

ARTIFICIAL VISION 2024

THE INTERNATIONAL
SYMPOSIUM
ON VISUAL
PROSTHETICS

Thursday, 5th – Friday, 6th December, 2024
Aachen, Germany

FINAL PROGRAMME

14 CME-POINTS

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The Deutsche Forschungsgemeinschaft DFG supports the meeting with EUR 20.000,-. The financial support of these eight companies adds to the budget of Artificial Vision 2024 financing the costs of this conference, i.e. printing costs, postage, bank fees, rental costs of the congress venue, technical equipment, catering, travel expenses and accommodation for invited speakers, web design, insurances, certification fees, PCO etc.

Dear Colleagues and Friends,

it is my great pleasure to invite you all to the 2024 Artificial Vision Conference in Aachen, Germany.

Although, many wonderful ideas how to design a visual neuroprosthesis for the blind had been developed in the past and enormous work was done in many labs, institutes, and clinics around the globe, the sustainable realization of a product providing useful vision for the patients is still not achieved. Clinical trials have been performed on several products in the past with moderate to good success, but it turned out that it is extremely difficult for companies to remain well financed for continuously pursuing research, development, fabrication, service, rehab, clinical trial sponsoring, and many other aspects.


Many lessons have been learned so far and although the translation is still a big problem, the enthusiasm of many researchers to continue the quest for a better visual prosthesis is still unbroken.

The challenge, to restore vision in blind patients remained a big task, but over the years, we learned a lot about how to interface the visual system with new materials and electrode designs. We learned how to provide data and energy for high density systems and for larger implants. AI based algorithms for data processing of the visual input shortly opened new possibilities and the design of stimulus patterns based on simultaneous recording of retinal or cortical activity may also be a wonderful approach to achieve useful percepts with future implants.

Artificial Vision 2024 in Aachen, Germany is the best opportunity to discuss all these new aspects of Visual Neuroprosthetics with colleagues and friends from all over the world.

Sincerely and on behalf of the organizing committee




Dr. Peter Walter
 Professor of Ophthalmology
 RWTH Aachen University



Scientific
programme
and further
information

Prof. Dr. Peter Walter
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Organization

Congress-Organisation Gerling GmbH
Werftstraße 23, 40549 Düsseldorf, Germany
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E-Mail: info@congresse.de, Homepage: www.congresse.de

Venue

Novotel Aachen City
Peterstraße. 66, 52062 Aachen, Germany

Official Language

English

Date

Thursday, December 5th, 2024, 12:30 h - 18:30 h
Friday, December 6th, 2024, 09:00 h - 17:30 h

Opening hours
congress office

Thursday, December 5th, 2024, 11:30 h - 18:30 h
Friday, December 6th, 2024, 08:30 h - 17:30 h

Opening hours
industrial

Thursday, December 5th, 2024, 12:30 h - 18:30 h
Friday, December 6th, 2024, 09:00 h - 13:50 h

Homepage and
Online Registration

www.artificial-vision.org

Hotel Booking

We blocked several rooms in the Novotel Aachen City from December 4 to December 7, 2024. Please contact the reservation department and refer to the code „Artificial Vision“:
Phone No.: +49 (0)89 121 406 255
E-mail: aachen.reservierung@accorhotels.com

ATTENDANCE FEE

Registration	Until 4 th Dezember	On site
International symposium attendance fee	EUR 300,—	EUR 320,—
Reduced rate for PhD students and residents*	EUR 150,—	EUR 170,—

*PhD Students and residents must supply a letter of verification as proof of training. The letter has to be sent to the congress organization prior to the meeting.
The attendance fee covers the costs for coffee breaks, lunch, and the conference dinner (accompanying person EUR 50,-).
Incl. VAT and excl. foreign transfer fees

Payment

by bank transfer (bank details are quoted on your confirmation and invoice. Please do not transfer money without noting your invoice number!), PayPal or by credit card: VISA, AMERICAN EXPRESS, MASTERCARD

Important notes for participants

The attendance fee covers the costs for coffee breaks, lunch, and the conference dinner. If you register late or on-site we cannot guarantee for lunch and participation in the social program.

You are encouraged to apply for the meeting either online.

Cancellation for the symposium has to be made via e-mail or via fax (+49 (0) 2 11 / 59 35 60) by December 1st, 2024. In any case an administration fee of EUR 22,- has to be paid. After this date no refunds can be made.

Changes, errors and misprints excepted.

CME-POINTS

The Symposium is certified by the Ärztekammer Nordrhein providing 7 CME-points for each day for the German Continuing Medical Education System.

For the german participants: Bitte geben Sie ihre EF-Nummer bei der Onlineanmeldung an, damit wir die Punkte an die Ärztekammer melden können.

An equivalent Certificate of Attendance will be given to you upon on-site registration.

INFORMATION FOR SPEAKERS**Presentations**

- V 10 min presentation + 5 min discussion
KV 5 min presentation + 2 min discussion

Projection

Microsoft PowerPoint presentation on CD-R/DVD/flash drive or own notebook.
Video codec: Quicktime 7.7.9®, Windows Media Player 12.0®

SOCIAL EVENT**Conference Dinner**

Thursday, December 5th, 2024

19:30 h

Erholungs-Gesellschaft Aachen 1837

Reihstraße 13
52062 Aachen

Price per person

(incl. dinner and drinks):

Participant – included in the attendance fee, but due to notification
Accompanying person – EUR 50,-



Thursday, 5th December, 2024

7 CME-POINTS

12:00 h Come together

12:30 h *Welcome Notes***Peter Walter** (Organizing Committee)**Veronika Rink** (DFG, Program Chair Microsystem Technology)**Stefan Uhlig** (Dean of the Medical Faculty, RWTH Aachen University)12:45 h - 1st Session14:30 h **Understanding degeneration and regeneration in the visual system**Chairs: **Yiqing Li** (Guangzhou/PRC)**Frank Müller** (Juelich/D)01.01 V **David G. Litvin**¹, A. Boizot¹, D. Ghezzi²12:45 h (¹Ophthalmic and Neural Technologies Laboratory, Department of Ophthalmology, University of Lausanne/CH, ²Hôpital ophtalmique Jules-Gonin, Fondation Asile des Aveugles, Lausanne/CH)*Corneal recordings reveal periodic rhythmic activity in-vivo*01.02 V **Anna Kochnev Goldstein**^{1*}, **S.V. Shah**^{2*}, Z.C. Chen³, P. Vasireddy¹, A.J. Phillips¹,
13:00 h M. Bhuckory^{3,4}, D. Palanker^{3,4}(¹Department of Electrical Engineering, Stanford University, CA/USA, ²School of Medicine, Stanford University, CA/USA, ³Hansen Experimental Physics Laboratory, Stanford University, CA/USA, ⁴Department of Ophthalmology, Stanford University, CA/USA, *These authors contributed equally)*Mapping the Electrical Resistivity of Retinal Layers*01.03 KV **Nruthyathi Nruthyathi**¹, M. Jung², J. Wang³, V. R. Montes², A. Offenhäusser²,
13:15 h A. Willuweit³, F. Müller¹(¹Institute of Biological Information Processing, Molecular and Cellular Physiology (IBI-1), Forschungszentrum Jülich/D, ²Institute of Biological Information Processing, Bioelectronics (IBI-3), Forschungszentrum Jülich/D, ³Institute of Neuroscience and Medicine (INM-4), Forschungszentrum Jülich/D)*Short phases of pathological rhythmic activity similar to rd retinae are also present in retinae of RCS rats*01.04 KV **Mari Bonse**¹, J. Wang¹, S. Krause¹, M. Schöneck¹, N. Burda¹, M. Cremer¹, N. Jon Shah^{1,4,5},
13:22 h K.-J. Langen^{1,6}, B. Kampa^{2,4}, F. Müller³, A. Willuweit¹(¹Institute of Neuroscience and Medicine (INM-4, INM-2, INM-11), Forschungszentrum Jülich/D, ²Department of Neurophysiology, Institute for Biology II, RWTH Aachen University/D, ³Institute of Biological Information Processing (IBI-1), Forschungszentrum Jülich/D, ⁴JARA BRAIN, Institute for Neuroscience and Medicine, Forschungszentrum Jülich/D, ⁵Department of Neurology, RWTH Aachen University/D, ⁶Department of Nuclear Medicine, RWTH University Hospital/D)*Distribution of Neurotransmitters in a Retinitis Pigmentosa rodent model*

01.05 KV **Julia Baumann¹**, D. Holtrup¹, E. Balla¹, H. Koch², K. van Loo², S. Rotter³, F. Müller⁴,
13:29 h B. Kampa¹

(¹RWTH Aachen University, Department of Neurophysiology/D, ²Uniklinik Aachen, Department of Neurology/D, ³University of Freiburg, Bernstein Center Freiburg/D, ⁴Forschungszentrum Jülich, Institute of Biological Information Processing (IBI)/D)

Plug-and-play integration of a new sensory channel in evolution

01.06 V **Yiqing Li**

13:36 h

(State Key Laboratory of Ophthalmology, Zhongshan Ophthalmic Center, Sun Yat-sen University, Guangdong Provincial Key Laboratory of Ophthalmology Visual Science, Guangzhou/PRC)

Restoring Sight: Zinc, Dopamine, and AR Technology in Glaucoma Recovery

01.07 KV **Liyan Liu**, J.H. Tang, Q. Zhang, Z. Liu, Y.H. Zhuo, Y.Q. Li

13:51 h

(State Key Laboratory of Ophthalmology, Zhongshan Ophthalmic Center, Sun Yat-sen University/PRC)

The role of sialylation on neuroprotection and optic nerve regeneration

01.08 KV **Jiahui Tang**, Z. Liu, Y.Q. Li

13:58 h

(State Key Laboratory of Ophthalmology, Zhongshan Ophthalmic Center, Sun Yat-sen University/PRC)

The Role of Mitochondrial Fusion in Optic Nerve Regeneration and Targeted Intervention Strategies

01.09 KV **Zhe Liu**, J.H. Tang, Q. Zhang, L.Y. Liu, Y.H. Zhuo, Y.Q. Li

14:05

(State Key Laboratory of Ophthalmology, Zhongshan Ophthalmic Center, Sun Yat-sen University, Guangdong Provincial Key Laboratory of Ophthalmology Visual Science, Guangzhou, Guangdong/PRC)

The mechanism and targeted therapy of zinc mediating retinal ganglion cell injury through histone H4 deacetylation

14:15 h - **2nd Session**

15:55 h **New Electrodes**

Chairs: **Karsten Seidl** (Duisburg/D)

Daniel Palanker (Stanford, CA, USA)

02.01 V **Daniel Palanker¹**, M. Bhukory¹, K. Ly¹, A. Shin¹, A. Kochnev-Goldstein¹, N. Jensen¹,
14:15h L. Galambos¹, E. Butt², K. Mathieson², T. Kamins¹

(¹Stanford University, CA/USA, ²University of Strathclyde, Glasgow/UK)

From clinical proof of concept to high-resolution prosthetic vision

02.02 V **Tarik Safa Kaya¹**, H. Nur Kaleli², R. Balamur³, A.Önal⁴, Ç. Pehlivan², U. Berkay Çalışkan³,
14:30 h R. Mohajeri³, A. Şahin^{2,5}, M. Hasanreisoglu^{2,5}, S.Nizamoglu^{3*}

(¹Department of Material Science and Engineering, Koç University, Istanbul/TR, ²Research Center for Translational Medicine, Koç University, Istanbul/TR, ³Department of Electrical and Electronics Engineering, Koç University, Istanbul/TR, ⁴Department of Biomedical Science and Engineering, Koç University, Istanbul/TR)

Quantum Dot-Integrated Nanowire Arrays for Photovoltaic Retinal Stimulation in the Near-Infrared

- 02.03 V **Jisung Kim¹, J.S. Lee², C.H. Baek¹**
 14:45 h (1stDepartment of Transdisciplinary Medicine, Seoul National University of Hospital/ROK, Department of Electrical and Computer Engineering, College of Engineering, Seoul National University/ROK)
Development of a Flexible 60-Channel PFA Film-Based Electrode for High-Resolution Retinal Stimulation
- 02.04 V **Hwi Ahn**
 15:00 h (Department of Electrical and Computer Engineering, Seoul National University, Seoul/ROK)
Neural electrode fabrication using spin-coated cyclic olefin copolymer film
- 02.05 V **Jiseon Lee¹, J. Kim², N. Lee¹, J. Seo^{1,3}**
 15:15 h (1stDepartment of Electrical and Computer Engineering, Seoul National University, Seoul/ROK, 2ndDepartment of Transdisciplinary Medicine, Seoul National University Hospital, Seoul/ROK, 3rdBiomedical Research Institute, Seoul National University Hospital, Seoul/ROK)
Fabrication process of 3D pre-pressed PFA based electrodes for effective stimulation
- 02.06 KV **Simon Decke^{1,2}, M. Jung^{1,2}, J. Abu Shihada^{1,2}, L. Koschinski^{1,2,3}, S. Musall^{1,2,4,5}, V. Rincón Montes¹, A. Offenhäusser¹**
 15:30 h (1stInstitute of Biological Information Processing (IBI-3) - Bioelectronics, Forschungszentrum Jülich/D, 2ndRWTH Aachen University/D, 3rdHelmholtz Nano Facility (HNF), Forschungszentrum Jülich/D, 4thFaculty of Medicine, Institute of Experimental Epileptology and Cognition Research, University of Bonn/D, 5th University Hospital Bonn/D)
Flexible 3D Microelectrode Arrays with High Aspect Ratio Electrodes for Neuronal Recordings
- 02.07 KV **Domenic Pascual¹, A. Albert¹, K. Seidl^{1,2}**
 15:37 h (1stUniversity of Duisburg-Essen, Electronic Components and Circuits, Duisburg/D, 2ndFraunhofer Institute for Microelectronic Circuits and Systems, Duisburg/D)
Towards a Flexible Retinal Implant with 3D Needle Microelectrodes through Silicon Ultrathinning and ASIC Integration
- 02.08 KV **Claire Baum^{1*}, P. Vasireddy^{1*}, P. Wang¹, A.J. Phillips¹, K. Affolder², S. Kachiguine², P. Hottoway³, A.Sher², A. Litke², E.J. Chichilnisky¹**
 15:44 h (1stStanford University, CA/USA, 2ndUniversity of California, Santa Cruz, CA/USA, 3rdAGH University of Science and Technology, Krakow/PL, *Equal contributions)
High density penetrating electrodes for three-dimensional neural recording and stimulation at single-cell resolution
- 15:55 h **Coffee break in the industrial exhibition**

16:25 h - **3rd Session**18:30 h **New Systems**

Chairs: **Yasuo Terasawa** (NIDEK CO., LTD)
Eduardo J. Chichilnisky (Stanford, CA/USA)

03.01 V **Yasuo Terasawa**^{1,2,3}, H. Tashiro², J. Ohta³

16:25 h (1 R&D Div., NIDEK CO., LTD., 2Department of Health Sciences, Faculty of Medical Sciences, Kyushu University/J, 3Institute for Research Initiatives, Nara Institute of Science and Technology (NAIST))

Toward a visual prosthesis featuring 1000+ ch stimulating electrodes by distributed architecture

03.02 V **Mohajeet B. Bhuckory**^{1,2}, A. Shin³, V. Mamchik¹, Q. Devaud¹, D. Pham-Howard^{1,2},16:40 h N. Jensen⁴, A. Kochnev Goldstein⁴, R. Dalal² and D. Palanker^{1,2}

(1Hansen Experimental Physics Laboratory, Stanford, CA/USA, 2Department of Ophthalmology, Stanford, CA/USA, 3Department of Material Science, Stanford, CA/USA, 4Department of Electrical Engineering, Stanford University, CA/USA)

Mimicking the subretinal space in atrophic AMD for pre-clinical testing of prosthetic vision

03.03 V **Nathan Jensen**, A. K. Goldstein, K. Ly, D. Palanker

16:55 h (Stanford University, CA/USA)

Design Optimization of a Subretinal Photovoltaic Prosthesis for Human Anatomy

03.04 KV **Roman Deubel**¹, S. Johnen², E. Glowacki³, Z. Gao¹, S. Ingebrandt¹

17:10 h 1Institute of Materials in Electrical Engineering, RWTH Aachen University/D, 2Department of Ophthalmology, RWTH Aachen University/D, 3Department of Bioelectronics Materials and Devices, CEITEC/CZ)

Advancing Therapeutic Strategies for Retinitis Pigmentosa: Development of a Triple Neuronal Interface

03.05 KV **Kazim Or**

17:17 h (Private Ophthalmology Office, Hamburg/D)

Li-Fi Data Transmission and Wireless Energy Transmission Perspective in Human Artificial Vision

03.06 KV **Eashika Ghosh**, G. Ziyu, V.T. Xuan, S. Ingebrandt

17:24 h (Institute of Materials in Electrical Engineering 1, RWTH Aachen University, Aachen/D)

Concept of foldable, active epiretinal implants with enhanced spatial resolution

03.07 KV **Ieva Veibraite Adereth**, S.Oz, C. Bar-Haim, Y. Hanein

17:31 h (School of electrical engineering, Tel Aviv University/IL)

Bi-directional recording and stimulation of the retina inside the eye with soft electrodes

03.08 KV **Martin Kasavetov**, E. Yilmaz, L. Koschinski, M. Jung, S. Decke, A. Offenhäusser,
 17:38 h V. Rincón Montes

(Institute of Biological Information Processing (IBI-3) – Bioelectronics, Forschungszentrum Jülich/D)

Development of 3D penetrating neural stacks for intraneural recording and stimulation

- 03.09 KV **Kalyani Devkota**, R. Opgenorth, B. Chowdhury, S. Johnen, S. Ingebrandt, Z. Gao
17:45 h (RWTH Institut für Werkstoffe der Elektrotechnik I, Aachen/D)
Opto-electro and lono-electro active microelectrode as multifunctional platform for neurodegeneration study of the retina
- 03.10 V **Viviana Rincón Montes**¹, M. Jung^{1,2}, M. Kasavetov¹, N. Nruthyathi³, F. Balcewicz⁴,
17:52 h T. Lohmann⁴, F. Müller³, P. Walter⁴, A. Offenhäusser¹
(¹Institute of Biological Information Processing (IBI-3) - Bioelectronics, Forschungszentrum Jülich/D, ²RWTH Aachen/D, ³Institute of Biological Information Processing (IBI-1), Molecular and Cellular Physiology, Forschungszentrum Jülich/D, ⁴Department of Ophthalmology, University Hospital RWTH Aachen)
A Roadmap to In Vivo Validation of Intraretinal Implants
- 03.11 KV **Fatemeh Molasarvestani**, E. Ghosh, S. Ingebrandt, X. Thang Vu
18:07 h (Institute of Materials in Electrical Engineering 1 (IWE1), RWTH Aachen University, Aachen/D)
Flexible epiretinal implant with high stimulation electrode count
- 03.12 V **Madeline Hays**¹, A.J. Phillips¹, R. Wijermars², M. Jang³, P. Wang¹, S. Cogan⁴,
18:14 h D. Muratore², E.J. Chichilnisky¹
(¹Stanford University, CA/USA, ²Delft University of Technology/NL, ³National University of Singapore/SGP, ⁴University of Texas at Dallas, TX/USA)
Evaluation of analog compressive readout architecture for neuroengineering applications using ex vivo recordings from the macaque retina
- 18:30 h **End of the scientific programme day 1**
- 19:30 h **Conference dinner**

Friday, 6th December, 2024

7 CME-POINTS

09:00 h - 4th Session11:20 h **Preclinical Stimulation Studies**

Chairs: **Paul Werginz** (Vienna/A)
John S. Pezaris (Boston, MA/USA)

04.01 V **Keith Ly**^{1,2}, D. Pham-Howard^{1,2}, M. B. Bhuckory^{1,2}, A.K. Goldstein³, N. Jensen³, D. Palanker¹
 9:00 h (¹Hansen Experimental Physics Laboratory, Stanford, CA/USA, ²Department of Ophthalmology, Stanford, CA/USA, ³Department of Electrical Engineering, Stanford University, CA/USA)
Selectivity for Bipolar Cell Stimulation by Subretinal Implants

04.02 V **Paul Werginz**, L. Koppenwallner, G. Zeck
 9:15 h (Institute of Biomedical Electronics, TU Wien, Vienna/A)
Short pulse stimulation to prevent axonal activation in retinal implants

04.03 KV **Andrea Corna**¹, G. Zeck¹
 9:30 h (¹Institute of Biomedical Electronics, TU Wien, Vienna/A)
Selective Sinusoidal Electrical Stimulation of Retinal Ganglion Cells for Visual Prosthetics

04.04 V **Taekyung Lee**¹, S Hwang³, J Lee¹, J Seo^{1,2}, S Jun^{3,4,5}
 9:37 h (¹Department of Electrical and Computer Engineering, Seoul National University/ROK, ²Biomedical Research Institute, Seoul National University Hospital/ROK, ³Department of Electronic and Electrical Engineering, Ewha Womans University/ROK, ⁴Graduate Program in Smart Factory, Ewha Womans University/ROK, ⁵Department of Brain and Cognitive Sciences, Ewha Womans University/ROK)
Fabrication of COC-based neural electrodes and performance evaluation via ex vivo stimulation of mouse retinal cells

04.05 V **Hyeonhee Roh**^{1,2}, J. Kang², H. Lee², M. Im^{1,3,4}
 9:52 h (¹Brain Science Institute, Korea Institute of Science and Technology (KIST)/ROK, ²School of Electrical Engineering, College of Engineering, Korea University/ROK, ³Division of Bio-Medical Science & Technology, KIST School, University of Science and Technology (UST) /ROK, ⁴KHU-KIST Department of Converging Science and Technology, Kyung Hee University/ROK)
Efficiency of Combined Optogenetic and Electric Stimulation Depending on Amplitude and Waveform of Electric Stimulation in Mouse Retina

04.06 V **Laurens Goyaerts**^{1,2}, M. Schelles^{1,2}, L. Merken^{2,3}, P. Janssen³, M. Kraft¹, F. Ceyssens²
 10:07 h (¹Micro- and Nanosystems, Dept. of Electrical Engineering, KU Leuven/B, ²ReVision Implant, Haasrode/B, ³Laboratory for Neuro- and Psychophysiology, Dept. of Neuroscience, KU Leuven/B)
Pre-clinical cortical prosthesis studies at ReVision Implant

04.07 KV **Jiayun Wang**¹, T. Lohmann¹, F. Balcewicz¹, S. Johnen¹, Y. Wu², H. Konermann², K. Keven², J. Stegmaier², P. Walter¹, S. Baumgarten¹
 10:22 h (¹Department of Ophthalmology, RWTH Aachen University/D, ²Institute of Imaging and Computer Vision, RWTH Aachen University/D)
Histological effects of cryo and laser coagulation on small animal eyes and anatomical reconstruction in 3D

- 04.08 V **John S. Pezaris**^{1,2}, N. J. Killian³
 10:29 h (¹Massachusetts General Hospital, Boston, MA/USA, ²Harvard Medical School, Boston, MA/USA, ³Einstein College of Medicine; New York City, NY/USA)
Visual exploration of letters in a simulation of artificial vision
- 04.09 KV **Bisruta Chowdhury**¹, R. Deubel¹, H. Koch², S. Ingebrandt¹, Z. Gao¹
 10:42 h (¹Institute of Materials in Electrical Engineering ¹ (IWE1), RWTH Aachen University/D, ²Section of Epileptology, Department of Neurology, RWTH Aachen/D)
Development of therapeutic neuro-ophthalmological implants
- 04.10 KV **Ramandeep Vilku**¹, P. Vasireddy¹, K. Kish², A. Gogliettino¹, A. Lotlikar¹, P. Hottowy³, W. Dabrowski³, A. Sher⁴, A. Litke⁴, S. Mitra¹, E.J. Chichilnisky¹
 10:49 h (¹Stanford University, CA/USA, ²University of Michigan, Ann Arbor, MI/USA, ³AGH University of Science and Technology, Krakow/PL, ⁴University of California, Santa Cruz, CA/USA)
Identifying and probing the mechanism of nonlinear current summation during multi-electrode stimulation using a biophysical model
- 04.11 KV **Amrith Lotlikar**¹, P. Vasireddy¹, A. J. Phillips¹, J. Brown¹, R. Vilku¹, P. Hottowy², A. Sher³, A. Litke³, S. Mitra¹, E.J. Chichilnisky¹
 10:56 h (¹Stanford University, CA/USA, ²AGH University of Science and Technology, Krakow/PL, ³University of California, Santa Cruz, CA/USA)
Rapid Calibration of Electronic Epiretinal Implants using Optimized Stimulation and Recording
- 04.12 V **Andrew J. Phillips**¹, M. Hays¹, A. Kling¹, R. Vilku¹, P. Vasireddy¹, P. Hottowy², W. Dabrowski², A. Sher³, A. Litke³, E.J. Chichilnisky¹
 11:03 h (¹Stanford University, CA/USA, ²AGH University of Science and Technology, Krakow/PL, ³University of California, Santa Cruz, CA/USA)
Precise reproduction of diverse naturalistic firing patterns in multiple neuronal populations using electrical stimulation
- 11:20 h **Coffee break in the industrial exhibition**
- 11:50 h - **5th Session**
 12:50 h **Encoding, AI**
 Chairs: **Johannes Stegmaier** (Aachen/D)
Michael Beyeler (Santa Barbara, CA/USA)
- 05.01 V **Michael Beyeler**¹, J. Granley¹, A. Lozano^{2,3}, C. Soto³, F. Grani³, A. Rodil³, E. Fernandez³
 11:50 h (¹University of California, Santa Barbara, CA/USA, ²Netherlands Institute for Neuroscience, Amsterdam/NL, ³University Miguel Hernandez de Elche/E)
Human-in-the-Loop Optimization of Neural Encoding Strategies for Visual Neuroprostheses
- 05.02 V **Yuli Wu**¹, D. Nguyen¹, H. Konermann¹, R. Yilmaz¹, P. Walter², J. Stegmaier¹
 12:05 h (¹Institute of Imaging and Computer Vision, RWTH Aachen University/D, ²Department of Ophthalmology, RWTH Aachen University/D)
Visual Fixation-based Retinal Prosthetic Simulation

- 05.03 KV **Henning Konermann¹**, Y. Wu¹, P. Walter², J. Stegmaier¹
 12:20 h (¹Institute of Imaging and Computer Vision, RWTH Aachen University/D, ²Department of Ophthalmology, RWTH Aachen University/D)
Beyond Downsampling: Semantic Preservation in Retinal Implant Stimuli
- 05.04 KV **Nick Lorenz¹**, L. Heyermann¹, P. Löhler¹, A. Albert¹, A. Erbslöh², K. Seidl^{1,3}
 12:27 h (¹ University of Duisburg-Essen, Electronic Components and Circuits, Duisburg/D, ²University of Duisburg-Essen, Intelligent Embedded Systems Lab, Duisburg/D, ³Fraunhofer Institute for Microelectronic Circuits and Systems, Duisburg/D)
Conceptional First Draft of Retinal Stimulation Encoding in Computational Environment
- 05.05 V **Leo Buron¹**, L. Kaiser¹, J. Dicke¹, N. Lorenz², J. Zimmermann³, K. Seidl², G. Schiele¹, A. Erbslöh¹
 12:34 h (¹University of Duisburg-Essen, Intelligent Embedded Systems Lab, Duisburg/D, ²University of Duisburg-Essen, Department of Electronic Components and Circuits, Duisburg/D, ³University of Pavia, Department of Civil Engineering and Architecture, Pavia/I)
How to Enable Embedded Neural Signal Processing in Future Retinal Implants
- 12:50 h **Lunch break in the industrial exhibition**
- 13:50 h - **6th Session**
 16:05 h **Human Studies**
 16:05 h Chairs: **Gislin Dagnelie** (Baltimore, MD/USA)
Peter Walter (Aachen/D)
- 06.01 V **Jungyeon Park¹**, A. K. Goldstein², Y. Zhou², D. Palanker^{1,3}
 13:50 h (¹Hansen Experimental Physics Laboratory, Stanford, CA/USA, ²Electrical Engineering, Stanford, CA/USA, ³Ophthalmology, Stanford University, CA, USA)
Simulating and enhancing prosthetic vision with PRIMA implants
- 06.02 V **Takeshi Morimoto**, R. Atsumi
 14:05 h (Department of advanced visual neuroscience, Osaka university graduate school of medicine/J)
The effect of the size of the visual field of a retinal prosthesis on visual recognition.
- 06.03 V **Nico Marek¹**, S. Pollmann^{1,2}
 14:20 h (¹Department of Psychology, University of Magdeburg/D, ² Center for Brain and Behavioral Sciences, University of Magdeburg/D)
Eye movements support memory-guided search with peripheral scotoma simulation in virtual reality
- 06.04 V **Roberto Morollón Ruiz**, L. Soo, D. Waclawczyk, J. A. Cueva Garcés, M. M. Ayuso Arroyave, I. Willemse, E. Fernández
 14:35 h (Miguel Hernandez University, Elche/E)
Evaluating the feasibility of a cortical visual neuroprostheses based on intracortical microelectrodes for Orientation and Mobility Tasks

- 06.05 V **Ralf Hornig¹**, Y. Le Mer², M. Muqit³, L. Olmos de Koo⁴, J.A. Sahel⁵, D. Palanker⁶, F.G. Holz⁷
14:50 h ('La Science, Paris/F, ²Fondation A. de Rothschild, Paris/F, ³Moorfields Eye Hospital, London/UK, ⁴University of Washington, Seattle, WA/USA, ⁵University of Pittsburgh School of Medicine, Pittsburgh, PA/USA, ⁶Stanford University, CA/USA, ⁷University of Bonn, Bonn/D)
Restoration of Detailed Form Vision with the PRIMA Retinal Implant System
- 06.06 V **Astrid Jiang¹**, M.P. Barry², G. Dagnelie³, P.R. Troyk²
15:05 h (¹Neuroscience Department, Johns Hopkins University, Baltimore, MD/USA, ²Pritzker Institute, Illinois Institute of Technology, Chicago, IL/USA, ³Ophthalmology, Johns Hopkins University, Baltimore, MD/USA)
Phosphene Interactions Among Electrode Groups in Intracortical Visual Prosthesis (ICVP)
- 06.07 V **Eduardo Fernandez**
15:20 h (Bioengineering Institute, University Miguel Hernández, Elche/E)
*Advancements in Cortical Visual Neuroprosthesis:
Recent Studies in Four Human Volunteers*
- 06.08 V **Gislin Dagnelie¹**, P. Grant², M.P. Barry³, K. Stipp³, V.L. Towle⁴, F.T. Collison², F.J. Lane³,
15:35 h K. Stephan⁴, K. Jiang¹, J.P. Szlyk², P.R. Troyk³
(¹Johns Hopkins University, Baltimore, MD/USA, ²Chicago Lighthouse, IL/USA, ³Illinois Institute of Technology, Chicago, IL/USA, ⁴University of Chicago, IL/USA)
Functional outcomes from the Intracortical Visual Prosthesis (ICVP)
- 06.09 V **Daniele Re**, R. Ibrahim, S. Oz, A. Sharon, I. Vebraite Adereth, Y. Hanein
15:50 h (Tel Aviv University/IL)
*Towards Wearable Non-invasive Approach to Retina stimulation:
Phosphene Induction and Temporal Interference Studies*
- 16:05 h **General discussion with coffee break and farewell**
- 17:30 h **End of the meeting**

International Airports. High Speed Train System

From Frankfurt: Take the ICE High Speed train from Frankfurt Airport Station to Cologne Main Station (approx. 1h) and continue to Aachen Main Station (approx. 45-60 min).

From Düsseldorf: Take the train from Düsseldorf Airport Station to Düsseldorf Main Station (approx. 10 min) and then continue to Aachen Main Station (approx. 1.5 h).

From Cologne. Take the train from Cologne Airport Station to Cologne Main Station (approx. 15 min) and then continue to Aachen Main Station (approx. 45 - 60 min).

From Aachen Main Station take a taxi to Novotel Aachen City.

By car.

From Frankfurt Airport you can drive highway A3 to Cologne and then change to A4 direction to Aachen. At AK Aachen please change to A544 direction Aachen Europaplatz (approx. 3 h).

From Düsseldorf Airport. A52 → A61 → A44. Then A544 direction Europaplatz. (approx. 95 km, 1 h)

From Cologne Airport. Take the A59, then change to A599 followed by A4 towards Aachen. Then A544 direction Europaplatz. (approx. 82 km, 1 h)



Meeting address

Novotel Aachen City
Peterstraße. 66
52062 Aachen
Germany

Aachen and the EUREGIO area

The city of Aachen is the most western city in Germany close to the borders of The Netherlands and Belgium. Aachen has approx. 250,000 inhabitants and the University and the University Hospital are the largest employer here in Aachen. Aachen has a long history and you can still see significant witnesses of a time long ago, such as the cathedral with its beautiful and mystic octagon and the astonishing gothic city hall. But Aachen with its important historic phase of Charlemagne today is a young and vivid town with its university and the many students from various countries in the world. RWTH Aachen University is one of the leading technical universities in Europe with a strong focus on mechanical and electrical engineering but also on information technology and natural sciences. Aachen forms a cultural, industrial and also scientific cross border triangle together with Liege in Belgium and Maastricht in The Netherlands forming the EUREGIO area. Many cooperations exist between the institutions within this area.

The Artificial Vision Meeting is set to the beginning of December. Although the weather might not be perfect – in fact it could be cold and maybe rainy – it is worth to visit the cosy Christmas Market in the city. You should try “Printen”, a local biscuit speciality with a high “addiction” potential.

Aachen is also not far away from Cologne with its huge cathedral and its several concert halls and the province capital Düsseldorf with its important art and fashion scene. You can also reach the European capitals Paris and Brussels by high speed train within a few hours.

There are also many more reasons to come and visit Aachen and we are looking forward to see you.