Investigating the Manipulation of Alignment/Activity via Geometrical INteraction Effects in Liquid Crystals

Fact Sheet

Project Information

**IMAGINE_LC**
Grant agreement ID: 101065631

**DOI**
10.3030/101065631

<table>
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<th>Start date</th>
<th>End date</th>
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<td>1 January 2023</td>
<td>31 December 2024</td>
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**Funded under**
Marie Skłodowska-Curie Actions (MSCA)

**Total cost**
€ 0,00

**EU contribution**
€ 187 624,32

**Coordinated by**
UNIVERSITEIT UTRECHT
Netherlands

Objective

Controlling the orientation of rod-like objects is crucial for liquid crystal technologies and the natural world. For biological systems, recent studies have shown that living materials form liquid crystalline structures that dictate biological function. These systems are out-of-equilibrium, converting energy into motion, and are modelled as active liquid crystals. However, alignment techniques commonly used in liquid crystal technologies are yet to be leveraged for active counterparts. The prevailing chemical alignment methods do not scale to these larger system sizes. Geometrical orientation of rods, however, applies across length scales. Though the influence of geometrical features on alignment is not well understood, even for passive systems, IMAGINE_LC will investigate the Manipulation of Anchoring and Activity via
Geometrical Interaction Effects on an experimental, colloidal, liquid crystal system. The colloidal scale minimizes chemical interactions and enhances geometrical effects. I will develop a passive and active model system that is confined by walls with diverse topographical features. The project will be conducted at Utrecht University, where the host has expertise in confined liquid crystals and colloidal synthesis.

The host and I will have a two-way transfer of knowledge by employing host expertise in liquid crystal analysis, colloidal synthesis, and high-resolution imaging for this project. These tools are essential for developing a colloidal liquid crystal. My knowledge of molecular liquid crystals is complimentary to the host group’s research focus on liquid crystal assembly. My experience with complex liquid crystal device fabrication will complement the host’s body of knowledge. By combining our expertise, IMAGINE_LC will advance the fundamental understanding of geometry on liquid crystal alignment and dynamics, establishing principles that are generalizable to synthetic and biological systems, ranging from nanometric to millimetric sizes.

**Fields of science**

- engineering and technology > materials engineering > crystals
- natural sciences > mathematics > pure mathematics > geometry
- engineering and technology > materials engineering > liquid crystals

**Programme(s)**

HORIZON.1.2 - Marie Skłodowska-Curie Actions (MSCA) [MAIN PROGRAMME]

**Topic(s)**

HORIZON-MSCA-2021-PF-01-01 - MSCA Postdoctoral Fellowships 2021

**Call for proposal**

HORIZON-MSCA-2021-PF-01

See other projects for this call

**Funding Scheme**
Coordinator

UNIVERSITEIT UTRECHT
Net EU contribution
€ 187 624,32

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Region
West-Nederland > Utrecht > Utrecht

Links
Contact the organisation Website Participation in EU R&I programmes HORIZON collaboration network

Other funding
€ 0,00

EC signature date 10 June 2022
Last update: 5 August 2022

Permalink: https://cordis.europa.eu/project/id/101065631

European Union, 2023