



# HOLLAND RESEARCH SCHOOL OF MOLECULAR CHEMISTRY



ANNUAL  
REPORT  
2024

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## General

This annual report presents an overview of the research and educational activities of the graduate research school 'Holland Research School of Molecular Chemistry' (HRSMC) during 2024. The University of Amsterdam legally represents the HRSMC. The research school was founded in 1994 and has been re-accredited by the Royal Netherlands Academy of Arts and Sciences (KNAW) in 1999, 2005 and 2012. The HRSMC is a collaboration between top research groups of four Dutch Universities: the University of Amsterdam (UvA), the VU University Amsterdam (VU), Leiden University (UL) and the Radboud University (RU).

The HRSMC harbours a powerhouse of expertise in Synthetic, Physical, and Theoretical Chemistry as well as Spectroscopy and Molecular Physics. This multidisciplinary character makes the School unique in the Netherlands and abroad; it allows it to operate in a broad field that addresses fundamental scientific problems but also challenges society currently faces in areas like sustainability, energy, and health.

This annual report presents a survey of the activities and achievements of the HRSMC, both educational and scientific, as well as the scientific achievements of the participating research groups.

As an interuniversity research school, the HRSMC has two main targets:

- A. to promote and facilitate research aimed at the three HRSMC research themes: (1) 'Synthesis, Characterisation, Properties and Reactivity of Molecules', (2) 'Physical Chemistry and Spectroscopy' and (3) 'Theoretical Chemistry'. The HRSMC board strives for coherence in the research activities of its members by promoting collaboration between the research groups and safeguarding complementarities with respect to infrastructure and expertise.
- B. to facilitate and provide a coherent, high-level educational programme to its PhD students, which offers a seamless connection to the Master degree programme. The primary aim is to teach PhD researchers to answer key questions in molecular science and to use their insights in a multidisciplinary approach.

The extensive educational programme (Schools, Courses and Symposia) offered by the HRSMC means that for all practical purposes the school takes care of the educational program of its PhD students and safeguards their progress. Importantly, the educational activities of the HRSMC are also accessible for (advanced) MSc students and thereby seamlessly connect to the undergraduate programs of the participating universities.

Besides organizing several educational activities, the HRSMC organized two application rounds within the Fellowship and PhD Mobility Programme.

Prof. dr. Wybren Jan Buma

Scientific Director of the HRSMC

# The Research Programme

The research program of the HRSMC is embedded in top research groups of the VU Amsterdam (VU), the University of Amsterdam (UvA), Leiden University (UL) and the Radboud University (RU). It is organized around three different research themes in molecular chemistry which complement and mutually reinforce each other.

## Theme 1: Synthesis, Characterisation, Reactivity and Properties of Molecules

This theme deals, among others, with the design, synthesis and characterization of new compounds, the development of new (bio)catalytic reactions, and the investigation of their mechanisms.



## Theme 2: Physical Chemistry and Spectroscopy

Theme 2 addresses the issue of experimentally uncovering the fundamental factors behind molecular properties through the interaction between light and molecular matter. Advanced spectroscopic techniques are employed to probe and utilize fundamental processes such as catalytic events, reaction mechanisms and dynamics, and energy and electron transfer.



## Theme 3: Theoretical Chemistry

Research within this theme is fully dedicated to understanding the structure of molecules and their chemistry from first principles. HRSMC's theoretical chemistry groups cover method and software development, computational chemistry, and the development of models and guiding principles for rational design of catalysts and sustainable processes. They are working on a broad range of time and length scales (atomic, molecular, supra-molecular, condensed-phase/membrane processes), naturally leading to a multi-scale approach of fundamental and applied theoretical chemistry.



# Overview of the Research Groups in 2024

## HRSMC Members

The research program of the HRSMC is embedded in top research groups of the VU Amsterdam (VU), the University of Amsterdam (UvA), Leiden University (UL) and Radboud University (RU). The following table gives an overview of the research groups involved in the HRSMC in December 2024:

Theme	Group (University, Institute) and Staff members
1	<b>Homogeneous, Supramolecular and Bio-Inspired Catalysis (UvA, HIMS)</b> Prof. dr. B. de Bruin, Prof. dr. J.N.H. Reek, Prof. dr. C.J. Elsevier, Dr. A.W. Ehlers, Dr. Ir. J.I. van der Vlugt (guest appointment), Dr. S. Pullen, Dr. B. Baumgartner
	<b>Functional Materials (UvA, HIMS)</b> Dr. S. Grecea
	<b>Heterogeneous Catalysis and Sustainable Chemistry (UvA, HIMS)</b> Prof. dr. G. Rothenberg, Dr. A. Garcia
	<b>Catalysis Engineering (UvA, HIMS)</b> Dr. N.R. Shiju
	<b>Synthetic Organic Chemistry (UvA, HIMS)</b> Prof. dr. J.H. van Maarseveen, Dr. M.Á. Fernández-Ibáñez, Dr. S. Ingemann, Dr. J.C. Slootweg
	<b>Biocatalysis (UvA, HIMS)</b> Prof. dr. F. Mutti
	<b>Flow Chemistry (UvA/HIMS)</b> Prof. dr. T. Noël
	<b>Industrial Sustainable Chemistry (UvA/HIMS)</b> Prof. dr. G.J.M. Gruter
	<b>Biomimetic and Biomolecular Chemistry (VU, AIMMS)</b> Prof. dr. T. Grossmann, Dr. S. Hennig, Dr. I. Drienovská
	<b>Synthetic Organic Chemistry &amp; Catalysis (VU, AIMMS)</b> Prof. dr. E. Ruijter, Dr. T. Hansen
	<b>Chemical Biology and Biotechnology (VU/AIMMS)</b> Dr. S.A.K. Jonkees

	<p><b>Metals in Catalysis, Biomimetics &amp; Inorganic Materials (UL, LIC)</b></p> <p>Prof. dr. E. Bouwman, Prof. dr. S. Bonnet, Dr. D.G.H. Hetterscheid</p>
	<p><b>Bio-organic Synthesis (UL/LIC)</b></p> <p>Prof. dr. J.D.C. Codée, Dr. S.J. Wezenberg</p>
	<p><b>Synthetic Organic Chemistry (RU/IMM)</b></p> <p>Prof. dr. F.P.T.J. Rutjes, Dr. T.J. Boltje</p>
2	<p><b>Molecular Photonics (UvA, HIMS)</b></p> <p>Prof. dr. A.M. Brouwer, Prof. dr. W.J. Buma, Prof. dr. S. Woutersen, Prof. dr. T. Šolomek, Dr. ir. A. Petrignani, Dr. R. M. Williams, Dr. H. Zhang</p>
	<p><b>Chemistry for Art Conservation (UvA, HIMS)</b></p> <p>Prof. dr. K. Keune, Dr. J.J. Hermans</p>
	<p><b>Biophotonics and Medical Imaging (VU, LaserLaB)</b></p> <p>Dr. F. Ariese</p>
	<p><b>Cellular Metabolism (VU/AIMMS)</b></p> <p>Dr. S. Moco</p>
	<p><b>BioAnalytical Chemistry (VU, AIMMS)</b></p> <p>Prof. dr. A.M. Rijs, Dr. M. Bärenfänger</p>
	<p><b>PhotoConversion Materials (VU)</b></p> <p>Prof. dr. E.L. von Hauff, Dr. C. Ramanan, Dr. A. Baldi, Dr. S. Askes, Dr. L.A. Muscarella</p>
	<p><b>Biophysical Organic Chemistry (UL, LIC)</b></p> <p>Prof. dr. H.J.M. de Groot, Dr. Alia, Dr. F. Buda, Dr. G.J.A. Sevink</p>
	<p><b>Molecular Nano-Optics and Spins (UL, LION)</b></p> <p>Prof. dr. E.J.J. Groenen, Dr. P. Gast, Dr. M. I. Huber</p>
	<p><b>Laboratory Astrophysics and Astrochemistry (UL, LION)</b></p> <p>Prof. dr. H. Linnartz</p>
	<p><b>Surface Chemistry and Catalysis (UL, LIC)</b></p> <p>Prof. dr. M. Koper, Dr. W.T. Fu, Dr. I.M.N. Groot, Dr. D.G.H. Hetterscheid, Dr. L.B.F. Juurlink, Dr. R.V. Mom</p>

**Bioelectrochemistry and Biocatalysis (UL, LIC)**

Prof. dr. L.J.C. Jeuken

**Laboratory Astrophysics and Astrochemistry (UL, STRW)**

Dr. K.-J. Chuang

**FELIX Laboratory (RU)**

Prof. dr. J. Oomens, Dr. J.M. Bakker, Dr. S. Brünken, Prof. dr. W.J. Buma (extraordinary professor)

**Spectroscopy and Catalysis (RU)**

Prof. dr. J. Roithova

3

**Computational Chemistry (UvA, HIMS)**

Prof. dr. P.G. Bolhuis, Prof. dr. E.J. Meijer, Dr. B. Ensing, Dr. D. Dubbeldam, Dr. J. Vreede, Dr. I.M. Ilie, Dr. A. Pérez de Alba Ortíz

**Theoretical Chemistry (VU, EMS)**

Prof. dr. F.M. Bickelhaupt, Prof. dr. L. Visscher, Prof. dr. C. Fonseca Guerra, Prof. dr. P. Gori Giorgi, Dr. K. J. H. Giesbertz, Dr. T.A. Hamlin, Dr. P. Vermeeren, Dr. A. Förster

**Biomolecular Simulation and Modeling (VU, EMS)**

Dr. D.P. Geerke

**Theoretical Chemistry (UL, LIC Energy & Sustainability)**

Prof. dr. G. J. Kroes, Dr. J. Meyer, Dr. M.F. Somers, Dr. A.L.M. Lamberts

**Theory in Surface science and electrochemistry (UL, LIC)**

Dr. Katharina Doblhoff-Dier

**Theoretical Chemistry (RU)**

Prof. dr. ir. G.C. Groenenboom, Prof. dr. H.M. Cuppen, Prof. dr. F.M. Bickelhaupt (extraordinary professor)

**Astrochemistry (UvA/API)**

Dr. A. Candian

## Research and Education

### HRSMC Course ‘Understanding Molecular Simulation’, Molsim 2024

8-19 January 2024, University of Amsterdam

A total of 82 participants: 13 UvA/VU MSc students, 2 PhD students from the University of Amsterdam (and HRSMC members), 3 PhD students from TU Delft, 1 PhD student from Leiden University (and HRSMC member), 2 PhD students from Vrije Universiteit Amsterdam, 1 PhD student from CWI and 60 participants came from other Dutch and foreign universities.

The invited lecturers were: Daan Frenkel (University of Cambridge, UK), Berend Smit (EPFL, CH), Thijs Vlugt (Delft University of Technology), Kevin Jablonka (EPFL, CH), Mohamad Moosavi (University of Toronto, CA), Peter Bolhuis (University of Amsterdam), Bernd Ensing (University of Amsterdam), Evert Jan Meijer (University of Amsterdam), David Dubbeldam (University of Amsterdam), Ioana Ilie (University of Amsterdam), Jocelyne Vreede (University of Amsterdam).

Organizers: Evert Jan Meijer (University of Amsterdam), Berend Smit (EPFL), Daan Frenkel (University of Cambridge), David Dubbeldam (University of Amsterdam), Laura Bastiaans-Tomé (University of Amsterdam), Christina Santaka (University of Amsterdam).

### HRSMC Course ‘Molecular Modelling 2024’

February 6 – March 1, 2024, Vrije Universiteit Amsterdam

A total of 15 participants attended this very well evaluated course, 9 PhD students of which 8 HRSMC members (VU: 4, UvA: 5) and 6 M.Sc. students (VU: 3, UvA: 3)

Coordinator: Dr. Trevor A. Hamlin

Lecturers: Prof. Dr. F. M. Bickelhaupt, Prof. Dr. C. Fonseca Guerra, and Dr. Trevor A. Hamlin

### HRSMC Course ‘Targeted Synthesis Challenges’

May 8, 2024, Vrije Universiteit Amsterdam

A total of 19 participants attended this course of which 11 PhD students (VU: 5, UvA: 6), 5 MSc students, 2 Postdocs (VU: 1, UvA: 1) and 1 technician (VU).

Organisers: Prof. dr. Eelco Ruijter, Prof. dr. Jan van Maarseveen (University of Amsterdam), Rachel Scheffelaar (University of Amsterdam, HRSMC), Laura Bastiaans (University of Amsterdam, HRSMC) and Christina Santaka (University of Amsterdam, HRSMC).

### HRSMC Course ‘Photophysics, Photochemistry & Photobiology’

May 31 – June 14, 2024

A total of 16 participants of which 15 PhD students (VU: 6, UL: 3, UvA: 2, TU Delft: 2, UM: 1, UT:1), 6 HRSMC members (VU: 2, UvA: 2, UL: 2) and 1 Postdoc HRSMC (VU).



Lecturers: Prof. dr. Maurice Aalders (University of Amsterdam /AMC), Dr. Tomas Solomek (University of Amsterdam), Dr. Francesco Buda (Leiden University), Dr. René Williams (University of Amsterdam), Dr. Ivo van Stokkum (Vrije Universiteit Amsterdam), Dr. Charusheela Ramanan (Vrije Universiteit Amsterdam), Dr. Freek Ariese (Vrije Universiteit Amsterdam), Dr. Sven Askes (Vrije Universiteit Amsterdam).

Organisers: Dr. René Williams (University of Amsterdam), Dr. Rachel Scheffelaar (University of Amsterdam), Laura Bastiaans-Tomé (University of Amsterdam, HRSMC), Christina Santaka (University of Amsterdam, HRSMC).

## **HRSMC Lustrum Symposium: 30 years!**

November 14 & 15, 2024, KIT, Amsterdam

A total of 195 people attended the symposium.

Guest lecturers: Prof. Sir Richard Friend (University of Cambridge, UK), Prof. dr. Kendall N. Houk (University of California, CA), Prof. dr. Burkhard König (University of Regensburg, Germany), Prof. dr. Morten Meldal (University of Copenhagen, Denmark), Prof. dr. Hans Jakob Wörner (ETH Zürich, Switzerland)

HRSMC staff lecturers:

- Dr. Thomas Hansen (VU Amsterdam) – Theme 1
- Prof. dr. Katrien Keune (Leiden University) – Theme 2
- Dr. Tanja Lamberts (Leiden University) – Theme 3

PhD lecturers:

- Lars van der Zee (University of Amsterdam)
- Pim Broersen (University of Amsterdam)
- Adarsh Koovakattil Surendran (Radboud University)
- Marlene Hoefnagel (Leiden University)
- Celine Nieuwland (VU Amsterdam)
- Irene Regeni (Leiden University)
- Titus de Haas (Leiden University)
- Massimiliano Paesani (University of Amsterdam)
- Alexander Korotkevich (University of Amsterdam)

## The Dick Stufkens Prize 2024

The Dick Stufkens Prize 2024 for the best thesis of the Holland Research School of Molecular Chemistry (HRSMC) has been awarded to Dr Chao Chun Hsu, for his thesis 'Probing interfaces and surfaces with molecular fluorescence'. Hsu received his PhD from Prof. Fred Brouwer and Prof. Daniel Bonn at the University of Amsterdam on 31 May. He has published about his research in renowned journals

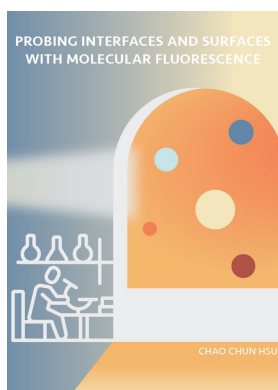
In his thesis, Hsu describes the development and application of a method for using fluorescence spectroscopy to visualise the structure of interfaces and (contact) surfaces at high resolution. With his method, he gained fundamentally new insights into the friction between sliding surfaces, and into the action of lubricants to reduce this friction. He also succeeded in mapping nanoscale phase separation in polymer blends.



Dr Chao Chun Hsu. Photo: UvA.

### Mechanophores and superresolution microscopy

For the first part of his research, Hsu focused on mapping complex mechanical contacts using fluorescence spectroscopy. To do so, he designed and synthesised fluorescent molecules that 'light up' under the influence of shear forces, pressure and changes in free volume. Thanks to these 'mechanophores', he was able to use fluorescence spectroscopy to visualise actual contact surfaces in nanometre detail. This simultaneously provided information about the stress within the contact zone. Hsu's approach thus forms a bridge between friction on a macroscopic and nanoscopic scale.



Thesis cover. Image: UvA.

In the second part of his thesis, Hsu describes how he managed to improve the super-resolution microscopy method PAINT to be able to investigate the phase separation of polymer blends. In doing so, he showed how polymer phases occur at the nanoscale in recycled polymer blends. This potentially changes the view on the recyclability of polymeric materials that were previously considered non-recyclable. This part of Hsu's research was conducted together with chemical companies BASF and BYK Altana, which can apply the new analytical methodology for the development of new industrial processes.

### 'An enterprising researcher'

The jury for the Dick Stufkens Prize 2024 unanimously chose Chao Chun Hsu's thesis from among six excellent dissertations. The jury was impressed by the breadth of his experimental approach and the quality of the research, the results of which have been published in a number of articles in a number of highly prominent journals as well as a fine dissertation. 'The thesis is testament to the fact that Dr Hsu is an enterprising researcher who has shown, already early in his career, the ability to work independently. He has in a short period of time mastered the very diverse knowledge and understanding necessary for this challenging project. Moreover, with his thesis, Dr Hsu has managed to present highly complex subject matter in the field of physical chemistry and spectroscopy in a clear and highly structured and well-organised manner, making it understandable even to non-specialists.' Hsu currently works as a Research Chemist at Quaker Houghton (Uithoorn), where he continues to explore the fascinating field of tribology and lubrication.

## HRSMC Class of Excellence

In September 2024 five (5) students started the HRSMC Class of Excellence. Four students obtained the certificate this year after successfully graduating from the programme.

### Class of Excellence Pitch Prize 2024

On July 2, 2024 Emil Hodžić has defended his research proposal for a jury of HRSMC staff members and a member of the external advisory committee of the HRSMC. The research proposal is an obligatory part of the [HRSMC Class of Excellence](#), a programme for excellent chemistry master students. The jury was very much impressed with his presentation and the subsequent discussion with the jury members, and therefore decided to award him with the HRSMC Class of Excellence Pitch Prize.

The prize consists of a certificate and € 450,- free to spend.



## PhD Theses

Listed here are PhD theses with HRSMC group leaders as supervisor and/or co-supervisor. In 2024 ten HRSMC PhD certificates were awarded.

### University of Amsterdam

1/25/2024

#### **Exploring Transition Metal Catalysis in Water for in vivo Applications**

Author: E.J. (Eva) Meeus

Supervisor: J.N.H. Reek

Co-supervisor: B. de Bruin

Group: Homogeneous, Supramolecular and Bio-Inspired Catalysis

Link: [Read or download this thesis](#)



1/30/2024

#### **Colloidal Patchy Particle Architectures | Simulations of accurate models in and out of equilibrium**

Author: H.J. (Hannah) Jonas

Supervisor: P.G. Bolhuis

Co-supervisor:

Group: Computational Chemistry

Link: [Read or download this thesis](#)



2/15/2024

#### **Carbenes as Versatile Tools in Polymer Chemistry**

Author: F.J. (Felix) de Zwart

Supervisor: B. de Bruin

Co-supervisor:

Group: Homogeneous, Supramolecular and Bio-Inspired Catalysis

Link: [Read or download this thesis](#)



2/29/2024

#### **S,O-Ligand-Promoted Palladium-Catalyzed C-H Functionalization of Anisole and Aniline Derivatives**

Author: V. (Vivi) Sukowski

Supervisor: M.Á. Fernández Ibáñez

Co-supervisor: J.H. van Maarseveen

Group: Synthetic Organic Chemistry

Link: [Read or download this thesis](#)



4/2/2024

**Chemical and mechanical properties of drying oils during polymerization**

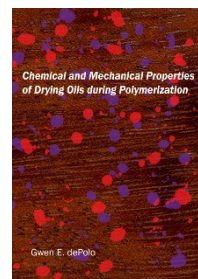
Author: G.E. (Gwen) dePolo

Supervisor: P.D. Iedema

Co-supervisor: J.J. Hermans

Group: Chemistry for Art Conservation

Link: [Read or download this thesis](#)



4/15/2024

**Photocatalysis for Applications in Living Cells**

Author: J. (Jiang-Hua) Liu

Supervisor: J.N.H. Reek

Co-supervisor: S. Pullen

Group: Homogeneous, Supramolecular and Bio-Inspired Catalysis

Link: [Read or download this thesis](#)



4/26/2024

**Supramolecular Immobilization of Molecular Catalysts on Electrodes for Solar Fuel Production**

Author: M.B. (Marie) Brands

Supervisor: J.N.H. Reek

Co-supervisor: S. Pullen

Group: Homogeneous, Supramolecular and Bio-Inspired Catalysis

Link: [Read or download this thesis](#)



5/16/2024

**Controlling Second Coordination Sphere Effects in Heterogeneous Catalysis|A Molecular Approach**

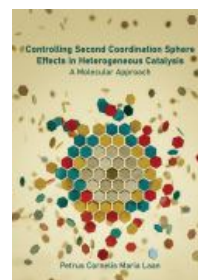
Author: P.C.M. (Pieter) Laan

Supervisor: J.N.H. Reek

Co-supervisor: G. Rothenberg

Group: Homogeneous, Supramolecular and Bio-Inspired Catalysis

Link: [Read or download this thesis](#)



5/22/2024

**Supramolecular strategies for the templated synthesis of confined nanoparticles and their application in catalysis**

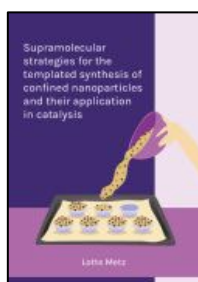
Author: L.L. (Lotte) Metz

Supervisor: J.N.H. Reek

Co-supervisor: S. Pullen

Group: Homogeneous, Supramolecular and Bio-Inspired Catalysis

Link: [Read or download this thesis](#)



5/29/2024

**Development of novel approaches toward energy-efficient photochemistry in continuous flow**

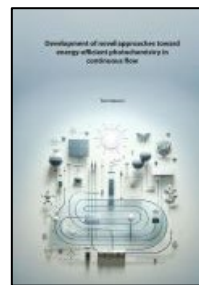
Author: T.M. (Tom) Masson

Supervisor: T. Noël

Co-supervisor:

Group: Flow Chemistry

Link: [Read or download this thesis](#)



5/31/2024

**Probing Interfaces and surfaces with molecular fluorescence**

Author: C.-C. (Chao) Hsu

Supervisor: A.M. Brouwer

Co-supervisor:

Group: Molecular Photonics

Link: [Read or download this thesis](#)



7/12/2024

**Taming gases in flow: valorization of abundant gaseous feedstocks through photochemical activation**

Author: F. (Fabian) Raymenants

Supervisor: T. Noël

Co-supervisor: J.H. van Maarseveen

Group: Flow Chemistry

Link: [Read or download this thesis](#)



9/25/2024

**Emulating Natural Photosynthesis|Self-Assembled Cage Scaffolds to Control Molecular Aggregation States**

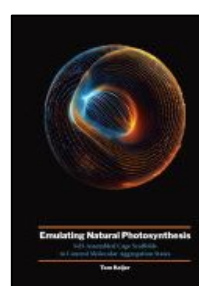
Author: T. (Tom) Keijer

Supervisor: J.N.H. Reek

Co-supervisor: S. Pullen

Group: Homogeneous, Supramolecular and Bio-Inspired Catalysis

Link: [Read or download this thesis](#)



11/8/2024

**Photolatent Alkyd Curing With Iron**

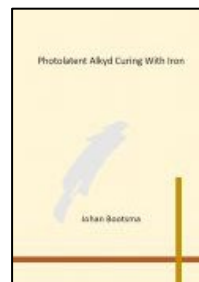
Author: J. (Johan) Bootsma

Supervisor: B. de Bruin

Co-supervisor: S. Pullen

Group: Homogeneous, Supramolecular and Bio-Inspired Catalysis

Link: [Read or download this thesis](#)



12/11/2024

**Design, Characterization and Application of Continuous-flow Photoreactors**

Author: S.D.A. (Stefan) Zondag

Supervisor: T. Noël

Co-supervisor:

Group: Flow Chemistry

Link: [Read or download this thesis](#)



VU Amsterdam

1/10/2024

**Molecular properties in the linear response regime and beyond with relativistic coupled-cluster**

Author: X. (Xiang) Yuan

Supervisor: L. Visscher

Co-supervisor:

Group: Theoretical Chemistry

Link: [Read or download this thesis](#)



1/15/2024

**Approaching novel antibiotic targets using peptidomimetics**

Author: F.M. (Felix Martin) Paulußen

Supervisor: T. Grossmann

Co-supervisor:

Group: Biomimetic and Biomolecular Chemistry

Link: [Read or download this thesis](#)



6/10/2024

**The Strong Interaction Limit of the Møller-Plesset Adiabatic Connection: From Theory to Applications**

Author: K.J. (Kimberly Jennifer) Daas

Supervisor: G. Giorgi

Co-supervisor: K. Giesbertz

Group: Theoretical Chemistry

Link: [Read or download this thesis](#)



6/26/2024

**Bio(-Inspired) Supramolecular Chemistry: Insights from quantum-chemical bonding analyses**

Author: C. (Celine) Nieuwland

Supervisor: C. Fonseca Guerra

Co-supervisor: T. Hamlin

Group: Theoretical Chemistry

Link: [Read or download this thesis](#)





10/9/2024

**The Isocyanide Strikes Back: Its Application in Transition Metal-Catalyzed Carbene Transfer Reactions**

Author: T.R. (Thomas Ruben) Roose

Supervisor: E. Ruijter

Co-supervisor:

Group: Synthetic Organic Chemistry & Catalysis

Link: [Read or download this thesis](#)



1/18/2024

**Thiosugars: reactivity, methodology and applications**

Author: J.M. (Jerre) Madern  
Supervisor: J.D.C. Codée  
Co-supervisor:  
Group: Bio-organic Synthesis

Link: [Read or download this thesis](#)



2/27/2024

**Design and synthesis of metal-based chemotherapeutic agents for targeted DNA interactions or DNA repair pathway modulation**

Author: C.J. (Corjan) van de Griend  
Supervisor: S.A. Bonnet  
Co-supervisor:  
Group: Metals in Catalysis, Biomimetics & Inorganic Materials

Link: [Read or download this thesis](#)

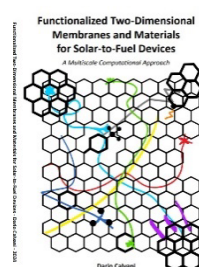


3/5/2024

**Functionalized two-dimensional membranes and materials for solar-to-fuel devices: a multiscale computational approach**

Author: D. (Dario) Calvani  
Supervisor: H.J.M. de Groot, F. Buda  
Co-supervisor:  
Group: Biophysical Organic Chemistry

Link: [Read or download this thesis](#)

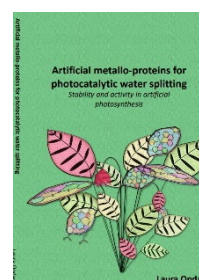


3/26/2024

**Artificial metallo-proteins for photocatalytic water splitting: stability and activity in artificial photosynthesis**

Author: L.V. (Laura) Opdam  
Supervisor: S.A. Bonnet, H.J.M. de Groot  
Co-supervisor:  
Group: Metals in Catalysis, Biomimetics & Inorganic Materials

Link: [Read or download this thesis](#)

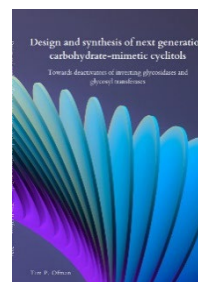


3/28/2024

**Design and synthesis of next generation carbohydrate-mimetic cyclitols: towards deactivators of inverting glycosidases and glycosyl transferases**

Author: T.P. (Tim) Ofman  
Supervisor: J.D.C. Codée  
Co-supervisor:  
Group: Bio-organic Synthesis

Link: [Read or download this thesis](#)

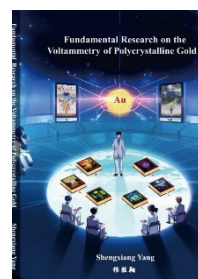


4/9/2024

**Fundamental research on the voltammetry of polycrystalline gold**

Author: S. (Sengxiang) Yang  
Supervisor: D.G.H. Hetterscheid  
Co-supervisor: M.T.M. Koper  
Group: Surface Chemistry and Catalysis

Link: [Read or download this thesis](#)

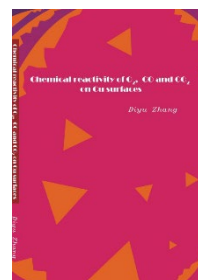


4/9/2024

**Chemical reactivity of O<sub>2</sub>, CO and CO<sub>2</sub> on Cu surfaces**

Author: D. (Diyu) Zhang  
Supervisor: M. Koper  
Co-supervisor:  
Group: Surface Chemistry and Catalysis

Link: [Read or download this thesis](#)

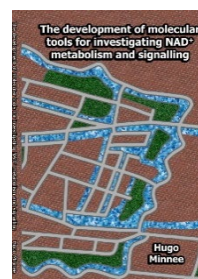


5/19/2024

**The development of molecular tools for investigating NAD<sup>+</sup> metabolism and signalling**

Author: H. (Hugo) Minnee  
Supervisor: J.D.C. Codée  
Co-supervisor: S.J. Wezenberg  
Group: Bio-organic Synthesis

Link: [Read or download this thesis](#)



9/5/2024

### Platinum surface instabilities and their impact in electrochemistry

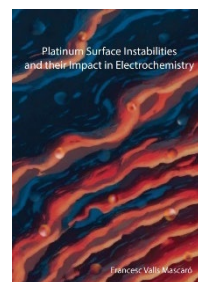
Author: F. (Francesc) Valls Mascaro

Supervisor: M.T.M. Koper

Co-supervisor:

Group: Surface Chemistry and Catalysis

Link: [Read or download this thesis](#)



9/12/2024

### Inhibitors and probes targeting PsIG

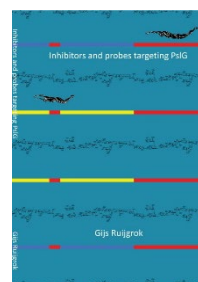
Author: G. (Gijs) Ruijgrok

Supervisor: J.D.C. Codée

Co-supervisor:

Group: Bio-organic Synthesis

Link: [Read or download this thesis](#)



9/12/2024

### Computational and experimental studies of reactive intermediates in glycosylation reactions

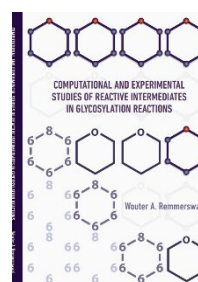
Author: W.A. (Wouter) Remmerswaal

Supervisor: J.D.C. Codée

Co-supervisor: T. Hansen

Group: Bio-organic Synthesis

Link: [Read or download this thesis](#)



9/19/2024

### Computational and experimental studies of reactive intermediates in glycosylation reactions

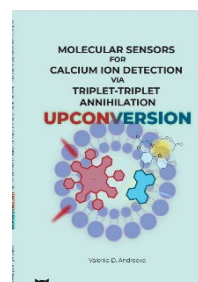
Author: V.D. (Valeriia) Andreeva

Supervisor: S. Bonnet

Co-supervisor: E. Bouwman

Group: Metals in Catalysis, Biomimetics & Inorganic Materials

Link: [Read or download this thesis](#)



11/12/2024

### Photocatalytic approaches for carbon-heteroatom bond construction

Author: D. (Dennis) Dam

Supervisor: E. Bouwman

Co-supervisor: S. Bonnet

Group: Metals in Catalysis, Biomimetics & Inorganic Materials

Link: [Read or download this thesis](#)

12/5/2024

**Deoxygenated cyclophellitol derivatives: synthesis and applications**

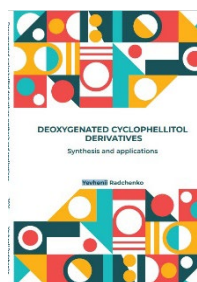
Author: Y. (Yevhenii) Radchenko

Supervisor: J.D.C. Codée

Co-supervisor:

Group: Bio-organic Synthesis

Link: [Read or download this thesis](#)



12/5/2024

**Influence of the electrode-electrolyte interface on electrochemical CO<sub>2</sub> reduction reaction and hydrogen evolution reaction**

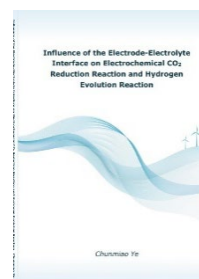
Author: C. (Chunmiao) Ye

Supervisor: M.T.M. Koper

Co-supervisor:

Group: Surface Chemistry and Catalysis

Link: [Read or download this thesis](#)



Radboud University

1/31/2024

**Efficient metabolic protein labeling with noncanonical threonine analogs**

Author: B.J. (Bob) Ignacio

Supervisor: F.P.J.T. Rutjes

Co-supervisor:

Group: Synthetic Organic Chemistry

Link: [Read or download this thesis](#)



4/16/2024

**Reference-free structural elucidation of agrochemical transformation products using infrared ion spectroscopy**

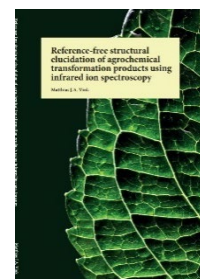
Author: M.J.A. (Matthias) Vink

Supervisor: F.P.J.T. Rutjes

Co-supervisor:

Group: Synthetic Organic Chemistry

Link: [Read or download this thesis](#)



4/23/2024

**Cosmic chemistry of complex aromatic molecules**

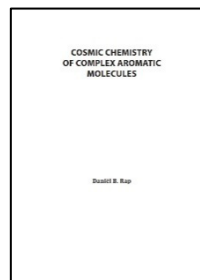
Author: D.B. (Daniël) Rap

Supervisor: B. Redlich

Co-supervisor: S. Brünken

Group: FELIX Laboratory

Link: [Read or download this thesis](#)



4/26/2024

**Design, Synthesis & Applications of Luminescent and Click-to-Release Substrates**

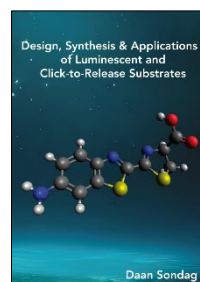
Author: D. (Daan) Sondag

Supervisor: F.P.J.T. Rutjes

Co-supervisor: T.J. Boltje

Group: Synthetic Organic Chemistry

Link: [Read or download this thesis](#)

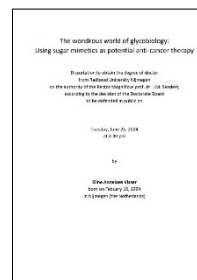


6/25/2024

**The wondrous world of glycobiology: Using sugar mimetics as potential anti-cancer therapy = De wonderde wereld van glycobiologie: Het gebruik van aangepaste suikers als mogelijke anti-kanker therapie**

Author: E.A. (Eline) Visser  
Supervisor: F.P.J.T. Rutjes  
Co-supervisor: T.J. Boltje  
Group: Synthetic Organic Chemistry

Link: [Read or download this thesis](#)

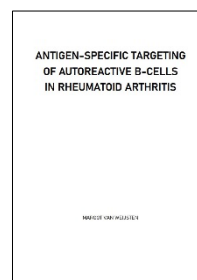


9/17/2024

**Antigen-specific targeting of autoreactive B-cells in Rheumatoid Arthritis**

Author: M.J. (Margot) van Weijsten  
Supervisor: F.P.J.T. Rutjes  
Co-supervisor:  
Group: Synthetic Organic Chemistry

Link: [Read or download this thesis](#)

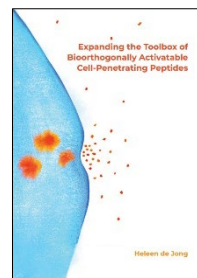


9/24/2024

**Expanding the Toolbox of Bioorthogonally Activatable Cell-Penetrating Peptides**

Author: H. (Heleen) de Jong  
Supervisor: F.P.J.T. Rutjes  
Co-supervisor:  
Group: Synthetic Organic Chemistry

Link: [Read or download this thesis](#)



9/27/2024

**Novel chemical entities against tropical diseases:  
Peptidomimetic lipopeptides as new anti-orthoflavivirals and 5,6,7,8-  
tetrahydroimidazo[1,2-a]pyridine derivatives as new antimalarials**

Author: L. (Lorenzo) Cavina

Supervisor: F.P.J.T. Rutjes

Co-supervisor:

Group: Synthetic Organic Chemistry

Link: [Read or download this thesis](#)



10/7/2024

**Monitoring high-valent metal-oxo species with electrospray-mass  
spectrometry**

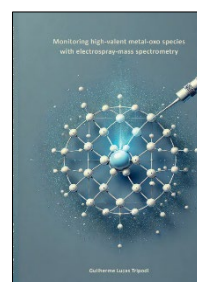
Author: G.L. (Guilherme Lucas) Tripodi

Supervisor: J. Roithova

Co-supervisor:

Group: Spectroscopy and Catalysis

Link: [Read or download this thesis](#)



10/29/2024

**Quantum Dynamics of Molecules in Space: Theoretical studies  
and efficient computational methods for collision-induced  
rovibrational transition rates in molecules**

Author: T.I.M.M. (Taha) Selim

Supervisor: G.C. Groenenboom

Co-supervisor:

Group: Theoretical Chemistry

Link: [Read or download this thesis](#)



11/8/2024

**Bio-based Surfactants: derived from sugar beet pulp monosaccharides**

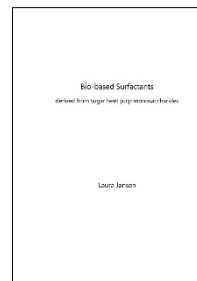
Author: L.M. (Laura) Jansen

Supervisor: F.P.J.T. Rutjes

Co-supervisor: T.J. Boltje

Group: Synthetic Organic Chemistry

Link: [Read or download this thesis](#)





12/4/2024

**Untangling the ultracold collision complex: reactivity, symmetry breaking, and statistical modeling**

Author: M.P. (Marijn) Man  
Supervisor: G.C. Groenenboom  
Co-supervisor:  
Group: Theoretical Chemistry

Link: [Read or download this thesis](#)



12/6/2024

**Reactive Copper Complexes**

Author: N.R.M. (Noël) de Kler  
Supervisor: J. Roithova  
Co-supervisor:  
Group: Spectroscopy and Catalysis

Link: [Read or download this thesis](#)



12/12/2024

**Understanding Reactive Organometallic Complexes through Mass Spectrometry**

Author: J.M. (Jaya) Mehara  
Supervisor: J. Roithova  
Co-supervisor:  
Group: Spectroscopy and Catalysis

Link: [Read or download this thesis](#)

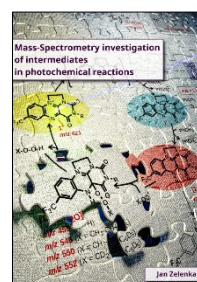


12/18/2024

**Mass-spectrometry investigation of intermediates in photochemical reactions**

Author: J. (Jan) Zelenka  
Supervisor: J. Roithova  
Co-supervisor:  
Group: Spectroscopy and Catalysis

Link: [Read or download this thesis](#)



## Fellowship Programme

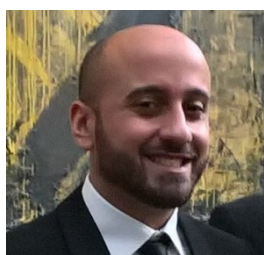
19<sup>th</sup> call – April 2024



**Prof. Dr. Hannes Jónsson** Full Professor, University of Iceland, Reykjavik  
Hosted by Dr. Jörg Meyer (UL), Dr. Thanja Lamberts (UL), Prof. dr. Peter Bolhuis (UvA).  
Stay: 2 months



**Dr. Divya Nayar** Assistant Professor, Department of Materials Science and Engineering, Indian Institute of Technology Delhi, India  
Hosted by Dr. Ioana Mariuca Ilie (UvA).  
Stay: 2 months



**Dr. Vincenzo Russo** Associate Professor of Industrial Chemistry, University of Naples Federico II, Italy  
Hosted by Dr. Ștefania Grecea, Dr. David Dubbeldam (UvA).  
Stay: 4 months

20<sup>th</sup> call – October 2024



**Dr. Francesco De Bon**, Junior Research Associate of Chemical Engineering, University of Coimbra, Portugal  
Hosted by Dr. Dennis G.H. Hettterscheid (UL), Dr. Rik V. Mom (UL).  
Stay: 2 months



**Dr. Susi Lehtola**, Research Fellow, Lecturer, Department of Chemistry,  
University of Helsinki, Finland

Hosted by Dr. Jörg Meyer (UL), Prof. dr. Lucas Visscher (VU).

Stay: 2 months

## PhD Mobility Programme

9<sup>th</sup> call – April 2024



**Ashique Lal** from the group of Prof. E.J. (Evert Jan) Meijer and Prof. Peter Bolhuis (UvA) has visited Prof. dr. J. Hutter, University of Zurich, Switzerland.

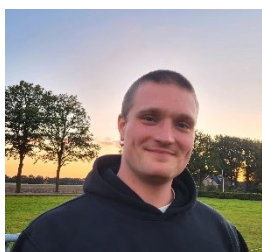
Stay: 4 months

10<sup>th</sup> call – October 2024



**Greta Grossman** from the group of Prof. dr. Marc Koper and Dr. Dennis G.H. Hetterscheid (UL) has visited Dr. Dušan Strmčnik, National Institute of Chemistry, Ljubljana, Slovenia.

Stay: 3 months



**Pier Wessels** from the group of Prof. dr. Chris Sloopweg (UvA) has visited Prof. dr. Tomislav Friščić, University of Birmingham, England.

Stay: 3 months



**Sander van Lith** from the group of Prof. dr. Katrien Keune and Dr. Joen Hermans (UvA) has visited Prof. dr. hab. Łukasz Bratasz, Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences, Poland

Stay: 5 weeks

## Financial Account 2024

Income		Expenses	
Contribution UvA 2024 - faculty <sup>1)</sup>	150.000	Donation HIMS Institute <sup>1)</sup>	150.000
Contribution UvA 2024 - HIMS <sup>1)</sup>	150.000	Personnel Costs	88.535
Fellowship JvGeuns - HRSMC (round 2024)	1.611	Office and management costs incl. Annual report	4.230
Correction Fellowship and PhD Mobility 2021/2022	15.176	Fellowship and PhD Mobility Programme	38.111
Income Lustrum Symposium 2024	14.850	Dick Stufkens PhD prize	2.599
		HRSMC Lustrum Symposium 2024	50.211
		HRSMC Class of Excellence	1.561
		Courses	3.472
		HRSMC PhD Social Event	1.965
	<b>€ 331.637</b>		<b>€ 340.684</b>
Income minus Expenses	<b>€ -9.047</b>		

1. As of 2014, a new agreement between the VSNU (Association of universities in the Netherlands) and SODOLA (the Dutch network of accredited research schools across all fields of academic research) has come into effect regarding the funding of Research Schools. Based on this agreement, starting in 2015, the HRSMC is expected to receive funding of 300 kEuro. Instead of the previous contributions of 50 kEuro from the faculty and 5 kEuro from the HIMS Institute, the new agreement increases the faculty's contribution to 150 kEuro and the HIMS Institute's contribution to 150 kEuro. Since this increase in the HIMS Institute's contribution would significantly affect HRSMC-affiliated research groups at UvA/HIMS, the HRSMC Board has decided to donate 150 kEuro to the HIMS Institute.
2. The HRSMC is grateful to the **John van Geuns foundation** for its financial support of the Fellowship and PhD Mobility Programme and the HRSMC Lustrum Symposium.

