

Project Reference: CTE_EMERC_Sanjay_002_25_26

About the Project

This is an exciting PhD opportunity within the College of Technology and Environment (CTE) at London South Bank University (LSBU). The successful candidate will receive a tuition fee waiver beginning in September 2025 for 4 years, including the write-up year.

Project Title

Morphology- and Defect-Tuned Thermochromic Coatings for Self-Adaptive Thermal Regulation in Smart Windows

Project Overview

Thermochromism refers to the reversible, temperature-induced change in a material's colour, which alters its light transmission and reflection properties. Thermochromic coatings can automatically regulate solar heat flux by responding to ambient temperature. When external temperatures exceed a certain threshold, these coatings reflect sunlight, reducing heat absorption and lowering cooling demands. However, current thermochromic materials typically suffer from high transition temperatures and limited emissivity contrast between hot and cold states.

This project builds on recent proof-of-concept findings to develop high-performance thermochromic coatings with tailored thin-film morphologies and controlled defect structures.

The successful candidate will gain hands-on experience in chemical vapour deposition, functional thin-film materials, handling air- and moisture-sensitive chemicals, advanced materials characterisation, and data analysis. The project benefits from strong industrial and multi-university collaborations and is expected to lead to patent applications and/or high-impact publications.

Who Are We Looking For?

- Open to any UK or international candidates. Starting in September 2025.
- The candidate must meet the minimum entry requirements for our PhD programme by clicking the ['Apply'](#) link.
- Previous research experience in materials science, chemistry or physics related topics is essential.
- Previous experience with chemical vapour deposition, thin film characterisation techniques and associated data analysis is desirable but not essential.
- A keen interest in thin film materials, chemical vapour deposition, thermochromism and associated characterisation techniques is desirable.

Selection Criteria:

- **Academic Qualifications** - You should have at least a 2.1 honours degree from a UK University or an equivalent qualification in engineering or the physical sciences.
- **Research and Analytical Skills** – Ability to research subjects using libraries, the internet, and other information resources, ability to conduct comprehensive literature reviews, experience in qualitative and quantitative data collection and analysis, strong research design and methodology skills, ability to independently collaborate with stakeholders, and excellent academic writing and communication skills.
- **Professional Skills** - Project management and organisational skills, ability to work independently and as part of a team, problem-solving and critical thinking skills, and adaptability and willingness to learn new skills.

- Communication Skills—The candidate should be highly motivated, able to collaborate, have good visual, oral, and written communication skills, and communicate the work's outcomes to commercial, industrial, and scientific audiences.
- Teamwork and Collaboration - Ability to work with industrial and academic supervisors.
- Language Proficiency - Overseas applicants must have a minimum English language IELTS score of 6.5, with at least 5.5 in any of the components.
- Understanding of Equality and Diversity - Able to demonstrate an understanding of equality and diversity and their practical applications.
- Visa and Legal Requirements - Non-EU/EEA nationals may need to apply to the Foreign and Commonwealth Office (FCO) for clearance from the Academic Technology Approval Scheme (ATAS).

Training & Development Opportunities

Doctoral students at London South Bank University ([LSBU](#)), through the London Doctoral College ([LDC](#)), benefit from a rich and structured training environment designed to support academic excellence and professional development. All PhD candidates are offered a comprehensive programme of workshops and seminars covering essential research skills, including research design, data analysis, academic writing, ethics, and project management. These sessions aim to support students through every stage of their doctoral journey—from literature review and methodology to thesis completion and viva preparation. Postgraduate researchers can access advanced, discipline-specific training aligned with their research focus. LSBU's doctoral training environment is designed to build deep expertise in a chosen research area and the broader skills necessary for successful careers in research, industry, and beyond.

About the College

The College of Technology and Environment (CTE) at London South Bank University (LSBU) is a newly formed academic college, launched in January following the university's recent reorganisation. Led by Executive Dean Professor Chris Harty, CTE brings together four schools: Architecture & Planning, Construction, Property & Surveying, Engineering & Design, and Computer Science & Digital Technologies. The college fosters a collaborative and interdisciplinary environment, addressing the complex challenges of the built and digital environments. CTE strongly emphasises research, with doctoral students playing a key role in shaping and contributing to the college's research agenda. CTE prepares students to become future leaders through innovation, industry partnerships, and a commitment to sustainability. With a focus on real-world impact and academic excellence, the college is set to drive forward LSBU's vision of delivering applied knowledge that transforms lives and communities locally and globally. The university has five centres, and any academic staff and students in the college can join. These research centres are described below.

About the Energy, Materials and Environment (EME) Research Centre

The [Energy, Materials and Environment Research Centre](#) leads interdisciplinary research on sustainable energy systems and material innovation. We address climate change by developing whole energy systems, spanning generation, storage, distribution, and consumption. Our research draws from materials engineering, policy, and societal impact to understand and influence the complex relationships between energy, economy, and society. With expertise in multiscale systems and cross-sector collaboration, we aim to shape policy and technology that supports the transition to a low-carbon future. Our work informs sustainable development strategies that balance environmental, economic, and social needs across local and global contexts.

Contact Person

Before applying, please contact the main supervisor, [Dr Sanjay Sathasivam](#), a senior lecturer in Chemical Engineering at the School of Engineering and Design, College of Technology and Environment.

E-mail: s.sathasivam@lsbu.ac.uk

In your email, include:

- Details of your current level of study and academic background.
- A summary of any relevant experience.
- A brief paragraph about your motivation for pursuing this PhD project.

Fee Waiver

The fee waiver is available for 4 years (48 months), including the writing-up year, examination period, and submission of the corrected thesis.

How to apply

Applications should be submitted via the programme page using the links below:

<https://www.lsbu.ac.uk/study/course-finder/chemical-process-and-energy-engineering-phd>

You should upload the problem statement, qualifications, CV, and other relevant documentation to the application portal. Remember to state the correct reference number and the appropriate supervisor.