

Chair of Aroma and Smell Research at Department of Chemistry and Pharmacy are looking for

2 Open HiWi Positions in Airborne Molecular Communication (m/w/d)

Airborne Molecular Communication (AMC) is an exciting and fast-growing interdisciplinary research field that explores how airborne chemical molecules can be used to encode, transmit, and recover information.

Unlike conventional electromagnetic systems, AMC uses chemical signals—often referred to as *odor objects*—as information carriers. This bio-inspired communication paradigm opens novel opportunities in environmental monitoring, agricultural applications, smart sensing, and nature-inspired information exchange.

Research in AMC is inherently interdisciplinary, combining olfactory chemistry, perception science, biophysics, fluid mechanics, and communication theory.

To foster this line of research, the German Research Foundation (DFG) has established the research training group SyMoCADS (Synthetic Molecular Communication Across Different Scales) at FAU, connecting experts from chemistry, engineering, and information sciences. Within this framework, the Chair of Aroma and Smell Research contributes to two projects focusing on transmitter (P7) and receiver (P8) architectures for airborne molecular communication systems.

Research Focus

- **Project P7 – Transmitter Systems**

Focuses on the design and characterization of airborne molecular transmitters that encode information into *odor objects*—controlled molecular mixtures released into the air.

The project investigates mixture composition, release mechanisms, and aerodynamic effects on molecular dispersion.

- **Project P8 – Receiver Architectures**

Aims to develop sensitive sensor arrays and decoding strategies for detecting and interpreting airborne molecular signals.

The research includes sensor response modeling, signal analysis, and machine-learning approaches, validated through experimental implementations.

Together, these projects aim to realize a complete end-to-end airborne molecular communication system—from molecular emission and air propagation to detection and information recovery.

What We Offer

As a student assistant (HiWi), you will:

- Participate in experiments and simulations of airborne molecular propagation;
- Assist in developing odor release setups and sensor-based detection algorithms;
- Collaborate with researchers from communication engineering, chemistry, physics, and biology;

- Acquire key skills in experimental design, modeling, simulation, and data analysis for future research and thesis projects.
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Prerequisites

Scientific skills	Enthusiasm for interdisciplinary research, strong analytical skills, and a solid background in math or physics.
System knowledge	Background in olfactory chemistry, perception systems, or communication theory is an asset.
Hardware/simulation skills	Experience in hardware programming is preferred; familiarity with simulation or signal-analysis tools is a plus.

Job Description:

- Temporary contract: Preferred duration of the position: 6-12 months
 - This is a part-time position, 8 hours/week; working hours: to be agreed upon.
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Notes:

Please submit your application by email only, including cover letter, CV and certificates in a single PDF document to manisha.sinha@fau.de

Supervisors

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Start: 01 January 2026
End: TBD