3-year postdoctoral position (M/F): Modeling of large-dimensional optical metasurfaces.

Mission: We are involved in the electromagnetic modeling of large collections of meta-atoms on layered surfaces, a longstanding and complex challenge. Our objective is to develop effective numerical tools and models capable of predicting light scattering behaviors of these ensembles. In 2020, we introduced a promising concept, as detailed in our publication in J. Opt. Soc. Am A **37**, 70-83 (2020). We aim to further this research, proving its potential to solve problems unattainable by the traditional T-matrix method. The plan is to release a freeware.

The postdoc will develop numerical methods and approximate models. The predictions will be validated by experiments obtained from samples either deposited from a colloidal solution onto a solid support or fabricated with advanced lithography and then replicated.

Activities: You will gain valuable experience in the fields of optical metasurfaces. Your role will be to develop theoretical tools and approximate models to predict how light is scattered by large sets of randomly or ordered metaatoms. You will also be a key player in the design for specific applications and will participate in the characterization of manufactured samples, to test models or interpret experimental data.

Expected skills: electromagnetism, numerical computing, nanophotonics, optical metasurfaces, disordered media

Work context: The work will be conducted under the auspices of the ERC UNSEEN initiative (budget exceeding 2 million euros), which is dedicated to the development of metasurfaces offering novel visual appearances. Visual appearance play a crucial role both in everyday life and in the realms of fine and applied arts. Commencing on September 1, 2023, at LP2N in Bordeaux, the project is slated to span a duration of 5-6 years. It gathers expertise in optical metasurfaces, complex media, rendering, structural color and nanofabrication. More details on the subject can be found in Nat. Mater. **21**, 1035–41 (2022) and ACS Nano **17**, 6362–72 (2023).

Moreover, the numerical tool that will be developed will be tested within an industrial context, involving collaboration with ST-microelectronics for entirely distinct applications.

Please contact: Philippe Lalanne
philippe.lalanne@institutoptique.fr
webpage - google scholar
Include
- CV
- Motivation letter
- Evaluation reports about the PhD manuscript and the defense