

# PHILADELPHIA SECTION of the IEEE

Membership in these counties: Bucks, Chester, Delaware, Montgomery, Philadelphia, (PA)  
Burlington, Camden, Gloucester (NJ)

# Almanack



Vol. 60, No. 1 [www.ieeephiladelphia.org](http://www.ieeephiladelphia.org)

January 2015

## SECTION MEETING

**Jan. 20, 2015**

**Dinner: 6 pm**

**Speaker: 7 pm**

**Sheraton University City**

**Philadelphia**

Meal Cost: \$25.00 (students \$15.00)

Parking cost paid by section

*Ahmed S. Ibrahim Mohamed, Ph.D.*

**Integrated Small Cell and Wi-Fi Networks**

*Second speaker will be announced*

**Watch your emails for information**

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Note: In the event of bad weather please call the Sheraton after 1pm the day of the meeting at 215-387-8000. Ask the front desk if the meeting has been canceled.

## January 2015

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				<b>1</b> New Year's Day	<b>2</b>	<b>3</b>
<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b> Tour Franklin Institute	<b>9</b> AP/MTT-S Mtg.	<b>10</b> Hackathon
<b>11</b> Hackathon	<b>12</b>	<b>13</b> Adcom	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>
<b>18</b>	<b>19</b> MLK Day	<b>20</b> IEEE Night	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>
<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>

# IEEE NIGHT

## Philadelphia Section Meeting

Joint with: Communications/Information Theory (COM/IT)

Date: Tuesday, January 20, 2015

Time: Dinner is at 6 pm. Program starts at 7 pm, and 8 pm.

Location: Sheraton University City, 36th and Chestnut, Philadelphia

Cost of dinner is \$25.00 (students \$15.00); meeting only is free (Real cost of dinner is higher, which is mostly subsidized by section)

Reservations are needed, call 484.270.5136 or email the section office.

[sec.philadelphia@ieee.org](mailto:sec.philadelphia@ieee.org) or use vtools in the web site

Indoor parking is at location and paid by section. Bring ticket to be stamped.

**Note: In the event of bad weather please call the Sheraton after 1pm the day of the meeting at (215) 387-8000. Ask the front desk if the meeting has been canceled.**

**Speaker: Ahmed S. Ibrahim Mohamed, Ph.D.**

**Topic: Integrated Small Cell and Wi-Fi Networks**

The current 3rd Generation Partnership Project (3GPP) telecommunications standards support core-network based integration between Evolved Packet Core (EPC) and Wireless Local Area Network (WLAN) at the Packet Data Network Gateway (PDN-GW). Using the PDN-GW as the mobility anchor point causes a bottleneck in the mobile core network and results in inefficient inter-system (vertical) handover procedures between the long-term evolution (LTE) and Wi-Fi air interfaces. In this talk, we present three new EPC-WLAN integrated architectures, which enable more efficient inter-system handover mechanisms. The new architectures propose moving the mobility anchor closer to the local integrated LTE/Wi-Fi network. In doing so, we introduce new logical network entities, reference points, and messages to the current 3GPP EPC-WLAN integrated architecture. Unlike existing user-initiated inter-system handover mechanisms, the proposed handover mechanisms are network-initiated and may be used to dynamically adapt to conditions in the local LTE/Wi-Fi network (e.g., load balancing).

**Ahmed S. Ibrahim Mohamed** is an IEEE member since 2009. He is currently a Senior Engineer at InterDigital Communications Inc. in King of Prussia, PA. He has received the Ph.D. degree in electrical and computer engineering from the University of Maryland, College Park, in 2009. He received the B.S. and M.S. degrees in electronics and electrical communications engineering from Cairo University, Cairo, Egypt, in 2002 and 2004, respectively. From 2009 to 2014, he was a wireless research scientist at Intel Corporation, Cairo, Egypt. He was also an Assistant Professor at Cairo University, Cairo, Egypt during 2010-2013. His research interests include wireless communications and networks such as integrated small cell and Wi-Fi networks along with cellular systems.



Dr. Mohamed is a recipient of the Best Speaker Award of the Electrical and Computer Engineering Department seminar series at the University of Maryland in 2008. He was a nominee for the Best Student Paper Award of the IEEE Conference on Acoustics, Speech, and Signal Processing (ICASSP) in 2007. He is also a recipient of the Graduate School Fellowship from the University of Maryland in 2004 and 2005. Finally, he holds over 35 conference and journal publications in addition to over 5 patents.

There will a second speaker at IEEE Night. Information will be sent via emails.

### ***Section notes***

#### **Election resulted in these IEEE Philadelphia Section Officers for 2015**

**Chair:** Philip Gonski, P.E. [pgonski@gmail.com](mailto:pgonski@gmail.com)

**Vice Chair:** Adam Fonteccio, Ph.D., [sec.philadelphia@ieee.org](mailto:sec.philadelphia@ieee.org)

**Treasurer:** Richard Primerano, Ph.D., [sec.philadelphia@ieee.org](mailto:sec.philadelphia@ieee.org)

**Secretary:** Leonardo Urbano, Ph.D., [sec.philadelphia@ieee.org](mailto:sec.philadelphia@ieee.org)

**Past Chair:** Mark Soffa [msoffa@kns.com](mailto:msoffa@kns.com)

Adcom members will be appointed in January and the list will be posted soon after.

#### **Almanack Staff**

Publisher: Phil Gonski, P.E.

Editor: Peter Silverberg

Asst. Editor: Janet English-Cartwright, Ph.D.

News and notices contact [psilverberg3@comcast.net](mailto:psilverberg3@comcast.net) or 856.461.6615 or fax 509.461.6617

Deadline for the February issue is January 13, 2015

New & improved web site: [www.ieeephiladelphia.org](http://www.ieeephiladelphia.org)

#### **ADVERTISE IN THE ALMANACK:**

**The Philadelphia Section of the IEEE encourages placement of technical, professional, promotional and commercial advertisements in the Almanack. The Almanack is published ten times a year and is read by more than 4,000 members with an average annual salary of over \$70,000 in over 150 key industries. For more information, contact Peter Silverberg at 856.461.6615 or [psilverberg3@comcast.net](mailto:psilverberg3@comcast.net)**

Rates:

Full Page: 7.5x10: \$100

3/4 Page: 7.5x7.5: \$75

1/2 Page: 5 x 5: \$50

1/4 Page: 2.5 x 5: \$25

1/8 Page: 2.5 x 2.5: \$12.50

Email blast: \$50

Main Office: 11 Bala Avenue, Bala Cynwyd PA 19004, 484.270.5136

[sec.philadelphia@ieee.org](mailto:sec.philadelphia@ieee.org)

#### **New Senior Members**

The last A&A Review Panel meeting was held on 22 November in New Brunswick, NJ. Two Members of this Section advanced to Senior Member. Congratulations to:

**Hakan Karakas** also in Aerospace and Electronic Systems Society

**Roger Milton** also in Communications Society and Computer Society

## Chair's Message



*By Philip Gonski*

On behalf of the IEEE Philadelphia, I wish everyone a happy and safe New Year. I hope the year will be full of many great professional and social events for the Section. As always, if there are any suggestions for events for the upcoming year, or any feedback on how we can improve, please do feel free to contact me personally.

One of our recent sponsorships, the Sumo Robot Competition, had me thinking about the benefit of exposing our students to different cultures. If you haven't read previous issues, the IEEE Philadelphia recently sponsored a student branch event that was partnering with a local school in Australia. The winner of the competition will head out to Australia to both meet the local IEEE students there, as well as experience the culture.

I am a firm believer of the value of exposing students and professionals to the experience of living and working in a foreign country. When I attended the University of Illinois, I was awarded a fellowship to study abroad in York, England. The experience I gained in traveling to other countries, the friends that I made in Europe, and the cultural

perspective, cannot be understated. Like many, I had mostly only seen the area around my house, and people from a similar background of myself. During this experience, I traveled to over ten countries, made life-long friends, many of whom I still talk with today. For the most part, the best part was having conversations and hearing about life, education, and politics.

During my working years, I was also lucky enough to work abroad in India for a month. I cherished every minute I was abroad there, and was able to gain a much better viewpoint about the cultural and working traditions, that helped me to gain a better grasp of how to deal with different cultures and backgrounds. We tend to always believe that people are the same in different countries, and that our way of doing things is better. However, being able to understand the differences and work around them is an invaluable experience for an engineer that has to work with people in other countries. My time there certainly made me much more adept at working with our Indian office to bring our project to a successful conclusion.

Engineering is a global industry and is intertwined between many different cultures and countries. For those student members that actually read the Almanack, I strongly encourage you to seek out study abroad programs, or simply travel to other countries.

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Philip M Gonski, P.E.  
IEEE Philadelphia Section Chair  
[www.ieeephiladelphia.org](http://www.ieeephiladelphia.org)  
Project Manager - Keystone Engineering Group  
(c) 630-363-0790

## **CALL FOR SPEAKERS**

### **The 40th Annual Trenton Computer Festival (TCF) at the College of New Jersey, Ewing, NJ**

It is hard to believe, but TCF@40, the 40th Annual Trenton Computer Festival (TCF) and its associated IEEE/ACM ITPC is here and will be held on March 20th/21st, 2015. [Please note that these dates are a week later than previously announced. The College of NJ (TCNJ) made a very late change to its academic schedule that moved its Spring Break a week later. We had no choice but to move our dates.]

The TCF (main part) will be one day on Saturday (March 21, 2015). The IEEE/ACM IT Professional Conference at TCF (ITPC) will be on Friday (March 20, 2015) and continue on Saturday as part of TCF. The IEEE Integrated STEM Education Conference (ISEC) will again be in Princeton and on a Saturday, but two weeks earlier (March 7, 2015).

This year's theme is TCF@40: Celebrating our Past and Exploring our Future -- A Look Back and a Leap Forward. All who attended TCF in its early days are invited back and will receive special recognition. We plan to feature both presentations on the history of TCF, and on the hottest leading-edge technologies shaping our future such as Net Neutrality, 3D Printing, Wearable Tech, etc.

We already have a keynote speaker on Wearable Tech, Dan Rosenbaum, President and Editor-in-Chief of Center Ring Media.

As in the past, talks (50 minutes) and tutorials/workshop (100 minutes) on all forms of computer/digital electronics, information, communications technology, robotics, home/environmental control, gaming, digital home entertainment, digital video/photography, wireless technology, networking, amateur radio related topics, education, etc., but especially on the history of TCF and its early years are desired.

If you have an idea for a talk or workshop/tutorial, please fill out a Speaker Application form at: <[https://tcnj.qualtrics.com//SE/?SID=SV\\_2376yIEtVsZoquF](https://tcnj.qualtrics.com//SE/?SID=SV_2376yIEtVsZoquF)>

For more information on:

The IEEE/ACM IT Professional Conference, contact David Soll at <[dsoll@Omicron.com](mailto:dsoll@Omicron.com)> or <<http://princetonacm.acm.org/tcfpro/>>

The IEEE Integrated STEM Education Conference see <<http://ewh.ieee.org/conf/stem/>>.

Speaking at TCF or TCF in general see <<http://tcf-nj.org>> or contact Allen Katz, TCF@40 Program Chairperson, [alkatz@tcnj.edu](mailto:alkatz@tcnj.edu), telephone: 609.771.2666, US Mail: Dr. Allen Katz, Electrical/Computer Engineering Department, The College of New Jersey, PO Box 7718, Ewing, NJ 08628-0718.

#### **Delaware Valley Volunteering**

On the web site is a tab for volunteering in the local region. Three are suitable and open for IEEE members. These are mentoring or judging. They can use YOU. Go to the web site for sign up details.

Future City – January 25. Archbishop Carroll High School. Wayne PA.

Science Fair – April 1. Conference Center. Oaks PA

MATE – May 9. Bartley Hall. Villanova University

## **Ernest's Page**

*By Ernest B. Cohen, Ph.D.*

America's strength is based on ample natural resources, and the human capital to make good use of these resources. This means first-rate engineering, and the science that underpins engineering. That is why I am so disturbed by sensing an anti-science trend in America's leaders, and in the American population. While there are many aspects to this anti-science, the two biggest are rejection of evolution based on religion, and disbelief in anthropogenic climate change. The latter is largely based on a public relations campaign, funded by the fossil fuel industry, and I suspect their political contributions. We have read that the same public relations firms that helped the tobacco industry confuse the public for two decades concerning the dangers of smoking have been working on the campaign to confuse the public on climate change.

As noted in an editorial on page 791 of the November 14, 2014 issue of *Science*: "The Federal Government's investment in science and technology now stands at roughly 0.78% of the economy, the lowest point in 50 years." A major part of American world leadership has been our embrace of science. Cutting back on funding for science and education is a kind of deferred maintenance, and the costs in the long term will dwarf the short-term monetary savings.

America is not the only country that had anti-science problems. The Lysenko affair of yesteryear in the USSR put back their biological science for decades. His work on heredity involving the transmission of acquired traits, clashed with Mendelian genetics but fit in with political doctrines of Marxism. When it comes in conflict, politics trumps science, whether in totalitarian states or democratic ones.

There seems to be a high correlation between the two major anti-science beliefs. I am not sure how these relate to other anti-science beliefs, such as rejection of vaccination.

People who believe these unsupported allegations are not above quoting non-existent scientific research, or distorting the facts. With regard to climate change, every cold snap is assumed to show the absence of global warming, while every warm spell is attributed to random variations in weather. They have claimed that Antarctic sea ice increases prove the absence of warming, but this sea ice is more sensitive to precipitation, which increases with global warming. The anti-evolution believers have falsely claimed that Carbon 14 has been found in diamonds, thereby proving that the Earth is quite young.

Good science is always subject to revision when more data is observed. Belief usually ignores data. If global climate change only meant a little less snow to shovel each winter, it would not be a problem. But the models and data imply more and stronger storms, as well as droughts in key agricultural areas. These are problems. Which do we want to guide policy in America or politics?

## **Technical Activities Report**

*By Marvin Weilerstein*

The vTools listing shows more than 82 listings for our Section so far this year (as of 12/9). This includes Section, Chapter, and Affinity Group meetings. A few more will show up before the end of the year. This is an outstanding level of activity. The leadership of our Section, Chapters, and Affinity Groups has done an outstanding job! We do have a few chapters that are without chairs and/or held no meetings this year, so there is room for improvement.

## Life Member Tour of CSEDS

*By Bob Paglee*

Courtesy of Lockheed Martin and the U.S. Navy, a tour of the Navy's VADM James H. Doyle, Jr. Combat System Engineering Development Site is being sponsored by IEEE Philadelphia Section Life Member Group. Known as “The Cornfield Cruiser” the facility is located at 300 Moorestown-Centerton Rd. in Moorestown, N.J. The tour will begin promptly at 2:00 P.M. on Tuesday, February 17, 2015.

It is open to IEEE members and others, but it is necessary to phone the IEEE Office at 484.270.5136 to make a reservation, as space will be limited to 25 visitors. You must provide your name, employer’s name (or “Retired”), and citizenship (if not U.S.A., country where you now reside).

Please arrive by 1:45 P.M. to enter the secure area. It will be necessary to stop at the Guardhouse, state your name and purpose (IEEE Tour), and provide a photo ID (driver's license or a passport, etc. with photo). Your name will be matched with the list of reservations from the IEEE Office and, provided all is in order, the guard will indicate that you may proceed to enter and park in any open unreserved space within the enclosed parking lot. Then proceed to the reception area within the entrance shown in the photo below.

### USS Rancocas: The Cornfield Cruiser



In the cornfields of southern New Jersey, there rises a sight that makes passersby look twice. It even draws in curious tourists, but this is no tourist attraction.

What looks like a warship among the waving cornstalks is actually, well, a warship among the cornstalks.

Known to locals as the “Cruiser in the Cornfield”—or the USS Rancocas, for its closest body of water, Rancocas Creek—the facility is officially called the Vice Admiral James H. Doyle Combat Systems Engineering Development Site (CSEDS). Housing both Navy and Lockheed Martin personnel, the research and development facility is devoted to the **AEGIS Combat System**, a revolutionary naval air defense system capable of guarding against missile threats from land, sea and air.

Despite its landlocked location, the Rancocas is a commissioned naval vessel, manned by sailors of the U.S. Navy. It holds live equipment with real combat element systems, used by naval officers and maintained by Lockheed Martin employees who work

side by side. The CSEDS allows the integration of full combat systems, making sure they can be tested before they're put to sea. Two live antennae allow the crew of the Rancocas to test the system's capabilities by tracking commercial flights around New York City.

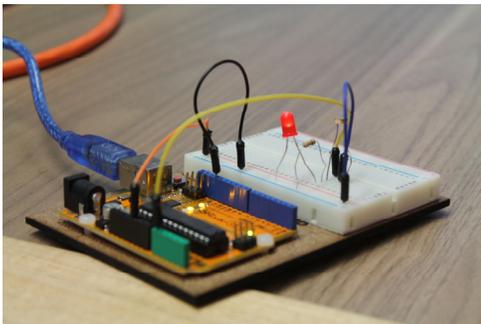
For more details see:

<http://www.lockheedmartin.com/us/100years/stories/cornfield-cruiser.html>

## ELECTRICAL CIRCUITS AND PROGRAMMING WITH IEEE WIE @ NEXTFAB



[Arduino class @ NextFab]



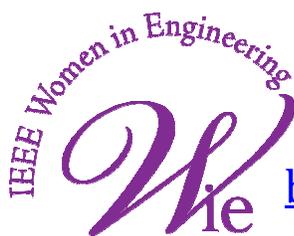
[Our first circuit]

### Women in Engineering hosted a microprocessor event at NextFab

IEEE Women in Engineering (WIE) hosted a full house of middle school students Dec. 6 for an exciting Arduino event at NextFab in Philadelphia at 2025 Washington Ave. The excitement started with a tour of NextFab – think 3D printers, CNC machines, laser cutting machines, and electronics labs. After the tour, class commenced with a crash course in wiring electrical circuits and programming a microprocessor.

Look for more events in the future. For more details on how you can participate as a student or volunteer, contact Ben Wolfgram.

Ben.Wolfgram@weautomation.com  
A special thank you to NextFab for allowing us to tour their facility and use their space to host our event!  
[[www.nextfab.com](http://www.nextfab.com)]



### More events to come!

For information contact:

Ben Wolfgram

[ben.wolfgram@weautomation.com](mailto:ben.wolfgram@weautomation.com)

## Technical Conferences Report

By Marvin Weilerstein

**ITC 2014** was a technical success — lots of good papers. The financial aspects should be good as well, although the actual numbers will not be known for several months. I was not able to attend the conference, and was therefore unable to supervise the Yellow Card procedure for collecting ratings of the content and presentation of the technical papers. This forced the Steering Committee to abandon the Yellow Cards, and change to an on-line procedure using mobile devices for data entry. **ITC 2015** work is underway — the winter Steering Committee meeting will be held soon. The conference will be held October 6-8 2015 at Disneyland in Anaheim CA. We will be 100% sponsors. **ITC 2016** planning has started. The conference will be in Fort Worth TX 11/15/16. I am working on the conference application.

### IEEE Philadelphia Employment Network Group

**Date:** No meeting in January. Next will be February

\*\*\* join our group on LinkedIn for the latest updates and articles related to IEEE Employment around the Philadelphia Region - Search LinkedIn Groups for "IEEE Philadelphia Employment Network" \*\*\*

George Butts

IEEE Philadelphia Employment Network Group Chair

610-675-7879, [george@georgebuttsjr.com](mailto:george@georgebuttsjr.com), [www.linkedin.com/in/georgebuttsjr/](http://www.linkedin.com/in/georgebuttsjr/)

### Drexel University Hackathon – January 10<sup>th</sup> – 11<sup>th</sup>



The poster for Dragon Hacks features the title "DRAGON HACKS" in large, stylized letters, with "DRAGON" in yellow and "HACKS" in blue, enclosed in black curly braces. Below the title are two teal laptops with orange code on their screens. The text "A 24-hour Hardware Hackathon" is on the left, and "January 10<sup>th</sup>-11<sup>th</sup> Start time: 1pm" is on the right. At the bottom, it lists "Drexel University Edmund D. Bosson Research Enterprise 3141 Market Street Philadelphia, PA 19104" and "Register at: [hack-dragon.com](http://hack-dragon.com)". Logos for Drexel IEEE and Major League Hacking (MLH) are also present.

**Philadelphia Chapter PSPE  
Engineers Club of Philadelphia  
American Society of Civil Engineers  
Institute for Electrical and Electronic Engineers**

**Franklin Institute  
2014 Expansion Tour**

**Presented by:**

**David L. Searles, AIA, LEED AP**

**Associate - SaylorGregg**

A studio of Jacobs Wyper Architects

Keast & Hood – Structural Engineers

Marvin Waxman Consulting Engineers – MEP Engineers

The tour/educational activity will focus on the recently completed addition to this Philadelphia Treasure. The tour presenters will point out the architectural and engineering challenges that they had to be overcome. Seeing how this addition compliments the original building and learning about their environmentally friendly approach to meeting these challenges will meet the requirements for 1.0 Professional Development Hours for continuing education activity requirements in NY, PA, NJ and National Model States.

**Thursday, January 8, 2015**

**Tour Registration: 5:45 PM to 6:00 PM**

**Tour: 6:00 PM to 7:00 PM**

**Price - \$15.00**

**Proceeds from the Tour will be used for the  
PSPE/ECP/CB3 and CW Philly STEM Awards Banquet  
On May 27, 2015**

**TOUR IS LIMITED TO 30 PEOPLE**

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<http://www.pspe-philly.org>

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USING TERAHERTZ FREQUENCY BANDS**

**DR. IWAO HOSAKO  
DIRECTOR GENERAL OF ADVANCED ICT RESEARCH INSTITUTE AND  
ASSOCIATE DIRECTOR GENERAL, THZ TECHNOLOGY RESEARCH CENTER  
NATIONAL INSTITUTE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (NICT), JAPAN**

**5:00- 6:00 PM, FRIDAY, JANUARY 9, 2015  
BOSSONE 302, DREXEL UNIVERSITY  
(LIGHT REFRESHMENTS ARE TO BE PROVIDED 15 MINUTES BEFORE START OF TALK)**

**Abstract:** The compound annual growth rate (CAGR) for global network traffic have been increasing exponentially over recent decades. For the upcoming decade this trend seems to be unbroken (cf., the Cisco® Visual Networking Index). This drastic increase in mobile data traffic will require much more bandwidth in wireless communications. However, the spectral resources are extremely limited because of the heavy use of today's conventional frequency range up to 60 GHz even by combining spectrally efficient quadrature amplitude modulation (QAM) and the spatially diversified multiple-input and multiple-output (MIMO) technologies. Terahertz (THz) frequency band - with approximately covering 0.1-10THz - is the promising candidate for a new-generation wireless communication technology because of their broad available bandwidth. Recently, many research and development projects has focused on the above-mentioned frequency bands since the high carrier frequencies promise unprecedented channel capacities such as the targeted 100 Gbit/s. This presentation overviews technical challenges towards reaching 100 Gbit/s wireless communications using the THz-band with particular emphasis on device technology progresses, wireless system experiments conducted at NICT, and standardization both at the IEEE 802.15 WPAN™ and the ITU-R.

**Biography:** Iwao Hosako received the B.S., M.S., and Ph.D. degrees from the University of Tokyo, Japan, in 1988, 1990, and 1993, respectively. After two years with NKK Corp's ULSI Laboratory from 1993 to 1994, he joined Communications Research Laboratory (former name of NICT). He is currently Director General of Advanced ICT Research Institute at the National Institute of Information and Communications Technology (NICT), Japan. His research during 1995–1998 focused on cryogenic readout circuits with emphasis on ultra-low 1/f-noise transistors for a far-infrared (terahertz) detector system. After 1999, he devoted considerable time to study terahertz semiconductor emitters such as p-type germanium lasers and quantum cascade lasers (QCLs). In 2006, he and his colleagues started a study for terahertz imaging system consisting of uncooled micro-bolometer array detector and QCL. Recently, he shifted his study field to wireless communication technology with terahertz waves. He is serving on several research committees for terahertz technologies. For example, since May 2014 he has served as vice chair of IEEE802.15.3d task group for '100Gbit/s wireless' standardization.