Report February 15, 2024

Summary:

- **LPPFusion 10-for-1 Share Split in New Offerings**
- **New Parts Ordered for Next Experiments**
- **JET Sets New Record, but Shuts Down**
- **Physics Class Moves on to Thermodynamics**

LPPFusion 10-for-1 Share Split in New Offerings

LPPFusion has carried out its first stock split, splitting all "B shares" 10 for 1. This means that all shareholders will now have ten shares for each one they previously owned. At the same time, the company has increased its valuation by 10%, making the new share price $22. **These changes will be effective immediately with the new Regulation D offering that is now available to accredited investors**. The same terms will apply to the 2024 Wefunder crowdfunding drive for all investors, which will be starting soon. Existing shareholders will receive new electronic share certificates, reflecting the stock split.

These decisions were taken unanimously by the LPPFusion Board of Advisors at their meeting January 9th and were implemented by LPPFusion Director and President Eric Lerner on February 8th. Lerner made the appropriate amendments to the LPPFusion incorporation papers (in its original name of Lawrenceville Plasma Physics, Inc.), increasing the limit of the issued shares to 4 million shares.

The Board decided on the 10-1 split mainly because lower-priced shares tend to be easier to market to small and medium investors, even though the split does not affect the fraction of the company shares that can be purchased for a given amount of money. The minimum investment through Wefunder will be reduced to the minimum $100 that the Wefunder site allows. (Wefunder allows fractional share purchases.) The Board decided to increase the valuation of the company to $72,345,000 based on maintaining a constant ratio of valuation to cash actually invested and also because of the substantial advances made in our research, in particular the completion of the new switch development and the resultant increase in peak current produced by 50%.

New Parts Ordered for Next Experiments

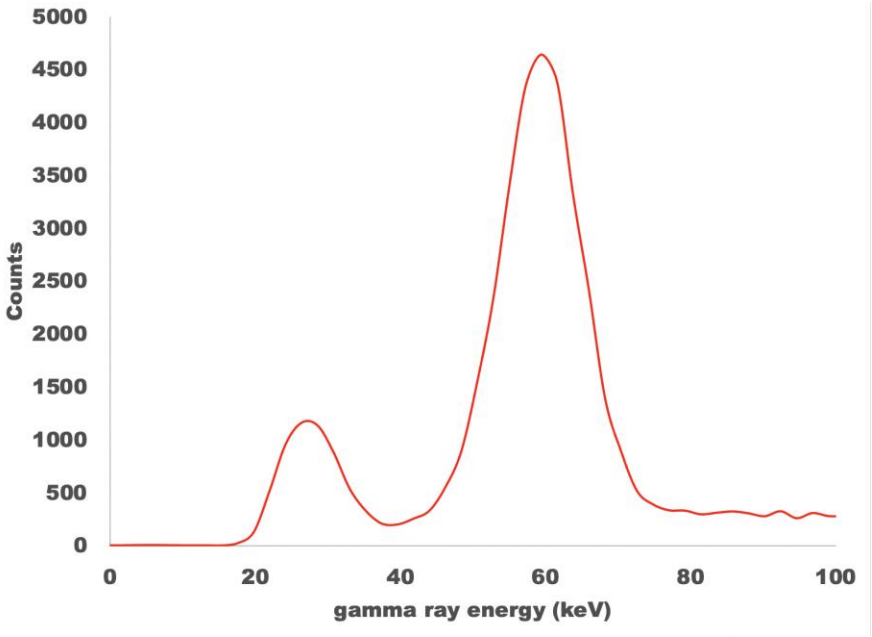
The LPPFusion research team has now completed ordering the new beryllium anodes we need to replace the one that cracked in November. We've redesigned them to avoid the stresses that caused the cracking and are confident that these new ones will last a long time. However, we did order two to make sure we have a spare on hand. The two anodes are of two different lengths, so that we will be sure to have an optimized one on hand to restart experiments with beryllium by April.

Research Scientist Syed Hassan also ordered some additional vacuum chamber parts we will need for an intermediate set of experiments we'll perform in March with our old tungsten electrodes. These experiments will involve tests of both longer and shorter anodes with the new, perfected switches. We showed last year that the new switches increased current by 50% and so produce different conditions with the same electrodes. While the tungsten electrodes suffer from far greater impurity production that the beryllium ones, the comparison of the anode lengths will give us a lot of clues as to the best length to start with in the beryllium experiments.

We need new vacuum parts because we wanted to keep the vacuum chambers used for beryllium and tungsten separate. This allows us to assemble and disassemble the tungsten set-up without worrying about beryllium dust, and it allows us to carry out the beryllium experiment without worrying about impurities from tungsten. But this decision did require that we get some new vacuum chamber parts. Fortunately, Dr. Hassan figured out how to obtain these parts without ordering any custom ones, which take longer and are more expensive than off-the shelf parts. As a result, we're confident that we'll be able to start the tungsten tests in March.

We also continued to prepare for our long-anticipated hydrogen-born(pB11) experiments. As we've reported, the alpha particles (helium nuclei) produced by the main pB11 reaction don't escape from the vacuum chamber so can't be measured directly in small numbers. However, side reactions produce neutrons and radioactive by produces like carbon-11(C-11), which can be detected outside the chamber. These can give indirect, but reliable measure of how many fusion reactions are taking place. To detect the C-11, which emits gamma rays when it decayed, LPPFusion has acquired an economical gamma-ray spectrometer. This detects the energies of the gamma rays, which are characteristic of each radioactive isotope.

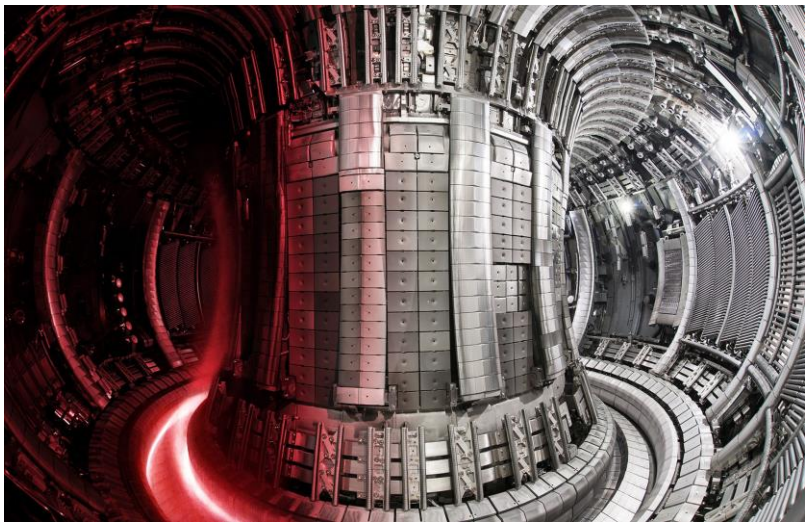
In January we tested the sensitivity of the spectrometer on a smoke-detector, which uses a tiny amount of Americium-241. The spectrometer easily detected the radioactivity, producing the spectrum below, with peaks at Americium-241's energy levels of 26 and 59 keV. The sensitivity of the spectrometer is at least 5 times better than that of our Geiger counter, allowing us to accurately measure the initial pB11 reactions.



A gamma ray spectrum from our new spectrometer shows the correct peaks for the Americium-241 in a smoke detector.

JET Sets New Record, but Shuts Down

In its final set of experiments, the Joint European Torus(JET) in Culham, UK, one of the world' largest tokamak devices, set a record for fusion energy production, generating 69 MJ(Million joules) of energy from deuterium-tritium fuel. This was 0.7% of the 10 GJ(billion joules) that was fed into the device to runs its giant magnets. While this ratio of energy produced to energy consumed was a record for tokamaks, it fell a bit short of the record results obtained with lasers at the National Ignition Facility in California. NIF achieved on July 30, 2023 an output fusion energy almost exactly 1% of its input energy of 0.38 GJ.



JET interior, lined with beryllium, with optical image of plasma superimposed on left half.

Deuterium-tritium fuel is far more reactive that pure deuterium fuel, used in our experiments at LPPFusion, so these results are not directly comparable with the far more modest yield with deuterium alone. However,

LPPFusion, as well as rival companies, expect to better these wall-plug efficiencies with pB11(hydrogen -boron fuel).

This was a swan song for JET, which is shutting down after 40 years of operation. With the construction of the enormous ITER facility indefinitely delayed, the leading tokamak devices will be in East Asia for now: the EAST device in China, K-Star in South Korea and JT-60SA in Japan.

Physics Class Moves on to Thermodynamics

We are going to start our new section of the "Evolution of Physics " class this week, Feb.17 at 2:30 PM EST via zoom. This section will be on the development of thermodynamics in the 19th century and will complete our look at the development of physics in that century. The first class will be on the development of the concept of energy and the First Law of Thermodynamics—conservation of energy. If you want to join the class, send a note right away to fusionfan@lppfusion.com and we'll send you the readings and zoom link.