



Call for Applications

Postdoctoral Researcher in “Double Categorical Systems Theory”

Summary

[Topos Institute](#) is searching for a **Postdoctoral Researcher** working on the theory and practice of compositional conceptual modelling, based in **Oxford, UK**. We are a non-profit research institute dedicated to shaping technology for public benefit. We use cutting-edge mathematical research, especially category theory, to develop new computational tools that shape the way information flows through science, technology, and society. Our goal is a world where the systems that surround us benefit us all. Our offices are located in Berkeley CA, USA and Oxford, UK.

- **Title:** Postdoctoral Researcher
- **Start date:** 1st of October 2024 at the earliest; 6th of January 2025 at the latest
- **Location:** Oxford, UK (required, but a transition period may be negotiated if desired)
- **Duration:** 1 year, with potential to extend*
- **Salary:** £46,275–50,902

** Topos is looking to grow our UK team – while this position is currently funded by a 1-year project, selected candidates may have the opportunity for extension, or even to transition into a permanent role.*

Topos is committed to building a team with diverse perspectives and life experiences, so those with personal or professional backgrounds underrepresented at Topos are highly encouraged to apply. We are dedicated to shaping the future of technology to ensure a more equitable and just world, and we believe that a technology that supports a healthy society can only be built by an organisation that supports its team members. As such, Topos is committed to ensuring that its team members thrive in their work and home lives.

About the position

This is a 1-year postdoc with a possibility for extension to a second year, pending grant approval, and with opportunity for promotion into a permanent staff scientist role. We will be laying the groundwork for a compositional modelling framework allowing for collaborative design and validation of models on the firm formal basis of type theory and category theory.

In this project, you will conduct research in categorical systems theory with our researcher David Jaz Myers. We will make use of the methods of applied category theory, categorical logic, and algebraic systems theory to develop a mathematical framework for compositional modelling and compositional model/system validation. In particular, we will be developing the research program of double categorical system theory, using double categories of relations (or graphical logics) to express validation specs and double categories of systems to express model composition and model surrogacy. We will investigate compositional validation of composite models by relating such double categories, for example through black-boxing / behaviour functors.

A component of this project is bridging the gap between domain expertise in modelling and validation with this categorical theory, so we will also work on expository materials expressing the lessons of double categorical systems theory in ways domain experts can use.

About you

Our ideal candidate either has a background in algebraic systems theory or model/system validation with some knowledge of category theory and an eagerness to learn double categorical systems theory, or a background in applied category theory or categorical logic and an eagerness to work on systems modelling and validation.

You should have or soon obtain a PhD in, or have made significant contributions to, one of the areas of algebraic systems theory, system validation, model validation, (applied) category theory, or categorical logic.

Eligibility criteria

Due to grant details, the intended start date for this position is the **1st of October 2024**, and it is an **in-person** role in **Oxford, UK**. However, we understand that moving to a new location takes time, and are offering the possibility of delaying the start to commence on any date **up until the 6th of January 2025**. There is also a possibility to start work remotely.

We are able to hire anyone with UK work rights. Furthermore, we are in discussion with visa sponsorship lawyers to see how we can extend our hiring capability beyond this. In brief, we guarantee the ability to hire anybody with the right to work in the UK, but **strongly encourage** applicants to apply **even if they do not meet this requirement** as we will work with any successful applicant to attempt to procure the necessary sponsorship licence.

Application process

To apply for this position, please email uk-jobs@topos.institute with the subject line “**Job Application (DCST)**” and two PDF attachments:

1. a copy of your CV; and

2. a cover letter (roughly one A4 page) **including the contact details for two referees** who we can contact for letters of recommendation; please also include details about **your right to work in the UK or any visa requirements** that you have.

Your cover letter might describe your interest in the Topos Institute and this postdoc research position, your professional experience, your future goals, your specific experience with relevant mathematical research, and your potential contribution to a diverse and inclusive environment at Topos. Please feel free also to convey any information about preferred names and pronouns.

Please note that we will only contact your referees in the case of a successful application, so you do not need them to send recommendation letters at this stage of the application process.

We will review applications on a rolling basis, but **the final deadline for application submissions is the 31st of October 2024.**

If you have any questions about the application process, please contact uk-jobs@topos.institute (with davidjaz@topos.institute in cc) with your questions and we will endeavour to reply in a prompt manner.