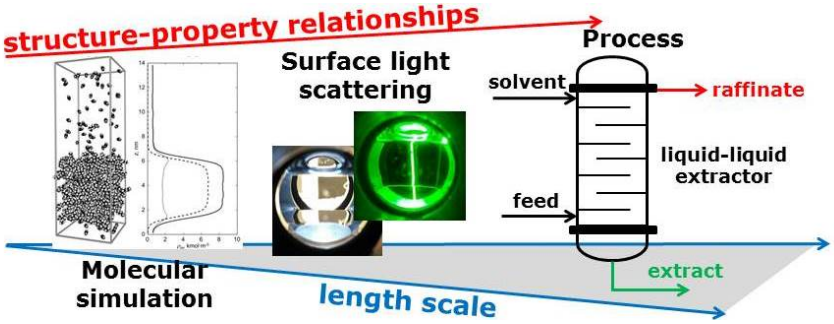
The **Institute of Advanced Optical Technologies – Thermophysical Properties (AOT-TP)** offers a

Position as Doctoral Researcher (m/f)

for a research project with the tentative title

Interfacial Tension and Viscosity of Biphasic Liquid Systems by Experiment and Molecular Simulation

Biphasic liquid systems consist of two partially miscible liquids and are thus associated with phase boundaries. Ordinary liquid-liquid systems which are of interest for the current research project are thermodynamically unstable and separate into the two phases with a defined interface. Understanding the physics at the interfaces and in the bulk of biphasic liquid systems is of importance in energy and process engineering. In liquid-liquid extraction processes, for example, a solvent is used to extract the valuable solute product from the feed stream. For process design in connection with biphasic liquid systems, knowledge about their thermophysical properties including viscosity and interfacial tension is required. The viscosity is important for the characterization of heat, mass, and momentum transfer. Besides its relevance for the physics of interfaces, the interfacial tension is also of technical importance, e.g., in connection with wetting, mass transfer across phase boundaries, and stability of liquid-liquid systems.



At AOT-TP, advanced measurement and simulation techniques are continuously developed and applied for the accurate determination of thermophysical properties of fluids. The major task of the doctoral researcher is to contribute to a fundamental understanding of biphasic liquid systems by studying their thermophysical properties interfacial tension and viscosity. Objects of investigations are systematically selected liquid-liquid systems related to energy and process engineering. For deriving structure-property relationships for these systems, surface light scattering (SLS) and molecular dynamics (MD) simulations should be combined and further developed. While the experimental data for viscosity and interfacial tension obtained by SLS serve to validate the results from the molecular simulations, the latter are helpful for the interpretation of the measurement results on a molecular level. The findings from the experiments and simulations should allow for the development of prediction methods for the viscosity and interfacial tension of biphasic liquid systems.

For the research project, we are looking for a graduated researcher with interests in energy and process engineering, thermophysical properties, as well as modern experimental and simulation techniques. We offer a multidisciplinary and international working environment with excellent potential for scientific and personal development. We are interested in starting the corresponding cooperation as soon as possible.

If you are interested, please contact and forward your application documents to

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