Press release, May 2023

A European champion for fusion: Proxima Fusion spins out of the Max Planck Institute for Plasma Physics

Munich, May 30th 2023 - Proxima Fusion, a fusion start-up that is designing fusion power plants based on the stellarator concept, completed its pre-seed fundraising of €7m. The fundraising is co-led by Plural and UVC Partners, and joined by High-Tech Gründerfonds (HTGF) and the Wilbe Group.

Proxima Fusion is the first spin-out from the Max Planck Institute for Plasma Physics (IPP). The startup was founded by former scientists and engineers from the Max Planck IPP, MIT, and Google-X. The group aims to deploy a new high-performance *stellarator* over the coming years. Its roadmap targets a first-of-a-kind fusion power plant within the 2030s.

Fusion is the process that powers the stars. To make it possible on Earth, one can confine high-energy ionized matter, called “plasma”, via magnetic fields. Tokamaks and stellarators are two approaches that do so by creating a magnetic “cage” in doughnut-shaped devices. Stellarators use a complex set of electromagnets outside of the plasma, whereas tokamaks combine external electromagnets with a large current within the plasma, which simplifies the overall design but incurs significant control challenges. Modern magnetic confinement devices can already routinely reach plasmas at more than 100 million degrees - 10 times the temperature at the center of the Sun. The opportunity to leverage fusion as a safe, clean, and abundant energy source has motivated academic research in this domain for decades.

The Proxima Fusion project stands on the shoulders of IPP’s **Wendelstein 7-X (W7-X)**, which is by far the most advanced stellarator in the world. Although more complex in design than tokamaks, stellarators present compelling features for a fusion power plant: they can operate in a steady state, with smaller operational challenges, and present an attractive solution to manage excessive heat loads on material surfaces. However, stellarators have long been affected by major drawbacks: poor plasma confinement at high temperatures, high losses of fusion products, challenging construction tolerances, etc.. Many of these challenges have been solved in recent years: "*Experimental progress from W7-X and recent advances in stellarator modeling have radically changed the picture*”, explains **Francesco Sciortino**, **co-founder and CEO** of Proxima Fusion. “*Stellarators can now remedy the key problems of tokamaks and truly scale up, radically improving the stability of the plasma and reaching high performance in steady state.”*

The performance of fusion devices has historically been quantified with the “triple product” of density, temperature, and confinement time. Since the start of its operations in 2015, W7-X has been rapidly catching up over the most advanced tokamaks, which have collectively received vastly more funding so far. However, the triple product says little of the engineering and economic viability of a fusion concept for power plants. W7-X excels in these respects: its

February 2023 record of *energy turnaround*[1], i.e. the total heating power multiplied by the duration of the experiment, is only the latest demonstration of how stellarators like W7-X are superior in a number of important ways.

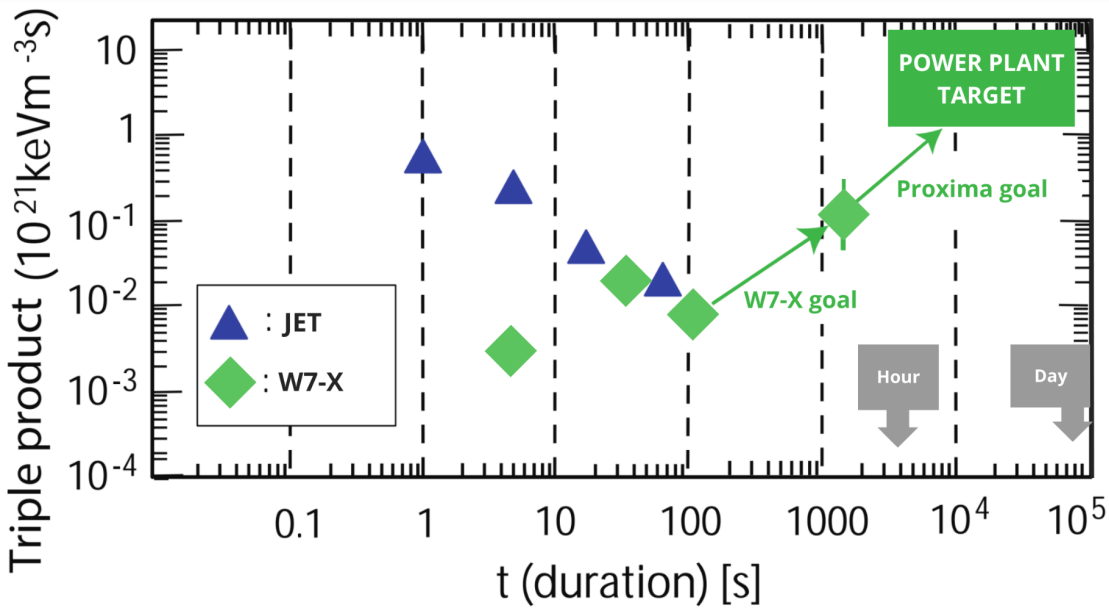

Figure: triple product of ion density, ion temperature and energy confinement time as a function of the time the triple product was sustained. Adapted from Refs. [1] and [2].

Proxima Fusion is based in Munich, Germany's most active deep-tech hub. Its proximity to one of IPP's research centers aims to maximize opportunities for collaboration with the Institute.

Jorrit Lion, a co-founder and expert in the modeling of stellarator power plants, says: *"We are building on decades of visionary investment by the German government in stellarator technology. It is this investment that created the opportunity for Proxima to be a European champion for fusion. Now, it is up to us to bring fusion energy to the grid".*

Martin Kubie, joining his co-founders after a decade of work in the McLaren Formula-1 team, Google-X and its spin-off Wing, acknowledges the hard work ahead*: "Fusion is the challenge of our time. Our task will be to make it a commercial reality. Over the next 12 months, in collaboration with its academic and industry partners, Proxima will focus on completing its initial fusion power plant design."*

Ian Hogarth of Plural Platform says: "*Stellarators offer the most robust and clearest path to fusion energy. The Proxima team has the energy and the speed that we need. They are ecosystem players, with a thrilling sense of ambition building on top of the Wendelstein 7-X*

[1] https://www.ipp.mpg.de/5322229/01_23

stellarator - a masterpiece of German leadership. Europe needs the audacity of this team and their willpower to take on the fusion challenge."

Benjamin Erhart, General Partner at UVC Partners, says: *"In the coming years, the energy issue will be one of our most existential ones. We already know today that we need a clever mix of different energy sources. Proxima's efforts for fusion leverage the massive investment made on stellarators in Germany. We are convinced that the team is ready to change the picture - for the world, and particularly for Germany and Europe, which are in urgent need of reliable sources beyond wind and solar."*

For further questions, contact: press@proximafusion.com

About Proxima Fusion

Fusion will be one of the greatest breakthroughs of this century. Proxima Fusion is working to develop power plants via optimized stellarators, devices that form magnetic cages for high-energy matter. Proxima is the first-ever spin-out company from the Max Planck Society Institute for Plasma Physics, which built and operates the most advanced stellarator on the planet, W7-X. Research over the past decade has now set the stage for Proxima to leverage modern optimization tools and design capabilities, and accelerate fusion. With W7-X reaching high-performance in continuous operation, uniquely among fusion concepts, Proxima Fusion is catalyzing the creation of a new fusion ecosystem in Europe. Connecting partners from industry and academia, the Proxima Fusion founding team, coming together from the Max Planck Society, MIT and Google, is now entering the race for fusion energy to turn stellarators into economically viable fusion power plants.

About Plural:

Set up by founders for founders, Plural is an investment platform focusing on providing early stage venture capital to exceptional European tech companies & founders addressing opportunity gap and tackling systemic risks. Its investors with scar tissue support founders to build tech companies that can make a GDP impact.

About UVC Partners

UVC Partners is a Munich- and Berlin-based early-stage venture capital firm that invests in European start-ups, from pre-seed to series A, across deep tech, climate tech, hard- and software, and mobility. As an independent partner of UnternehmerTUM, Europe's most extensive innovation center, UVC Partners has access to proprietary deal flow, an industrial network of more than 1,000 corporates, and access to talent from the leading European technical university.

About HTGF:

High-Tech Gründerfonds (HTGF) is a German seed investor with more than 700 startup investments since 2005. HTGF supports startups that challenge the status quo through technology, science and innovative business models. The public-private partnership supports founders with a unique ecosystem of 45 fund investors from a wide variety of industries.

About Wilbe:

Wilbe is a venture group that supports entrepreneurial scientists from leading academic institutions in developing disruptive and high impact science companies through education, venture building, investment and operational support. Wilbe has worked alongside Proxima Fusion from its early stages.

[1] Kikuchi and Azumi, Frontiers in Fusion Research II, Springer, Berlin, 2015
[2] Wolf et al., Physics of Plasmas 26, 082504, 2019.