

# CALL FOR INTERNATIONAL POSTDOCTORAL FELLOWSHIPS

**Project Title:** Bio-Derived PCM Nano-Emulsions for Controlled Heat Storage: Colloidal Stability, Supercooling Suppression, and Thermophysical Properties

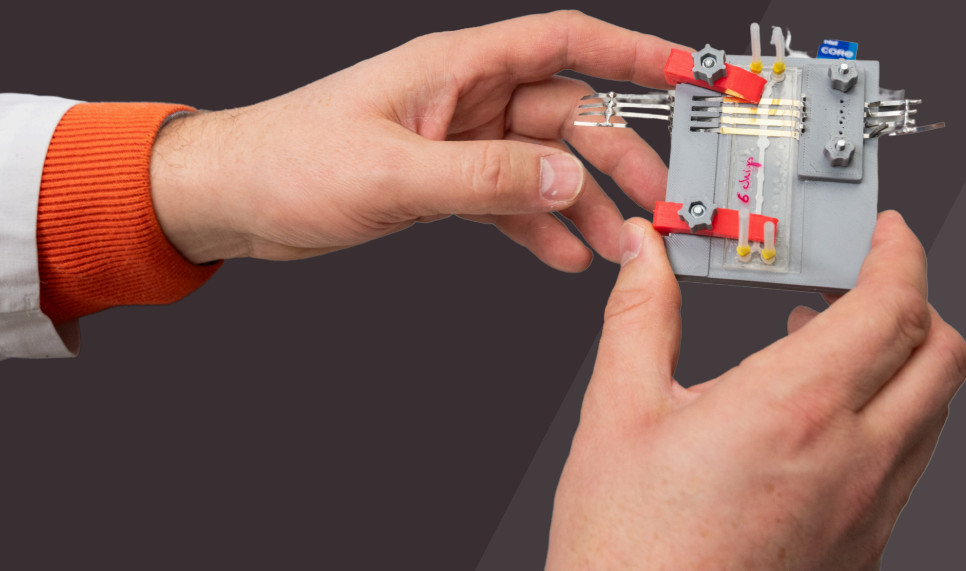
**Project Duration:** 24 months

**Project Start Date:** no later than 30 June 2026

**Employment Terms:** Full-time (40 hours/week)

**Gross Salary:** €3,142/month

**Location:** Vilnius, Lithuania



## Eligibility Criteria

- Applicants must hold a doctoral degree awarded by a Lithuanian (excluding FTMC) or foreign institution in physical sciences or technological sciences.
  - No more than 5 years should have elapsed since the award of the doctoral degree (periods of maternity and parental leave are excluded).
- 

## Position Overview

Energy optimization is essential for economic growth, with efficient thermal energy storage playing a key role. Passive thermal management supports both military and civilian needs; however, existing methods often rely on heavy insulation or energy-intensive systems, reducing efficiency. Phase Change Materials (PCMs) are promising for temperature regulation due to their ability to absorb and release heat, especially in latent heat storage systems. Yet, issues such as low thermal conductivity, supercooling, and instability limit their commercial use. Fine PCM nano-emulsions improve stability and heat transfer but still face challenges with supercooling and degradation. This project aims to address these challenges by developing bio-based PCMs in ultra-stable nano-emulsions, utilizing renewable materials and advanced stabilization methods, and exploring their applications in cooling systems and textiles.

We are seeking a highly motivated Postdoctoral Researcher to join an innovative project dedicated to advancing energy optimization through the development of bio-based Phase Change Materials (PCMs) in ultra-stable nano-emulsions. This research focuses on enhancing thermal regulation in textiles and cooling systems by leveraging renewable materials and sophisticated stabilization methods. The successful candidate will contribute to the integration of these advanced PCMs into smart textile composites, exploring their potential for efficient passive thermal management in wearable applications. Responsibilities will include synthesizing and characterizing bio-based PCM nano-emulsions, as well as embedding them into textile substrates to create multifunctional, flexible, and protective smart textiles capable of regulating temperature and improving user comfort in real-world conditions.

---

## Requirements for a Postdoctoral Fellow:

- PhD degree in one of the following fields: chemistry, materials science, textile engineering or printed electronics.
- The PhD must demonstrate strong research competence in experimental materials research.
- At least one peer-reviewed scientific publication relevant to the project field is required.
- Synthesize, characterize, and optimize stable bio-based PCM nano-emulsions with controlled supercooling.

- Investigate structure-function relationships using advanced characterization techniques (SEM, FTIR, DSC, XRD, Rheology, TEM).
  - Prepare a detailed protocol for producing PCM emulsions by utilizing different PCM types, emulsifiers, nucleating agents, and processing parameters.
- 

**Contact person:**

*Arunas Stirke, PhD*

*Chief Researcher*

*Head of Bioelectronics Laboratory*

*Center for Physical Sciences and Technology*

*Sauletekio ave. 3, C331, LT-10257 Vilnius*

*Lithuania*

*Mobile +370 61515363*

*[arunas.stirke@ftmc.lt](mailto:arunas.stirke@ftmc.lt)*