


International Internship

- Start your first international research project
- Visit one of the world's top institutes in the fields of molecular sciences, spectroscopy, and simulation
- Publish your first scientific paper together with internationally recognized top researchers
- Gain international experience at a very early stage in your career
- Earn leadership qualities in multicultural, interdisciplinary, high profile research teams
- Your internship will be organized and co-financed by the university

Our excellent Research Network:

Institution	Institution
 Cornell University, USA	 University of California Berkeley, USA
 Ecole Normale Supérieure Paris, France	 University of California Irvine, USA
 ETH Zürich, Switzerland	 University of California Los Angeles, USA
 Indian Institute of Science Bangalore, India	 University of California Santa Barbara, USA
 Indian Institute of Technology Kanpur, India	 University of Cambridge, UK
 National Institutes of Natural Sciences, Japan	 University of Illinois at Urbana Champaign, USA
 Purdue University, USA	 University of Nottingham, UK
 University of Pennsylvania, USA	 Seoul National University, Korea
 Radboud University Nijmegen, The Netherlands	 Weizmann Institute of Science, Israel
 University College London, UK	 University of Vienna
 Yale University, USA	

University Alliance Ruhr



- A regional network for the universities at Bochum, Dortmund, and Duisburg-Essen supporting
- 110,000 students
- 15,000 international students
- 8,000 researchers
- 800 partnerships with universities in 130 countries
- with an annual budget over 1.1 billion euros

Bochum in the Heart of Metropolis Ruhr

- Modern cultural, scientific, and technological area
- High standard, lower cost of living
- Eleven metropolitan cities
- 5.2 million people
- 20 universities
- Enjoy thousands of leisure activities like festivals, concerts, and sports

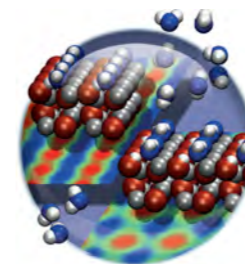
Ruhr-Universität Bochum

"RUB" is one of Germany's leading research universities. It draws its strengths from both the diversity and the proximity of many different scientific disciplines on a single, coherent campus. This highly dynamic setting enables students and researchers to work across traditional boundaries of academic subjects and faculties. The range of cross-disciplinary networks include the RUB Research School, two German Clusters of Excellence, and RUBiss for international student support. The Ruhr-Universität is a vital institution in the Metropolis Ruhr and hosts about 34,000 students and about 4,700 staff.



Main Destinations close by

- Kemnade See 5 minutes
- Dusseldorf 0.5 hour
- Cologne 1 hour
- Berlin 4 hours
- Amsterdam 3 hours
- Brussels 3 hours
- Luxembourg 3 hours
- Paris 6 hours
- Prague 7 hours
- North Sea 3 hours



Ruhr Explores Solvation

RESOLV @ RUB provides a unifying framework for understanding and predicting solvent processes at Ruhr-Universität Bochum. Many of the iMOS instructors are affiliated with this Cluster of Excellence. Find out more about the doctoral program and research opportunities:

www.solvation.de



RUHR-UNIVERSITÄT BOCHUM

RUB



iMOS international Master
Molecular Sciences

International Master's Program Molecular Sciences - Spectroscopy and Simulation

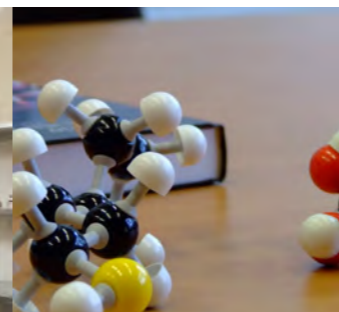
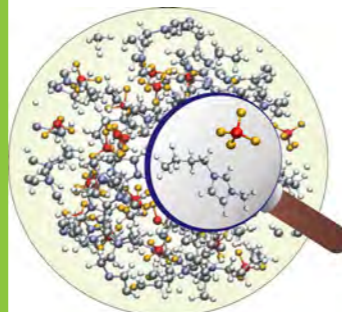
Faculty of Chemistry and Biochemistry
Solvation Science @ RUB
University Alliance Ruhr



www.rub.de/imos

RUHR-UNIVERSITÄT BOCHUM
FACULTY OF CHEMISTRY AND BIOCHEMISTRY

International Master Program
Molecular Sciences - Spectroscopy and Simulation
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www.rub.de/imos
Images © RUB



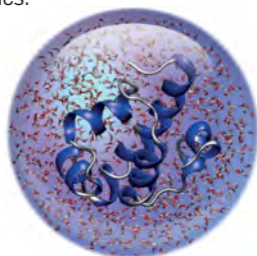
iMOS

International Master Molecular Sciences – Spectroscopy and Simulation

Offered by the Faculty of Chemistry and Biochemistry at RUB, iMOS offers you the unique chance to acquire and to apply in practice cutting-edge skills in theoretical and spectroscopic techniques in the fields of molecular chemistry, biochemistry, and physics.

Plan ahead:

- The Master's Program takes two years
- The teaching language is English
- 1st Semester every Winter Semester in October
- Arrive early for optional language courses at RUB
- 10 ECTS in mathematics and 8 ECTS in theoretical chemistry and/or spectroscopic techniques and/or quantum mechanics are required prerequisites
- Qualify for your funded doctoral thesis in Germany
- 1.5 GPA? **Fast-track option** for outstanding students: Start your doctoral work after only one year, competitive scholarship available, **May 15th** deadline



Apply now:

- International students: online application at www.rub.de/imos by **June 15th**
- Submit your academic certificates
- An English language certificate may be needed if your bachelor's degree was conducted in another language
- **Fast-track option** - may apply via iGSS at RESOLV

For You?

Tailored for students of

- Chemistry
- Physics
- Mathematics
- Biochemistry
- related Engineering fields



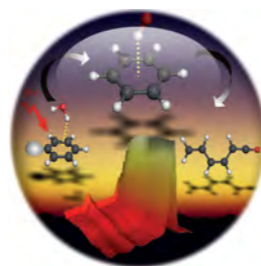
We are looking for students who have a passion for science and wish to work in an international environment.

What skills do you need?

This highly competitive program relies on your skills in quantum mechanics, mathematics, physics, and chemistry. Basic knowledge of classical mechanics and thermodynamics / statistical mechanics is required.

You have already learned:

- Schrödinger's equation and wave functions
- Hamiltonian operator
- real and complex valued vector spaces, matrices
- basis set transformations, partial differentiation
- integration over arbitrary dimensional space
- basic statistical entities like distributions, averages, data regression and hypothesis tests.



The course curriculum is designed to be accessible for students who have completed their undergraduate chemistry degree at RUB and elsewhere.



What we offer:

- Comprehensive student support
- Low semester fees fund your unlimited regional transit pass, bicycle rentals, available German and English language courses and more
- Three-month international internship
- 2nd year: opportunity to apply for paid scientific student jobs
- Track into Ph.D. study
- Active research environment with internationally renowned scientists

iMOS Scope

- Earn cutting-edge skills in theoretical and spectroscopic techniques
- Gain deep insights into molecular physics, chemistry, and bio-chemistry
- Acquire the ability to apply the tools to a wide range of interdisciplinary scientific challenges
- Learn how to develop and solve scientific questions by employing suitable theoretical and experimental methods
- Work in international, multicultural, and interdisciplinary teams

iMOS Curriculum (120 CPs*)

1st Semester (28 or 33 CPs)

- Concepts of Quantum Mechanics**
- Statistical Physics and Thermodynamics**
- Dynamics and Simulation (+ Practical)
- Concepts of Spectroscopy 1 (+ Practical)
- Concepts of Molecular Chemistry 1
- Biomolecular Simulation**

2nd Semester (28 or 33 CPs)

- Electronic and Molecular Structure Theory (+ Practical)
- Concepts of Spectroscopy 2 (+ Practical)
- Theoretical Spectroscopy
- Concepts of Molecular Chemistry 2**
- Methods of Structural Analysis**
- Fundamentals of Magnetic Resonance**
- Scientific Programming Methods for Chemists**

3rd Semester (29 CPs)

- Hands-on training in a research group of your choice
- International Course (three-month internship)

4th Semester (30 CPs)

- Master's Thesis

*: CPs means credit points in ECTS

** : Three of seven elective courses are required for graduation.

Work Perspectives

Germany is one of the world's leaders in applied optical technologies, chemistry and pharmacy. There exist excellent opportunities for alumni with a top-level education and training in spectroscopy and microscopy, as well as simulation techniques.

