Awards

to be

presented during the

2022 IEEE International Electron Devices Meeting

December 2022
2022
IEEE Electron Devices Society
Award Recipients

IEEE EDS Fellows - Class of 2022

EDS Paul Rappaport Award

EDS George E. Smith Award

EDS Leo Esaki Award

EDS Education Award
Professor Ilesanmi Adesida

EDS Lester F. Eastman Award
Professor Oliver Ambacher

EDS J.J. Ebers Award
Professor Albert Wang

EDS Celebrated Member
Dr. Morris Chang
IEEE Fellow is a distinction reserved for select IEEE members whose extraordinary accomplishments in any of the IEEE fields of interest are deemed fitting of this prestigious grade elevation.

Only lists IEEE/EDS Fellows that would like to be recognized at the 2022 IEDM

Anirban Bandyopadhyay
Zhihong Chen
Tarek El-bawab
Edmundo Gutierrez
Ioannis Kymissis
Hang-ting Lue
Eric Pop
Chuan Seng Tan
Tetsuzo Ueda
Huili Grace Xing
(Jianhua) J. Joshua Yang
Carl Zetterling
The Paul Rappaport Award was established in 1984 to recognize the best paper appearing in a fast turn around archival publication of the IEEE Electron Devices Society, targeted to the IEEE Transactions on Electron Devices.

Winning Paper:
Monolithic Integration of Oxide Semiconductor FET and Ferroelectric Capacitor Enabled by Sn-Doped InGaZnO for 3-D Embedded RAM Application

Authors:
Jixuan Wu, Fei Mo, Saraya Takuya, Toshiro Hiramoto, Mototaka Ochi, Hiroshi Goto and Masaharu Kobayashi
The George E. Smith Award was established in 2002 to recognize the best paper appearing in a fast turn around archival publication of the IEEE Electron Devices Society, targeted to the IEEE Electron Device Letters.

**Winning Paper:**
Demonstration of a p-type Ferroelectric FET with immediate read-after-write capability

**Authors:**
Dominik Kleimaier, Halid Mulaosmanovic, Stefan Dunkel, Sven Beyer, Steven Soss, Stefan Slesazeck and Thomas Mikolajick
EDS LEO ESAKI AWARD

The EDS Leo Esaki Award was established in 2019 to recognize the best paper appearing in a fast turn around archival publication of the IEEE Electron Devices Society, targeted to the IEEE Journal of Electron Devices Society.

Winning Paper:
Utilization of Unsigned Inputs for NAND Flash-Based Parallel and High-Density Synaptic Architecture in Binary Neural Networks

Authors:
Sung-Tae Lee, Gyuho Yeom, Joon Hwang, Hyseongsu Kim, Honam Yoo, Byung-Gook Park and Jong-Ho Lee
EDS EDUCATION AWARD

The EDS Education Award was established in 2006 by the IEEE Electron Devices Society. The Award is presented annually and is intended to recognize distinguished contributions to education within the fields of interest of the IEEE Electron Devices Society.

PREVIOUS AWARD WINNERS

2006  Mark S. Lundstrom  2014  Juin J. Liou
2007  Meyya Meyyappan  2015  Roger T. Howe
2008  Robert W. Dutton  2016  Hiroshi Iwai
2009  David L. Pulfrey  2017  Mansun Chan
2010  Sorab K. Ghandhi  2018  Muhammad Ashraful Alam
2011  Chenming Hu  2019  Chennupati Jagadish
2012  Jesús Del Alamo  2020  Valipe Ramgopal Rao
2013  Charvaka Duvvury  2021  Tsu-Jae King Liu

2022 EDS EDUCATION AWARD RECIPIENT

PROFESSOR ILESANMI ADESIDA

“For outstanding contributions to international education, mentoring and diversity in the field of electron devices”

Ilesanmi Adesida is an experienced academic administrator and is currently the University Provost at Nazarbayev University in Kazakhstan where he oversees the institution's entire academic and research programs, including innovative strategic initiatives, awarding of research grants as well as overseeing the creation and implementation of quality assurance programs. Prior to his present appointment, he served as the Provost and Vice Chancellor for Academic Affairs at the University of Illinois at Urbana-Champaign (UIUC). He also served as the Dean of the College of Engineering and the Director of Micro and Nanotechnology Laboratory at UIUC.

Adesida received his BS, MS, and PhD in Electrical Engineering from the University of California at Berkeley. He has also worked as a Visiting Assistant Professor at Cornell University and served as the Head of the Electrical Engineering Department at Tafawa Balewa University in Nigeria. During his tenure as a faculty and administrator at UIUC, he was instrumental in creating many programs including the iFoundry for Innovation in Engineering Education, Illinois First-Year Engineering Experience (iFEX), Applied Research Institute, Advanced Digital Systems Center in Singapore, a new Engineering-Based College of Medicine, and the Siebel Center for Design.

As a faculty member, he designed curricula on semiconductor materials, semiconductor devices, and nanofabrication technologies and taught these courses to thousands of electrical engineering and materials science undergraduate and graduate students. In research, he has made important contributions to the science and technology of nanofabrication and high-speed electronic devices. He has authored or co-authored over 350 publications and over 250 conference papers including plenary talks. He has mentored and continues to mentor many students and faculty members including women and underrepresented minority groups. Many of these people have gone all over the world to become successful educators, start-up founders, and excellent academic administrators in top universities.

He has won many awards including the Oakley Kunde Award for Excellence in Undergraduate Education, and the TMS John Bardeen Award for outstanding contributions to electronic materials. He was named an outstanding graduate of the EECS Department at the University of California, Berkeley. He was awarded the Distinguished Service Award by the IEEE Electron Device Society of which he served as President in 2006/2007. He served as the Chair of the TMS Electronic Materials Committee. He has also served on many academic and industry Advisory Boards all around the world; and he is an elected member of the National Academy for Engineering.
EDS LESTER F. EASTMAN AWARD

The Lester F. Eastman Award was established in 2019 by the IEEE Electron Devices Society. It is intended to recognize individuals with outstanding achievement in high-performance semiconductor devices.

PREVIOUS AWARD WINNERS

2020  Asif Khan  2021  Erhard Kohn

2022 EDS LESTER F. EASTMAN AWARD RECIPIENT

PROFESSOR OLIVER AMBACHER

“For outstanding achievement in high-performance semiconductor devices”

Oliver Ambacher received his diploma and doctor of natural sciences at the Ludwig-Maximilians and the Technical University of Munich with distinction in 1989 and 1993. In 1993 he got a position as a research assistant at the Walter Schottky Institute at the Technical University of Munich, where he dealt with the growth of gallium nitride and its alloys with the help of molecular beam epitaxy and chemical vapor deposition. He was significantly involved in the implementation of the first ultra violet light detectors, surface acoustic wave components, microwave amplifiers and sensors as well as in the research of polarization-induced effects in GaN-based hetero- and quantum structures. In 1998/99 he was offered the Feodor Lynen grant from the Alexander von Humboldt Foundation at Cornell University (USA) to deepen his work in the field of AlGaN/GaN transistors for high-frequency power amplifiers. Following his habilitation in experimental physics in 2000 and his promotion to senior assistant in 2001, he was appointed professor for nanotechnology at the Technical University of Ilmenau a year later. In 2002 he was elected director of the Institute for Solid State Electronics and two years later he was appointed director of the Center for Micro and Nanotechnologies. Since October 2007, Oliver Ambacher has been a professor at the Albert-Ludwigs-University in Freiburg and head of the Fraunhofer Institute for Applied Solid State Physics until 2021.

He acquired a fundamental understanding of polarization-induced effects during a research stay as a young Humboldt fellow in Professor Les Eastman’s group at Cornell University (1998-1999). In recent years Oliver Ambacher and his working group designed and demonstrated outstanding, integrated, broadband, low-noise amplifier for applications in cellular base stations for mobile communication. Due to its technical performance, this low-noise amplifier enables mobile communication with the help of various mobile radio standards in our wireless networks, such as 5G, LTE or WLAN. The work resulted in more than 650 journal contributions, about 300 conference and workshop proceedings, 7 books and book chapter and 8 patents.

In 2015 he received the Karl-Heinz-Beckurts-Prize for his contributions to the development of highly efficient power amplifiers based on GaN for the latest generation of mobile phone base stations. In 2018 he was awarded an honorary professorship for power electronics by the Gips-Schüle-Foundation. In 2021 he was awarded the Rudolph-Jäckel-Prize for the development of energy-efficient power electronics.
EDS J.J. EBERS AWARD

The J.J. Ebers Award was established in 1971 by the IEEE Electron Devices Society. It is intended to foster progress in electron devices and to commemorate the life activities of Jewell James Ebers, whose distinguished contributions, particularly in the transistor art, shaped the understanding and technology of electron devices. The award is intended to recognize and honor accomplishments of unusual merit in the electron device field and is given for outstanding technical contributions to electron devices.

J.J. EBERS
1921 – 1957

PREVIOUS AWARD WINNERS

1971 John L. Moll
1972 Charles W. Mueller
1973 Herbert Kroemer
1974 Andrew S. Grove
1975 Jacques I. Pankove
1976 Marion E. Hines
1977 Anthony E. Siegman
1978 Hung C. Lin
1979 James M. Early
1980 James D. Meindl
1981 Chih-Tang Sah
1982 Arthur G. Milnes
1983 Adolf Goetzberger
1984 Izuo Hayashi
1985 Walter F. Kosonocky
1986 Pallab K. Chatterjee
1987 Robert W. Dutton
1988 Al F. Tasch, Jr.
1989 Tak H. Ning
1990 Yoshiyuki Takeishi
1991 Simon M. Sze
1992 Louis C. Parrillo
1993 Richard S. Payne
1994 Karl Hess
1995 Alfred U. Mac Rae
1996 Martin A. Green
1997 Tetsushi Sakai
1998 Marvin H. White
1999 B. Jayant Baliga
2000 James T. Clemens
2001 Bernhard S. Meyerson
2002 Hiroshi Iwai
2003 Lester F. Eastman
2004 James D. Plummer
2005 Jerry G. Fossum
2006 Ghavam G. Shahidi
2007 Stephen J. Pearnton
2008 Mark R. Pinto
2009 Baruch Levush
2010 Mark E. Law
2011 Stuart Ross Wenham
2012 Yuan Taur
2013 Nobukazu Teranishi
2014 Joachim N. Burghartz
2015 Jack Yuan-Chen Sun
2016 Jaroslav Hynecek
2017 Kang L. Wang
2018 Michael Shur
2019 H.-S. Philip Wong
2020 Arokia Nathan
2021 Bruce Gnade

2022 EDS J.J. EBERS AWARD RECIPIENT

PROFESSOR ALBERT WANG

“For pioneering contributions to reliability of 3D heterogeneous integration in Integrated Circuits”

Albert Wang received the BS degree from Tsinghua University, the MS degree from the Chinese Academy of Science and the PhD degree from State University of New York at Buffalo. He is a Professor of Electrical and Computer Engineering at the University of California, Riverside, USA. He was a Si Valley IC designer at National Semiconductor before joining Illinois Institute of Technology as an Assistant Professor of Electrical and Computer Engineering. His research covers semiconductor devices, analog/mixed-signal and RF ICs, design-for-reliability for ICs, 3D heterogeneous integration, emerging devices and circuits, and LED visible light communications. He published two books and 300+ peer-reviewed papers, and holds sixteen U.S. patents. His editorial board services include IEEE Transactions on Circuits and Systems I, IEEE Electron Device Letters, IEEE Transactions on Circuits and Systems II, IEEE Transactions on Electron Devices, IEEE Journal of Solid-State Circuits, and IEEE Transactions on Device and Materials Reliability. He has been IEEE Distinguished Lecturer for IEEE Electron Devices Society, IEEE Circuits and Systems Society and IEEE Solid-State Circuits Society. He was President of IEEE Electron Devices Society. He was Chair for the IEEE CAS Analog Signal Processing Technical Committee. His other committee services include the International Technology Roadmap for Semiconductor (ITRS) Committee, IEEE Heterogeneous Integration Roadmap (HIR) Committee, IEEE 5G Initiatives Committee, IEEE Smart Lighting Project Roadmap Committee and IEEE Fellow Committee. He was General Chair of IEEE Electron Devices Technology and Manufacturing (EDTM) Conference and IEEE Radio-Frequency Integrated Circuits (RFIC) Symposium. He served as a Program Director of the National Science Foundation, USA (2019-2021). He was recipient of NSF CAREER Award and IEEE EDS Distinguished Service Award. Wang is a Fellow of National Academy of Inventors, an IEEE Fellow and an AAAS Fellow."
EDS CELEBRATED MEMBER
The EDS Celebrated Member was established in 2010 by the IEEE Electron Devices Society. It is intended to recognize and honor legendary individuals in the field of electron devices.

PREVIOUS AWARD WINNERS

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>George E. Smith</td>
</tr>
<tr>
<td>2011</td>
<td>Herbert Kroemer</td>
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<tr>
<td>2012</td>
<td>Chih-Tang Sah</td>
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<td></td>
<td>Leo Esaki</td>
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<tr>
<td>2015</td>
<td>B. Jayant Baliga</td>
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<td>Robert H. Dennard</td>
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<td>2016</td>
<td>Mildred Dresselhaus</td>
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<td>2017</td>
<td>Gordon E. Moore</td>
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<tr>
<td>2018</td>
<td>Simon M. Sze</td>
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<tr>
<td>2019</td>
<td>Martin Green</td>
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<tr>
<td>2020</td>
<td>Leon Chua</td>
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2022 EDS CELEBRATED MEMBER
DR. MORRIS CHANG

Dr. Morris Chang founded Taiwan Semiconductor Manufacturing Company Ltd. (TSMC) in 1987, served as its Chairman for 31 years, and its CEO for many of those 31 years. Dr. Chang retired from TSMC in June 2018. TSMC pioneered the dedicated silicon foundry business model and has served as a powerful force of innovation in the information industry.

Prior to his career in Taiwan, Dr. Chang’s career was in the United States. He served at Texas Instruments for 25 years (1958-1983), where he was Group Vice President responsible for worldwide semiconductor business for six years.

Dr. Chang received many honors and awards in his career. Among them were: the “Exemplary Leadership Award” of the Global Semiconductor Alliance (GSA) (1999), the IEEE Robert N. Noyce Medal for Exceptional Contributions to Microelectronics Industry (2000), Nikkei Asia Prize (2005), and the highest honor of the Semiconductor Industry Association (U.S.), its Robert N. Noyce Award (2008). He received the IEEE Medal of Honor (2011), the R.O.C. Order of the Brilliant Star (2011), the SEMI Akira Inoue award for green management (2011), Businessman of the Year by Forbes Asia magazine (2012), the Visionary Award from SPIE (the international society for optics and photonics) (2014), and the R.O.C. Order of Propitious Clouds with Special Grand Cordon (2018), and the “Asia Game Changer Award” from the Asia Society (2021).

Dr. Chang is a Member of National Academy of Engineering (U.S.A.), a Laureate of the Industrial Technology Research Institute (Taiwan), a Life Member Emeritus of MIT Corporation (U.S.A.), and Fellow of the Computer History Museum (U.S.A.).

IEEE is the world’s largest association of technical professionals, and the Celebrated Member distinction honors and recognizes esteemed alumni whose accomplishments inspire young scholars and researchers and take the field to new heights.

For more information, please visit https://eds.ieee.org/members/celebrated-members
EDS EARLY CAREER AWARD
To honor an IEEE EDS member who received their first professional degree within ten years and making contributions in the EDS field of interest

GIRISH PAHWA
University of California Berkeley, Berkeley, CA, USA

EDS PHD STUDENT FELLOWSHIP
Awarded to promote, recognize, and support graduate level study and research within the Electron Devices Society’s field of interest

ASIR INTISAR KHAN
Stanford University, Stanford, CA, USA

NILESH PANDEY
Indian Institute of Technology, Kanpur, India

SHAOCHUAN CHEN
RWTH Aachen University, Germany

EDS MASTERS STUDENT FELLOWSHIP
Awarded to promote, recognize, and support graduate Masters level study and research within the Electron Devices Society’s field of interest.

KAMAL RUDRA
University of Michigan, Ann Arbor, Michigan, USA

EDS UNDERGRADUATE STUDENT FELLOWSHIP
Awarded to promote, recognize, and support undergraduate level study and hands-on experience within the field of interest Electron Devices Society (EDS).

ALEXANDER YOVANOVICH
Rochester Institute of Technology, Rochester, NY, USA

TEJAS KETKAR
Indian Institute of Technology, Kanpur, India
EDS DISTINGUISHED SERVICE AWARD

The EDS Distinguished Service Award was established in 1993 by the IEEE Electron Devices Society. The Award is presented annually and is intended to recognize and honor outstanding service to the Electron Devices Society and its sponsored activities.

PREVIOUS AWARD WINNERS

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>Friedolf M. Smits</td>
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<td>1995</td>
<td>Lewis M. Terman</td>
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<td>1996</td>
<td>Alfred U. Mac Rae</td>
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<td>1997</td>
<td>George E. Smith</td>
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<td>1998</td>
<td>W. Dexter Johnston, Jr.</td>
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<td>1999</td>
<td>John R. Brews</td>
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<td>2000</td>
<td>Michael S. Adler</td>
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<td>2001</td>
<td>H. Craig Casey, Jr.</td>
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<td>2002</td>
<td>Lucian A. Kasprzak</td>
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<td>2003</td>
<td>Frederick H. Dill</td>
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<td>2004</td>
<td>Louis C. Parrillo</td>
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<td>2005</td>
<td>Cary Y. Yang</td>
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<td>2006</td>
<td>Steven J. Hillenius</td>
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<td>2007</td>
<td>Richard S. Muller</td>
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<td>2008</td>
<td>Hiroshi Iwai</td>
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<td>2009</td>
<td>Tak H. Ning</td>
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<td>2010</td>
<td>Marvin H. White</td>
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<td>2011</td>
<td>Ilesanmi Adesida</td>
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<td>2012</td>
<td>Douglas P. Verret</td>
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<td>2013</td>
<td>Cor L. Claey</td>
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<td>2014</td>
<td>Yuan Taur</td>
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<td>2016</td>
<td>Renuka P. Jindal</td>
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<td>2017</td>
<td>Paul K.L. Yu</td>
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<td>2018</td>
<td>Shuji Ikeda</td>
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<tr>
<td>2019</td>
<td>Albert Z. H. Wang</td>
</tr>
<tr>
<td>2020</td>
<td>Jacobus W. Swart</td>
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<tr>
<td>2021</td>
<td>Samar Saha</td>
</tr>
</tbody>
</table>

2022 EDS DISTINGUISHED SERVICE AWARD RECIPIENT

PROFESSOR TIMOTHY ANDERSON

Tim Anderson received his education in chemical engineering from Iowa State University (B.S.) and the University of California, Berkeley (M.S., Ph.D.), where he measured the thermodynamic properties of III-V compound semiconductors for application in optoelectronic devices. He joined the Chemical Engineering Department at the University of Florida in 1978 and promoted through the ranks to Distinguished Professor. He served as chairman from 1991 until 2003, and was Associate Dean of Research and Graduate Programs in the College of Engineering until 2009. He then was the founding Director of the Florida Energy Systems Consortium (FESC), which consists of the 11 State of Florida universities and dedicated to research, education, and outreach in Florida-centered energy systems. Tim joined the University of Massachusetts, Amherst in 2013 as the Dean of the College of Engineering and returned to faculty in 2019.

His research includes the deposition of advanced electronic and photonic materials. In particular, his group has an active program in the growth of CuInxGa1-xSe2 absorbers for photovoltaics, group III nitrides for solid state lighting applications, and thin film materials for electronic device applications. Tim has been recognized for his research accomplishments through several awards, including the AIChE Charles M. A. Stine Award, the California Institute of Technology's W.N. Lacey Lectureship, the Professional Achievement Citation in Engineering Award from Iowa State University, the Michigan/Michigan State Joint Lectureship, and the DOE Research Partnership Award. Tim also spent a sabbatical year at the University of Grenoble as a Fulbright Senior Research Scholar. His group is credited with over 276 publications in his discipline research and he has supervised 71 Ph.D. graduates. Prof. Anderson is the inaugural editor-in-chief of the IEEE J. of Photovoltaics, inaugural and past Associate Editor (Solar Energy) of WIREs: Energy and Environment, past member of the editorial advisory board of J. Energy Systems. He is a Fellow of the American Institute of Chemical Engineers (AIChE).

Professor Anderson has long been active in engineering education. He served as editor of the Chemical Engineering Education journal for 19 years. In addition, he served as director of the NSF SUCCEED Engineering Education Coalition until its completion in 2003. This coalition of 8 colleges of engineering in the southeastern U.S. was an incubator of educational innovations whose mission was to effect systemic change in undergraduate engineering education. He has offered a workshop on career development for new faculty to more than 1500 people for which he received the Chester F. Carlson Award (ASEE). He is recipient of the Warren K. Lewis Award for Chemical Engineering Education (AIChE), ConocoPhillips Lectureship, Benjamin J. Dasher Award, and Union Carbide Lectureship Award. Tim has over 80 publications and presentations in engineering education research to his credit, and is a Fellow of the American Society for Engineering Education.
EDS MEMBERSHIP BENEFITS

IEEE EDS Members enjoy an incredible array of free and deeply discounted, members-only benefits for only US$10.00 per year. IEEE Student members save even more and can join EDS for US$5.00 a year!

Exclusive access to EDS content, community events and funding:

- EDS Resource Center - a portal to electron device content
- Podcast Series - personal interviews with internationally known engineers
- Attend live EDS Webinars, or replays of past events in the EDS Webinar Archive
- Attend Virtual Chapter Events throughout the world
- Keep abreast of the latest technical content with free access to some of our top Journals and conference proceedings in the IEEE Xplore Digital Library
- Network with EDS members
- Receive Technical Briefs and Society News in the EDS Newsletter
- Access to Grants with our Student Fellowship Programs
- Volunteer Opportunities in Society Governance and Humanitarian Programs
- Monthly EDS Society Brief featuring important announcements

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https://eds.ieee.org/members/join-today
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President-Elect, Bin Zhao
Sr. Past President, Fernando Guarin
Secretary, M.K. Radhakrishnan
Treasurer, Roger Booth

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George E. Smith Award Chair, Arockia Nathan
Leo Esaki Award, Arockia Nathan
Distinguished Service Award Chair, Ravi Todi
Education Award Chair, Hiroshi Iwai
Lester F. Eastman Award Chair, Erhard Kohn
J.J. Ebers Award Chair, Paul K.L. Yu
Early Career Award Chair, Bin Zhao
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