

UNIVERSITY OF
BIRMINGHAM



EPSRC CDT in Topological Design:

Collaboration Guide
for Industrial Partners

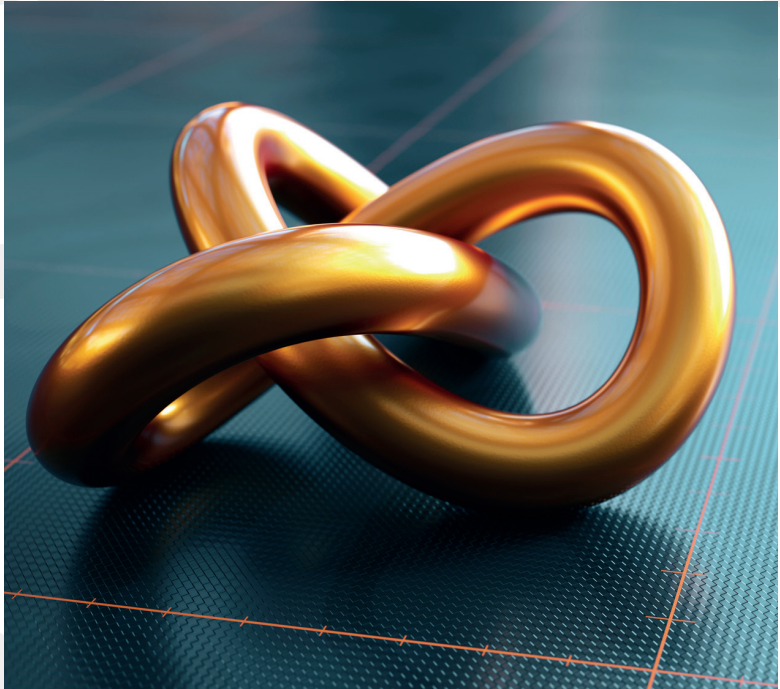


The Centre for Doctoral Training in Topological Design was created in 2018 at the University of Birmingham, spearheading interdisciplinary research in topology and related fields.

Based at our campus in Edgbaston, the CDT provides an innovative and challenging programme to support both the academic and professional development of students from a variety of STEM backgrounds.

The Centre offers a unique opportunity for students, academic colleagues and industrial partners to work together to produce applied research in the emerging field of topological design.

Drawing on expertise from across the University of Birmingham, the CDT offers our industrial collaborators the opportunity to develop cutting edge research projects, in collaboration with our exceptional students in this exciting area of interdisciplinary research.



What is Topological Design?

Topological Design is concerned with the functionality of an object or device derived from its shape rather than the material it is made from. Topology is the branch of mathematics that describes properties of objects which are preserved under continuous deformations (such as stretching, bending, twisting and crumpling).

In recent years, topological concepts have reshaped our understanding of condensed matter, optics and photonics, ultra-cold atoms and the mechanics of materials, and exploiting topological properties has the potential to revolutionise technology.

The University of Birmingham has been at the forefront of Topological Science. Historically, the worlds of Topology and Physics merged with the seminal work of Profs Tony Skyrme, David Thouless and Michael Kosterlitz at Birmingham. Thouless and Kosterlitz received the Physics Nobel prize in 2016 for this work, opening “the door on an unknown world where matter can assume strange states”.

Our Programme

The CDT offers a new programme of postgraduate study for students from a variety of STEM backgrounds, who are interested in research in topological design. Our PhD with Integrated Study combines innovative teaching in a range of professional skills and technical fields, with an interdisciplinary approach to the science of topology.

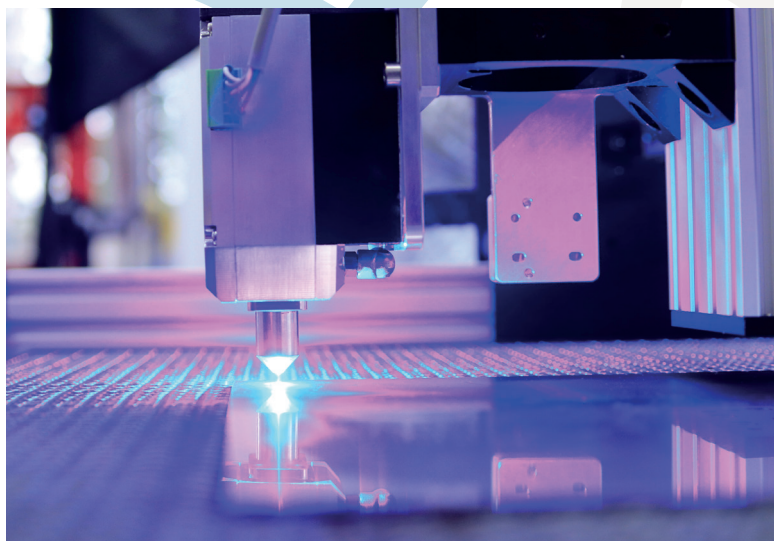
Recognising the different needs of our research projects and co-funders, we offer two pathways for students.

1+3 pathway

Students enrol in the CDT in late Sept each year, and undertake the complete training programme in year 1 of their PhD. Ideal for students working on highly interdisciplinary research projects, in new academic fields, or who have less experience in mathematics and theoretical physics.

4-year pathway

Students can enrol in the CDT at any point in the academic year, and complete their training programme alongside their research activity from years 1–3 of the PhD. Students begin full-time research from the beginning of their enrolment. The programme is ideal for co-funded projects where partners need students undertaking the research from the start of the PhD.



Industrial Partnership Activities

The CDT has a number of collaboration models for industrial partners, offering a range of different levels of support for students and the CDT.

These can include:

- Co-funding PhD research projects
- Hosting internships for students
- Acting as industrial advisors to the CDT management team
- Sharing access to specialised equipment
- Mentoring students

Co-Funding Arrangements

Co-funding research with the CDT allows a partner to develop a bespoke research project to meet their needs, with support from the Centre to attract high-quality applicants interested in interdisciplinary applied research.

The CDT operates a match-funding model with partners funding 50% of the studentship costs, along with costs for equipment and consumables when appropriate.

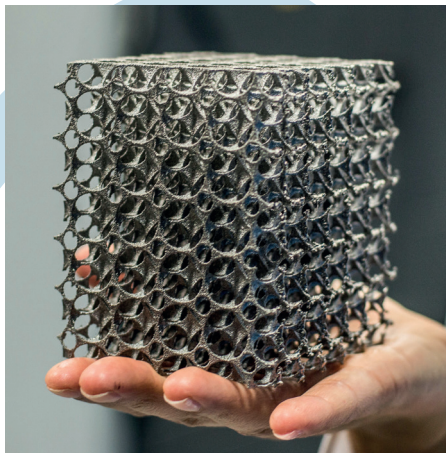
Indicative Co-Funding Costs Based on a 50% Studentship Arrangement

Year	2021–22	2022–23	2023–24	2024–25	Total cost
Partner Contribution	£10,905	£11,050	£11,250	£11,425	£44,630

**Estimated costs only. Subject to specific costs of the research project and annual review to account for inflation.*

Benefits of working with us

Our industrial partners benefit from collaborating with CDT in a variety of ways. Partners can engage directly with our highly qualified students, working with them on cutting edge research. Match-funded studentships offer the opportunity to collaborate with leading academics and PhD researchers at the University of Birmingham, developing a bespoke project on an area specifically relevant to a company's R&D needs.



As advisors to the CDT, industrial partners also have the opportunity to support the development of the Centre and the application of topological design in commercial research.





How do I become an industrial partner?

Enquiries about working with the CDT are welcome at any time.
Please contact the operational team for more information.

By post:

EPSRC Centre for Doctoral Training in Topological Design
School of Physics and Astronomy
University of Birmingham
Edgbaston, Birmingham
B15 2TT

Email: cdt-topologicaldesign@contacts.bham.ac.uk

Follow us on Twitter:

@CdtTopDes

Join our LinkedIn group:

[www.linkedin.com/
groups/8959733/](https://www.linkedin.com/groups/8959733/)



For more information, please visit our website:

<https://www.birmingham.ac.uk/cdt-topological-design>



UNIVERSITY OF
BIRMINGHAM

Edgbaston, Birmingham,
B15 2TT, United Kingdom
www.birmingham.ac.uk

Designed and printed by

UNIVERSITY OF
BIRMINGHAM

creativemedia