Welcome to the last season of the year. I am a believer that dreams don’t die. Therefore, what we were not able to achieve fully in 2018 will surely be realised if we remain connected and committed with IEEE Sweden Section in 2019. We urge every member to see the benefits of collaboration, participating in IEEE activities. The board is grateful to committed members of IEEE Sweden section and as Newsletter Editor, I remain thankful for the opportunity to serve. We have put in place strategies which includes participating in workshops and Conferences for 2019. It is exciting to note that this section is pregnant with potential and possibilities and be rest assured, they will not be wasted. Please engage with IEEE events in 2019. Don’t shy away from commanding your tomorrow and joining the league of stars.

A message from the Sweden Section Chair

Dear IEEE Members,

2018 is at the very end now and I am very happy for what we have been able to achieve at the IEEE Sweden Section.

Several high-quality seminars and workshops took place during autumn. Among others, worth mentioning is the HVDC Transmission Seminar, that was organized at Chalmers by the IEEE Sweden Section; and the LiFi workshop in Stockholm. Members of the board attended the talks by 2018 Noble Laurates at Uppsala university and had a unique opportunity to interact with them over lunch.

Harold “Bud” Lawson was awarded the prestigious 2019 IEEE Simon Ramo Medal “For pioneering contributions to computer systems, systems engineering, and standards.”; while the Section WIE Chair defended her thesis and was awarded the PhD title. Many congratulations to both on their achievements.

As we dive into 2019, I want to remind you to please renew your IEEE membership if you haven’t yet. Your IEEE membership is the key to numerous benefits.

I want to take this opportunity to wish you and your family a Merry Christmas and a very Happy New Year 2019.

Samarth Deo,
Chair IEEE Sweden
Uppsala LiFi-workshop at the Swedish Energy Agency with Father of LiFi, Prof. Haral Haas

On Dec 7, the Swedish Energy Agency (SEA) hosted a workshop on the status of LiFi. The word LiFi can be thought of as WiFi using visible light instead of radio waves. Participants and speakers arrived as far as from Scotland, Germany, USA, France and India attended.

The original discussion point for the workshop at the planning stage was if LiFi is yet another service being added to smart light sources (like colour tunability and internet connection) with a potentially limited practical use in the end but with the risk of becoming a forgotten additional energy consumption and standby consumption once the products are installed.

The LiFi concept was presented to be much broader than anticipated by the audience. The presenters covered multiple areas from research, standardization, manufacturing, telecom operator views, architectural lighting design views, off grid solutions using photovoltaic solar panels as receivers in communication links.

The main take away were:

Radio range is limited, by moving into optical space it will open up additional communication opportunities.

LiFi can be fast and has demonstrated Gbps transmissions. The optical communication has a security aspect from being very locally centered around the user and the signal is stopped by walls.

The energy usage increase is limited if existing luminaires are used and the signal modulation can be done with very low energy usage.

LiFi can improve WiFi traffic by off-loading the WiFi channel, this had been shown in field tests in a school environment.

Applications for industry 4.0 was presented for communication with industrial robots over multiple channels (MIMO).

The presentation of Architectural Lighting Design showed that the communications world and the art of lighting designing for humans are two worlds that would benefit from working more closely with each other. Perhaps the architectural lighting designers can handle the placement of radio antennas on building with the same approach as they plan for the placement and appearance of luminaires. Besides pure LiFi there was also a presentation on optical camera communication, enabling LiFi-like functions from existing smart phones using smart phone cameras to detect information from modulated local light sources which can be used for applications like guiding guests in large multiple level (3D) complexes like conference centers, hotels etc. were the 2D gps is not sufficient.

The Lighting Research Center from Troy, NY, presented how failure modes (sudden failures and decaying luminous flux levels) in light sources can be estimated and explained by accelerated aging at elevated temperatures. This method is by the way one of the inspirations for a new test method for accelerated aging that is proposed and up for approving vote by EU on Dec 17 for the coming unified light regulation.

Three appreciated demonstrations were presented by the Fraunhofer HH Institute, Pure LIFI and Zero One. We also learnt that there is a Light Communication Alliance being formed and that technical standards are under development.

A challenge is now to understand how LiFi can contribute to energy efficient communications in large buildings like hospitals, apartment buildings, offices etc. were multiple systems are used in parallel with mobile base stations, WiFi networks. If LiFi can replace part of an energy intense communication system, then we might see a strong interest for the technology in the future.

The workshop was organized with the IEEE Sweden Photonics Chapter and IEEE Sweden Social Implications of Technology Society and we are look forward to following workshops on the same theme. Please contact christofer.silfvenius@energimyndigheten.se for more information about the workshop.
IEEE Sweden at the Nobel lectures in Uppsala

On December 13th, 2018, Uppsala University played host to a series of Nobel lectures, followed by a luncheon in Uppsala Castle. The session commenced with Sofia Lindblad receiving the Swedish Chemical Society award for ‘Best Master Thesis’ in Chemistry, with congratulations from the Nobel Laureates.

The laureates then treated attendees to lectures which were in equal parts fascinating and entertaining.

The Chemistry laureates begun. Prof. George P. Smith guided participants through the principles of affinity selection from phage display libraries; portraying what can be learned from surface plasmon resonance. Prof. Sir Gregory P. Winter spoke of harnessing evolution to make medicine, building on the work of Prof Smith. He highlighted the two main approaches to new medicines, e.g., to cure cancer, chemical and antibodies. Of 10 top such medicines (by revenue) today, 8 are based on antibodies, the other 2 on chemicals. He then elaborated on his third alternative, a “bicycle” approach; a combination of both. These ‘engineered’ antibody treatments appear very promising, as trials on mice indicate some tumors are effectively treated in only 21 days.

Prof. Frances H. Arnold took the podium next, or rather the stage - walking freely exploring every centimeter, almost as a metaphor to her work exploring the intricacies and permutations of evolution. She engaged the auditorium comparing music composition, with evolutions innovation - bringing new chemistry to life. By mimicking and speeding up natural evolution processes, new innovative solutions could be developed – without using traditional chemical processes, a point emphasized...
with a playful dig at the illustrious laureates. One illustration is binding Silicon with Carbon, which does not appear in ‘mother nature’. By repetitively using a ‘synthetic’ natural evolution process, Frances and her team have developed SI – C bondings – without chemical processes etc.

Prof. Donna Strickland – one of the Laureates in Physics and the first woman in 55 years – performed a very entertaining show, on the informal topic ‘how to develop a hammer, in order to hit atoms and electrons’. To generate high-intensity ultrashort optical pulses includes substantial challenges. E.g. to amplify a short laser pulse to high energy levels is difficult due to equipment damage etc. The groundbreaking inventions in the field of laser physics include step-wise approaches: First generating an ultra-short pulse, ‘prolonging it’, amplifying it using ‘chirped pulse amplification’ (CPA), then finally shortening it to a femto-second. All of the laureates succeeded in “hitting the nail on the head” when it came to delivering lectures based in complex subjects in a manner accessible to the diverse and captivated gathered in Uppsala universities ornate auditorium.

IEEE Sweden Section was present at the lectures and the luncheon: Jiajia Chen, Associate Professor KTH; Gerard Duff, Chair IEEE Young Professionals and Mats Edvinsson, Sweden Section Board. We were grateful to get opportunities to chat with Donna Strickland, who has published many IEEE articles in e.g. Journal of Selected Topics in Quantum Electronics and Journal of Quantum of Electronics.

The day was rounded out with a luncheon in the opulent Uppsala castle. It was fitting that on Lucia attendees were presented to perhaps a new spark of innovation in Sofia Lindblad, and four of the shining lights in physics, chemistry and biochemistry. Hopefully leading to a bright new year in innovation and engineering.

**IEEE Young Professionals (YP) Affinity Group Gets New Dynamic Excos**

The Young Professionals (YP) affinity group (AG) have voted in a new board and have begun work on planning events for the coming year.

The newly elected chair Gerard comes from Ireland, and has been living in Sweden for 6 years. After undertaking a masters in embedded systems in Mälardalen University, he is now working for a fast-growing consultancy company Syntronic. His portfolio of projects include work for Scania and Ericsson. He's hoping to bring a bit of Irish luck to the affinity group!

The newly elected vice chair Yuan comes from China, and has been living in Sweden for 3 years. She completed a bachelor’s degree and a master’s degree in mechanical engineering in Tsinghua University, China in 2013 and 2016. Now she is a second-year PhD student in big data and transport at the Chalmers University of Technology in Sweden. Her research vision is a data-driven understanding of humans to empower future intelligent transport.

The new secretary is Suleyman Savas who has a master's degree on Embedded and Intelligent Systems from Halmstad University has worked on embedded systems, Bluetooth and parallel programming in the industry for two years as a research engineer and product developer. In 2013 he started his PhD education on manycore architectures in Halmstad University. The focus of his research is exploiting heterogeneity in manycore architectures. He is planning to graduate soon.

The newly appointed treasurer is Claudio from Italy. He lived for three years in Norway where he got his Ph.D. in Engineering Cybernetics from the Norwegian University of Science and Technology (NTNU), Trondheim, Norway. He worked with control theory applied to marine systems. He has been living in Sweden for one and a
half years and works at Volvo GTT where he is involved in the development of braking systems and the stability control of trucks.

The youngest board member is Industrial Relations Officer Aris Ramadhan. He is from Indonesia and has been involved with IEEE in R10 Asia and Pacific, particularly with IEEE Telkom University Student Branch that he co-founded a few years ago. From September 2018, he has moved to Sweden after getting sponsored by the Swedish Institute (SI), undertaking a Master study of Systems, Control, and Mechatronics in Chalmers University of Technology.

Also, we count with the past-chair of the YP AG Alberto Lorente, originally from Spain. Alberto recently joined Spotify, as a Software Engineer. Alberto has been living in Stockholm since 2011 and has been involved in IEEE since 2006. During his period in Stockholm, he studied at KTH where he obtained his master’s degree in Distributed Systems and has previously worked in other Software companies in the Stockholm region in other business domains like fin tech, as an iZettle employee and software developer at Spotify, in his current role.

Waled, from Italy, is the webmaster for IEEE YP Sweden. He started his IEEE Journey with Sapienza IAS Student Branch in Rome and is now starting a new chapter in Sweden - following his passion for cars by working as a system design engineer at Volvo Cars, designing the cars of tomorrow. Keep following us on the social media, because he will keep you updated. ;)

The goals and ambitions of the board for the coming year are to spread the IEEE values to soon-to-be graduates, and to try and bridge the gap from academia to industry through a series of university and company visits throughout 2019.
IEEE HVDC Transmission Seminar

Chalmers, 21st November

Three invited speakers lectured on different aspects of high voltage insulation systems for representatives from academia and industry. Marc Jeroense, from MarCable Consulting, presented systems aspects focusing on reliability of HVDC cable systems and the consequence of increasing power transfer capabilities in HVDC links. Villgot Englund, from Borealis, gave the audience an overview of the link between mechanical and electrical properties in polymeric insulation systems for HVDC cables. Finally, Prof. Yuriy Serdyuk from Chalmers presented electrostatic computational methods in solid, liquid, and gaseous insulation systems taking space charge transfer and accumulation into account. In summary, it was a successful seminar highlighting different aspects of high voltage insulation systems for a heterogenous audience.
Dear IEEE Sweden Section Members,

I want to take this opportunity to thank you for your loyalty in the IEEE community. In the year 2018, we have been able to see a stable growth of IEEE members in the Sweden Section. In October, we got the recognition from IEEE Member Recruitment and Recovery Committee for the outstanding achievement in meeting the Section’s retention goal for the 2018 membership year. It is interesting to note that the active members in the Sweden Section has grown since October to reach a number that is slightly more than two thousand right now at the end of the year.

IEEE is the world’s largest community for electric and electronic engineers. It is constantly influencing the world via its conferences, regional activities and societal activities. By joining IEEE, you will be able to be connected to a large community and enjoy all the exclusive benefits that an IEEE member can have. If you have not joined IEEE or renewed your 2019 membership yet, please do it now so you will not miss any important opportunities from IEEE. In the Sweden Section, we are also planning to arrange activities for boosting IEEE Senior Member applications. If you have fulfilled the criteria for a Senior Member, we can possibly help you to find enough references from the relevant societies in your field of expertise.

In the end, I attach the 2018 membership development prize for the Sweden Section, and wish you a happy new year!

Best Regards,

Qinghua Wang
Membership Development Officer, IEEE Sweden Section
**Award and Recognition**

**Elena Vasileva, Congratulations**

**Dissertation; photonics, ‘transparent wood’ & laser**

Elena Vasileva, the IEEE Women in Engineering (WIE) Sweden Section Chair and a Photonics chapter board member, defended her PhD thesis ‘Light Propagation in Anisotropically Scattering Medium’ on 14th Dec 2018. Transparent wood is a relatively new material. This PhD thesis builds knowledge on its optical characteristics, and even demonstrates how to make a laser by combining transparent wood with dye! The opponent was the high-profile Prof. Miguel Alonso, The Institute of Optics, University of Rochester, NY, USA

Our heartiest congratulations to Elena and a very good luck for her future.

**Harold “Bud” Lawson, Congratulations**

The IEEE Board of Directors selected Harold “Bud” Lawson to receive the 2019 IEEE Simon Ramo Medal, which is given for exceptional achievement in systems engineering and systems science.

The award comes with the following citation:

“For pioneering contributions to computer systems, systems engineering, and standards.”

Congratulations on your achievement and thank you for your commitment to IEEE and its mission of advancing technology to benefit humanity.

**Get Your News to IEEE Region 8**

Do you know that Dr Celestine Iwendi is a contributor to IEEE Region 8 Digital? Please send your society news and activities to him.