Report March 16, 2023
Special Two-Part Report: Part 1

Summary:

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Realism in a Financial Panic: Invest in Our Fusion Future Now!

A letter from LPPFusion President and Chief Scientist Eric Lerner to our investors, donors and supporters:

Hi fusion fan!

In the midst of a new financial panic, we've received questions from many of you as to its effects on LPPFusion, and we thank you for your concerns. **Please be assured that LPPFusion has no financial connections with any institutions involved in the crisis so far, that our bank accounts are fully insured, and that we do not have any external debt at all, nor are we seeking any credit.**

However, we do share the concern that the extreme uncertainty that goes with a crisis, added to the already great economic uncertainty existing previously, will cause investors to pull back from all "high-risk" investments, including LPPFusion. We noted last year that total crowdfunding in the US dropped by half last year, and our own crowdfunding reflected that drop. If you and others lump LPPFusion in one big "high risk" basket and don't invest in our fusion future, that could deprive us of the funds that we need to get to fusion energy.

But such a pull-back would be an emotional, not a rational, response to the crisis. **The most hard-headed, realistic thing to do with money available for medium-to-long-term investment is to invest in LPPFusion now.** Let me explain why.

A financial panic is a sharp reminder that "money" in all its forms consist of **symbols** of value that people use with each other—symbols, like words or numbers. Money, after all, is not actual real things of value, like food or energy. And since money consists of symbols, with meaning ascribed to them by people, the actual **amount** of value symbolized by any piece of money—bank account or stock or bond --is a product of what people THINK its value is and how they act on those thoughts. Today, millions of people can collectively change their minds in minutes or hours, so in a panic, the value of almost all "money" becomes rapidly variable and the risk of almost all financial investments sky-high.

Investment in LPPFusion is completely different from all this, especially right now. There are **no short-term risks** attached to our shares, because they don't trade on any exchange. The biggest long-term risk is that we are NOT on the fastest route to fusion energy, and **that risk has just dropped a lot with the publication of our new paper March 9 in the *Journal of Fusion Energy*.**

That paper states clearly that we are, right now, in the lead in scientific results that show how close we are to practical fusion energy—that **we ARE now on the fastest route to fusion**, both in progress per year, and by an even wider lead in terms of progress per money spent. The large significance of the publication is that these statements are now not just ours, but **were carefully reviewed and passed by our scientific peers—who are researchers with our fusion company competitors. We are now the acknowledged leader in the race among all private fusion firms.** (We know the media hasn't reported this yet, but we're working on this!)

This validation of our approach is not based on opinion but on **reality: scientific results in the lab**, that don't change with the click of a mouse. Just like you **know** the power is on if the light goes on, we-- and now our peers-- **know we are currently the fastest to fusion.**

Of course, we're not going as fast as we thought we would and we know that many of you who've been supporting us are deeply frustrated by that. So are we! But, as we've written before, it is clear that the critical limitation on our rate of progress is the **lack of financial resources required to hire the people we need** for even for such a small device. If we had had two full-time researchers in our lab instead of one, our progress would have been much faster.

That problem links to the second long-term risk LPPFusion faces—that we won't get the financial resources needed to keep us on the fastest route to fusion. But that is a risk that investors can self-protect from—by investing in LPPFusion in a way that maximizes the chances that others will as well. **You can, right now, help protect us against lack of resources, and speed us towards fusion by investing now.**

If you are an accredited investor, with $5,000 or more available for medium-to long term investment, I'm asking you to invest this month to help us reach our March goal of $100,000. Reaching that goal will speed us toward fusion in two ways. First, it will mean that I stop pending time fundraising and can get back to the lab to help Dr. Syed Hassan finish assembling our switching system for new experiments. (That's going well, but needs care and time to be done right.) Second, the "vote of confidence" from existing investors will help jump start the crowdfunding campaign we intend to start this month on Wefunder and then, in May on StartEngine. Crowd funding is based in part on following a crowd and this $100,000 can be the "spark" for a much larger flow of funds from Wefunder. It also will help with larger investors who are talking to us.

If you want to invest, please send an email to us at invest@lppfusion.com and we'll send you the subscription agreement and wire info.

If you are not an accredited investor—everybody else!—please join our crowdfunding campaign as soon as it starts—it will be a short one. You can invest there as little as $200. You'll be notified as soon as we start.

To sum up—no short-term risks, reduced long-term risk, confirmed as the fastest route to fusion—based on real peer-reviewed results. And, of course, when you invest in LPPFusion your return will not be just in share price if we succeed. **You and all of us will also get a future with clean, safe, decentralized, unlimited fusion energy, far cheaper than any existing energy source. That's a future worth investing in.**

Yours for fusion,

Eric Lerner

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Fusion Tech in Medicine, Industry May Fund Path to Power Plants

Commercializing nuclear technologies in other sectors is creating new revenue streams

By Will Wade
January 24, 2023 at 2:26 PM EST

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Building a fusion power plant will be a long, complicated and costly

On January 24, Bloomberg News service reported on LPPFusion's important spin-off technology, the X-scan inspection technology. In an article titled, "Fusion Tech in Medicine, Industry May Fund Path to Power Plants" journalist Will Wade wrote that LPPFusion's " plasma focus system can be configured to emit an intense X-ray beam. The device could be mounted on a truck and **used to examine infrastructure such as roads and bridges to find defects that need to be repaired.** The company says this X-Scan technology could provide revenue as it seeks to build a commercial fusion power plant based on the same plasma focus technology."

LPPFusion is continuing to look for suitable partners to develop this technology already proven in the lab into a commercial product. We'd like this to be our equivalent of the Wright Brother's bicycle shop for income!

The news coverage in a major wire service is part of an increased media interest in LPPFusion which we hope will soon include our news about being fastest to fusion.

Stellerator Experiments Boost pB11 Fusion

A new paper published Feb 21 in *Nature Communications* (junior sibling publication to the more prominent *Nature*) has given widespread publicity to the advantages of hydrogen-boron (pB11) fusion fuel. While LPPFusion has long explained such advantages, as have other companies like TAE Technologies and HB11, the dominant narrative in fusion has been the prominence of DT fuel. This new paper, which was highlighted in many media outlets, emphasized that pB11 is not only a viable route to fusion, capable of net energy production, but greatly simplifies the design of fusion generators by eliminating destructive neutron emission.

The paper, authored by researchers form TAE Technologies, University of California-Irvine and the National Institute for Fusion Science, report on pB11 fusion experiments in the Large Helical Device, a 25 year-old stellarator operating in Toki, Japan. A stellarator is a fusion device that is close in concept to the better known tokamaks. It uses a complex twisting external magnetic field to trap plasma at low density (Fig. 1). The experimenters injected boron dust into the stellarator, building up a dilute boron plasma . Then they turned on the hydrogen ion beams already built into the LHD. These beams supplied protons at an energy of 135-180 keV, hot enough to achieve pB11 fusion. The beams had sufficient current, abut 13 A, to heat the dilute plasma to high temperature.

The researchers counted the alpha particle (helium nuclei) produced from the pB11 reactions and observed a fusion power yield of about 5 W during the 2-second runs. This yield implied that the hot pB11 ions were confined for tens of thousands of orbits around the toroidal stellarator and that perhaps 1 in a million burned in the fusion reactions. This was a significant achievement as the previous pB11 fusion experiments had been done using laser facilities with inertial confinement—the plasma confined only by its own inertia.

By comparison, the stellarator experiments achieved a fusion output to device energy input ratio of 0.012 J per MJ, a bit short of the 0.05 J per MJ ratio achieved in the laser experiments. Using the much less reactive deuterium fuel, LPPFusion has achieved the much higher ratio of 4 J per MJ and we expect to do still better with pB11 in the near future. But the new experiments and relatively high profile media coverage gives a boost in credibility to all work with pB11 fuel.

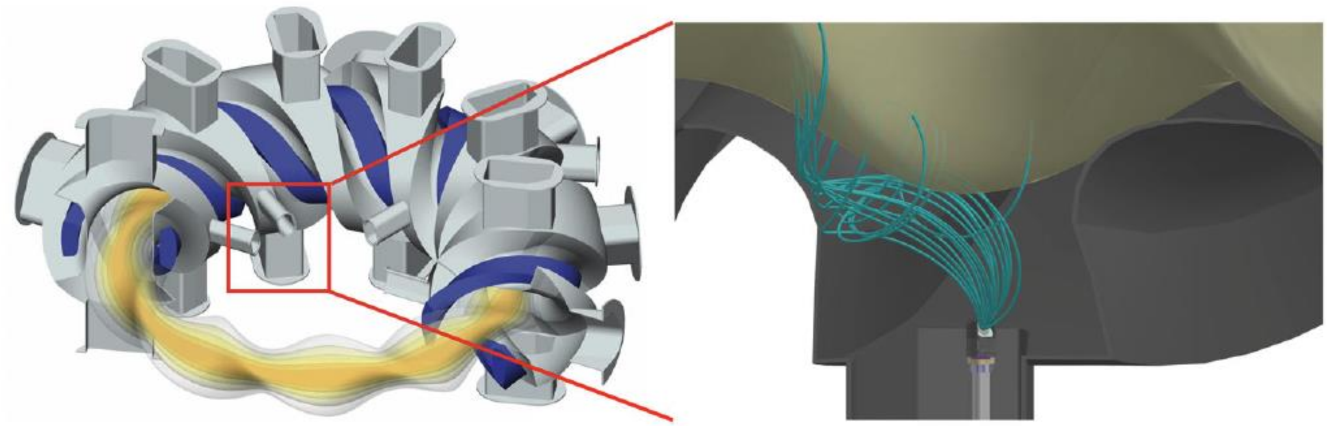

Figure 1. The LHD stellarator in Loki Japan trapped a dilute boron plasma (yellow band, left) in complex magnetic fields and then shot beams of protons into the plasma. Fusion reactions generated alpha particles (green lines on right) which were counted by a detector (bottom, right). Figure in the paper.

Stay tuned for Part 2 of this Special report, coming tomorrow.