CALL FOR FINAL PROGRAMME

ARTIFICIAL VISION 2019
THE INTERNATIONAL SYMPOSIUM ON VISUAL PROSTHETICS

Friday, 13th – Saturday, 14th December, 2019
Aachen, Germany

FINAL PROGRAMME

Center for Technology
Aachen Europaplatz
www.artificial-vision.org
We thank the following companies for their generous support of the Artificial Vision Symposium 2019 in Aachen:

Pixium Vision
Sponsoring: € 5,000,–

Bayer Vital GmbH
Sponsoring: € 2,500,–

Second Sight Medical Products (Switzerland) Sàrl
EPFL Innovation Park A, 1015 Lausanne, Switzerland, www.secondsight.com
Sponsoring: € 2,000,–

D.O.R.C. Deutschland GmbH
Schießstraße 55, 40549 Düsseldorf, www.dorc.eu
Sponsoring: € 1,800,–

The Deutsche Forschungsgemeinschaft e.V. will support the meeting with € 10,000,–

The financial support of these eight companies adds to the budget of Artificial Vision 2019 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.

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 mid 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.
The treatment of blindness caused by degenerative or dystrophic retinal diseases remains an unsolved medical but also social problem. Although significant progress has been made, e.g. with the approval of the first gene therapy for RPE65 associated Leber’s Congenital Amaurosis (LCA) on one hand or with the fabrication and implantation of retinal implant systems in RP patients on the other hand, there is still a bumpy road ahead.

Several years ago the implantation of retina implant systems sounded as a success story. Totally blind subjects were able to perceive light, to locate and avoid obstacles, some were even able to slowly read large letters and to identify high contrast objects. However, this success was not well recognized in the ophthalmic community and in the patient community. The number of implantations did not meet the expectations and calculations of the companies. As a result, e.g. Retina Implant AG stopped fabricating the Alpha AMS device and Second Sight also stopped their Argus II activities. Clinical results in a larger scale are now expected from trials with the subretinal photovoltaic device of PIXIUM and also from the cortical stimulation device ORION. Other activities are expected from the Australian and from the Japanese consortium and possibly also from other groups.

However, we learned a lot from the experiences with the early implants. Many research projects are still running to better understand the mechanisms of retinal degeneration, how to interfere with these mechanisms, what components of retinal or cortical implants can be improved or optimized to achieve a better outcome. New projects are planned to solve more general bottlenecks of retinal stimulation using implants.

The Artificial Vision 2019 Conference in Aachen, Germany serves as an interdisciplinary forum bringing together researchers of all disciplines involved in the design, planning, fabricating and testing of visual prostheses as well as scientists from the neurobiological world giving insights in the process of visual system degeneration. We also welcome the participation of patients in this conference to better understand their needs and expectations.

This conference is a fully open, non-invitational meeting. For young researchers we will have a number of travel grants available. The conference is supported by the German Research Association (Deutsche Forschungsgemeinschaft, DFG).

Together with my colleagues Wilfried Mokwa (RWTH), Frank Müller and Andreas Offenhäusser (RC Julich) I cordially invite you to come to Aachen.
**Scientific programme and further information**

**Prof. Dr. Peter Walter**
Department of Ophthalmology, University Hospital Aachen
Pauwelsstraße 30, 52074 Aachen, Germany
Phone: +49 (0) 2 41 / 8 08-81 91, Fax: +49 (0) 2 41 / 8 08-24 08
E-Mail: pwalter@ukaachen.de

**Organization**

Congress Organisation Gerling GmbH
Werftstraße 23, 40549 Düsseldorf, Germany
Phone: +49 (0) 2 11 / 59 22 44, Fax: +49 (0) 2 11 / 59 35 60
E-Mail: info@congresse.de, Homepage: www.congresse.de

**Venue**

Center for Technology
Aachen Europaplatz
Dennewartstraße 25-27
52068 Aachen, Germany

**Lecture hall**

Auditorium

**Official Language**

English

**Date**

Friday, December 13th, 2019 13:00 h – 18:15 h
Saturday, December 14th, 2019 08:15 h – 17:15 h

**Opening hours congress office**

Friday, December 13th, 2019 12:00 h – 18:15 h
Saturday, December 14th, 2019 07:45 h – 17:15 h

**Opening hours industrial exhibition**

Friday, December 13th, 2019 13:00 h – 18:15 h
Saturday, December 14th, 2019 08:15 h – 15:00 h

**Homepage and Online Registration**

www.artificial-vision.org

**Hotel Booking**

See hotel on the registration form
(or online www.artificial-vision.org)

**ATTENDANCE FEE**

<table>
<thead>
<tr>
<th>Registration</th>
<th>After 30th September</th>
<th>On site</th>
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<tbody>
<tr>
<td>International symposium attendance fee</td>
<td>EUR 200,—</td>
<td>EUR 220,—</td>
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<tr>
<td>Reduced rate for PhD students and residents*</td>
<td>EUR 120,—</td>
<td>EUR 140,—</td>
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*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, by mail or by fax. Cancellation for the symposium has to be made via e-mail or via fax (+49 (0) 2 11 / 59 35 60) by December 9th, 2019. In any case an administration fee of EUR 22,– has to be paid. After this date no refunds can be made.

CME-POINTS
The Symposium is registered at the Ärztekammer Nordrhein providing CME-points for the German Continuing Medical Education System. Please bring your Barcode Labels and we will register you for CME-point documentation. An equivalent Certificate of Attendance will be given to you upon on-site registration.

INFORMATIONS FOR SPEAKERS

Presentations
- Lecture 15 min presentation incl. discussion
- Talk 10 min presentation incl. discussion

Projection
- Microsoft PowerPoint presentation on CD/DVD/USB-Stick or own notebook.
- video codecs: Quicktime 7.7.9®, Windows Media Player 12.0®

SOCIAL EVENT

Friday, 13th December, 2019

Conference Dinner
20:00 h  Schloss Rahe
Schloss-Rahe-Straße 15, 52072 Aachen

Price per person (incl. dinner and drinks):
- Participant included in the attendance fee, but due to notification
- Accompanying person EUR 50,–

Bus transfer from the congress venue: 19:30 h
Return: approx. 23:30 h
**Friday, 13th December, 2019**

13:00 h  **Come Together**

14:00 h  **Prof. Dr. med. Peter Walter**
          (Department of Ophthalmology, RWTH Aachen University, Aachen/D)  
          *Welcome Note*

**Univ.-Prof. Dr. rer. nat. Stefan Uhlig**
          (Dean of the Medical Faculty RWTH Aachen University)  
          *Welcome Note*

**Dr.-Ing. Damian Dudek** (German National Research Agency DFG)
          *Welcome Note*

14:40 h  **1st Session**

16:00 h  **Retinal Degeneration – Models & Mechanisms**

  *Chair: Frank Müller (Juelich/D)*
  *Günther Zeck (Tuebingen/D)*

- **Lecture 14:15 h**
  **Hamed Shabani**\(^1\), M. Sadeghi\(^2\), M. Hosseinizadeh\(^2\), E. Zrenner\(^1\),
  D.L. Rathbun\(^1\)
  (*University Eye-Clinic Tuebingen/D, \(^2\)University Eye-Clinic Leipzig/D*)
  *MEA-based classification of retinal ganglion cells for bionic vision*

- **Talk 14:30 h**
  **Nicholas Hempel**\(^1\), B. Denecke\(^2\), J. Weis\(^3\), F. Mueller\(^4\), P. Walter\(^1\),
  S. Johnen\(^1\)
  (*Department of Ophthalmology, University Hospital RWTH Aachen/D,*
  \(^2\)Genomics Core Facility, Interdisciplinary Center for Clinical Research,
  University Hospital RWTH Aachen, \(^3\)Institute of Neuropathology,
  University Hospital RWTH Aachen/D, \(^4\)Institute of Complex Systems,
  Cellular Biophysics, ICS-4, Forschungszentrum Juelich/D*)
  *Retinal transcriptome analysis of the rd10 mouse model of retinal
degeneration*

- **Talk 14:40 h**
  **Alfred Yamoah**\(^1\), H. Guo\(^1\), P. Tripathi\(^1\), I. Katona\(^1\), P. Walter\(^2\),
  S. Johnen\(^2\), F. Müller\(^3\), A. Goswami\(^1\), J. Weis\(^1\)
  (*Institute of Neuropathology RWTH Aachen University Medical School
  Aachen/D, \(^2\)Department of Ophthalmology RWTH Aachen University
  Medical School Aachen/D, \(^3\)Institute of Complex Systems Cellular
  Biophysics ICS-4 Forschungszentrum Jülich GmbH Juelich/D*)
  *Altered autophagy and RNA binding proteins (RBPs) together with
ER chaperones are linked to retinal degeneration in the rd10 mouse
model of retinitis pigmentosa*

- **Lecture 14:50 h**
  **Seong-woo Kim**\(^1\), K.-E. Choi\(^2\), Y.S. Goo\(^3\)
  (*Department of Ophthalmology, Korea University College of Medicine,
  Seoul/ROK, \(^2\)Department of Physiology, Chungbuk National University
  School of Medicine, Cheongju/ROK*)
  *Morphological findings of experimental pig models with outer retinal
degeneration induced by intravitreal loading of Nmethyl-N-nitrosourea
after vitrectomy*
05 Lecture Yong Sook Goo¹, S.-W. Kim²
15:05 h
(¹Chungbuk National University School of Medicine, Cheongju/ROK, ²Korea University College of Medicine, Seoul/ROK)
Physiological findings of experimental pig models with outer retinal degeneration induced by intravitreal loading of Nmethyl-N-nitrosourea after vitrectomy

06 Lecture Jana Gehlen¹, S. Esser¹, K. Schaffrath², S. Johnen², P. Walter², F. Müller¹
15:20 h
(¹Institute of Complex Systems, Cellular Biophysics, ICS-4, Forschungszentrum Juelich/D, ²Department of Ophthalmology, University Hospital RWTH Aachen/D)
Towards an enhancement of prosthesis-based therapy in retinitis pigmentosa

07 Lecture Günther Zeck¹, A. Corna¹, P. Ramesh², J. H. Macke²
15:35 h
(¹Neurophysics, Natural and Medical Sciences Institute at the University Tuebingen/D, ²Computational Neuroengineering, Department of Electrical and Computer Engineering, TU Munich/D)
Spatio-temporal resolution upon sinusoidal stimulation of ex vivo rd mouse retina

08 Talk Claudia Ingensiep, K. Schaffrath, P. Walter, S. Johnen
15:50 h
(Department of Ophthalmology, University Hospital RWTH Aachen/D)
A MEA-based hypoxia model for the analysis of electrical activity in murine retinae

16:00 h Coffee break in the industrial exhibition

16:30 h 2nd Session

18:15 h Technology of Visual Prosthetic Devices

Chair: Marta J.I. Airaghi Leccardi (Lausanne/CH)
Yasuo Terasawa (Gamagori/J)

09 Lecture Marta J.I. Airaghi Leccardi¹, N.A.L. Chenais¹, C.P.J. Vila¹, T.J. Wolfensberger², and D. Ghezzi²
16:30 h
(¹Medtronic Chair in Neuroengineering, Center for Neuroprosthetics and Institute of Bioengineering, School of Engineering, École polytechnique fédérale de Lausanne/CH, ²Hôpital Ophtalmique Jules Gonin, Université de Lausanne/CH)
Development of a Foldable and Photovoltaic Wide-Field Epiretinal Prosthesis

10 Lecture Changhoon Baek, J. Kim, J. Yi, Y. Lee, J. Kim, H. Jeong, J. Seo
16:45 h
(National University Seoul/ROK)
Updates of Seoul Artificial Retina Project

11 Lecture Yasuo Terasawa¹, H. Tashiro², J. Ohta²
17:00 h
(¹Artificial Vision Institute, Nidek Co., Ltd, Gamagori/J, ²Materials Science, Nara Institute of Science and Technology, ³Department of Health Sciences, Kyushu University/J)
Suprachoroial retinal stimulation using temporally interfering electric fields: A simulation study
12 Lecture 17:15 h
Sohee Kim, H.W. Seo, N. Kim
(Department of Robotics Engineering, Daegu Gyeongbuk Institute of Science and Technology (DGIST), Daegu/ROK)
Transparent 3D microelectrodes with high resolution for subretinal stimulation

13 Lecture 17:30 h
Kim Young-jin, H. Jung, S.-A Lee
(Osong Medical Innovation Foundation/ROK)
Development of reliable hybrid packaging technology for sub-retinal stimulation system

14 Lecture 17:45 h
Andreas Erbslöh¹, R. Viga¹, K. Seidl¹,², R. Kokozinski¹,²
(¹University of Duisburg-Essen, Electronic Components and Circuits, Duisburg/D, ²Fraunhofer Institute for Microelectronic Circuits and Systems, Duisburg/D)
Concept of a Retinal Closed-Loop System with an on-Chip Fire-Rate-Detection Algorithm

15 Lecture 18:00 h
Charles Yu, V Fan, I Vieira
(Stanford University, Palo Alto/USA)
Visual Prosthesis for Corneal Blindness

18:15 h End of day I
20:00 h Conference dinner, Castle Rahe, Aachen
Saturday, 15th December, 2019

08:15 h 3rd Session

Preclinical data on stimulation and new devices

10:20 h Chair: Tibor K. Lohmann (Aachen/D)
Takeshi Morimoto (Osaka/J)

16 Lecture Peter Stalmans (Department of Ophthalmology, UZ Leuven, Leuven/B)
08:15 h Safety and performance clinical trial of the NR600 retinal implant in end-stage inherited outer retinal degenerative diseases

17 Lecture Mahmut E. Celik1, D. Nguyen2, E. Scorsone3, L. Rousseau4, S. Picaud2
08:30 h (1Electrical and Electronics Engineering Department, Gazi University, Ankara/TR, 2L’Institut de la Vision, Paris/F, 3CEA Saclay, Paris, France, 4ESIEE Paris/F)
Investigation of Spatial Selectivity using Blind Source Separation Algorithm for Electrical Retinal Stimulation

18 Lecture Naïg Chenais, M.A. Leccardi, D. Ghezzi
08:45 h (Swiss Federal Institute of Technology (EPFL), Medtronic Chair in Neuroengineering, Center for Neuroprosthetics, Geneva/CH)
Ex-vivo characterization of high-resolution photovoltaic epi-retinal stimulation

19 Lecture Viviana Rincón Montes1, J. Gehlen2, K. Srikantanarajah1, F. Müller2, A. Offenhäuser1
09:00 h (1Institute of Complex Systems – Bioelectronics (ICS-8) – Forschungszentrum Jülich/D, 2Institute of Complex Systems – Cellular Biophysics (ICS-4) – Forschungszentrum Jülich/D)
Polymer-based penetrating probes for retinal applications

20 Lecture Paul Werginz1,3, V. Raghuram2,3,4, S.I. Fried2,3
09:15 h (1Vienna University of Technology, Vienna/A, 2Boston VA Healthcare System, Boston/USA, 3Massachusetts General Hospital, Boston/USA, 4Tufts University, Medford/USA)
Location-dependent AIS variations influence activation thresholds in mouse RGCs

21 Talk Tibor Karl Lohmann1, K. Schaffrath1, S. Baumgarten1, J. Seifert1, P. Raffelberg2, F. Waschkowski3, R. Viga2, R. Kokozinski2,4, S. Johnen1, W. Mokwa3, P. Walter1
09:30 h (1Department of Ophthalmology, RWTH Aachen University Hospital, Aachen/D, 2Electronic Components and Circuits, University of Duisburg-Essen, Duisburg/D, 3Institute of Materials in Electrical Engineering 1, RWTH Aachen University, Aachen/D, 4Fraunhofer Institute of Microelectronic Circuits and Systems, Duisburg/D)
Biocompatibility and surgical feasibility of the OPTO-EPIRET stimulation system

22 Lecture Takeshi Morimoto1, T. Miyoshi2, T. Saitoh2, K. Ito2, M. Ozawa3, K. Nishida4, T. Fujikado5
09:40 h (1Dept. of Advanced Visual Neuroscience, Osaka University/J, 2Dept. of Integrative physiology, Osaka University/J, 3Nidek Co., Gamagori/J, 4Dept. of Ophthalmology, Graduate School of Medicine, Osaka University/J, 5Graduate School of Frontier Biosciences, Osaka University/J)
Feasibility of 3rd generation suprachoroidal–transretinal stimulation (STS) prosthesis in healthy dogs
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<th>Time</th>
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<th>Speaker(s)</th>
<th>Title/Abstract</th>
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<tr>
<td>09:55</td>
<td>Lecture</td>
<td>Vivien Gaillet¹, A. Cutrone², F. Artoni², P. Vagni³, A.M. Pratiwi¹, S.A. Romero Pinto¹, D. Lipucci Di Paola², S. Micera², D. Ghezzi¹</td>
<td>(¹Medtronic Chair in Neuroengineering, Center for Neuroprosthetics and Institute of Bioengineering, School of Engineering, École polytechnique fédérale de Lausanne, Geneva/CH, ²The BioRobotics Institute, Scuola Superiore Sant'Anna, Piazza Martiri della Libertà, Pisa/IT, ³Bertarelli Foundation Chair in Translational Neuroengineering, Center for Neuroprosthetics and Institute of Bioengineering, School of Engineering, École polytechnique fédérale de Lausanne, Geneva/CH) Electrical Stimulation of the Optic Nerve for Neuroprosthetic Applications</td>
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<td>10:10</td>
<td>Talk</td>
<td>Martina Kropp¹, D. Ghezzi¹, A. Conti¹, C. Jonescu-Cuypers¹, G. Thumann¹</td>
<td>(¹Experimental Ophthalmology, University of Geneva, Geneva/CH, ²Department of Ophthalmology, University Hospitals of Geneva, Geneva/CH, ³Medtronic Chair in Neuroengineering, École polytechnique fédérale de Lausanne, Geneva/CH) Surgical in vivo model in rabbits to test chronically self-opening intra-neural electrodes for optic nerve stimulation</td>
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<td>10:50</td>
<td>Coffee break in the industrial exhibition</td>
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<td>10:50</td>
<td>4th Session</td>
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<td>12:20</td>
<td>4th Session</td>
<td>Chair: Penelope J. Allen (Melbourne/AUS) Yannick Le Mer (Paris/F)</td>
<td>Clinical Experiences with Retinal Stimulation and Implants</td>
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<td>10:50</td>
<td>Talk</td>
<td>Ronja Jung¹,², K. Stingl¹, K. Stingl², C. Kelbsch², H. Wilhelm¹, T. Peters¹, B. Wilhelm¹, T. Strasser¹, P. Richter¹</td>
<td>(¹Pupil Research Group, Center for Ophthalmology, University of Tuebingen, Tuebingen/D, ²University Eye Hospital, Center for Ophthalmology, University of Tuebingen, Tuebingen/D) Dynamics of pupillary responses to sinusoidal transcorneal electrostimulation in healthy subjects - Effects of stimulus frequency</td>
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<tr>
<td>11:00</td>
<td>Lecture</td>
<td>David A.X. Nayagam¹,², M.A. Petoe³, S.A. Titchener³, M. Kolic³, E.K. Baglin³, C.J. Abbott³,⁴, C.D. Luu³,³, S.B. Epp³, P. Thien³, J. Kvansakul³, M.N. Shivdasani³,¹, W.G. Kentler², O. Burns³, J. Villalobos³, R. Millard³, P. Seligman³, J. Yeoh³, R.J. Briggs³, R.K. Shepherd³, C.E. Williams³, P.J. Allen³</td>
<td>(¹Bionics Institute, East Melbourne/AUS, ²Department of Pathology, University of Melbourne, St. Vincent's Hospital, Melbourne/AUS, ³Medical Bionics Department, University of Melbourne/AUS, ⁴Centre for Eye Research Australia, Royal Victorian Eye and Ear Hospital, Melborne/AUS, ⁵Ophthalmology, Department of Surgery, University of Melbourne/AUS, ⁶Graduate School of Biomedical Engineering, The University of New South Wales, Sydney/AUS, ⁷Department of Biomedical Engineering, University of Melbourne, Melbourne/AUS, ⁸Otolaryngology, Department of Surgery, University of Melbourne/AUS) 44-Channel Suprachoroidal Retinal Prosthesis Clinical Trial: Interim Device Status Update 1 Year Post-Implantation</td>
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27 Lecture  
**Penelope J. Allen**1,2, D.A.X. Nayagam3,4, S.B. Epp3, C.D. Luu1,2, N. Barnes3, M. Kolic1, K. Young1, E.K. Baglin1, C.J. Abbott1,2, R.J. Briggs5, J. Yeoh1, W.G. Kentler6, S.A. Titchener3, M.A. Petoe3,4, C.E. Williams3,4  
(1Centre for Eye Research Australia, Royal Victorian Eye and Ear Hospital, Melbourne/AUS, 2Department of Surgery (Ophthalmology), University of Melbourne/AUS, 3Bionics Institute, Melbourne/AUS, 4Medical Bionics Department, University of Melbourne/AUS, 5Otolaryngology, University of Melbourne/AUS, 6School of Engineering, University of Melbourne/AUS, 7Data 61, Commonwealth Scientific and Industrial Research Organisation, Canberra/AUS, 8The Australian National University, Canberra/AUS)  
*A suprachoroidal retinal prosthesis: surgical safety and stability*

28 Lecture  
**Caroline Van Cauwenbergh**1, D. Nerinckx1, I. Spielberg1, L. Hebbelinck1, A. Vandesteene1, E. Van De Ginste1, W. Schrauwen1, I. Joniau1, L. Wouters1, B.P. Leroy1  
(1Department of Ophthalmology, Ghent University & Ghent University Hospital, Ghent/B, 2Department of Medical Psychology, Ghent University Hospital, Ghent/B)  
*First Belgian Argus II retinal prosthesis implantation and rehabilitation: one-year outcomes*

29 Talk  
**Kim Schaffrath**, T. Lohmann, S. Baumgarten, H. Schellhase, P. Walter  
(Department of Ophthalmology, University Hospital RWTH Aachen/D)  
*Management of surgery-associated adverse events of Argus II retinal prosthesis system*

30 Talk  
**Mahi M.K. Muqit**1,2, J.P. Hubschman3, S. Picard4, D.B. McCreery6, J.C. van Meurs6,7, C. Nouvel-Jaillard4, C-M. Fovet4, P. Hantraye8, J. Sahel9,10,11, J.N. Martel10, Y. Le Mer11  
(1Vitreoretinal Service, Moorfields Eye Hospital, London/UK, 2Institute of Ophthalmology, University College London/UK, 3Stein Eye Institute, University of California Los Angeles/USA, 4Sorbonne Université, INSERM, CNRS, Institut de la Vision; Paris/F, 5Huntington Medical Research Institutes, Pasadena/USA, 6Rotterdam Eye Hospital, Rotterdam/NL, 7ErasmusMC, Rotterdam/NL, 8Molecular Imaging Research Center (MIRCen), CEA, Fontenay aux Roses/F, 9Hôpital des Quinze Vingts, Paris/F, 10Retina and Vitreous Service, University of Pittsburgh Medical School, Pittsburgh/USA, 11Fondation Ophtalmologique A. De Rothschild, Paris/F)  
*Surgical technique of the PRIMA photovoltaic retinal implant: from animal testing to implantation in humans*

31 Lecture  
**Yannick Le Mer**1, S. Mohand-Saïd2, M. Muqit1, J. Sahel1, D. Palanker5  
(1Fondation Ophtalmologique Rothschild, Paris/F, 2CHNO des 15-20, Paris/F, 3Moorfields Eye Hospital, London/UK, 4Pittsburgh University/USA, 5Stanford University/USA)  
*12 months results of first in human study, implanting the wireless subretinal PRIMA microchip in patients with dry AMD*

12:20 h  
Lunch break in the industrial exhibition
13:10 h 5th Session
Cortical Prosthesis: The next step?

14:30 h
Chair: Patrick Degenaar (Newcastle/UK)
Shelley Fried (Boston/USA)

32 Lecture
Patrick Degenaar, Y. Liu, A. Soltan
13:10 h (Newcastle University, Newcastle upon Tyne/UK)
Newcastle Visual Cortical Prosthesis

33 Talk
Yu Liu, P. Degenaar
13:25 h (Newcastle University, Newcastle upon Tyne/UK)
The Newcastle Optogenetic Visual Cortical Prosthesis

34 Lecture
Eduardo Fernandez
13:35 h (University Miguel Hernández, Bioengineering Institute, Elche/E)
Development of a Cortical Visual Neuroprosthesis for the Blind:
Preliminary results in human

35 Lecture
Shelley Fried, S.W. Lee, S.B. Ryu
13:50 h (Dept. of Neurosurgery, Massachusetts General Hospital, Boston/USA)
Towards the development of a micro-coil based cortical visual prosthesis

36 Talk
Walter Gallo Gomez, Y. Pecho Trigueros
14:05 h (Lima/PE)
Implantation of microchips in the relay neurons of the lateral geniculate nucleus

37 Lecture
Katerina Eleonora K. Rassia1, J.S. Pezaris2,3
14:15 h (1Cognitive Science Laboratory, Dept. of History and Philosophy
of Science, National and Kapodistrian Univ. of Athens/GR,
2Dept. of Neurosurgery, Massachusetts General Hospital, Boston/USA,
3Dept. of Neurosurgery, Harvard Medical School, Boston/USA)
Improvement in reading performance through training with simulated
thalamic visual prostheses

14:30 h Coffee break in the industrial exhibition

15:00 h 6th Session
Perception in Artificial Vision?

16:20 h
Chair: Gislin Dagnelie (Baltimore/USA)
Stefan Pollmann (Magdeburg/D)

38 Talk
Kazim Hilmi Or
15:00 h (Hamburg)
A model of sight in artificial vision and some of its perception properties
39 Lecture Penelope J. Allen¹,², D.A.X. Nayagam³,⁴, C.D. Luu¹,², N. Barnes¹,⁵, M. Kolic⁶, K. Young⁷, E.K. Baglin¹, C.J. Abbott¹,², R.J. Briggs³, J. Yeoh¹, W.G. Kentler⁶, J. Kvansakul³, S.A. Titchener¹, M.A. Petoe³,⁴, C.E. Williams³,⁴
(¹Centre for Eye Research Australia, Royal Victorian Eye and Ear Hospital, Melbourne, Victoria, Australia, ²Department of Ophthalmology, University of Melbourne/AUS, ³Bionics Institute, Melbourne/AUS, ⁴Medical Bionics Department, University of Melbourne/AUS, ⁵Otolaryngology, University of Melbourne/AUS, ⁶School of Engineering, University of Melbourne/AUS, ⁷Data 61, Commonwealth Scientific and Industrial Research Organisation, Canberra/AUS.
⁸The Australian National University, Canberra/AUS)
A suprachoroidal retinal prosthesis: initial functional results

40 Talk Samuel A. Titchener²,³, M.A. Petoe¹,², J. Kvansakul¹,²,
M.N. Shivdasani³,¹, J.B. Fallon¹,², D.A.X. Nayagam¹,⁴, S.B. Epp¹, C.E. Williams¹,², N. Barnes⁵,⁶, W.G. Kentler¹, M. Kolic⁶, E.K. Baglin⁶, C.J. Abbott⁸,⁹, C.D. Luu⁸,⁹, P.J. Allen⁸,⁹
(¹Bionics Institute, East Melbourne/AUS, ²Medical Bionics Department, University of Melbourne/AUS, ³Graduate School of Biomedical Engineering, The University of New South Wales, Kensington/AUS, ⁴Department of Pathology, University of Melbourne, St. Vincent's Hospital, Melbourne/AUS, ⁵Data61, CSIRO, Canberra/AUS, ⁶Research School of Engineering, Australian National University, Canberra/AUS, ⁷Department of Biomedical Engineering, University of Melbourne/AUS, ⁸Centre for Eye Research Australia, Royal Victorian Eye & Ear Hospital, Melbourne/AUS, ⁹Ophthalmology, Department of Surgery, University of Melbourne/AUS,)
Perception of motion in a 2nd generation suprachoroidal retinal implant

41 Lecture Nadia Paraskevoudi¹,², J.S. Pezaris³,⁴
(¹Brainlab – Cognitive Neuroscience Research Group, Department of Clinical Psychology and Psychobiology, University of Barcelona, Barcelona/E, ²Inst. of Neurosciences, University of Barcelona, Barcelona/E, ³Department of Neurosurgery, Massachusetts General Hospital, Boston/USA, ⁴Department of Neurosurgery, Harvard Medical School, Boston/USA)
The effect of eye and head position on reading speed in a simulation of prosthetic vision

42 Lecture Stefan Pollmann, C. Nath, L. Wang
(Institute of Psychology, Otto-von-Guericke-Universität Magdeburg/D)
Object recognition training with simulated retina implant perception

43 Lecture Gislin Dagnelie¹, A. Kartha¹, R. Sadeghi¹,², C. Bradley¹, D. Geruschat¹
(¹Departments of Ophthalmology, Johns Hopkins University, Baltimore/USA, ²Departments of Biomedical Engineering, Johns Hopkins University, Baltimore/USA)
Towards a unified set of performance outcomes for vision restoration trials
<table>
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| 16:20 h  | **7th Session**  
Patients, Companies and Health Care Systems                            |
| 16:50 h  | Chair: Alfred Stett (Reutlingen/D)  
Ralf Hornig (Paris/F)                                                        |
| 16:20 h  | **Lecture**  
Vasiliki Karadima\(^1\), J.S. Pezaris\(^2, 3\)  
(\(^1\)Multisensory and Temporal Processing Lab, Panteion University, Athens/Greece, \(^2\)Dept. of Neurosurgery, Massachusetts General Hospital, Boston/USA, \(^3\)Dept. of Neurosurgery, Harvard Medical School, Boston/USA)  
*Potential users of visual prosthesis: expectations, motivation and attitudes towards participation* |
| 16:35 h  | **Lecture**  
Eberhart Zrenner\(^1\), R. Rubow\(^2\), A. Stett\(^3\)  
(\(^1\)Institute for Ophthalmic Research, Eberhard Karls Universität Tübingen/D, \(^2\)Retina Implant AG i.L. Reutlingen/D, \(^3\)Okuvision GmbH, Reutlingen/D)  
*The challenge to meet the expectations of patients, ophthalmologists and public health care systems with current retinal prostheses* |
| 16:50 h  | **Round Table – The Future of Visual Prosthetics**                       |
| 17:15 h  | **Closure remarks – farewell reception**                                 |
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**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 Technologiezentrum at Europaplatz.

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)

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Meeting address

Technologiezentrum Europaplatz. Dennewartstraße 25-27. 52068 Aachen, Germany.
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<th>Name</th>
<th>First name</th>
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- I register definitely for Artificial Vision 2019

Lunch on Saturday, 14th December, 2019 (included in the conference fee)
- yes  
- no (please tick)

Social event:
- Conference Dinner (Friday, 13th December, 2019) _____ person/-s
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