

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)

Instructions:

Please submit your full application packet as one PDF to the iGSS Office (igss@rub.de).

Please include the following documents for a complete application packet:

- This signed application form (required fields in red)
- Curriculum Vitae
- Copy of translated certificate of qualification for higher education/university entrance (high school diploma and/or school leaving certificate) AND transcript of records
- Copy of translated university transcript of records AND certificate of bachelor's diploma degree (if not yet obtained, please submit proof of current enrollment and transcript to date)
- Proof or certificate of language proficiency (official certificate or degree program in English)
- Only applicants from universities in China, Vietnam or Mongolia: official certificate of the APS (Akademische Prüfstelle)

To be submitted separately, directly from referrers to igss@rub.de: Two letters of reference (in English)

1. Personal details and academic qualification

<i>Version of application form:</i>	2020-igss_vTrackII_1
Name of applicant (<i>surname, first name</i>)	
Date of birth (<i>dd/mm/yyyy</i>)	
Nationality	
Gender (<i>m/f/d</i>)	
Private address of applicant , <i>please indicate your street, house number, postal code, town and country</i>	
Email address	
Phone number	
Current academic status	
Grade and date of bachelor's degree , <i>if not yet obtained, please indicate here your expected date of graduation and your current grade</i>	
Institution where bachelor's degree was awarded (<i>name, town, country</i>)	
Explanation of bachelor's transcript grading system , <i>please indicate the best and the worst possible grade</i>	

Note: A Master's Degree is NOT required for Track II applicants, **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)

5. **Letter of Motivation** (*up to one page, 2750 characters max.*)

6. **Proposed project** (to be written by the candidate, please prepare this project outline **together** with your (preferred) first supervisor; up to 0.5 pages, 1400 characters max.)

7. **List of publications**

Date and signature of applicant

8. 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 CO₂-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

9. 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 (October 2021 onward only: 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 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Thermodynamics
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Chemical Kinetics
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Surface Chemistry
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Electrochemistry
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Biophysical Chemistry
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	AFM Methods
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Laser Spectroscopy
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	EPR Spectroscopy
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	NMR Spectroscopy
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Mass Spectrometry
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	IR / Raman Spectroscopy
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	UV/Vis Spectroscopy
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Light Microscopy Techniques
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	TEM Methods
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Time-resolved Spectroscopy
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	VCD Spectroscopy
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	X-Ray Scattering

Organic / Inorganic Chemistry

1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Synthesis
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Theoretical Organic Chemistry
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Physical Organic Chemistry
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Bioorganic Chemistry
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Metal-organic Chemistry
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Catalytic Methods
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Supramolecular Chemistry
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Nanomaterials
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Coordination Chemistry
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Molecular Clusters
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Bioinorganic Chemistry

Theoretical Chemistry

1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Computational Chemistry
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Quantum Chemistry
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Force Fields
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Molecular Dynamics Simulations
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Theoretical Biophysics
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Ab initio Molecular Dynamics
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Statistical Mechanics

Biochemistry

1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Molecular Biology
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Biocatalysis
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Protein Chemistry
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Protein Purification Methods
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Protein Structure and Dynamics
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Nucleic Acid Systems
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Membranes

Chemical Engineering

1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Multiphase systems
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Mixture Properties
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Supercritical Fluids
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Pharmaceutical Formulations
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	(Bio-)Chemical Reactions
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Protein Stability
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	(Reactive) Separation and Purification
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Process Design and Optimization
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Predictive Equations of State

Physics

1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Classical Mechanics
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Quantum Mechanics
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Statistical Physics
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Laser Physics
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Atomic Physics
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Optics
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Soft Matter and Interfacial Physics

Mathematics / Statistics / Computer Science

1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Analysis
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Differential Equations
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Linear Algebra
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Numerical Mathematics
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Data Science
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Data Visualization
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Probability Theory
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Descriptive Statistics
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Programming (e.g. C, C++, Fortran, Matlab, Mathematica)
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Scripting Languages (e.g. Python, Perl)
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	High-Performance Computing
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Software Parallelization
1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/>	Machine Learning