research note came out of a new use of an existing research code ("Sky3d": 10.1016/j.cpc.2014.04.008). The existing code solves the Schrödinger equation in the case of atomic nuclei reacting with one another. The code can be used to calculate nuclear fission, nuclear fusion, and other nuclear reactions such as are performed at laboratories like CERN.

An unplanned (and hence undocumented) use of the code is to map out the *potential energy* of interaction between two nuclei as they get closer to each other. Such a mapping is useful to understand nuclear reactions and can be used as input to simpler models.

The picture below plots the potential energy in two different lines. At various points along those lines there are snapshots of two interacting nuclei (isotopes of *einsteinium* and *calcium*). For the nuclei to fuse, they need to get over the potential energy barriers, coming from the right in the plot.

Depending on the orientation, the barrier height is different. It is easier for the nuclei to fuse if the smaller calcium nucleus approaches the tip of the elongated einsteinium nucleus. We can tell those running experiments what energies to try combining these two nuclei to make element 119, which is the next undiscovered element. We have observed them up to 118 (oganesson) so far.