

**Compound Semiconductor Week
2020 and 2021
Awards**

May 10th, 2021

The International Symposium on Compound Semiconductors

May 18th, 2020

ISCS Awards 2020

The Welker Award

Presented to

Prof. Henning Riechert

Paul-Drude-Institut für Festkörperelektronik

The Quantum Devices Award

Presented to

Prof. Alexey Kavokin

Westlake University

The Young Scientist Award

Presented to

Dr. Hannah Joyce

University of Cambridge

The Welker Award

Prof. Henning Riechert

In recognition of his contributions to the development of MBE growth and III-V Laser/LED technologies and providing leadership to the compound semiconductor research.



Prof. Henning Riechert completed his studies of physics at the University of Bonn in 1982. Following doctoral work at the Research Center Jülich and the Ecole Polytechnique in Palaiseau, France, he obtained his PhD at the University of Köln in 1986. He then joined the Corporate Research and Technology Labs of Siemens AG in München. As a staff scientist and project manager, he set up and directed the MBE growth of III-V materials for electronics and optoelectronics. In 1996, he received a Volkswagen fellowship as a guest scientist at Stanford University. In 1999, he transferred to the Corporate Research Labs of Infineon Technologies AG, where he headed the department for Photonics from 2001 to 2005 and served as technical manager for nanomaterials. In 2006, he was appointed Senior Principal Scientist for materials science at Qimonda AG in Dresden. From 2007 until the end of 2019, he was Director of the Paul-Drude-Institut für Festkörperelektronik in Berlin and Professor of Physics at the Humboldt-Universität zu Berlin.

Henning Riechert has made numerous contributions to both, the basics of MBE growth and its application for (opto)-electronic devices. He is one of the pioneers of the MBE growth of III-nitrides and of dilute nitrides. With his group, he succeeded in the first realization of InGaN/GaN LEDs in Europe, grown by MBE. His work on dilute nitrides led to the first monolithic 1.3 μm VCSEL, which he brought to commercialization. In his recent activities, he diversified MBE growth to III/V nanowires and to novel materials such as phase change materials, 2D materials and semiconducting oxides.

The Quantum Devices Award

Prof. Alexey Kavokin

For the prediction of room temperature Bose-Einstein condensation of exciton-polaritons, that led to the development of polariton lasers



Prof. Alexey Kavokin received his Master in Physics from the Polytechnic University of St-Petersburg in 1991 and his PhD in Physics from the Ioffe institute of the Russian Academy of Sciences in 1993. After several postdoc appointments, he received the Professorship from the Blaise Pascal university, Clermont-Ferrand, France, in 1998. In 2005 he became a Chair of Nanophysics and Photonics at the University of Southampton, UK. In 2018 he joined the Westlake university, Hangzhou, China, as a Chair Professor and Director of the International Center for Polaritonics. Prof. Kavokin has founded the Spin Optics laboratory at the State university of St-Petersburg in 2011 and the Quantum Polaritonics group at the Russian Quantum Center in 2014.

Professor Kavokin made seminal contributions in the field of polaritonics: physics of light-matter quasiparticles, exciton-polaritons. He predicted the Bose-Einstein condensation and superfluidity of exciton-polaritons at the room temperature in wide-band gap semiconductor microcavities. He directed an international research effort towards the experimental verification of this prediction, which resulted in the discovery of the room temperature Bose-Einstein condensation in 2007. These studies paved the way to creation of a new generation of quantum opto-electronic devices based on polariton condensates, such as polariton lasers, optical parametric amplifiers and switches. Professor Kavokin predicted the superconductivity mediated by polariton condensates and demonstrated the high potentiality of polaritonics as a platform for quantum computation.

The Young Scientist Award

Dr. Hannah Joyce

For significant contributions to III–V nanowire optoelectronics and terahertz spectroscopy of compound semiconductor nanomaterials



Dr Hannah Joyce is a Reader in low-dimensional electronics at the University of Cambridge. She received her PhD in 2010 from the Australian National University and then joined the Department of Physics at the University of Oxford as a postdoctoral researcher. In 2013, Hannah joined the Department of Engineering at the University of Cambridge, where she leads a research group focusing on the development of compound semiconductor nanomaterials and nanodevices for applications in photonics and electronics. From 2013 to 2016 she held a Research Fellowship from the Royal Commission for the Exhibition of 1851. Her research is currently funded by an ERC Starting Grant, EPSRC (UK) grants and the Philip Leverhulme Prize.

Dr Joyce has made significant contributions towards the engineering of III-V nanowire-based optoelectronic devices. Her research spans nanowire growth, electron microscopy, ultrafast spectroscopy and device development. Dr Joyce's achievements include the development of metalorganic vapour phase epitaxy processes to achieve phase-pure III-V nanowires in both twin-free zinc-blende and stacking fault-free wurtzite crystal structures.

She pioneered the use of terahertz spectroscopy for the ascertainment of doping in III-V nanowires, and for high-throughput contact-free electrical characterisation of III-V nanowires. She has demonstrated the first ultrafast switchable terahertz polarisation modulators, which are based on arrays of GaAs nanowires, and have potential application in ultrafast terahertz-band communications.



The International Conference on Indium Phosphide and Related
Materials

May 18th, 2020

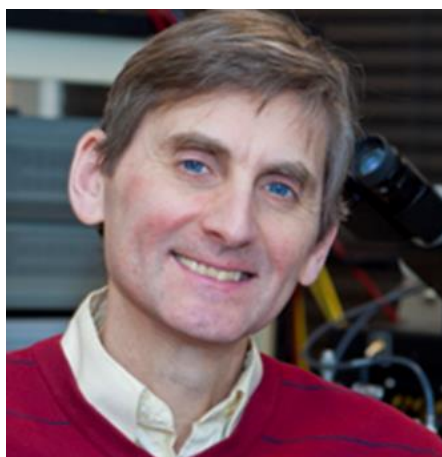
IPRM Award 2020

Presented to
Prof. Jesús A. del Álamo
Massachusetts Institute of Technology

IPRM Award 2020

Prof. Jesús A. del Álamo

for key technical contributions to InGaAs-based transistors for high frequency and CMOS applications, and pioneering studies on GaN transistor reliability.



Jesús A. del Álamo is a Professor of Electrical Engineering at the Massachusetts Institute of Technology (MIT). He holds degrees from Polytechnic University of Madrid (Telecommunications Engineer, 1980), and Stanford University (MS EE, 1983 and PhD EE, 1985). From 1977 to 1981 he was with the Institute of Solar Energy of the Polytechnic University of Madrid, investigating silicon photovoltaics. From 1981 to 1985, he carried out his PhD dissertation at Stanford University on minority carrier transport in heavily doped silicon. From 1985 to 1988 he was a research engineer with NTT LSI Laboratories in Atsugi (Japan) where he conducted research on III-V heterostructure field-effect transistors. He joined MIT in 1988.

Professor del Alamo has had a distinguished career in III-V transistor technology, reliability, and physics. For the last few years, his research effort has been divided between advancing high electron mobility transistors (HEMTs) for high frequency applications, and exploring the opportunities of highly-scaled III-V MOSFETs (Metal-Oxide-Semiconductor Field-Effect-Transistors) as alternative to Si transistors for CMOS logic applications. His work opened the doors to the use of these devices in THz applications, and to consider III-V compound semiconductor alloys as serious alternatives to Si in deep nanoscale CMOS applications. Prof. del Alamo has received numerous awards including the 2012 Intel Outstanding Researcher Award in Emerging Research Devices, the Semiconductor Research Corporation 2012 Technical Excellence Award, the 2014 Roger A. Haken Best Student Paper Award at IEDM, and the 2019 SIA-SRC University Researcher Award. He is a Fellow of IEEE and the American Physical Society, and a corresponding member of the Royal Spanish Academy of Engineering. Prof. del Alamo is also the Editor-in-Chief of IEEE Electron Device Letters.

Compound Semiconductor Week
2021 Awards

Stockholm, Sweden

May 10th, 2021



ISCS 2021

The 47th International
Symposium on Compound
Semiconductors

The 47th International Symposium on Compound Semiconductors

May 10th, 2021

ISCS Awards 2021

The Welker Award

Presented to

Prof. Alfred Forchel

Julius-Maximilians-University of Würzburg

The Quantum Devices Award

Presented to

Prof. Steven P. DenBaars

University of California Santa Barbara

The Young Scientist Award

Presented to

Prof. Yasutomo Ota

Keio University

The Welker Award is supported by OSRAM Opto Semiconductors GmbH.
The Quantum Devices Award is supported by the ISCS Japan Committee.

The Welker Award

Prof. Alfred Forchel

For contributions to the understanding of light-matter interaction in semiconductor microcavities and the development of semiconductor lasers including the successful transfer to commercialization.



Prof. Alfred Forchel obtained his PhD in Physics in 1983 from Stuttgart University for optical studies of highly excited semiconductors. In 1984 he was appointed head of the newly founded Microstructure Laboratory of the university, dedicated to III-V semiconductor quantum wire and dot fabrication. He was appointed full professor in Applied Physics in 1990 at Julius-Maximilians-University of Würzburg. In 1994 he became head of the new micro- and nanofabrication facility of Würzburg University which, in addition to lithography based nanofabrication techniques, comprised molecular beam epitaxy systems for material growth of different III-V semiconductors. Since then the research of Alfred Forchel and his team addressed in addition to fundamental properties of semiconductors semiconductor lasers for wavelengths the visible to the mid-infrared spectral range. In 1998 he founded together with Johannes Koeth nanoplus Nanosystems and Technologies GmbH, a company specialising in semiconductor lasers for sensing with close to 100 employees today. 2009 Alfred Forchel was elected President of Julius-Maximilians-University. In April 2021 he retired from the university. He is currently setting up a further company together with J. Koeth focusing of large scale production of sensing lasers (Sensalight Technologies GmbH).

Prof. Alfred Forchel's work has provided ground breaking results on fundamental physical phenomena in low dimensional III-V compound semiconductors as well as for semiconductor lasers. He and his team were the first to demonstrate strong coupling between a single quantum dot exciton and a single photon in a solid by using high quality factor micropillars with InGaAs quantum dots. Using GaInNAs GaAs based lasers for 1,5 μ m have been realized for the first time. Currently he is working on new laser applications for sensing.

The Quantum Devices Award

Prof. Steven P. DenBaars

For the development and commercialization of non-polar and semi-polar quantum well laser diodes in laser lighting, automotive and general illumination



Prof. Steven P. DenBaars is the Mitsubishi Chemical Chair Professor of Materials at the University of California Santa Barbara. He obtained a Ph.D. Electrical Engineering from the University of Southern California 1988 (P.D. Dapkus, Advisor), MS Materials Science 1986, and BS in Metallurgical Engineering, from the University of Arizona 1984. Dr. DenBaars started his career in semiconductors at Hewlett-Packard in 1988, and joined UCSB in 1991. Prof. DenBaars has helped co-found several start-up companies in the field of photonics and electronics. He Co-founded Nitres Inc., along with Dr. Umesh Mishra, which was one of the first GaN start-up in US. Subsequently, Nitres was acquired by Cree Inc. in May 2000. He assisted Dr. Jeffrey Shealy in the founding of Akoustis Technologies Inc. (AKTS) for commercialization of RF Filters. In 2013 he Co-Founded SLD Laser, along with Professor Nakamura, Dr. James Raring, and Dr. Paul Rudy to pioneer blue lasers and laser lighting products. SLD Laser successfully commercialized laser lighting, and grew to over 150 employees before being acquired by Kyocera Corporation in 2021.

Prof. DenBaars has made seminal contributions to the science of nitride materials, and is recognized as an international authority on growth and structure of nitride semiconductors by metal-organic chemical vapor deposition (MOCVD). He has performed pioneering work on polar, non-polar and semi-polar gallium nitride (GaN) materials and devices. The pioneering developments in non-polar and semi-polar quantum well materials have subsequently led to their commercial use in laser diodes for laser-lighting, automotive forward lighting, and general illumination.

The Young Scientist Award

Prof. Yasutomo Ota

For realization of state-of-the-art nanophotonic structures based on compound semiconductors and demonstration of quantum electrodynamic effects and related phenomena



Prof. Yasutomo Ota received a B.E. (2006) in Mechanical System Engineering from Osaka Prefecture University and a M.E (2008) and a Ph.D. (2011) in Electrical Engineering from The University of Tokyo in Japan. He joined Institute for Nano Quantum Information Electronics, The University of Tokyo as a project assistant professor in 2011 and became a project associate professor in 2015. From 2018, he also serves as a researcher of PRESTO, Japan Science and Technology Agency. In 2021, he became an associate professor in the Department of Applied Physics and Physico-Informatics, Faculty of Science and Technology, Keio University in Japan, where he leads a research group focusing on the physics and applications of photonic nanostructures.

Prof. Ota achieved high quality factor photonic crystal nanocavities based on compound semiconductors and their optical couplings to quantum dots. With this platform, he made important contributions to solid-state cavity quantum electrodynamics, nonlinear optics and nanocavity lasers. He has also developed the hybrid integration of such photonic nanostructures on silicon photonic chips using transfer printing toward the realization of scalable quantum photonic circuits. Prof. Ota also contributed to the field of topological photonics, in which he demonstrated the first topological nanocavity laser and a photonic nanocavity based on topological corner state.

Previous Recipients of the Welker Award

1976 Nick Holonyak, Jr	1978 Cyril Hilsum	1980 Hisayoshi Yanai
1981 Gerald L. Pearson	1982 Herbert Kroemer	1984 Izuo Hayashi
1985 Heinz Beneking	1986 A.Y. Cho	1987 I. Alferov
1988 Jerry M. Woodall	1989 Don W. Shaw	1990 Greg Stillman
1991 Lester F. Eastman	1992 Harry C. Gatos	1993 James Turner
1994 Federico Capasso	1995 Isamu Akasaki	1996 Ben G. Streetman
1997 M. George Craford	1998 Takashi Mimura	1999 Claude Weisbuch
2000 James S. Harris	2001 Karl Hess	2002 Hiroyuki Sakaki
2003 Klaus Ploog	2004 James J. Coleman	2005 Hans Melchior
2006 Marc Illegems	2007 Kenichi Iga	2008 Gunter Weimann
2009 Daniel Dapkus	2010 Pallab Bhattacharya	2011 Yasuhiko Arakawa
2012 Umesh K. Mishra	2013 Tom Foxon	2014 Gerald Bastard
2015 Dieter Bimberg	2016 Joe Charles Campbell	2017 Chennupati Jagadish
2018 Bernard Gil	2019 Hideo Ohno	

Previous Recipients of the Quantum Devices Award

2000 Emilio E. Mendez and Gerald Bastard		2001 Leo P. Kouwenhoven, Mark A. Reed and Seigo Tarucha
2002 Yasuhiko Arakawa	2003 Pallab Bhattacharya	2004 Jean-Pierre Leburton
2005 Pierre Petroff	2006 Carlo Sirtori	2007 Umesh K. Mishra and James S. Speck
2008 Jean-Michel Gerard	2009 Joe Charles Campbell	2010 Chennupati Jagadish
2011 Alan C. Seabaugh	2012 David Gershoni	2013 Yoshiro Hirayama
2014 Connie Chang-Hasnain	2015 Mauris Skolnick	2016 Kazuhiko Hirakawa
2017 Nicolas Grandjean	2018 Hiroshi Yamaguchi	2019 Gottfried Strasser

Previous Recipients of the Young Scientist Award

1986 Russell D. Dupuis	1987 Naoki Yokoyama	1988 W.T. Tsang
1989 Russ Fischer	1990 Yasuhiko Arakawa	1991 Sandip Tiwari
1992 Umesh K. Mishra	1993 Kai Chang	1994 Michael A. Haase
1995 John D. Ralston	1996 Nikolai Ledentsov	1997 Fred Kish
1998 Steven P. DenBaars	1999 Jerome Faist	2000 Kohki Mukai
2001 Masahiko Kondow	2002 Diana Huffaker	2003 Mike Larson
2004 Toshihide Kikkawa	2005 Nils Weimann	2006 Andrea Fiore
2007 Masataka Higashiwaki	2008 Jonathan J. Finley	2009 Seth R. Bank
2010 Tomás Palacios	2011 Yoshitaka Taniyasu	2012 Debdeep Jena
2013 Sanjay Krishna	2014 Huili (Grace) Xing	2015 Zetian Mi
2016 Srabanti Chowdhury	2017 Masahiro Nomura	2018 Shadi Dayeh
2019 Mark Holmes		

The Welker Award was initiated in 1976; the recipients will be selected by the International Symposium on Compound Semiconductors Award Committee for outstanding research in the area of III-V compound semiconductors. The Award is established by Siemens AG, Munich, in honor of the foremost pioneer, Heinrich Welker, in III-V compound semiconductor development. This award is currently sponsored by OSRAM GmbH.

The Quantum Devices Award was established in 2000 by Fujitsu Quantum Devices, Ltd; the recipients will be selected by the International Symposium on Compound Semiconductors Award Committee for pioneering contributions to the fields of compound semiconductor devices and quantum nanostructure devices, which have made a major scientific or technological impact in the past 20 years. The fields of the Award covers: invention of new device concepts and structures, device physics and modeling, device realization and characterization. This award is currently sponsored by the ISCS Japan Committee.

The Young Scientist Award was initiated in 1986; the recipients will be selected by the International Symposium on Compound Semiconductors Award Committee for technical achievements in the field of compound semiconductors by a scientist under the age of forty. Nominees should be younger than 40 years of age on the first day of the symposium.



IPRM 2021

The 32nd International Conference
on Indium Phosphide and Related
Materials

The 32nd International Conference on Indium Phosphide and
Related Materials
Stockholm, Sweden, May 10th, 2021

IPRM Award 2021

Presented to
Prof. John E. Bowers
University of California, Santa Barbara

IPRM Award 2021

Prof. John E. Bowers

For contribution to the development of III-V/Si photonics and heterogeneous integration techniques with the pioneering demonstration of hybrid indium phosphide/Si laser.



John E. Bowers is the Fred Kavli Chair in Nanotechnology and is the Director of the Institute for Energy Efficiency and a Distinguished Professor in the Department of Electrical and Computer Engineering at University of California, Santa Barbara. Dr. Bowers received his M.S. and Ph.D. degrees from Stanford University and worked for AT&T Bell Laboratories and Honeywell before joining University of California, Santa Barbara.

Professor Bowers has made numerous contributions to the development of III-V/Si photonics and heterogeneous integration techniques. He demonstrated first hybrid indium phosphide/Si laser in 2006 by using direct bonding of InP-based active layer onto Si photonics wafer. This groundbreaking technology has become a very important technology to support the increase of transmission capacity and the reduction of cost and energy. He also developed quantum dot lasers epitaxially grown on Si, which is the ultimate laser fabrication technology that researchers in this field have been working on for a long time. Prof. Bowers has received numerous awards including the IEEE Photonics Award, OSA/IEEE Tyndall Award, the IEEE LEOS William Streifer Award and the South Coast Business and Technology Entrepreneur of the Year Award. He is a member of the National Academy of Engineering and the National Academy of Inventors, a Fellow of the IEEE, Optical Society of America (OSA) and the American Physical Society.

The Michael Lunn Award was established in 1993 to commemorate a young research scientist at Wafer Technology Ltd. who became a victim of a car accident. Awardees were chosen by the organizing committee of IPRM on behalf of the III-Vs Review magazine. The award was given for the best paper presented at IPRM in the first three years following its introduction (1993-1995). The criteria were subsequently revised in 1996 to recognize individuals who have made "outstanding contributions to the InP community". In 2007, the award was renamed **the IPRM Award** and has since been sponsored by the IPRM international steering committee.

Previous Recipients of the Michael Lunn Award

1993 Mitsuo Yamamoto, Norio Yamamoto and Junichi Nakano
1994 Theodore Thrush
1995 Dubravko Babic
1996 Tony Jones
1997 Joe Lorenzo
1998 Holger Jurgensen and staff at AIXTRON
1999 Jerome Faist
2000 Shigehisa Arai
2001 Gregory H. Olsen
2002 Dwight Streit
2003 Hideki Hasegawa
2004 Drew Nelson
2005 Tomohiro Kawase and Masami Tatsumi
2006 George Antypas

Previous Recipients of the IPRM Award

2007 Osamu Wada
2008 Andre Scavennec
2009 Mark Rodwell
2010 Hajime Asahi
2011 F. J. Tegude
2012 Brad Boos
2013 Yuichi Matsushima
2014 Abderrahim Ramdane
2015 Larry Coldren
2016 Takatomo Enoki
2017 Sebastian Lourdudoss
2018 Meint K. Smit
2019 Yoshiaki Nakano

ISCS Award 2021 Committee

Yasuhiko Arakawa (Chair), Pallab Bhattacharya, Gerald Bastard, Dieter Bimberg, Jim Coleman, Shizuo Fujita, Chennupati Jagadish, James Harris, Yoshiro Hirayama, Umesh Mishra, Martin Strassburg, Eric Tournié

IPRM Award 2021 Committee

Shinji Matsuo (Chair), Shigehisa Arai, Hajime Asahi, Sophie Bouchoule, Norbert Grote, Sebastian Lourdudoss, Yuichi Matsushima, Yasuyuki Miyamoto, Yoshiaki Nakano, Tomas Palacios, Abderrahim Ramdane, Mark Rodwell, Andre Scavennec, Osamu Wada, Huili (Grace) Xing
