

Open Position: PhD researcher

Topic: Raman Gas Sensing – Breath Analysis



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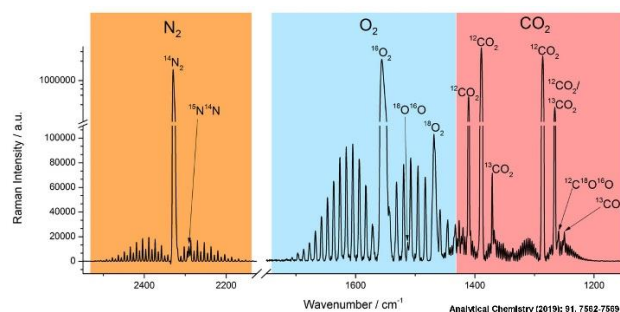
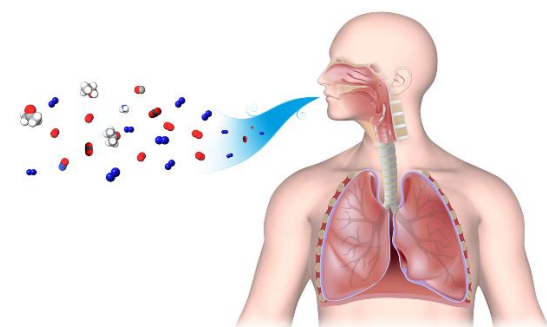
The [Biophotonics](#) research group at TU Darmstadt, Germany, is currently looking for a PhD-researcher for the topic Raman gas sensing.



The [PhD position](#) is **fully funded** (100% E13 salary, approx. 5000 EUR per month). The researcher will benefit from a **structured doctoral training** with excellent opportunities for **interdisciplinary research**, **skills development** and **building a scientific network**.

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 enhancement 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



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- Highly motivated and creative 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 Master's degree or equivalent (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.

The candidate must not have lived or worked in Germany for more than 12 months in the past 3 years.

Please send your detailed application as one pdf-file by e-mail to: Prof. Dr. Torsten Frosch, **E-Mail:** application@biophotonics.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](#)