Track II Application for a membership in the *integrated Graduate School Solvation Science* **(iGSS) within the research network RESOLV**

For the iGSS Track II training schedule: a preparatory course of studies followed by the doctoral project (research course of studies)

Please fill in the information below and include the following documents for a complete application to be emailed as one PDF to igss@rub.de.

• Application Form – this completed form, signed
• Research proposal, if applicable – one page, single-spaced in Arial 11-pt font, written by the candidate outlining the proposed project with special emphasis on solvation science aspects
• Curriculum Vitae
• Copies of translated certificates and transcripts of records of qualification for higher education/ university entrance and all university exams (bachelor's and/or master's/diploma degree)
• Two letters of reference - in English, should be submitted separately to igss@rub.de
• Proof or certificate of language proficiency
• Only applicants from universities in China, Vietnam or Mongolia: official certificates of the APS (Akademische Prüfstelle)

1. **Personal details and academic qualification**

Version of application form:	*2022-igss_vTrackII_1*
Name of applicant *(surname, first name)*	
Date of birth *(dd/mm/yyyy)*	
Nationality	
Gender *(m/f/d)*	
Private address of applicant, *please indicate your street, house number, postal code, town and country*	
Email address	
Phone number	
Current academic status	
Grade and date of bachelor's degree, *if not yet obtained, please indicate here your expected date of graduation and your current grade*	
Institution where bachelor's degree was awarded *(name, town, country)*	
Explanation of bachelor's transcript grading system, *please indicate the best and the worst possible grade*	

Note: *A Master's Degree is* <u>*NOT required for Track II applicants*</u>, **leave blank or write "N/A"**. *If you have any master's program course credits, please enquire with the iGSS office regarding reporting requirements.*

Grade and date of master's degree, *if not yet obtained, write your expected date of graduation and your current grade*	
Institution where master's degree was awarded *(name, town, country)*	
Explanation of master's transcript grading system, *please indicate the best and the worst possible grade*	
English skills, *please indicate the level of proficiency (basics, B2 / good, C1 / fluent)*	
Other language skills, *please indicate the language(s) and the level of proficiency (basics, good, fluent)*	

2. Proposed Doctoral Project (Research Course of Studies)

(Preferred) RESOLV research area, *please refer to the glossary below*	
(Preferred) supervisor(s) from the list of RESOLV PIs/PSs, *please refer to the RESOLV homepage*	
(Preferred) second supervisor from the list of RESOLV PIs/PSs, *please refer to the RESOLV homepage*	

3. Proposed Preparatory Course of Studies

Note: *Please ask the iGSS office for guidance, (see Footnote 9).*

Proposed preparatory studies *indicate a Faculty's Fast-Track program i.e. Chemistry at RUB (footnote 9)*	
Starting date of preparatory course of studies *most Track II applicants begin "Winter Semester" of applicable year*	
Request Track II stipend? *yes/no; 1-year DFG Qualifizierungsstipendien est. 800 EUR/month, may NOT be combined with any other funding, scholarship / stipend etc.*	

4. Survey Question: How did you learn about iGSS? *(E.g. search for PhD on DAAD/PhD Portals; met a RESOLV PI at an international conference; local PhD student/PI discussion)*

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5. Letter of Motivation *(up to 0.5 page)*

6. List of publications

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Date and signature of applicant

7. **Glossary:**

Titles of research areas:

Research area I: Local solvent fluctuations in heterogeneous systems
I-1: Local thermodynamics and solvent dynamics
I-2: Local polarity, pH and dipolar fluctuations
I-3: Local electrochemistry and solvent-driven electrocatalysis

Research area II: Solvent control of chemical dynamics and reactivity
II-1: Solvation of reactive species
II-2: Solvent control of selectivity
II-3: Establishing new chemical processes utilizing CO_2-based solvent mixtures
II-4: Solvent control of reactivity in bioinspired artificial systems

Research Area III: Solvation under extreme conditions
III-1: Tuning reactions with high pressure
III-2: Cryosolvation and cryochemistry
III-3: Restricted solvation and solvent effects in confined spaces

8. **RESOLV / iGSS Relevant Faculties for Doctoral Programs with a Preparatory Course of Studies component (also known as Fast-Track)**

TU Dortmund University
Chemie und Chemische Biologie / Chemistry and Chemical Biology
Physik / Physics
Bio- und Chemieingenieurwesen / Bio- and Chemical Engineering

Ruhr University Bochum
Chemie und Biochemie / Chemistry, Biochemistry,
  or Molecular Science - Spectroscopy and Simulation
Elektrotechnik und Informationstechnik / Electrical Engineering and Information Technology
Maschinenbau / Mechanical Engineering
Biologie und Biotechnologie / Biology and Biotechnology

University Duisburg – Essen
Physik / Physics
Biologie / Biology

Self-Evaluation: *please rank competency in the following topics from **1 (least knowledge) to 4 (most knowledge)**. Grouped by theme, this list covers a wide range of topics that may be found in various preparatory programs and RESOLV research. Items may overlap.*

Physical Chemistry / Analytical Methods

1◯ 2◯ 3◯ 4◯   Thermodynamics

1◯ 2◯ 3◯ 4◯   Chemical Kinetics

1◯ 2◯ 3◯ 4◯   Surface Chemistry

1◯ 2◯ 3◯ 4◯   Electrochemistry

1◯ 2◯ 3◯ 4◯   Biophysical Chemistry

1◯ 2◯ 3◯ 4◯   AFM Methods

1◯ 2◯ 3◯ 4◯   Laser Spectroscopy

1◯ 2◯ 3◯ 4◯   EPR Spectroscopy

1◯ 2◯ 3◯ 4◯   NMR Spectroscopy

1◯ 2◯ 3◯ 4◯   Mass Spectrometry

1◯ 2◯ 3◯ 4◯   IR / Raman Spectroscopy

1◯ 2◯ 3◯ 4◯   UV/Vis Spectroscopy

1◯ 2◯ 3◯ 4◯   Light Microscopy Techniques

1◯ 2◯ 3◯ 4◯   TEM Methods

1◯ 2◯ 3◯ 4◯   Time-resolved Spectroscopy

1◯ 2◯ 3◯ 4◯   VCD Spectroscopy

1◯ 2◯ 3◯ 4◯   X-Ray Scattering

Organic / Inorganic Chemistry

1◯ 2◯ 3◯ 4◯   Synthesis

1◯ 2◯ 3◯ 4◯   Theoretical Organic Chemistry

1◯ 2◯ 3◯ 4◯   Physical Organic Chemistry

1◯ 2◯ 3◯ 4◯   Bioorganic Chemistry

1◯ 2◯ 3◯ 4◯   Metal-organic Chemistry

1◯ 2◯ 3◯ 4◯   Catalytic Methods

1◯ 2◯ 3◯ 4◯   Supramolecular Chemistry

1◯ 2◯ 3◯ 4◯   Nanomaterials

1◯ 2◯ 3◯ 4◯   Coordination Chemistry

1◯ 2◯ 3◯ 4◯   Molecular Clusters

1◯ 2◯ 3◯ 4◯   Bioinorganic Chemistry

Theoretical Chemistry

1◯ 2◯ 3◯ 4◯   Computational Chemistry

1◯ 2◯ 3◯ 4◯   Quantum Chemistry

1◯ 2◯ 3◯ 4◯   Force Fields

1◯ 2◯ 3◯ 4◯   Molecular Dynamics Simulations

1◯ 2◯ 3◯ 4◯   Theoretical Biophysics

1◯ 2◯ 3◯ 4◯   Ab initio Molecular Dynamics

1◯ 2◯ 3◯ 4◯   Statistical Mechanics

Biochemistry

1 ○	2 ○	3 ○	4 ○	Molecular Biology
1 ○	2 ○	3 ○	4 ○	Biocatalysis
1 ○	2 ○	3 ○	4 ○	Protein Chemistry
1 ○	2 ○	3 ○	4 ○	Protein Purification Methods
1 ○	2 ○	3 ○	4 ○	Protein Structure and Dynamics
1 ○	2 ○	3 ○	4 ○	Nucleic Acid Systems
1 ○	2 ○	3 ○	4 ○	Membranes

Chemical Engineering

1 ○	2 ○	3 ○	4 ○	Mulitphase systems
1 ○	2 ○	3 ○	4 ○	Mixture Properties
1 ○	2 ○	3 ○	4 ○	Supercritical Fluids
1 ○	2 ○	3 ○	4 ○	Pharmaceutical Formulations
1 ○	2 ○	3 ○	4 ○	(Bio-)Chemical Reactions
1 ○	2 ○	3 ○	4 ○	Protein Stability
1 ○	2 ○	3 ○	4 ○	(Reactive) Separation and Purification
1 ○	2 ○	3 ○	4 ○	Process Design and Optimization
1 ○	2 ○	3 ○	4 ○	Predictive Equations of State

Physics

1 ○	2 ○	3 ○	4 ○	Classical Mechanics
1 ○	2 ○	3 ○	4 ○	Quantum Mechanics
1 ○	2 ○	3 ○	4 ○	Statistical Physics
1 ○	2 ○	3 ○	4 ○	Laser Physics
1 ○	2 ○	3 ○	4 ○	Atomic Physics
1 ○	2 ○	3 ○	4 ○	Optics
1 ○	2 ○	3 ○	4 ○	Soft Matter and Interfacial Physics

Mathematics / Statistics / Computer Science

1 ○	2 ○	3 ○	4 ○	Analysis
1 ○	2 ○	3 ○	4 ○	Differential Equations
1 ○	2 ○	3 ○	4 ○	Linear Algebra
1 ○	2 ○	3 ○	4 ○	Numerical Mathematics
1 ○	2 ○	3 ○	4 ○	Data Science
1 ○	2 ○	3 ○	4 ○	Data Visualization
1 ○	2 ○	3 ○	4 ○	Probability Theory
1 ○	2 ○	3 ○	4 ○	Descriptive Statistics
1 ○	2 ○	3 ○	4 ○	Programming (e.g. C, C++, Fortan, Matlab, Mathematica)
1 ○	2 ○	3 ○	4 ○	Scripting Languages (e.g. Python, Perl)
1 ○	2 ○	3 ○	4 ○	High-Performance Computing
1 ○	2 ○	3 ○	4 ○	Software Parallelization
1 ○	2 ○	3 ○	4 ○	Machine Learning