

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

## Master thesis

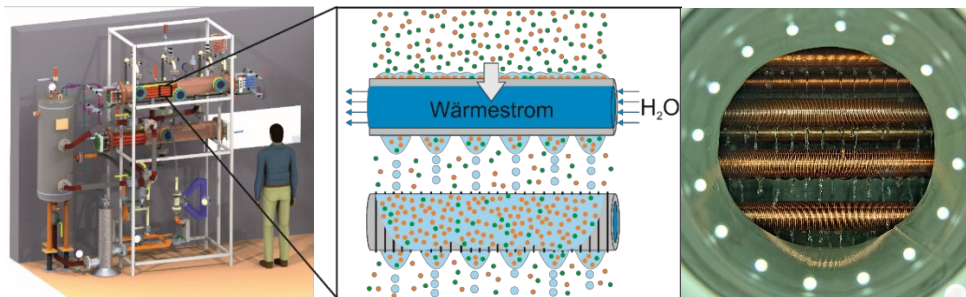
in connection with the research topic:

### Condensation of binary zeotropic hydrocarbon mixtures on smooth and finned tubes and in tube bundles

**Background:** As climate change advances, there is a growing focus on climate-friendly alternatives to conventional refrigerants. Hydrocarbons and hydrocarbon mixtures with low Global Warming Potential (GWP) represent promising options, potentially allowing for "drop-in" solutions in existing systems using phased-out high-GWP refrigerants. However, experimental data and a fundamental understanding on the condensation behavior of these mixtures on various tube surfaces is still lacking.

**Project Objective:** Funded by the Bavarian Research Foundation and in collaboration with Wieland-Werke AG, our research aims to investigate the condensation behavior of natural refrigerant mixtures on smooth and finned tubes. We seek to develop modeling approaches for simulating mixture condensation heat transfer, thus enhancing condenser design and efficiency.

**Innovation:** In addition to the accurate measurement of condensation heat transfer coefficients, the used setup enables a precise real-time analysis of refrigerant mixture composition during operation based on Raman spectroscopy.



#### Your Tasks:

- Experimental investigation of the condensation behavior of zeotropic mixtures on condensation tubes with varying surface geometries and in tube bundles
- Investigation of the influence of surface structure, composition and saturation temperature on the condensation heat transfer coefficient.

#### Our Offer:

- Application of a specially designed experimental facility with state-of-the-art measurement technology
- Work in an interdisciplinary team with close collaboration between academia and industry
- In-depth insights into current research on **thermophysical properties** and **heat transfer**
- Excellent opportunities for personal and academic development

#### Requirements:

- Interest in **heat and mass transfer** as well as **thermophysical properties**
- Basic knowledge of heat and mass transfer
- Independent, structured working style and scientific curiosity

**We look forward to your application!**

**Start:** as soon as possible

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