



PhD Program between Freie Universität Berlin (FUB) and the China Scholarship Council (CSC)

**Open PhD Position at Freie Universität Berlin,
offered only to Chinese CSC scholarship candidates 2026**

Department/Institute: [BCP, Institut für Chemie und Biochemie]

Subject area: [Molecular Spectroscopy and Quantum Chemical
Calculations]

Name of Supervisor: [Sebastian Hasenstab-Riedel]

Number of open PhD positions: [1]

Type of the PhD Study: [full-time]

Project title: [Investigation of heavy atom tunneling in small molecules at
cryogenic conditions]

PhD Project description:

In our recent work (Nature Commun. 16, 4027 (2025). <https://doi.org/10.1038/>), we demonstrated for the first time that fluorine atoms can undergo quantum tunnelling. This phenomenon allows a particle to effectively pass through an energetic barrier that it does not have enough energy to overcome. This probabilistic phenomenon is most noticeable for very small particles with little mass, such as electrons or hydrogen atoms. For these particles, there is a small chance that they could be found on the other side of, or even within, a barrier – and they often are. The largest atoms known to tunnel so far are oxygen and nitrogen, but our group has recently shown that fluorine can also tunnel. This opens up new possibilities for controlling chemical reactions and improving our understanding of the chemistry of fluorinated compounds. The aim of this project is to prepare other molecules that might demonstrate heavy atom tunnelling.

Language requirements:

- IELTS: 6,5 oder TOEFL: 95 ibt

Academic requirements:

Master in chemistry or physics

Information of the professor or research group leader (website, awards etc.):

https://www.bcp.fu-berlin.de/en/chemie/chemie/forschung/InorgChem/agriedel/Hasenstab-Riedel_Sebastian_Prof/index.html

Please note:

In a first step, the complete application should be uploaded to the online portal (<https://fuberlin.moveon4.de/form/60acfece5d328710e40bdbd5/eng>) for evaluation by December 15th, 2025.