

The National Fluid Mechanics Hub

Accelerating UK Global Leadership through Cutting-Edge Innovation, Transdisciplinary Excellence, and Transformative Societal Impact

Background

Fluid mechanics underpins critical UK sectors: energy, health, defence, transport, and climate. The UK fluids sector already contributes £14bn in economic output, £3bn GVA, and 45k direct jobs, with 70% of firms exporting [1].

Yet, the community is fragmented and lacks coordination, risking fragmented progress and missed opportunities in driving ambitious, globally leading, and transformative initiatives.

The National Fluid Mechanics Hub will break down barriers and establish an inclusive and diverse community that leads transdisciplinary research on the global stage, co-creating new solutions to complex societal challenges.

Nationwide Representation

The Hub embodies a truly national initiative. The EPSRC-funded UK Fluids Network established a thriving community of over 2000 researchers and 50 special interest groups [2].

The proposal arises from a collective effort of this community, including input from two national away days and two national surveys. The Executive Committee and Council will comprise representatives from over 40 UK institutions distributed across all nations, ensuring broad representation, connectivity and engagement.

Strategic Goals for National Advantage

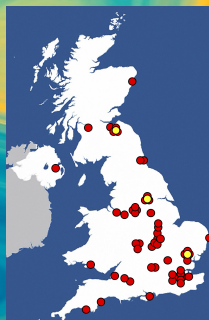
This five-year, £7.5 million Hub will support national priorities by **securing fluid mechanics as a strategic UK resource**: kickstarting economic growth by translating the UK's leadership in fluid mechanics into impactful projects and commercial success, and making Britain a clean energy superpower by developing and harnessing disruptive technology for a clean future.

The Hub will achieve this by:

Co-creating and delivering transdisciplinary research and innovation, and knowledge exchange in emerging and transdisciplinary topics.

Developing and sustaining a dynamic, adaptable, world-leading, inclusive fluid community.

Coordinating with other investments in fluids, acting as a gateway to international activities, and fostering globally leading and ambitious initiatives.



Distribution of the Hub's leadership (red) and of the three Centres (yellow) across the UK.

Delivering Breakthrough Innovation and National Prosperity

Three interconnected centres connecting research, policy, and industry.

National Fluid Mechanics Centre: Break disciplinary barriers through 25 short post-doctoral fellowships pioneering novel, transdisciplinary approaches to fluid mechanics. Fellowships will be awarded annually on a competitive basis in five cohorts of five.

National Fluid Knowledge-Exchange Centre: Drive collaboration and impact through knowledge exchange programmes, impact training, public engagement, and outreach.

National Fluid Future-Leader Centre: Develop future leaders via a flagship winter school, a wide-reaching summer research programme, and an inclusive early-career forum.

Ensuring Enduring National Benefit

After the initial five years of the hub, it will transition into a self-sustaining *Fluid Mechanics Society*, ensuring continuity of legacy and governance through specialist and regional representation.

[1] *Our Fluid Nation: The Impact of Fluid Dynamics in the UK*, University of Leeds, 2021. <https://edin.ac/3VNTkY3>.

[2] EPSRC, EP/N032861/1 - UKERC EDC: Projects. <https://edin.ac/4gq2io0>.