



OXFORD SIGMA – TACKLING ENERGY SECURITY AND CLIMATE CHANGE BY ACCELERATING THE COMMERCIALISATION OF FUSION ENERGY.

Based at the world-leading Harwell science and innovation campus in Oxfordshire, Oxford Sigma were established in 2019 to develop novel material solutions and technology for nuclear fusion energy. The challenge is to find materials that will increase the overall fusion plant availability in order that the energy source can become commercial.

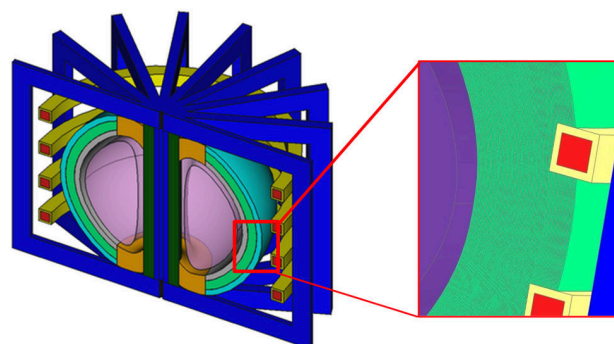
We caught up with Dr Thomas Davis, Oxford Sigma's Co-Founder and Chief Technology Officer, to hear their inside story. "Jonathan Musgrove, our CEO, and I met when we were undergraduates at Birmingham University. I was studying Nuclear Engineering and Jonathan Chemical Engineering. I went on to study a PhD in fusion materials at the University of Oxford and Jonathan to working in Nuclear Consulting. We kept in touch, and a few years after we finished our undergraduate studies we identified through our shared interest that there was very little work taking place within the fusion sector focused on solving the long-term materials challenges that need to be solved to enable the ultimate energy source to be realised. So, in 2019 we founded our business to focus on designing novel technologies for fusion. We're essentially trying to create a long-term energy source for the future by replicating the sun's conditions on earth and putting it in a box. The community has a clear plan on how to do it. But there are many technical milestones. There's still a lot of innovation and discovery work to be done."

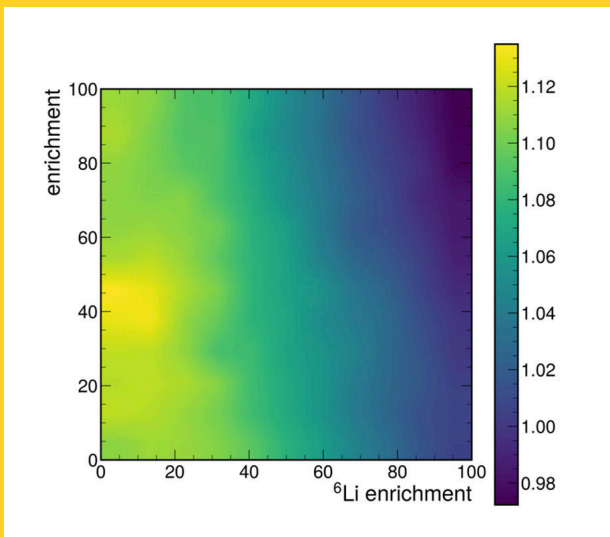
EVERYBODY NEEDS SUPPORT FROM GOOD NEIGHBOURS

We were seeking people, groups and mentorship locally. And when we moved to Harwell we discovered OxLEP Business. They were our neighbours, based on the same site. We read up on them and got in touch. We discovered that they had an innovation grant Go-Create available as part of their Innovation Support for Business (ISfB) programme, which sounded ideal for us, and talking with the team gave us confidence that some of our

research and development ideas would be eligible, and we decided to apply. Compared to other grants we have applied for, the application process was by far the most straightforward, and we felt we had the most support as well. Working through our ideas with the team really helped us to refine these into our final application. If it hadn't had been for this added layer of help, I don't think we would have submitted anything.

Our Go-Create grant was key in enabling us to further deliver our project in fusion blanket designs. We had come up with a unique design idea for a component in a fusion reactor, one that we felt had potential to help overcome some of the limitations experienced with blanket designs, and therefore also reactor performance. We had the theory behind it and had done some basic modelling, but needed more sophisticated software and hardware to understand this potential fully.





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The grant enabled us to bring in the resources to do the physics modelling we needed to do. The project was successful and our team are happy with the innovation that we produced.”

In March 2023 Oxford Sigma were also then awarded a Business Investment Fund grant from OxLEP. Thomas tells us about this, “Our second grant was a stamp of confidence for us. We used this to procure materials from a supplier and to take those materials and simulate them in a high temperature liquid metal environment they are going to be predicted in. To do this we needed to purchase two, high powered servers. Having these has really pushed our technology forward. Again, the OxLEP team were brilliant during this application. We took advantage of the one-to-one advice available. Just really valuable, positive support.”

OXLEP BUSINESS ARE THE STEPPINGSTONE TO MILLION-POUND INVESTMENT

Thomas explains how OxLEP have played a huge part in enabling them to apply for larger investment opportunities. “The much larger grants we apply for start off by asking, ‘Have you got a feasible study already done?’. So being able to complete these smaller studies, with OxLEP’s support, has enabled us to form much bigger grant applications, for million-pound grants. Without OxLEP we would not be in the position to do that at this stage. They have been a key enabler. We would be months behind where we are now without them. We can’t say anything negative about working with OxLEP, it’s been good to have the local support. Knowing there’s a group of people across the road who are able to guide us and help with any questions we have goes down very well and helps us a lot. We’re now in a strong position to receive investment and take things to the next level. We have built up our technology so we can kick start a lot of our development work. We’re expanding the team, we will be ten people by September. We’re also working with a large portion of the private fusion companies across the world on a consultancy basis, which massively helps us understand what the market looks like and therefore what we need to develop in the future.”

FOR MORE INFORMATION ON OXFORD SIGMA
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Find out more about the support available from OxLEP Business:

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