



UNIVERSITY OF LEEDS

CANDIDATE BRIEF

**Summer Research Internship – Future Fluid Dynamics CDT
Faculty of Engineering and Physical Sciences**



Salary: Grade 4 (£26,707 - £28,778 p.a.)

Reporting to: Dr Jonathan O'Connor, School of Physics and Astronomy

Reference: EPSMA1135

Closing date: Monday 01 June 2026

Fixed term (between 6-12 weeks, available from 01 June 2026 - to complete specific time limited work)

Location: Leeds Main Campus

We are open to discussing flexible working arrangements

Summer Research Internship - Future Fluid Dynamics CDT, Faculty of Engineering and Physical Sciences.

Are you interested in gaining first-hand experience of the research environment in fluid dynamics at the University of Leeds? Would you like to explore this opportunity to help you make an informed decision about progressing to postgraduate research? Would you like to develop knowledge, skills and experience to strengthen your application for research degree opportunities?

The [EPSRC Centre for Doctoral Training \(CDT\) in Future Fluid Dynamics](#), hosts an annual internship programme throughout summer. This opportunity is designed to enhance access to postgraduate research for individuals from underrepresented groups, supporting a more diverse and inclusive research community.

The programme allows prospective postgraduate researchers to gain first-hand experience of the research environment in fluid dynamics at the University of Leeds.

This experience will assist them to help informed decisions around progression to PGR and to develop relevant knowledge, skills and experience that can strengthen their applications to research degree opportunities. The centre provides advanced training and research opportunities in the field of fluid dynamics, with the aim of equipping future academics and industry practitioners with the interdisciplinary skills required to tackle complex fluid-related challenges across a range of industrial and scientific sectors. Research areas are Engineering and Physical Sciences, Environment, Biological Sciences, or Medicine and Health.

Widening participation

Applications are open to those who have not undertaken a research internship previously, and meet one or more of the following criteria:

- The first in their family to go to university;
- From Black, Asian or other minoritised ethnic groups;
- Neurodivergent (e.g. ASD, ADHD) and/or Disability (e.g. physical impairments, mental health condition, learning difficulties, chronic illness);
- Are female;
- Have caring responsibilities;
- Have been outside of education for 5 or more years;
- Studying/studied at a university that is not a member of the [Russell Group](#).



About the project

Title: Gravitational fractional separation of microbubbles in 3D printed microfluidic devices

Microbubbles are a powerful and highly controllable vehicle in clinical treatments. They can be visualised, cavitated and burst with ultrasound, providing high penetration into biofilms and biological tissue. Additionally, they can be customised for improved targeted drug delivery and biofilm disruption. It is imperative that any synthesised clinical microbubbles are uniform in their size and payload for consistent resonance frequency actuation and bursting. Some methods of microbubble formation can result in wildly heterogeneously sized microbubbles, therefore, require additional processing to sort. Microfluidics is an incredibly versatile tool for handling tiny volumes of liquids and gases. With the advent of readily available novel high-resolution 3D printing, new microstructures are possible for high-resolution gravitational separations of microbubbles. Such architectures would have been extremely complex and impractical with traditional 2D photolithographic fabrication.

This project will focus on the development of a platform for the microfluidic gravitational separation of microbubbles. Devices will be 3D printed using a commercial SLA 3D printer. Students will focus upon the development of concept designs from within the group and implement these within microfluidic flow and microbubble buoyancy simulations using a commercial software. These devices will then be produced within the MNP rapid-prototyping facilities. Students will follow an established procedure to generate a heterogenous mixture of microbubbles. Size heterogeneity of the microbubble populations will be size characterised and evaluated before and after gravitational separation using microscopy, nanoparticle tracking analysis (NTA) and other related techniques.

Overview of the role

To undertake independent research project supervised by an academic at the University of Leeds. This project will take place over 210 hours worked over a period of 6 weeks to 3 months during summer.

Main Duties and responsibilities

- Produce a brief report focusing on the simulations and experimental data produced during the internship;



- Conduct CFD (Computational Fluid Dynamics) simulations to model microbubble behaviour and buoyancy within 3D printed microfluidic devices;
- Utilise commercial SLA 3D printers for the fabrication of microfluidic platforms designed for gravitational separation of microbubbles;
- Generate heterogeneous microbubble samples following established procedures to ensure a range of sizes for evaluation;
- Perform statistical analysis of microbubble populations using microscopy and nanoparticle tracking analysis (NTA) to assess size distribution before and after separation;
- Collaborate closely with the project supervisor and other team members experienced in microbubble research throughout the internship.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

Developmental benefits

The intern will be an active researcher in cutting edge technology in a new field where they will develop transferable skills including CAD, CFD simulations, 3D printing, fabrication in controlled environments, microscopy, microfluidic flow handling and general laboratory experiments. This position will allow the intern to develop their professional skills including communication, time management and problem-solving skills for novel research.

Qualifications and skills

Qualifications

- Open to graduates or current second- or third-year undergraduates eligible for the Home (UK) fee-rate at postgraduate research (PGR).

Essential

- Curiosity and willingness to learn skills and techniques;
- Critical thinking;
- Good verbal and written communication skills;
- Ability to work both independently and as part of a team;
- Project specific:



- Knowledge of fluid mechanics;
- Confident with basic CFD simulations;
- Ability to analyse and communicate results.

Desirable (Will be trained & supervised regardless of experience)

- Project specific:
 - CAD skills (Autodesk Fusion/Inventor or Solidworks);
 - Familiar with coding and programming (Python or Matlab);
 - 3D Printing (SLA in particular);
 - Microscopy;
 - Knowledge of microfluidic/microbubble/separation science.

How to apply

You can apply for this role online; more guidance can be found on our [How to Apply](#) information page. Applications should be submitted by **23:59** (UK time) on the advertised closing date.

Please upload a supporting statement (Word or PDF) with the following details:

- An **introduction** to yourself and a **brief overview** of why you are applying for your chosen project and the internship;
- An outline demonstrating how you meet all **essential** and **desirable criteria** in the job description. Please address each criterion separately, clearly referencing the specific criterion;
- A description of which **widening participation criteria** mentioned in the job description you satisfy.

Contact information

To explore the post further or for any queries you may have, please contact:

Dr Jonathan O'Connor, Research Fellow

Email: J.S.OConnor@leeds.ac.uk

OR



Patricia Grant, Centre Manager

Email: P.Grant@leeds.ac.uk

Additional information

Faculty and School Information

Further information is available on the research and teaching activities of the [Faculty of Engineering & Physical Sciences](#), and the [School of Mathematics](#).

Working at Leeds

We are a campus-based community and regular interaction with campus is an expectation of all roles in line with academic and service needs and the requirements of the role. We are also open to discussing flexible working arrangements. To find out more about the benefits of working at the University and what it is like to live and work in the Leeds area visit our [Working at Leeds](#) information page.

A diverse workforce

As an international research-intensive university, we welcome students and staff from all walks of life and from across the world. We foster an inclusive environment where all can flourish and prosper, and we are proud of our strong commitment to student education. Within the Faculty of Engineering and Physical Sciences we are dedicated to diversifying our community and we welcome the unique contributions that individuals can bring, and particularly encourage applications from, but not limited to Black, Asian and ethnically diverse people; people who identify as LGBT+; and people with disabilities. Candidates will always be selected based on merit and ability.

We have identified that women are currently underrepresented in this role and particularly welcome applications. Candidates will always be selected based on merit and ability.

The Faculty of Engineering and Physical Sciences are proud to have been awarded the Athena SWAN [Silver](#) Award from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our [equality and inclusion webpage](#) provides more information.



Information for disabled candidates

Information for disabled candidates, impairments or health conditions, including requesting alternative formats, can be found under the 'Accessibility' heading on our [How to Apply](#) information page or by getting in touch by emailing HR via hr@leeds.ac.uk.

Criminal Record Information

Rehabilitation of Offenders Act 1974

A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our [Criminal Records](#) information page.

