

January 25, 2022

Letter on 'ultradense hydrogen matter' to the attention of the Editorial Boards of the following scientific journals:

1. International Journal of Hydrogen Energy (EAVeziroglu@outlook.com)
2. EPJ Techniques and Instrumentation (massimo.caccia@uninsubria.it ; info@springeropen.com)
3. High Energy Density Physics (D.Gericke@warwick.ac.uk)
4. Astrophysics and Space Science (e.brinks@herts.ac.uk)
5. Physica Scripta (physscr@iopublishing.org)
6. The Astrophysical Journal (evishni1@jhu.edu)
7. International Journal of Modern Physics E (Dmitri.Kharzeev@stonybrook.edu)
8. AIP Review of Scientific Instruments (pardo@anl.gov)
9. Laser and Particle Beams (katarzyna.batani@ifpilm.pl)
10. For information, copy to PLOS ONE (plosone@plos.org)

Dear editors!

By chance my eye fell on a publication on energy production by particle-antiparticle annihilation in ultradense hydrogen [1], published by the International Journal of Hydrogen Energy. The title 'Energy production by laser-induced annihilation in ultradense hydrogen H(0)' immediately catches the eye. The claim of the observation of proton-antiproton annihilation in these 'low energy' experiments goes very far and would imply revolutionary 'new physics'.

The paper contains 33 references, of which 25 are to other papers by the same author. Of these 25 there are 2 crucial references to as yet unpublished papers and thus cannot be consulted. A number of references (with 'clickable' hyperlinks) are included in the present letter.

A central theme is ultradense hydrogen with a distance between the protons of 2 pm, $2 \cdot 10^{-12}$ m. The distance between the protons in ordinary hydrogen is of the order of 0.1 nm, 10^{-10} m. So the density of ultradense hydrogen is 10.5 kg/cm^3 , $50^3 = 125\,000$ larger than that of ordinary hydrogen (0.084 g/cm^3).

In [3] it even reads 'this type of matter has a density of many hundred kg/cm^3 since the interatomic distances are down to 0.57 pm.'

In various publications the author attributes quite exceptional properties to this substance, the most exceptional perhaps being that it is a prolific source of muons (particles with a mass of $100 \text{ MeV}/c^2$). These muons, in turn, result from the decay of pions and kaons, and these are created through the annihilation of protons and antiprotons. Where the antiprotons come from remains unclear. Whatever process it may be, it must be 'new physics' involving a remarkably coherent process (creating a $1 \text{ GeV}/c^2$ particle) taking place at a remarkably small distance scale (10^{-15} m , the size of the antiproton). A few quotes. Quote 1: 'The first steps forming the antibaryons are not described here...' [1]. Quote 2: 'The complete mechanism of the antimatter formation and annihilation reaction cannot be given here since it has been submitted elsewhere' [3]. 'Elsewhere' turns out to be [1].

I have found no independent confirmation of the creation of this remarkable state of matter in the literature. The closest I got is a recent review [4]. No evidence on ultra-dense hydrogen is presented in this review. Note that ultra-dense hydrogen is not identical to (hydrogen) Rydberg matter (RM) but goes beyond that. But even hydrogen RM itself is not well researched yet. I quote the last sentence of the abstract of [4]: 'And as there is little knowledge on the exact mechanisms for RM formation, suggestions are given as to where research should start.'

Note that all the references in the present letter are to publications in respectable journals or on respectable platforms. One of the journals retracted a publication [15].

What should be the conclusion on the results published on ultradense hydrogen? Fabricated results? Or 'just' overstated conclusions? Delusion? Until independent replication (or falsification) of this research is published it is hard to know, but the claims are so far reaching that they do not deserve the benefit of the doubt on the basis of the claims by a single author.

To you, the editors of the journals listed above I would make the request to share with me (or even better: with the scientific community) your considerations leading to the publication of these articles. Of course, there should be room for 'crazy ideas' but these papers go much further than just the idea: they claim experimental proof. If the editors agree that this proof has not been given, far from that, perhaps they should follow the example of PLOS ONE [15] and RETRACT the papers.

The letter above has been written 'à titre personnel'.

Yours Sincerely,

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References

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