IEEE Sweden Section 50 years, 1965 – 2015

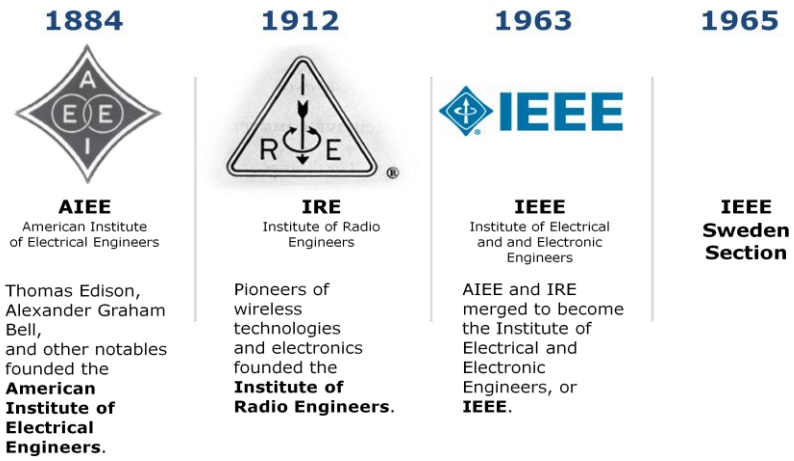
Mats J Edvinsson, Chair IEEE Sweden Section

Abstract

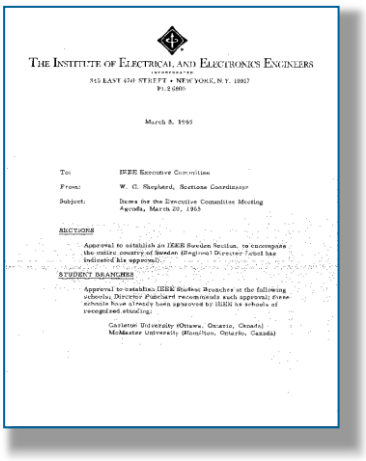
The IEEE Sweden Section is celebrating the 50th anniversary. This document is the first attempt to outline a brief history of IEEE Sweden Section. We welcome further research and documentation.

Foundation

It all began in the spring of 1884. Thomas Edison, Alexander Graham Bell, and other notables founded the American Institute of Electrical Engineers, or AIEE. In 1912 came a new society with an international focus, as well as focus on the new industries of wireless technologies and electronics; the Institute of Radio Engineers, or IRE. AIEE and IRE were behind many of history's world-changing technological developments, such as television, radar, satellites, transistors, computers, and others. On January 1, 1963, AIEE and IRE merged to become the Institute of Electrical and Electronic Engineers, or IEEE.



On January 29, 1965, J Torkel Wallmark, an IEEE Fellow and a new Professor in solid state physical electronics at Chalmers University of Technology, Gothenburg, Sweden, submitted a petition to IEEE. Prof Wallmark had then recently been a researcher at Radio Corporation of America in Princeton, NJ, USA, during 1953 – 1964.


THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

345 EAST 47th STREET • NEW YORK, N.Y. 10017

March 3, 1965

To: IEEE Executive Committee

From: W. G. Shepherd, Sections Coordinator

Subject: Items for the Executive Committee Meeting Agenda, March 20, 1965

SECTIONS

Approval to establish an IEEE Sweden Section, to encompass the entire country of Sweden (Region) Director Tafel has indicated his approval.

STUDENT BRANCHES

Approval to establish IEEE Student Branches at the following schools. Director Pickard recommends such approval since schools have already been approved by IEEE as schools of recognized standing:

Carleton University (Ottawa, Ontario, Canada)
McMaster University (Hamilton, Ontario, Canada)

On March 20, 1965, the IEEE Executive Committee approved the establishment on IEEE Sweden Section, "to encompass the entire country of Sweden".
The historic moment for Sweden is illustrated in the Formation Letter: Items for the IEEE Executive Committee Meeting; Agenda March 20, 1965.

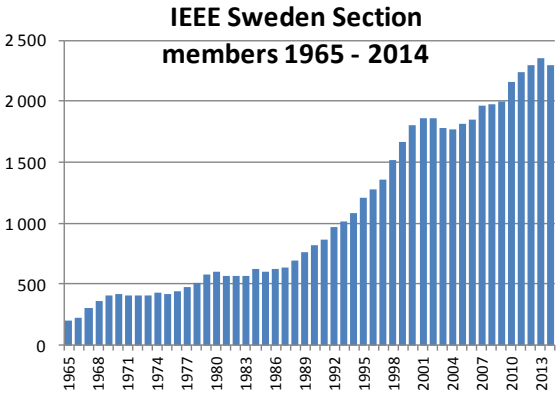
50 years later, March 27, 2015, the Sweden Section receives the IEEE 50 year anniversary banner at the IEEE Region 8 meeting in Limassol, Cyprus. The banner is provided by Costas Stasopoulos, Region 8 Director, and Wai-Choong Wong, Director & Vice President, IEEE MGA (Member and Geographic Activities), to Mats Edvinsson, Chair IEEE Sweden Section.

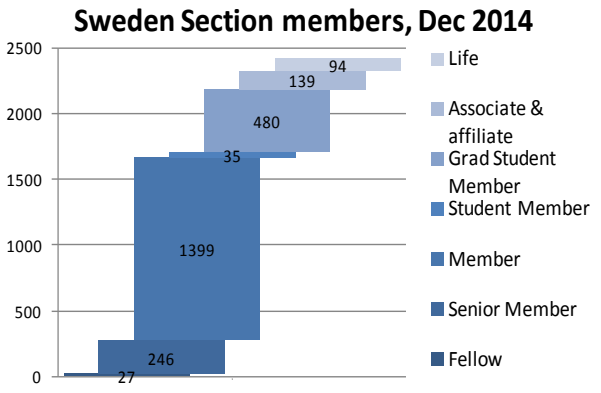
Membership development

At the end of 1965, IEEE Region 8 consisted of Benelux, Egypt, France, Switzerland, Israel, Italy, Norway, Sweden, United Kingdom & Eire, and West Germany. The total Section membership of Region 8 was 3 023, of which 200 members in the Sweden Section.

Over the past 50 years, IEEE as well as the Sweden Section have grown substantially; in size, scope and engagement: IEEE has 426 000 members, of which more than 50% is outside the United States; IEEE is located in more than 160 countries, organized in 334 local sections in 10 geographic regions. Region 8 has now over 78 000 members, and is the biggest region in geographical terms.

The Sweden Section has increased more than 10 times in terms of members, reaching 2430 including associates as of December 2014. The membership growth was particularly strong from mid 1980's to the end of the millennium. In the global financial turbulence after year 2000, quite a few members in the Sweden section did not renewed their membership. The membership growth was then recovered after 2004.





The Sweden Section membership categories are predominantly regular Members, Graduate Student Members and Senior Members. There student members are few, hence an area for further focus and growth ambitions. In this context, the Sweden Section has developed Student Branches at technical universities, established an active Women in Engineering as well as a Young Professional entities.

Leadership

The Sweden Section board has over the years mostly consisted of professionals from both industry and academia. The combination stimulates exchange of experiences, and links practitioners with education and research. This combination principle also includes the Chair of the Sweden Section.

The key initiator of the Sweden Section and the first Chair was the IEEE Fellow Torkel Wallmark (1919 – 2007), Professor in solid state physical electronics at Chalmers University of Technology. His previous position was a researcher at Radio Corporation of America in Princeton, NJ, USA. Since inception, the Sweden Section has been led by the following Chairs. (Some minor interim solutions are excluded from the list).

Chair Sweden Section	Start
J Torkel Wallmark	1966
E Folke Bolinder	1967
Robert I Magnusson	1970
Carl-Axel Wannerskog	1972
Lars H Zetterberg	1976
Per Arne Tove	1980
Lars G Olsson	1982
Lars H Zetterberg	1983
Sven Olof Öhrvik	1984
J Piotr Starski	1988
Sten A Bergman	1994
Margaretha A Eriksson	2000
Hans Peter Nee	2002
Ragnar E Kåhre	2004
Lars G Svensson	2006
Ragnar E Kåhre	2008
Margaretha A Eriksson	2009
Igor Gazdik	2010
Mikael Bergqvist	2012
Mats J Edvinsson	2014

The Sweden Section has been and still is contributing to the regional and global IEEE organisation and leadership.

Members from the Sweden Section are and have been active in IEEE Region 8:

- Folke Bolinder, Professor at the Division of Network Theory at Chalmers University of Technology, Gothenburg, Sweden, was the Region 8 Director in 1977 & 1978.

- Sven-Olof Öhrvik, (1928 – 2014) Professor at the Department of Applied Electronics at Lund University, Lund, Sweden, and previously Development Manager at Ericsson Radio, was the Region 8 Director in 1989 & 1990.

- Margaretha Eriksson is the first female Region 8 Director ever; currently serving as the Region 8 Director-Elect, and will be the Region 8 Director in 2017 & 2018, then the Past-Director in 2019 & 2020.

In this context, it is worth mentioning that Sweden will host the very first IEEE Region 8 Nordic S/YP/WIE Congress in November 2015. Students, Young Professionals and Women in Engineering from the Nordics and other countries will gather in Sweden, as will leadership representatives from Region 8 and IEEE.

Lina Bertling Tjernberg, Professor in Power Grid Technology at Royal Institute of Technology, was elected Treasurer of the IEEE Power Engineering Society 2012 & 2013, and elected Secretary of the IEEE Power Engineering Society 2014 & 2015.

IEEE Fellow and Professor Harold Bud Lawson was elected by WG7 member countries to be the architect of the new IEEE standard ISO/IEC/IEEE 15288:2015 Systems and Software Engineering – System Life Cycle Processes. He is currently the Swedish Head of Delegation to ISO/IEC JTC1 SC7.

Awards & Achievements

In a historical perspective, science and industry development has been ongoing in Sweden since long ago. The pioneering and engineering breakthroughs achieved since more than a century in e g the communication and electric power fields respectively can be viewed in the long Swedish history of heavy industry. Today there is a wide range of engineering fields in Sweden, including new areas like e-finance, e-health etc.

An illustration of the time perspective of industry and trade: A document from 1288 confirmed that Bishop Peter Elofsson of Västerås had bought back one-eighth share in the copper mine Tiskasjöberg, in return for precious land and buildings. 700 years later, this industry is known as the Great Copper Mountain Mining Co, Stora Kopparberg, today StoraEnso.

The Sweden Section has received a number of prestigious IEEE awards since inception 1965, listed below. Areas include high voltage transmission, telecommunication, various forms of control theory, signal processing, acoustic phonetics, and digital audio coding.

Award - Science	Year	Recipient	Citation	Remarks
William M. Habirshaw Award	1971	Gunnar Jancke	For leadership in the creation of the world's first 400 kV extra-high voltage transmission system, including the application of series capacitors at that voltage	
Alexander Graham Bell Medal	1979	A. Christian Jacobaeus	For pioneering work in the theory of switching systems and technical leadership in the development of telecommunication systems	
Donald G. Fink Prize Paper Award	1989	Karl Johan Åström	Adaptive Feedback Control	
Control Systems Award	1990	Karl Johan Åström	For fundamental contributions in control theory with emphasis on its practical application	
Medal of Honor	1993	Karl Johan Åström	For fundamental contributions to theory and applications of adaptive control technology	
W.R.G. Baker Prize Paper Award	2000	Petra Stoica	Maximum likelihood methods in radar array signal processing	with A. Lee Swindlehurst
James L. Flanagan Speech and Audio Processing	2004	Gunnar Fant	For fundamental contributions to the theory and practice of acoustic phonetics and speech perception	with Kenneth N. Stevens
Control Systems Award	2007	Lennart Ljung	For seminal contributions to system identification and its impact on industrial practice	
Masaru Ibuka Consumer Electronics Award	2013	Kristofer Kjörling	For pioneering innovations in digital audio coding, technology leadership, and contributions to the development of High-Efficiency AAC (HE-AAC)	with Martin Dietz and Lars Liljerd
Masaru Ibuka Consumer Electronics Award	2013	Lars Liljerd	For pioneering innovations in digital audio coding, technology leadership, and contributions to the development of High-Efficiency AAC (HE-AAC)	with Martin Dietz and Kristofer Kjörling

The Sweden Section has also received industry related awards, both individual and corporate recognitions. Ericsson Radio Systems AB, part of the Ericsson group, the telecom company, was awarded the Corporate Innovation Recognition in 1992. Lars H. Ramqvist, the President and Group CEO of Ericsson during 1990 – 1998, was awarded IEEE Honorary Membership in 1995.

Award - Industry	Year	Recipient	Citation
Corporate Innovation Recognition	1992	Ericsson Radio Systems AB	For significant contributions to the development and implementation of analog and digital cellular radio
Honorary Membership	1995	Lars H. Ramqvist	For distinguished and far-sighted leadership of the Ericsson Group in a period of rapid technology change and market development

The IEEE Member Geographic Activities (MGA) Board has recognized strong contributions by individual members of the Sweden Section. Margaretha Eriksson, now Region 8 Director-Elect, has twice been awarded: The Leadership Award in 2002 and the Meritorious Achievement in Continuing Education Award in 2012. Amir Zahoor received in 2012 the GOLD Achievement Award, referring to Graduates of the Last Decade, now Young Professionals.

Award - IEEE work	Year	Recipient	Citation
Leadership Award	2002	Margaretha Eriksson	For stimulating and promoting the formation of technical chapters and promoting the value of the IEEE membership at regional conferences within IEEE Region 8
Meritorious Achievement in Continuing Education Award	2012	Margaretha Eriksson	For exceptional leadership in organizing and delivering practical leadership and management training to young entrepreneurs, IEEE students & Graduates of the Last Decade
GOLD Achievement Award	2012	Amir Zahoor	For inspirational leadership and outstanding contributions to IEEE GOLD activities, boosting member engagement, and motivating and training volunteers

Chapters and Affinity groups

The scope of IEEE has expanded last 50 years. IEEE has 39 Societies and six technical councils representing the wide range of IEEE technical interests: IEEE has more than 3.5 million documents in the IEEE Xplore Digital Library, with more than 8 million downloads each month.

The scope of the Sweden Section has expanded into a variety of areas, both in terms of technology areas as well as organizational activity in Chapters and Affinity groups.

The structure of the Sweden Section chapters has evolved over the years, illustrated below as of Dec 2014. Two new chapters have just been established – the Robotics & Automation chapter and the Photonics chapter.

A few mergers into joint chapters have occurred since early days of the Sweden Section, and are still being discussed. Drivers include technical development, close cooperation across different chapters, and to create larger entities to form a critical mass. E g in 1984 – 1990, three joint chapters were formed. In some chapters, both the industry and academia have since long been represented in the board as well as in the membership.

There are also cross-border and Nordic dimensions on structure, cooperation and scale: The Education chapter is a pan-Nordic chapter, hosted by Sweden. In addition, the Components, Packaging & Manufacturing Technology chapter has recent years been acting with a pan-Nordic focus, which 2015 is in the process of being formalized into a joint Nordic chapter.

In this context, it is worth noticing that on June 23, 2015 the IEEE Sweden Section acknowledged and the IEEE Sweden PE/PEL chapter submitted an IEEE Milestone proposal regarding the Gotland HVDC Link in Sweden: “Commissioned in 1954, the Gotland HVDC Link is the world’s first commercial High Voltage Direct Current (HVDC) transmission link. It connected mainland Sweden and the island Gotland in the Baltic Sea using the world’s first submarine HVDC cable - 96 km long with mass-impregnated technology. The HVDC link was delivered to Vattenfall by ASEA, where Dr. Uno Lamm was instrumental in developing the mercury-arc valves in the converters.”
The Sweden Section and chapters are scouting for more potential IEEE Milestone applications.

	Chapter	Year
MTT/AP	Microwave Theory & Technology / Antenna & Propagation	1984
VT/COM/IT	Vehicular Technology / Communication / Information Technology	1985
PE/PEL	Power & Energy / Power Electronics	1990
EMC	ElectroMagnetic Compatibility	1990
ED	Electronic Device	1995
CPMT	Components, Packaging & Manufacturing Technology	1996
MAG	Magnetics	1997
E	Education	1998
SP	Signal Processing	2001
C	Computer and Software Engineering	2002
SSC/CAS	Solid State Circuits / Circuits & Systems	2003
EMB	Engineering in Medicine & Biology	2006
IA	Industry Applications	2008
SIT	Social Implications of Technology	2011
RA	Robotics & Automation	2013
P	Photonics	2013

IEEE Student branches were quickly established, shortly after the Sweden Section was formed in March 1965. Following the initiation of the Sweden Section by Prof Torkel Wallmark, the first IEEE Student Branch was formed at Chalmers University of Technology in Gothenburg. Within the next two years, IEEE Student Branches were formed at all four major Technology universities / institutes in Sweden at the time. IEEE was quick to form a Student Branch, as Linköping University was formed 1970 and fully established 1975. Blekinge Institute of Technology started 1989, and has a high share of international students. In 2002 a Student Branch of CPMT chapter was formed at Chalmers University of Technology. In 2013, a Student Branch of PE chapter was formed at Royal Institute of Technology.

Student Branch	Year
Chalmers University of Technology	1966
KTH, Royal Institute of Technology	1967
Uppsala University	1967
Lund University / Lund Institute of Technology	1968
Linköping University	1974
Blekinge Institute of Technology	2012

Women in Engineering started as an affinity group at KTH, Royal Institute of Technology in 2010. A key initiator and driver is Nasim Farahini, a PhD Candidate at Dept of Electronic Systems at School of ICT, Royal Institute of Technology. By 2014, the WiE group of Sweden Section was formed, chaired by Nasim Farahini.

WiE - Women in Engineering	Year
KTH, Royal Institute of Technology	2010
Blekinge Institute of Technology	2013
Sweden Section	2014

The Young Professional, YP, affinity group was formed as an Sweden Section affinity group in 2011, then labeled GOLD, Graduates of Last Decade. A key initiator and driver was Amir Zahor, Master in Electrical Engineering at Blekinge Institute of Technology, and Chair YP. He then received the 2012 GOLD Achievement Award *"for inspirational leadership and outstanding contributions to IEEE GOLD activities, boosting member engagement, and motivating and training volunteers."*

Nobel Prize

Alfred Nobel (1833-1896), the inventor of dynamite and holder of 355 patents, established the Nobel Prizes for the "benefit to mankind". The Nobel Prize has since the first Award Ceremony on December 10, 1901 been honoring men and women from all corners of the globe for outstanding achievements. The foundations for the prize were laid in 1895 when Alfred Nobel wrote his last will, leaving much of his wealth to the establishment of the Nobel Prize.

The Nobel Prices in physics, chemistry, physiology or medicine and literature, as well as the Prize in Economic Sciences, are awarded in Stockholm, Sweden. The Nobel Peace Prize is awarded in Oslo, Norway.

Quite a few Nobel Laureates are or have been IEEE members, or members in IEEE predecessors AIEE or IRE. As an illustration, a selected few of them are listed below;

- Guglielmo Marconi 1909
- Robert Andrews Millikan 1923
- Irving Langmuir 1932
- Willem Einthoven 1924
- Edward Appleton 1947
- William Shockley 1956
- Walter Brattain 1956
- Charles Townes 1964
- John Bardeen 1972
- Leo Esaki 1973
- Brian Josephson 1973
- Arthur Schawlow 1981
- Nicolaas Bloembergen 1981
- Jack S. Kilby, Zhores I. Alferov and Herbert Kroemer 2000
- Peter Grünberg 2007
- Willard S. Boyle 2009
- Charles K. Kao 2009
- George E. Smith 2009
- Michael Levitt 2013
- Isamu Akasaki, Hiroshi Amano and Shuji Nakamura 2014

The IEEE Sweden Section has actively been engaged with a few of these Nobel Laureates, as illustrated below

In December **2000**, the Nobel Prize in Physics was shared by 3 IEEE members: Jack S Kilby received half the prize "f*or his part in the invention of the integrated circuit"*. The other half of the prize was shared by Zhores I. Alferov and Herbert Kroemer "f*or developing semiconductor heterostructures used in high-speed- and opto-electronics"*. The IEEE Sweden Section was engaged in a lecture seminar by Kilby and Alferov in Kista, Stockholm, a lecture seminar by Alferov at Chalmers University of Technology in Gothenburg, and a lecture seminar by Kroemer in Lund.

*Rolf Jansson (Treasurer), Hans Peter Nee (Vice Chair), Nobel Laureate **Jack S. Kilby**, Margaretha Eriksson (Chair), Rune Persson(Secretary), Per Bodin (Membership & Student Relationship Officer) Nobel Laureate Prof Zhores I. Alferov*

The 2007 Nobel Prize in Physics was shared by the IEEE member Peter Grünberg and Albert Fert (not an IEEE Member) *"for the discovery of the giant magneto resistance effect, GMR"*
In **2008** a workshop was arranged by Johan Åkerman, Professor Experimental Physics, and Chair Magnetics Chapter, with both Peter Grünberg and Albert Fert as keynote speakers. These workshops were repeated in 2010 and 2012.


Nobel Laureate & IEEE member Prof Peter Grünberg and Prof Johan Åkerman, Chair Magnetics Chapter, and Nobel Laureate Prof Albert Fert

The 2013 Nobel Prize in Chemistry was shared by Michael Levitt, former IEEE member, and Martin Karplus and Arieh Warshel *"for the development of multiscale models for complex chemical systems"*
In June **2014**, Michael Levitt made a seminar tour in Sweden, partly privately arranged. Lectures were held in Stockholm, Umeå, Gothenburg and Lund. The IEEE Sweden Section invited all Swedish IEEE members to the events. IEEE member Ass Prof Ingemar André hosted the arrangements at Lund University.

IEEE Sweden Section arranged a well received workshop seminar with KTH, Royal Institute of Technology in Stockholm, followed by a dinner cruise with Michael Levitt in the archipelago.
We also arranged a private and informal social sailing cruise in the archipelago the following days, which was much appreciated.


Nobel Laureate Professor Michael Levitt leading the workshop at KTH, Royal Institute of Technology. Sailing by Erik Lindahl, Prof Theoretical and Computational Biophysics, KTH; Nobel Laureate Professor Michael Levitt; Mats Edvinsson, Chair IEEE Sweden Section and Captain

The **2014** Nobel Prize in Physics was shared by the three IEEE members Isamu Akasaki; Hiroshi Amano; Shuji Nakamura *"for the invention of efficient blue LED which has enabled bright and energy-saving white light sources"*

IEEE Sweden Section participated in and invited Swedish members to the lecture by Nobel Laureate Professor Hiroshi Amano in the Ångström Laboratory at Uppsala University on December 13, 2014. We also participated in the Nobel Prize Luncheon at the Uppsala Castle.


Nobel Laureate Professor Hiroshi Amano, and Mats Edvinsson, Chair Sweden Section
Nobel Prize Luncheon: Rune Persson (Section Member Development), Mats Edvinsson (Sweden Section Chair), Nobel Laureate Professor Hiroshi Amano, Sten Bergman (former Section Chair), Professor Olof Karis, (Ångström Laboratory, MTT/AP chapter member)

Acknowledgements

Many thanks to all individuals who have directly and indirectly assisted with contributions and inputs to this brief overview of the Sweden Section. Special thanks to Martin J Bastiaans for valuable inputs and data, and to my fellow members in the Sweden Section Board for reviews and comments. Special thanks to the IEEE Member and Geographic Activities for providing IEEE material and to Donna M. McClelland and Peggy Kovacs for contributing with data from the IEEE archives.

October 10, 2015

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