

Positions in Ultrafast Laser Science and Terahertz Technology

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Project TerAqua: Compact and efficient strong-field Terahertz light source to explore water in new regimes

Coherent sources of THz radiation (0.1 THz – 10 THz) have become ubiquitous tools for a wide range of applications in science and technology. In particular, fast progress in the demonstration of intense, ultrafast laser driven THz sources for time-domain spectroscopy have enabled nonlinear time-resolved spectroscopies in this frequency region to bloom. However, the study of liquids, and more particularly, water, with these nonlinear spectroscopic techniques in the THz region remains a widely unexplored area with many unanswered questions, due to the inadequacy of current sources.

In this project (Project TerAqua, funded for 5 years by an ERC St.G.), we aim to explore new schemes to efficiently generate strong-field THz pulses with very high repetition rate. The goal of this project is both to demonstrate these unique sources, and apply them in the context of the cluster of excellence RESOLV (Ruhr Explores SOLVation), to gain fundamental understanding of the inter-molecular dynamics of water using nonlinear time-resolved spectroscopies.

The research topics cover both applied and fundamental aspects of ultrafast laser science and technology and have various multi-disciplinary application fields in physics and physical chemistry. For various aspects of this interdisciplinary work, we have several projects for Masters students/PhD students/Postdocs who would like to work on state-of-the-art research topics in a young and international research group. Candidates should hold (or be close to completing) a Masters' degree/PhD in Physics or Electrical Engineering (or related areas) and ideally already have some experience in experimental laser physics and/or optics.

Interested candidates are encouraged to contact us and send (1) a letter of motivation, (2) a CV, (3) a copy of the diploma and/or grades, (4) a list of publications if applicable, and (5) the name and contact information of at least two references (alternatively two letters of recommendation) to clara.saraceno@ruhr-uni-bochum.de.