

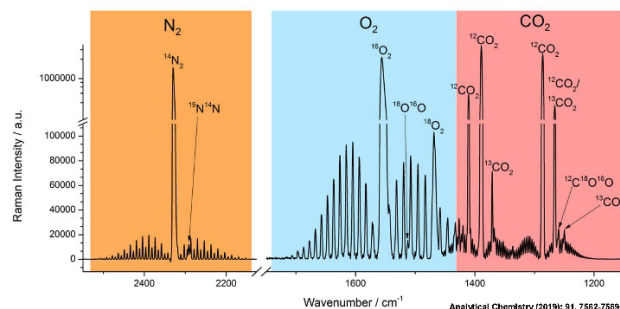
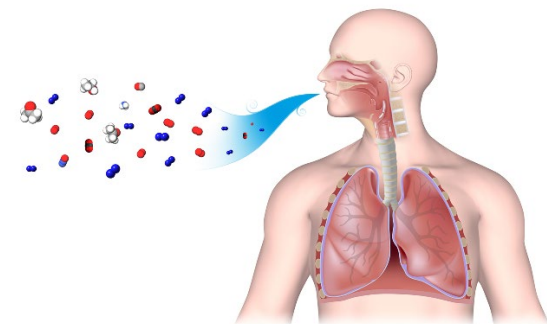


## PhD Topic Raman Gas Sensing

The Research Group Biophotonics-Biomedical Engineering currently has a PhD Topic on Raman gas sensing.



In this project, we are researching novel, highly sensitive Raman spectroscopic gas measurement techniques. We achieve excellent selectivity so that we can identify and quantify almost all gaseous and volatile components of a sample simultaneously with a single measurement. An important focus of the project is research into innovative signal amplification mechanisms in order to detect even trace gases with the lowest concentrations. With our developments in fiber-enhanced (FERS) and cavity-enhanced (CERS) Raman gas spectroscopy, we are at the forefront of international research. Due to the high selectivity, we can also detect unknown substances in complex gas mixtures in an exploratory manner. Highly sensitive Raman gas spectroscopy is therefore an extremely promising method for the analysis of gaseous and volatile biomarkers in exhaled gas and thus for early, non-invasive disease diagnostics and therapy monitoring.



### Your knowledge and skills:

- Solid knowledge of optics, photonics, and optical spectroscopy
- Excellent experimental skills in the development and application of new instruments and setups
- Interest in Raman spectroscopy, gas sensing, fiber sensors and biomedical analytics
- Interest in data analysis and programming
- Interest in interdisciplinary research
- Highly motivated and creative individuals with scientific ambition
- Excellent English communication skills, both written and spoken

We offer an attractive research environment with a friendly, young team, excellent instrumentation, and diverse interdisciplinary cooperation opportunities.



We expect the candidate to have a university degree (physics, photonics, engineering, physical chemistry, analytical chemistry or comparable) with very good academic results, to be self-motivated and to work independently on the research tasks.

Start is possible on mutual agreement. Please send your detailed application as a pdf file by e-mail to:  
**Prof. Torsten Frosch, E-Mail: [torsten.frosch@tu-darmstadt.de](mailto:torsten.frosch@tu-darmstadt.de)**

**Literature:**

Trends in Analytical Chemistry (2018); 103, 230-238; Analytical Chemistry (2014), 86, 11, 5278–5285; Analytical Chemistry (2021); 93, 30, 10546–10552; Analytical Chemistry (2020); 92, 18, 12564–12571; Analytical Chemistry (2019); 91, 7562-7569; Analytical Chemistry (2017); 89, 12269–12275; Analyst (2017); 142, 3360–3369; Analytical Chemistry (2017); 89, 1117–1122; Analytical Chemistry (2015), 87, 2, 982-988; Bioanalysis (2015), 7, 3, 281–284