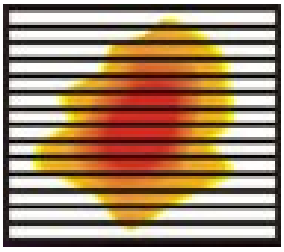


Hakone XVII

August 21st – 25th, 2022
Rolduc Abbey, Kerkrade,
The Netherlands.

Contents

1 Introduction

HAKONE XVII will be held in the south of the Netherlands in the former Abbey Rolduc, August 21st – 25th, 2022. The biennial HAKONE symposium series started in Hakone (Japan) in 1987 and is devoted to the fundamentals and applications of non-thermal plasmas and their chemistry at elevated pressures.

1.1 Scope & Format

HAKONE brings together scientists and engineers from academia and industry working on high pressure and low temperature plasma chemistry. The symposium aims to connect more traditional subjects such as ozone synthesis, basic oxidants generation, water treatment and environmental protection to the emerging and innovative fields of biomedical applications, micro-plasmas and alternative materials.

1.2 Venue

HAKONE XVII will be held at the Rolduc abbey in Kerkrade, which is one of the most important religious monuments in the Netherlands. The abbey's rich history dates back more than 900 years. Rolduc is the largest abbey complex in the Benelux and one of the Dutch UNESCO Top 100 monuments. Rolduc abbey can be reached by public transport from Amsterdam Schiphol airport (≈3:30 hrs), Düsseldorf airport (≈2:00 hrs) and Maastricht airport (≈1:30 hrs).

We will provide a shuttle bus between Herzogenrath railway station (Germany) and the conference venue, and possibly between Kerkrade railway station and the venue as well. We will likely start with this around 13:00 on Sunday. If you would like to use this then please let us know when and where you expect to arrive.

WIFI

WIFI is available on an open network without requiring a password.

1.3 Conference Topics

T01 Fundamental problems of high pressure discharges

T02 Modelling and diagnostics

T03 Molecular synthesis and decomposition

T04 Ozone generation and applications

T05 Generation of radiation in high-pressure discharges

T06 Depollution and environmental applications

T07 Surface processing and technology (cleaning, coating, etching and modification, equipment)

T08 Biological applications

T09 Miscellaneous

1.4 Information for Presenters

Orals are 20 minutes (16 min + 4 min questions), while invited presentation and the Ulrich Kogelschatz Lecture Award are 50 minutes (45 min + 5 min questions). Please upload your presentation to the central laptop well in advance of your scheduled presentation block.

Posterboards will be 1.25 meter high and 1.00 meter wide. Posters can be mounted on the poster boards inside the lecture hall for the entire symposium. Furthermore, all poster presenters are requested to submit a one-page slide latest on Sunday, Aug. 21st for the one-minute poster presentation introduction. Please submit a PDF, preferably in 16:9 aspect ratio.

2 Committees

2.1 Local Organizing Committee

- Sander Nijdam (chair), Eindhoven University of Technology
- Behnaz Bagheri, Eindhoven University of Technology
- Ute Ebert, Centre for Mathematics and Computer Science (CWI) Amsterdam
- Tom Huiskamp, Eindhoven University of Technology
- Gerrit Kroesen, Eindhoven University of Technology
- Gerard van Rooij, Maastricht University
- Ana Sobota, Eindhoven University of Technology

2.2 International Scientific Committee

- Mirko Černák (chair), Czech Republic
- Ronny Brandenburg, Germany
- Nicolas Naude, France
- Tony Herbert, Ireland
- Tomáš Hoder, Czech Republic
- Indrek Jõgi, Estonia
- Kirill V. Kozlov, Russia
- Štefan Matejčík, Slovakia
- Jerzy Mizeraczyk, Poland
- Naoki Osawa, Japan
- Cristina Paradisi, Italy
- Yi-Kang Pu, China
- Henryka D. Stryczewska, Poland
- Fumiyoshi Tochikubo, Japan

3 Sponsors

Hakone XVII is sponsored by the Dutch Research Council (NWO) and Plasma Matters B.V.

Plasma Matters.

4 Program

4.1 Program table

	Sun, Aug 21		Mon, Aug 22		Tue, Aug 23		Wed, Aug 24	Thu, Aug 25
		08:00	Breakfast	08:00	Breakfast	08:00	Breakfast	Breakfast
		09:00	Opening	09:00	I02 - Koichi Sasaki	09:00	I04 - Deborah O'Connel	I05 - Xin Pei Lu
		09:10	**Françoise Massines**	09:50	C08 - Kazuki Watanabe	09:50	C17 - Alex Destrieux	C29 - Yury Gorbanev
		10:00	C01 - Elizabeth Mercer	10:10	C09 - Vlasta Štěpánová	10:10	C18 - Anne Limburg	C30 - Ursel Fantz
		10:20	Coffee break	10:30	Coffee break	10:30	Coffee break	Coffee break
		10:50	C02 - Roman Přibyl	11:00	C11 - Kristian Wende	11:00	C19 - David Prokop	C31 - Mostafa Hassan
		11:10	C03 - Antoine Belinger	11:20	C12 - Mark Kushner	11:20	C20 - Siebe Dijcks	C33 - Chiel Ton
		11:30	C04 - Fumiyoshi Tochiku	11:40	C13 - Jan Cech	11:40	Organ concert	Closing ceremony
		11:50	C05 - Corentin Bajon	12:00	C14 - Ravi Patel	12:00		
		12:30	Lunch	12:30	Lunch	12:30	Lunch	Lunch
		14:00	Poster 1-slide presenta	14:00	C15 - Perla Trad	14:00	IXX - Mark Kushner	Bus to Eindhoven (optional)
		14:40	Poster session	14:20	C16 - Jeroen van Oorsch	14:50	C21 - Markus Becker	
						15:10	C22 - Mohammad Hasar	
						15:30	Coffee break	
						16:00	C23 - Hans Höft	
						16:20	C24 - Hani Francisco	Labtour Eindhoven (optional)
		16:40	I01 - Judith Golda			16:40	C25 - Thijs van der Gaag	
		17:30	C06 - Naoki Osawa	15:00	Excursion + banquet	17:00	C26 - Davide Del Cont-B	
		17:50	C07 - Thomas Orrière			17:20	C27 - Francisco Pontiga	
		18:10	Free time			17:40	P08C - Shahriar Mirpour	
18:00	Formal registration	18:30	Dinner			18:00	Free time	
						18:30	Dinner	
19:00	Welcome reception					19:30	ISC-meeting	

Ulrich Kogelschatz Award Lecture Invited lecture Contributed lecture

4.2 Detailed program including social program

Sun, Aug 21

18:00 - 20:00 Formal registration

Chance to register for the conference. Hotel rooms will be available starting from 15:00. Conference registration is in Aula Minor (E on the map), while hotel registration is at the reception (R). After 19:00, the registration table will move to the welcome reception location in the basement.

19:00 - 22:00 Welcome reception

A welcome reception is organized in the hotel bar ('De Verloren Zoon', 'The Lost Son') located in the cellar (I on the map).

Mon, Aug 22

08:00 - 09:00 Breakfast

In the large dining room ('Grote Eetzaal')

09:00 - 09:10 Opening

In the Aula Minor (building opposite to the reception).

Session chair: Mirko Černák

09:10 - 10:00 Ulrich Kogelschatz Lecture Award UKL: **Françoise Massines** T01
CNRS, France.
Physics of diffuse DBDs and on line thin film treatment: History, recent developments and new challenges

10:00 - 10:20 Contributed C01: **Elizabeth Mercer** T01
University of Antwerp, Belgium.
Effects of Post-Plasma Mixing in a CO_2 Microwave Plasma on Conversion and Energy Efficiency

10:20 - 10:50 Coffee break

Foyer + terrace

Session chair: Ronny Brandenburg

10:50 - 11:10 Contributed C02: **Roman Přibyl** T01
Masaryk University, Czech Republic.
Alumina ceramic tapes doped by various dopants and their effect on properties of coplanar dielectric barrier discharge

11:10 - 11:30 Contributed C03: **Antoine Belinger** T01
LAPLACE, Université de Toulouse, France.
Influence of the dielectric on a Diffuse Dielectric Barrier Discharge in air at atmospheric pressure

11:30 - 11:50 Contributed C04: **Fumiyoshi Tochikubo** T01
Tokyo Metropolitan University, Japan.
Characteristics of Trichel Pulse Discharge from Taylor Cone with AC Superimposed DC Voltage

11:50 - 12:10 Contributed C05: **Corentin Bajon** T01
Laboratoire Plasmas et conversion d'énergie, France.
Dielectric Barrier Discharge in CO_2: electrical and optical characterization

12:30 - 14:00 Lunch

Foyer + terrace

14:00 - 14:40 Poster 1-slide presentations

A quick introduction to all posters. All poster presenters are requested to submit a one-page slide latest on Sunday, Aug. 21st.

14:40 - 16:40 Poster session

Including some refreshments.

P01: **Indrek Jõgi** T08
University of Tartu, Estonia.
Virus and aerosol removal by electrostatic precipitator

P02: **Kubra Ulucan-Altuntas** T06
University of Padua, Italy.
Degradation of Perfluorooctanoic Acid (PFOA) in Water by Non-Thermal Plasma Enhanced by Boron-Doped Reduced Graphene Oxide
P03: **Sean Kelly** T06
University of Antwerp, Belgium.
Microwave plasma-based conversion of methane and carbon dioxide
P04: **Francisco Pontiga** T06
Universidad de Sevilla, Spain.
Carbon dioxide conversion using ac and pulsed dielectric barrier discharge
P05: **Tian Tian** T06
GREMI, UMR7344, CNRS/Université d'Orléans, France.
Removal of amoxicillin and sulfamethoxazole in water using non-thermal plasma
P07: **Rezvan Hosseini Rad** T06
Leibniz Institute for Plasma Science and Technology (INP), Germany.
Electrical Characterization of a Coaxial Dielectric Barrier Discharges for CO_2 splitting at Elevated Pressure
P09: **Lucia Švandová** T01
Masaryk University, Czech Republic.
Properties of Cr-doped Al_2O_3 as a dielectric barrier layer
P10: **Mária Cíbiková** T01
University of Comenius, Faculty of Mathematics, Physics and Informatics, Bratislava, Slovakia, Slovakia.
Characterization of emission current generated by pulse electric field in microdischarge electrode system
P11: **Lucia Kuthanová** T01
Masaryk University, Czech Republic.
Spatiotemporal memory effects in barrier discharge at water interface
P12: **Simon Dap** T01
LAPLACE - Toulouse University, France.
Pre-ionization in atmospheric pressure townsend discharges (APTD): surface vs volume mechanisms
P13: **Hiroshi Arai** T01
Chiba Institute of Technology, Japan.
Linearized Penning effect in gas mixture with small amount of H_2O content in He
P14: **Haruo Itoh** T01
Chiba Institute of Technology, Japan.
Increase of Penning ionization coefficient proportional to small amount of water vapor admixed with helium
P15: **Shuai Zhao** T09
Eindhoven University of Technology, Netherlands.
Microelectrode-assisted atmospheric pressure air discharge and its extended applications
P16: **Nicolas Naudé** T09
Université de Toulouse, France.
Dielectic barrier discharges: from spatially resolved electrical measurements to a reconfigurable electrode

P17: **Zdenek Navratil** T02
Masaryk University, Czech Republic.
2D-resolved electric field measurement in helium coplanar DBD using multi-wavelength single photon counting
P18: **Emanuel Maťaš** T02
Faculty of Mathematics, Physics and Informatics, Comenius University, Slovakia.
Ion Mobility Spectrometry diagnostics of NOx generated in kHz driven DBD plasma jet in Argon
P19: **Sara Ceulemans** T02
University of Antwerp, Belgium.
Effect of quenching on the afterglow temperature to improve CO_2 conversion in a rotating gliding arc plasma reactor
P20: **Dennis Bouwman** T02
Centrum Wiskunde & Informatica (CWI), Netherlands.
Theoretical approximations for macroscopic parameters of positive streamer discharges
P21: **Tomas Hoder** T02
Masaryk University, Czech Republic.
Kinetics of the $N_2(A^3\Sigma_u^+, v)$ state in atmospheric pressure townsend discharge in N_2
P22: **Tomas Hoder** T02
Masaryk University, Czech Republic.
Development of a method for determination of the electric field in transient argon discharges
P23: **Omar Biondo** T02
University of Antwerp, Belgium.
Gas heating dynamics in a CO_2 pulsed glow discharge resolved by kinetic modeling
P24: **Yihao Guo** T02
Eindhoven University of Technology, Netherlands.
3D reconstruction and analysis of branching streamer discharges in air
P25: **David Rauner** T02
AG Experimentelle Plasmaphysik, Universität Augsburg, Germany.
Spectroscopic determination of rotational and vibrational temperatures in molecular MW plasmas for gas conversion
P27: **Gerard van Rooij** T03
Maastricht University, Netherlands.
Unravelling Transport in CO_2 Microwave Plasma by Comparing Flow Geometries
P28: **Hemaditya Malla** T04
Centrum Wiskunde & Informatica, Netherlands.
Identifying the Major Reactive Oxygen-Nitrogen Species in a Pulsed Streamer Discharge
P29: **Dušan Kováčik** T07
Masaryk University, Czech Republic.
Air plasma treatment for improving the safety properties of laminated glasses containing ionoplast interlayer used in civil engineering
P30: **Katerina Polaskova** T07
Brno University of Technology, Czech Republic.
Effect of Plasma and Light Irradiation on Morphology of Deposited TiO_2 Nanoparticles
P31: **Richard Krumpolec** T07
Masaryk University, Czech Republic.
Ultra-fast low temperature atmospheric plasma triggered reduction-exfoliation of highly porous aerogel-like graphene oxide

P32: **Maria Luíza de Azevedo** T07
Maastricht University, Netherlands.
Fast pyrolysis in methane plasma
P33: **Wouter Graef** T02
Plasma Matters, Netherlands.
Status report on the LXCat project
P34: **Daan Boer** T02
Eindhoven University of Technology, Netherlands.
A Novel Data Platform for Low-Temperature Plasma Physics
P35: **Jakub Kelar** T07
Masaryk University, Czech Republic.
High quality UV digital printing on various materials with plasma enhanced surface
P36: **Tao Zhu** T07
Leibniz Institute for Plasma Science and Technology, Germany.
Tracing model of in-flight particles during a plasma spray process

Session chair: Nicolas Naudé

16:40 - 17:30 Invited I01: **Judith Golda** T06
Ruhr-University Bochum, Germany.
Cold Atmospheric Pressure Plasmas for Plasma Catalytic Applications: Characteristics, Constraints and Challenges

17:30 - 17:50 Contributed C06: **Naoki Osawa** T01
Kanazawa Institute of Technology, Japan.
Comparison of surface charge density distribution generated by diffuse and filamentary barrier discharges in atmospheric pressure air

17:50 - 18:10 Contributed C07: **Thomas Orrière** T01
Université de Poitiers, France.
3D Topography of a liquid surface interacting with an Argon plasma jet

18:10 - 18:30 Free time

18:30 - 20:00 Dinner

Zaal 2, afterwards, the hotel bar (De Verloren Zoon in the cellar) is open.

Tue, Aug 23

08:00 - 09:00 Breakfast

In the large dining room ('Grote Eetzaal')

Session chair: Indrek Jõgi

09:00 - 09:50 Invited I02: **Koichi Sasaki** T02
Hokkaido University, Japan.
Detection of negative ions in dc glow and streamer discharges produced in ambient air

09:50 - 10:10 Contributed C08: **Kazuki Watanabe** T01
Kanazawa Institute of Technology, Japan.
Effect of surface resistivity on surface charge density and diffuse dielectric barrier discharge in atmospheric pressure air

10:10 - 10:30 Contributed C09: **Vlasta Štěpánová** T07
Masaryk University, Czech Republic.
Adhesion improvement of LLDPE/PA tubular foil used as sausage casing after a very short atmospheric-pressure roll-to-roll plasma treatment

10:30 - 11:00 Coffee break

Foyer + terrace

Session chair: Naoki Osawa

11:00 - 11:20 Contributed C11: **Kristian Wende** T08
Leibniz Institute for Plasma Science and Technology, Germany.
Biomolecule oxidation by gas phase species – the role of the gas-liquid interphase

11:20 - 11:40 Contributed C12: **Mark Kushner** T08
University of Michigan, United States of America.
Atmospheric pressure plasma treatment of organics in liquid: extending reaction mechanisms into solution

11:40 - 12:00 Contributed C13: **Jan Cech** T06
Masaryk University, Faculty of Science, Czech Republic.
CaviPlasma – The new tool for energy-efficient large-scale treatment of liquids

12:00 - 12:20 Contributed C14: **Ravi Patel** T06
Eindhoven University of Technology, Netherlands.
Filamentary DBD plasma for ignition stabilized combustion

12:30 - 14:00 Lunch

Foyer + terrace

Session chair: Behnaz Bagheri

14:00 - 14:20 Contributed C15: **Perla Trad** T06
Laboratoire de Physique des Gaz et des Plasmas, France.
Influence of the applied HV-pulse rise time on the removal efficiency of n-hexane in a DBD

14:20 - 14:40 Contributed C16: **Jeroen van Oorschot** T06
Eindhoven University of Technology, Netherlands.
Real-Time In-Situ Characterization of Plasma Activated Water

14:40 - 21:40 Excursion + banquet

The excursion will be to the Zonneberg caves near Maastricht, followed by a boat-tour with dinner on the Maas (Meuse) river. The caves have a temperature of about 11 degrees all year round. Keep this in mind with regard to your clothes and put on sturdy shoes! The caves are basically accessible to everyone. However, the walk from the meeting point to the entrance is a difficult climb.

Wed, Aug 24

08:00 - 09:00 Breakfast

In the large dining room ('Grote Eetzaal')

Session chair: Fumiyoshi Tochikubo

09:00 - 09:50 Invited I04: **Deborah O'Connell** T01
Dublin City University, Ireland.
Controlling vibrational kinetics through energy input into repetitively pulsed atmospheric pressure nitrogen discharges

09:50 - 10:10 Contributed C17: **Alex Destrieux** T02
Laval University, Canada.
Toward a better understanding of the electrical properties in a dielectric barrier discharge during long-time operation

10:10 - 10:30 Contributed C18: **Anne Limburg** T02
Eindhoven University of Technology, Netherlands.
Influence of probing laser beam and electric field properties in E-FISH measurements

10:30 - 11:00 Coffee break

Foyer + terrace

Session chair: Ana Sobota

11:00 - 11:20 Contributed C19: **David Prokop** T02
Masaryk University, Czech Republic.
Spatiotemporal spectroscopic characterization of nanosecond pulsed volume barrier discharge in argon

11:20 - 11:40 Contributed C20: **Siebe Dijcks** T02
Eindhoven University of Technology, Netherlands.
Corona Imaging

11:40 - 12:20 Organ concert

An organ concert by the TU/e organist, Jan Verschuren in the Rolduc Abbey Church (Abdijkerk).

12:30 - 14:00 Lunch

Foyer + terrace

Session chair: Tom Huiskamp

14:00 - 14:50 Replacement - invited IXX: **Mark Kushner** T06
University of Michigan, United States of America.
The Role of Plasma Surface Interactions in Achieving Sustainability Goals

14:50 - 15:10 Contributed C21: **Markus Becker** T02
Leibniz Institute for Plasma Science and Technology (INP), Germany.
Combining modelling and experiment for advanced plasma diagnostics

15:10 - 15:30 Contributed C22: **Mohammad Hasani** T02
Eindhoven University of Technology, Netherlands.
Charge detection of plasma exposed surfaces using quantum dots photoluminescence

15:30 - 16:00 Coffee break

Foyer + terrace

Session chair: Gerrit Kroesen

16:00 - 16:20 Contributed C23: **Hans Höft** T02
INP Greifswald, Germany.
Impact of dielectric-covered electrode proximity on streamer propagation in pulsed-driven dielectric barrier discharges

16:20 - 16:40 Contributed C24: **Hani Francisco** T02
Centrum Wiskunde & Informatica, Netherlands.
The propagation and chemistry of positive streamers in lightning and sprite discharges at different air densities

16:40 - 17:00 Contributed C25: **Thijs van der Gaag** T02
Tokyo Institute of Technology, Japan.
EEDF measurement of cold atmospheric-pressure plasma by OES

17:00 - 17:20 Contributed C26: **Davide Del Cont-Bernard** T02
Maastricht University, Netherlands.
Development of the EFISH technique for electric field measurements in nanosecond repetitively pulsed discharges

17:20 - 17:40 Contributed C27: **Francisco Pontiga** T02
Universidad de Sevilla, Spain.
Distribution of neutral species in a corona discharge: effect of the electrohydrodynamic gas motion

17:40 - 18:00 Contributed P08C: **Shariar Mirpour** T01
Eindhoven university of technology, The Netherlands.
Investigating CO_2 streamer inception in repetitive pulsed discharges

18:00 - 18:30 Free time

18:30 - 20:00 Dinner

Zaal 2, afterwards, the hotel bar (De Verloren Zoon in the cellar) is open.

19:30 - 22:00 ISC-meeting

Thu, Aug 25

08:00 - 09:00 Breakfast

In the large dining room ('Grote Eetzaal')

Session chair: Ute Ebert

09:00 - 09:50 Invited I05: **Xin Pei Lu** T01
HuaZhong University of Science and Technology, China.
Atmospheric Pressure Plasma

09:50 - 10:10 Contributed C29: **Yury Gorbanev** T03
University of Antwerp, Belgium.
Pulsed plasma jet for nitrogen fixation: Fundamentals and prospective technologies

10:10 - 10:30 Contributed C30: **Ursel Fantz** T03
Max-Planck-Institut fuer Plasmaphysik, Germany.
Enhancement of CO_2 conversion at atmospheric pressure by influencing the gas quenching in the effluent of a microwave plasma torch

10:30 - 11:00 Coffee break

Foyer + terrace

Session chair: Tomáš Hoder

11:00 - 11:20 Contributed C31: **Mostafa Hassan** T03
Faculty of Mathematics, Physics and Informatics, Comenius University, Slovakia.
The role of gas-water interface size on solvation of gaseous species to water

11:20 - 11:40 Contributed C33: **Chiel Ton** T04
Eindhoven University of Technology, Netherlands.
Transient plasma for air purification using 400 kV pulses

11:40 - 12:00 Closing ceremony

12:30 - 14:00 Lunch

Foyer + terrace

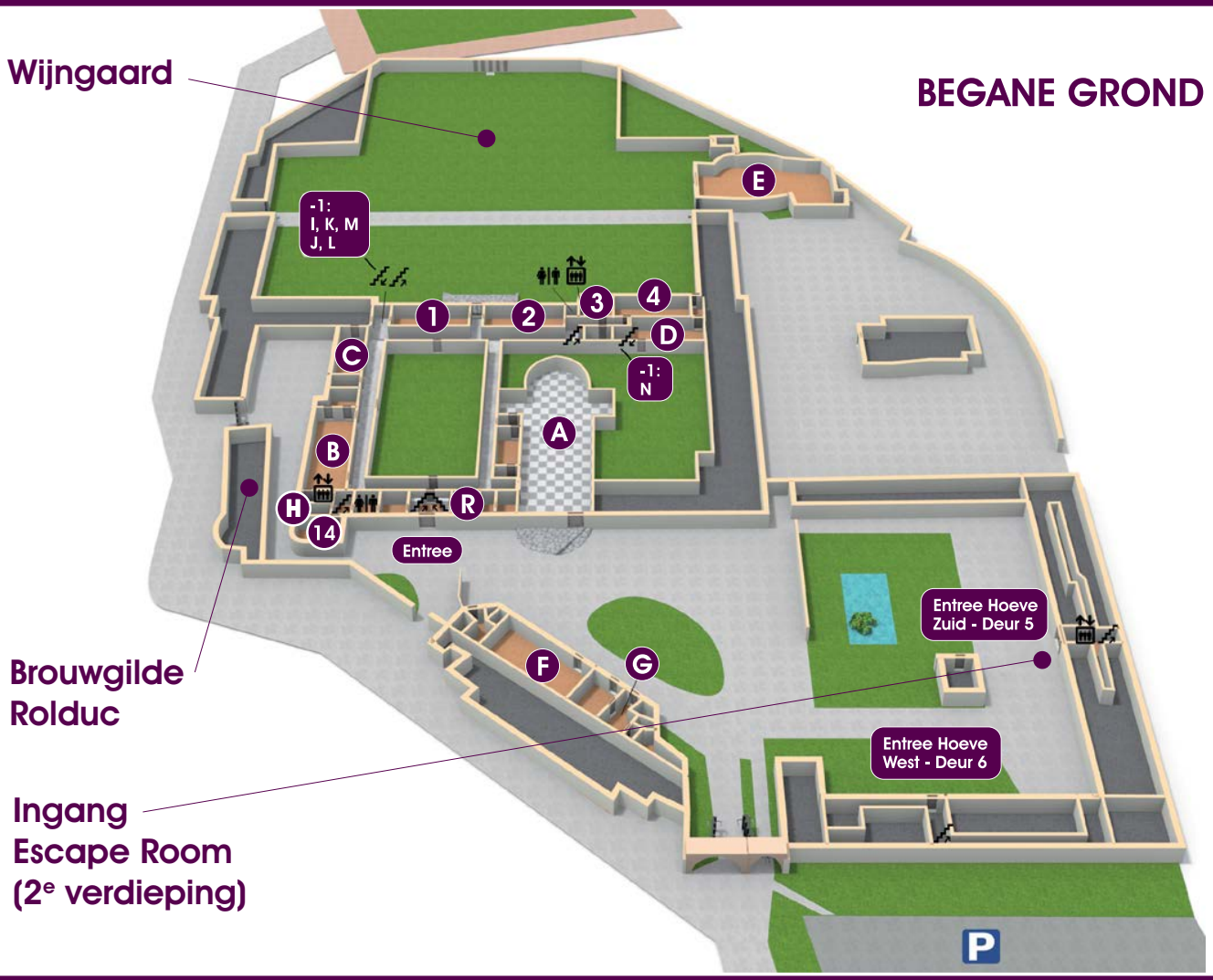
14:00 - 15:30 Bus to Eindhoven (optional)

If you would like to join the lab tour and have not registered yet, then please do this as soon as possible.

15:30 - 17:30 Labtour Eindhoven (optional)

ABDIJ ROLDUC

hotel restaurant conferentieoord



BEGANE GROND

- A Abdijkerk
- B Grote Eetzaal
- C Brasserie De Kanunnik
- D Foyer
- E Aula Major (buiten)
- F Aula Minor (buiten)
- G Fietsenstalling (buiten)
- H Bagageruimte
- R Receptie

BEGANE GROND

- 1 Zaal 1
- 2 Zaal 2
- 3 Zaal 3
- 4 Zaal 4
- 14 Zaal 14

KELDER (-1)

- I De Verloren Zoon
- J Zwaantje
- K Rookruimte
- L Kana 1
- M Kana 2
- N Boerenkelder

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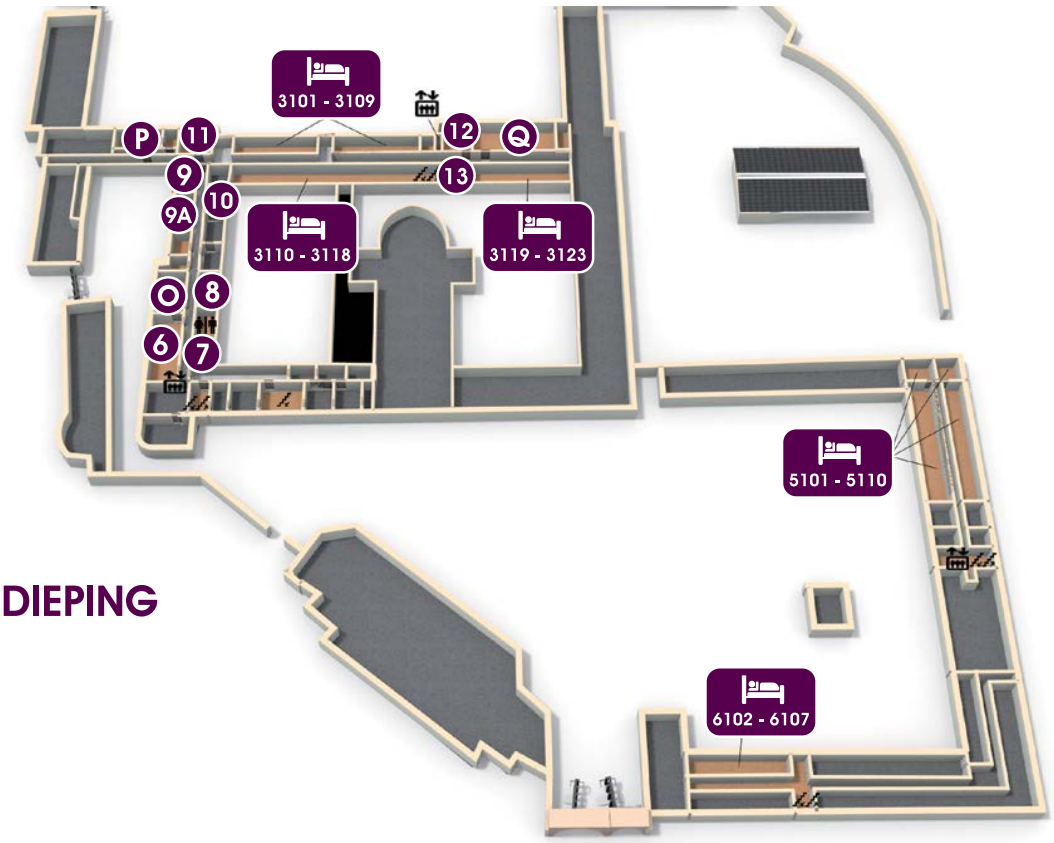
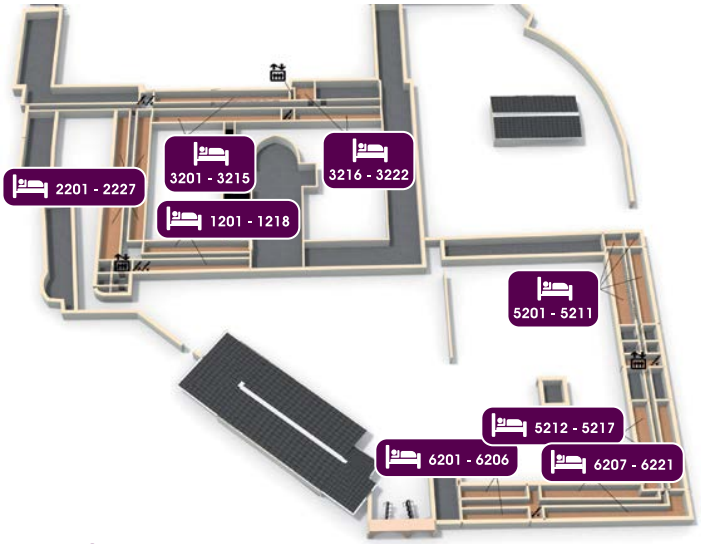
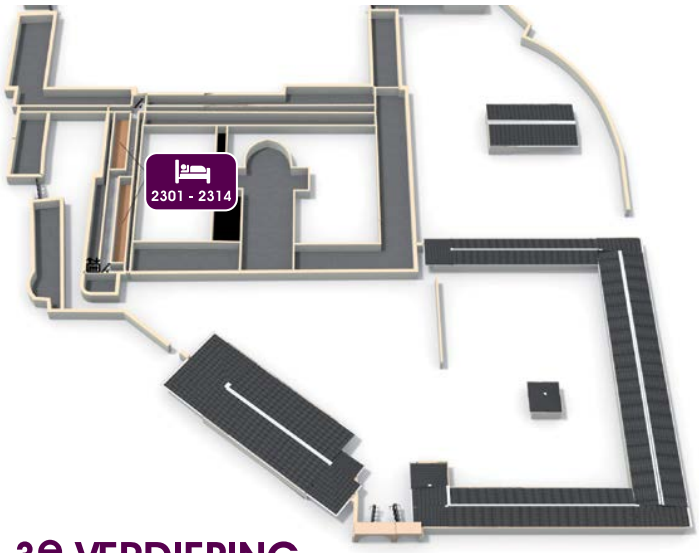


1e VERDIEPING



2e VERDIEPING



3e VERDIEPING

1e VERDIEPING

O	Kleine Eetzaal
P	Bisschopszaal
Q	Rococo-bibliotheek

Lift

1e VERDIEPING

6	Zaal 6
7	Zaal 7
8	Zaal 8
9	Zaal 9
9A	Zaal 9A
10	Zaal 10
11	Zaal 11
12	Zaal 12
13	Zaal 13

1e VERDIEPING

3101 - 3123 (hoofdgebouw)
5101 - 5110 (Hoeve)
6102 - 6107 (Hoeve)

2e VERDIEPING

1201 - 1218 (hoofdgebouw)
2201 - 2227 (hoofdgebouw)
3201 - 3222 (hoofdgebouw)
5201 - 5217 (Hoeve)
6201 - 6221 (Hoeve)

3e VERDIEPING

2301 - 2314 (hoofdgebouw)