IEEE★USA

A YEAR OF ACTION

2016 Annual Report

IEEE

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LETTER FROM THE PRESIDENT

In 2016, IEEE-USA focused on improving its long-standing efforts at building careers and influencing public policy on behalf of IEEE's U.S. members, and for the public good. As IEEE-USA's 2016 President, I outlined four major priorities for the year:

★ Increasing member engagement, through enhanced communication (including use of alternative channels of delivery)

★ Increasing member engagement on public policy and government relations, including an expanded emphasis on engagement at the state/local levels

★ Revitalizing local professional activities, by clarifying the guidelines for acceptable PACE projects

★ Enhancing member value, engagement and revenue from new and existing products and services

I am pleased to report we made substantial progress in each area, as well as serving our overall mission, and finished the year with a financial surplus, despite declining IEEE membership. Enhanced use of social media helped drive our increased member engagement, and we experimented with new ways of delivering program content—such as live streaming content online. The MOVE Emergency Vehicle created tremendous opportunities for national and regional exposure, with multiple deployments to support the Red Cross during emergencies.

Despite a fierce partisan stalemate, and an election-shortened legislative session, we saw significant progress and important outcomes in a number of public policy areas critical to our profession, including:

★ Lessening administrative burdens on research

★ Working with Congress to outline proposals for future comprehensive energy legislation

★ Advancing new restrictions to prevent the misuse of the H-1B visa to displace U.S. skilled workers

I was also pleased to see our efforts in Hawaii and Massachusetts seeking to limit the use of non-compete clauses in employment contracts.

During 2016, IEEE-USA nearly doubled its funding for local professional activities, with special allocations to the six U.S. regions, including targeted support for young professional activities. We also clarified what types of activities qualify for PACE support, to ensure greater consistency.

In addition, we took the first successful steps in enhancing service to IEEE's Young Professional members—launching the first IEEE-USA Future Leaders Forum, held 28-30 July, at Tulane University, in New Orleans.

These focal points are just a few of our many achievements. You will see many more highlighted in this *2016 Annual Report*, including a full calendar of my personal engagements as IEEE-USA President (see Appendix II). I hope you find this report enlightening and inspirational, and you are pleased with what IEEE-USA is doing to help you, and other U.S. IEEE members, build your careers and shape public policy.

Sincerely,

Peter A. Eckstein
2016 IEEE-USA President

INTRODUCTION

The Institute of Electrical and Electronics Engineers—United States of America (IEEE-USA) is a major organizational unit of the IEEE that traces its origins to the 1973 formation of the IEEE U.S. Activities Committee. IEEE-USA was created to **advance the public good**, and it **promotes the careers and public policy interests** of the approximately 200,000 engineers, scientists and allied professionals, who are U.S. members of the IEEE. IEEE-USA is led by a volunteer board of directors, and chaired by the member-elected IEEE-USA President. IEEE-USA's operations are supported by its professional staff, based in the IEEE-USA Office, in Washington, D.C.

MISSION AND PURPOSE

As provided in IEEE's By-Laws, IEEE-USA's mission is to "recommend policies and implement programs specifically intended to serve and benefit the members, engineering professionals, and the general public in the United States. IEEE-USA shall be the organizational unit that represents the professional interests of the IEEE before U.S. governmental bodies. It shall also be responsible for coordinating and reporting, under federal disclosure laws, all official communications with government."

IEEE-USA Policy 1.2, further describes this mission, defining as our organizational purposes the responsibility to:

★ **PROMOTE** the professional, social, economic and ethical status of electrical, electronics, communications and computer engineering, as well as computer science and allied branches of engineering, the related arts, sciences and technologies, and related technical professionals in the United States, with a special emphasis on U.S. IEEE members

★ **PROVIDE** technical advice and policy perspectives to U.S. policymakers at all levels, in the areas of electrotechnology and information technology, to improve the quality of life, and for the benefit of the public

★ **WORK** with U.S. policymakers and regulators to enhance the careers and improve the working conditions of U.S. engineers, and other technical professionals

★ **DEVELOP** products and services that support the lifelong professional development and career vitality needs of U.S. IEEE members, and other technical professionals

★ **SUPPORT** communication with and among U.S. IEEE members, potential members, their employers, and the public about IEEE-USA, and the professional issues that affect its members and their professions

★ **ENHANCE** public awareness and understanding of electrical, electronics and computer engineering, and related technical fields

FINANCES

IEEE-USA operates on an annual budget approved by the IEEE Board of Directors. IEEE-USA's 2016 operations budget was $5.65 million. This budget supported the programs, volunteer activities and staff highlighted in this annual report.

IEEE-USA's budget is primarily funded through a mandatory assessment of all U.S. IEEE Higher Grade members, indexed to inflation. The 2016 assessment was $44. This assessment generated approximately 91 percent of IEEE-USA's operating revenues for the year.

In 2016, IEEE-USA was able to offset a shortfall in assessment income caused by the decline in IEEE U.S. higher grade membership, by successfully controlling expenses; downsizing and reorganizing our staff function; through conference revenues; and from the sale of products and services. IEEE-USA ended the year with an operational surplus of $565.5K, which includes dividends and interest earned on IEEE-USA's $2.25 million in reserves.

In addition to IEEE-USA's operating budget, tax -deductible member contributions to the IEEE-USA Fund, the IEEE-USA E-Week Fund, the MOVE Disaster Relief Fund, and/or the IEEE-USA Awards Fund provided seed money for new career and professional programs and services. For information on how you can support IEEE-USA through a voluntary contribution, see: **https://ieeeusa.org/giving-opportunities/**.

IEEE-USA's 2016 Treasurer was Bala Prasanna.

COMMUNICATING WHAT WE DO

Work continues on IEEE-USA's website redevelopment, along with migrating both *IEEE-USA Insight*, and the new IEEE-USA Shop. IEEE's Information Technology Department is scheduled to deliver a new content management system (WordPress), along with the required templates by year-end, and complete full migration of site content by 2nd quarter 2017.

While IEEE-USA's on-line presence is being reengineered, our flagship publication, *InSight*, published 125 new articles on a host of career and policy issues, as well as news and coverage of IEEE-USA's awards, products, programs, services, activties, conferences and volunteer leaders. In 2016, APEX honored *IEEE-USA InSight* with an Award for Publication Excellence. *InSight* is supported by a monthly email update to all IEEE U.S. members.

As part of our enhanced emphasis on communications, IEEE-USA continued its monthly *InSight Podcast* in 2016. In addition to news of IEEE-USA products, programs, services, activities, conferences and events, the podcast featured newsmaker interviews with such notable figures as Cory Doctorow (Sci-Fi Author/Futurist), Rush Holt (former Member of Congress and AAAS CEO), Emmitt Smith (former Dallas Cowboy), Dr. Pramod Khargonekar (NSF's Assistant Director for Engineering), Andy Viterbi (Qualcomm co-founder), and Dr. Robert Atkinson (founder and president of the Information Technology and Innovation Foundation).

IEEE-USA has continued to expand its use of social media for member engagement and communications, and has seen its networks steadily grow: Twitter (14,651 followers), LinkedIn Group (5,796 members), and Facebook (4,309 likes), at year-end. We have also recently launched Twitter accounts for *IEEE-USA InSight* and Future Leaders—along with an official IEEE-USA Instagram account, whose

followers have grown 10x, since relaunching on 3 November. Viewership and interactions have increased exponentially, with Twitter Impressions up 30x, and engagements up 35x, from October-December 2016. Facebook Impressions are up 31x, and Engagements are up 10x, during the same period. Much of this new interactivity was made possible by the addition of a full-time Social Media Associate to our staff—to help promote our programs, products, services, activities, and the profession, through social media outlets.

IEEE-USA delivered 17 new career and professional e-books in 2016, on topics ranging from *Tips for Young Engineers* to *Project Management*. The additions include four new titles, and a compilation
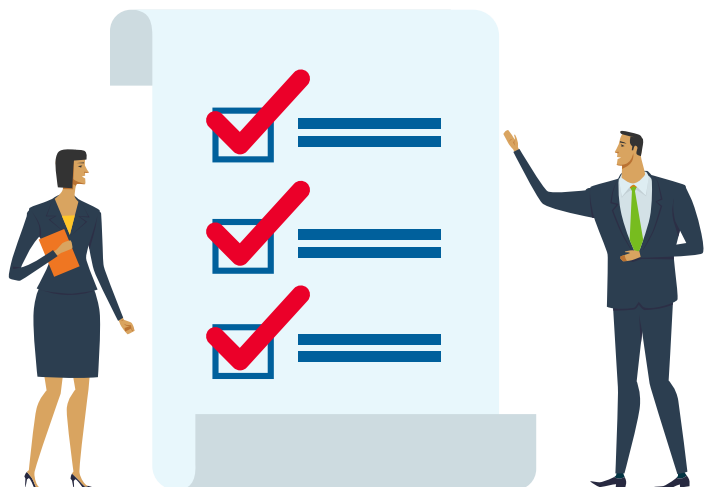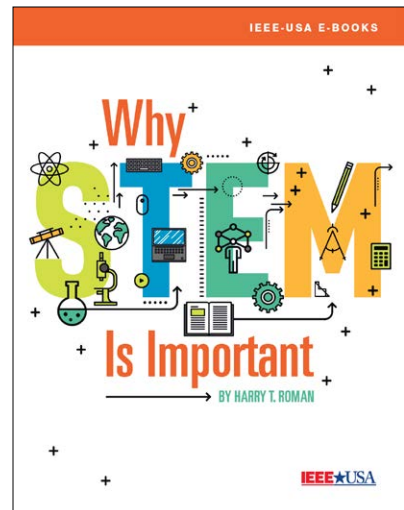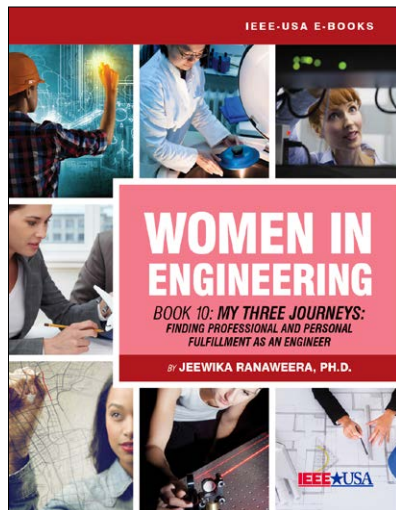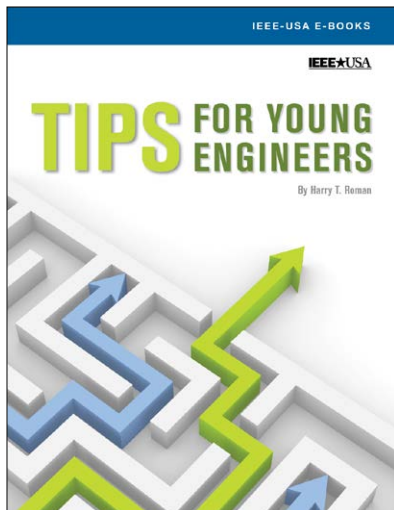
(From left to right) IEEE-USA's award winning e-books,: *Tips for Young Engineers, Women in Engineering—Book 10,* and *Why Stem Is Important.*

volume, in the award-winning *Women in Engineering* series, as well as three surveys (the *2016 Consultants Fee Survey*, the *2016 Employment Survey Report*, and the *2016 Salary Survey*), five Industry Reports, and the award-winning *2015 IEEE-USA Annual Report*. IEEE-USA staff also updated and reissued an additional 17 titles on a range of topics—including start-ups, shaping your career, lifelong employability, and maintaining a living resume.

A total of 13,934 titles were downloaded from the IEEE-USA web store; and an additional 39,852 titles from the IEEE-USA *Women in Engineering* series e-books were distributed through special arrangements with Carnegie Mellon University, Queens College Ontario and James Madison University.

Carnegie Mellon and Queens College Ontario each distributed to its student populations, at 13,000 and 24,852, respectively. James Madison University distributed 2,000 for recruiting and teaching in their School of Engineering, and for local outreach efforts.

The IEEE-USA *Women in Engineering* series e-book: *My Three Journeys—Finding Professional and Personal Fulfillment as an Engineer*, by author Jeewika Ranaweera, Ph.D., a principal hardware engineer at Oracle, was distributed to more than 136,000 technical staffers at Oracle. From IEEE-USA's award-winning *Women in Engineering* e-book series, the e-book highlights Ranaweera's personal and professional journey from childhood in Sri Lanka, to a high-tech career in Silicon Valley.

IEEE-USA also expanded its portfolio of email newsletters sent directly to U.S. IEEE members. In addition to the monthly *IEEE-USA InSight Email Update,* and the quarterly *IEEE-USA Conference Brief*—our communications team, in conjunction with Member & Professional Activities staff, launched a monthly email update, the *IEEE-USA Future Leaders Connection*—geared toward student members and young professionals. Building on the success of the inaugural Future Leaders Forum, the *Future Leaders Connection* delivers resources to help students and YPs at the beginning of their careers. The *Connection* had an open rate of 30% in the first three months— one of the highest in all of IEEE's email campaigns.

During 2016, IEEE-USA's electronic publications received a total of 21 awards for publication excellence from Apex, Hermes Creative, and The Communicator's International Academy of Visual Arts and Sciences.

BUILDING OUR MEMBERS' CAREERS

Young professionals aspiring to be future leaders packed IEEE-USA's first Future Leaders Forum opener in The Big Easy.

Future Leaders: The inaugural IEEE-USA's Future Leaders Forum debuted 26-28 July, in New Orleans, and targeted IEEE Student Members and Young Professionals. This first-of-its-kind event drew more than 275 participants, featuring executive talks from Google, Linked-In, Microsoft, Cisco, Coca-Cola, Intel, GE Global Research, Entergy, Walt Disney Imagineering, Goldman Sachs, Accenture, and a host of entrepreneurial start-ups. For more

(Left to right) "Father of the Internet," Vint Cerf, hangs out with an aspiring leader at IEEE-USA's first Future Leaders Forum.

information including session videos, visit: **https://futureleaders.ieeeusa.org/events/ future-leaders-forum-2016/.**

IEEE-USA is leveraging the success of the Future Leaders Forum, in coordination with the IEEE Young Professionals and IEEE-MGA Student Activities groups, by developing an online community and communications outreach program to engage graduating students and young professional members. The goal is to provide targeted information and services that will enhance member value, and improve membership retention, during the critical first three post-graduation years. IEEE-USA has also begun preparing for the next Future Leaders Forum in 2018.

CareerConnect Community: IEEE-USA originated and supports CareersConnect-USA, an IEEE Collabratec community that provides IEEE members with a resource for career-related discussions, networking and mentorship, and posts employment notices and internship

opportunities. Since its launch in Fall 2015, CareersConnect-USA has grown to nearly 2,600 participants.

Professional Activities (PACE): IEEE-USA's Professional Development Fund supported more than 100 local professional activities projects (e.g., events, workshops, speakers, STEM projects, etc.), at the Section, Chapter, or Region levels, in U.S. Regions 1-6.

The IEEE-USA Board also used PACE funding to co-sponsor the Region 6 Rising Stars Conference, held in January in Las Vegas, in conjunction with the Consumer Electronics Show. Rising Stars is a Region 6 initiative to engage young professionals.

Student Professional Activities (SPAx): IEEE-USA sponsored 54 SPAx activities, organized by U.S. IEEE student groups, in all six U.S. regions,

2016 STUDENT PROFESSIONAL ACTIVITIES

DATE	SCHOOL	DATE	SCHOOL
1/7	Stanford	9/18	North American Power Symposium
1/22	Southern Methodist University	9/18	U. of Illinois at Urbana-Champaign
2/16	DeVry University Online	9/19	Norwich University
2/16	UCLA	9/22	University of Rhode Island
2/16	Ohio University	9/26	Zane State College
2/22	Cleveland State University	10/5	Shepherd University
2/22	Florida Institute of Technology	10/6	Liberty University
2/23	University of Texas at Arlington	10/7	University of Virginia
3/8	Valparaiso University	10/12	DeVry University (Columbus)
3/14	University of Maine	10/15	University of Alaska-Anchorage
4/2	UCSD	10/18	Gonzaga University
4/6	Ohio University	10/28	Long Island University
4/9	Region 5 Meeting—U. of Missouri-Kansas City	11/8	Eastern Michigan University
4/9	The Pennsylvania State University	11/9	Central Michigan University
4/10	The Pennsylvania State University	11/12	Christian Brothers University
4/12	DeVry University Online	11/14	University of Houston-Clear Lake
4/15	California State University-East Bay	11/14	Norwich University
4/16	California State University-East Bay	11/15	Ohio University
4/16	Central Michigan University	11/15	University of California-Los Angeles
4/17	California State University-East Bay	11/16	University of Pittsburgh
4/22	Gonzaga University	11/18	Christian Brothers University
4/29	University of Hawaii at Manoa	11/29	Grove City College
5/3	DeVry University (Columbus)	11/29	University of Wisconsin-Stout
5/12	University of Washington-Seattle	12/2	Cleveland State University
6/14	DeVry University Online	12/12	University of Washington-Bothell
9/8	Cleveland State University	12/14	University of California-Riverside
9/13	Ohio Northern University	12/15	The Ohio State University

during 2016. On 15 Oct., IEEE-USA successfully utilized the Facebook Live social media platform to deliver its first live-streaming SPAx event, coordinated with the University of Alaska-Anchorage Student Branch. The event featured Disney Imagineers Jonathan Chew and Leo Szeto, presenting on

Secrets to Being a World-Changer, and reaching more than 150 online viewers, in addition to the onsite audience.

Webinars: IEEE-USA produced 30 webinars in 2016. In addition to 11 regular Government Relations

IEEE-USA'S 2017 CAREER WEBINAR SERIES

WEBINAR	MODERATOR(S)
Taking Challenges to Opportunities: Tips and Tricks to Own Your Career	Tim Worboys
Civility in the Workplace	Nathalie Thompson
Preparing Reliable Estimates for Professional Services	Kayne McGladrey
Knowing the Secret to Being a World-Changer	Jonathan Chew & Leo Szeto
Teaming at a Distance: Learn How to Make Remote Teams Work for You and Your Company	Pamela Estes Brewer, Ph.D.
Patent Cooperation Treaty	Layla Lauchman (USTPO)
What Small Business Owners, Inventors and Entrepreneurs Need to Know about China	Tom Moga
Landing Your Dream Job in Today's Competitive Landscape	John Collins
Employee Engagement—How to Take the Reins and Get Involved	Elizabeth Lions
Global Dossier—Modernizing the Global Patenting System	Jessica Patterson & Nelson Yang (USPTO)
Copyrights—What's Copyright Got to Do With It?	Susan Anthony (USPTO)
Patents—What's the Process? Forms, Fees, Office Actions, Rejections and Allowances	Elizabeth Dougherty (USPTO)
Good Girls Ask: Negotiation Techniques for Women	Elizabeth Lions
Mastering Tricky Conversations: How to Talk to Anyone about Anything	Deborah Grayson Riegel, MSW, PCC
Patents: An Overview—Provisional and Nonprovisional Utility Patent Applications	Elizabeth Dougherty
Radical Risk Identification—Bringing Risk Management into the 21st Century	Laurie Wiggins
Tailoring Your Online Resume to Your Strengths	Don Herres and Jenna Turman
Emotional Intelligence	Elizabeth Lions
IEEE Collabratec	Justine Spack

updates, 19 other webinars included such popular topics as emotional intelligence, managing tricky conversations, teaming at a distance, and preparing reliable estimates for professional services. One highlight of the 2016 offerings was a series of patent and copyright-related presentations—delivered in partnership with the U.S. Patent Office.

Career/Professional Surveys: In Sept., IEEE-USA released its *2016 IEEE-USA Salary & Benefits, Consultants Fee*, and *Employment Survey Reports*:

★ More than 9,500 U.S. IEEE members participated in the *2016 IEEE-USA Salary and Benefits Survey*. Key findings include a 3.85% rise in median income for all electrotechnology and information technology professionals, and a widening in the compensation gap for men and women—reversing recent trends. An online Salary Calculator captures data that survey takers and subscribers can use to benchmark compensation.

★ In October, IEEE-USA also released five special *Salary Industry Reports*, drawing data from the *2016 Salary Survey*, with a focus on compensation in the systems and controls, power and energy, and computing/information technology fields. In addition, cross-cut reports examined compensation trends for women and young professionals.

★ Nearly 600 IEEE members/consultants responded to the *2016 IEEE-USA Consultant's Fee Survey.* Among the highlights, the median hourly rate U.S. IEEE members/consultants charged jumped 17% to $167.

★ More than 350 U.S. IEEE members responded to our annual *2016 IEEE-USA Employment Survey,* used to assess unemployment problems among IEEE's U.S. members. Although the percentage of U.S. members reporting periods of unemployment dropped by nearly one-third, the median length of time spent unemployed jumped to 92 weeks, up from an average of 60 weeks in previous years' reports.

Consultants Networks and Services: The IEEE Consultants Network, a member affinity group, has grown by 46% to 4,223 members during 2016 (with 1,849 U.S. and 2,374 non-U.S. members). IEEE-USA services the Network with a quarterly newsletter; and 330 Network members currently subscribe to IEEE-USA's online Consultants Directory, to advertise their services. IEEE-USA also supports a "Consultants Exchange" community in IEEE Collabratec, with nearly 300 participants.

In addition, the Coordinating Committee for IEEE-USA's Alliance of IEEE Consultants Networks put on a half-day workshop for members/consultants in the IEEE New York City Section this spring. A meeting was also held in December, with the Board of Directors, for the Consultants Network of Silicon Valley (the largest IEEE local consultants nework), to share ideas and discuss ways the committee can better serve local networks and members.

Engineering and Software Licensure: In partnership with the IEEE Computer Society, the National Society of Professional Engineers, the Texas State Board of Licensure, and the National Council of Examiners for Engineering and Surveying (NCEES), IEEE-USA continues to support the new P.E. software licensure examination. Administered annually in the spring,

15 individuals took the 2016 exam. NCEES will assume responsibility for the exam in 2018.

IEEE-USA also provided ongoing support to NCEES, by providing item writers and subject matter experts for the Fundamentals of Engineering (FE) and Principles and Practices of Engineering (PE) examination programs, and volunteer leaders for related NCEES policy committees in 2016.

Entrepreneurship Activities: Members of IEEE-USA's Entrepreneurship Policy and Innovation Committee (EPIC) provided public policy-oriented sessions on issues affecting small businesses and entrepreneurs at the IEEE N3XT events, held in Austin, Texas (17 Sept.), and Toronto, Canada (1 Oct.).

During 2016, IEEE-USA explored a proposal to partner in an equity crowd-funding service for technology professionals, but elected not to proceed.

CareerExpo: IEEE-USA continues to provide promotional and other support for the Region 6 Virtual Career and Talent Expo, offering all U.S. members access to virtual job fairs, a personal skills assessment, and related career development resources.

Women in Engineering Forum USA–East: IEEE-USA was a co-sponsor of the 2016 IEEE Women in Engineering USA-East Forum, held on 1-3 Dec., in Boston, Mass. The Forum's featured speakers included 2016 IEEE-USA Vice President for Government Relations, Maura Moran.

SERVING HUMANITY, PROMOTING STEM LITERACY, AND ENHANCING PUBLIC AWARENESS OF ENGINEERING

MOVE Vehicle Supports STEM Outreach at Morningstar Academy, Jacksonville, Florida

THE MOVE PROJECT

IEEE-USA's most prominent public visibility effort for 2016 has been the IEEE-USA MOVE (Mobile Outreach Vehicle) Community Outreach Initiative. Working in partnership with IEEE Regions 3 and 5, and the American Red Cross, IEEE-USA unveiled the MOVE Emergency Response Vehicle in May— with an eye-catching exterior design created in-house, by IEEE-USA's own communications staff.

Based at the University of North Carolina-Charlotte, and manned by a dedicated group of IEEE members trained as Red Cross volunteers, the MOVE vehicle deploys to provide short-term communications, computer and power solutions to the Red Cross, as it serves communities affected by disasters. When not deployed for humanitarian reasons, the vehicle is used to support both K-12 STEM education

outreaches and public visibility appearances. The Red Cross mobilized the IEEE-USA MOVE disaster relief vehicle to Charleston, West Virginia, in early July. It provided communications and Internet connectivity to Red Cross personnel and caseworkers assisting West Virginians devastated by heavy flooding that killed 24, and destroyed more than 1,200 homes.

In mid-August, the MOVE vehicle supported the Red Cross in southern Louisiana, providing communications and Internet connectivity to aid Louisianans displaced by heavy regional flooding. Officials described it as "the worst natural disaster to strike the United States since Superstorm Sandy."

On the heels of their August deployment to flood-affected areas of Louisiana, the IEEE-USA MOVE Emergency Response Vehicle then deployed twice in September, to assist the Red Cross in Wilmington, N.C., in the wake of tropical storm Hermione; and to Fayetteville, N.C., as part of a smoke alarm/home safety community outreach.

In mid-October, the IEEE-USA MOVE vehicle deployed for two weeks to the Red Cross Regional Headquarters in Fayetteville, N.C.; and then to Greenville, N.C., to provide emergency Internet/communications support for Red Cross operations in areas Hurricane Matthew disrupted. At one point, over two million people in the hurricane-affected areas, along the U.S. East Coast, were without power.

In December, the MOVE Truck assisted Red Cross efforts in communities affected by the Tenessee wildfires.

In addition to disaster deployments, the MOVE vehicle also supported the Red Cross' home fire awareness campaigns in May and September. The team helped install smoke alarms, and shared information on electrical safety, at these engagements.

When not supporting the Red Cross in its disaster relief efforts, the MOVE team conducted more than a dozen K-12 educational outreach events, reaching nearly a thousand students and educators—as well as scheduled appearances at IEEE conferences and other public events.

From left to right: IEEE-USA's MOVE vehicle has deployed to Missouri, Tennessee, Florida, North Carolina and Louisiana; volunteers have assisted natural disaster victims with short-term communication infrastructure, computer and power solutions.

Girls and boys of all ages enjoyed science and technology activities, experiments and exhibits at National Engineers Week Family Day, 27 February, at the National Building Museum. The event drew more than 8,000 parents, teachers and K-12 students.

50K Coalition: IEEE-USA partners with NSBE (National Society of Black Engineers), and other engineering societies, in support of the 50K Coalition—a multi-society effort to generate 50,000 diverse engineers graduating annually by 2025. In addition, IEEE-USA formed an adhoc committee in 2016 to address the issue of diversity in the workforce.

U.S. Advisory Committee to UNESCO: Former IEEE-USA and IEEE President Gordon Day served as IEEE-USA's 2016 representative to the U.S. Advisory Committee to UNESCO. The Committee advises the State Department on U.S. participation in UNESCO, and its support for development programs around the world.

OTHER PUBLIC AWARENESS/K-12 STEM ACTIVITIES

Other 2016 highlights and activities in the areas of public awareness and K-12 STEM include:

★ IEEE-USA arranged for IEEE volunteer Pamela Jones, and a group of Baltimore area middle/high school robotics competitors, to participate in the 3rd Annual State of STEM (SoSTEM) event, held at the White House, on 13 January 2016. Held the day following the President's State of the Union address, SoSTEM provided its select audience of young innovators with opportunities to interact with government, science and technology leaders and researchers, in the areas of robotics, space and Antarctica.

★ IEEE-USA held its annual Awards Ceremony on 30 Jan., in conjunction with the joint Region 4, 5 and 6 Meetings in Las Vegas, Nevada.

★ IEEE-USA Past President Marc Apter presented the Best Communications System and Overall Third Place Awards, at the IEEE-USA-supported Future City Competition National Finals, on 16 Feb., in Washington, D.C.

★ IEEE-USA was a major sponsor of Discover Engineering Family Day, an annual EWeek event, held on 27 Feb., at the National Building Museum. Family Day drew more than 8,000 parents, teachers, and K-12 students interested in

learning more about engineering and computing. Featured guests included former NASA Shuttle astronaut, Roger Crouch; and engineer/entrepreneur/TV celebrity, Nate Ball.

★ The IEEE-USA-originated DiscoverE Future City Competition received two major recognitions in 2016. Turner Construction and the National Building Museum presented Future City with the Henry C. Turner Prize, and a $25K honorarium for advancing a STEM-literate workforce. The Future City Competition also received a $100,000 grand prize from the Underwriters Laboratories Innovative Education Award program. Sixth-through eighth-grade participants in the annual Future Cities Competition use software to design smart and sustainable cities of the future.

★ IEEE-USA was an official partner of the U.S.A. Science and Engineering Festival, held 16-17 April, at the Washington Convention Center, in Washington, D.C. A celebration of U.S. STEM, the Festival drew more than 350,000 attendees, who sampled over 3,000 hands-on exhibits and activities, and 30 stage shows, sponsored by over 1,000 STEM-related organizations. IEEE-USA's exhibit featured participatory activities related to circuits, light and sound, along with historical materials the IEEE History Center provided; and informational materials on IEEE's pre-university resources, such as TryEngineering.org.

★ IEEE-USA debuted two new K-12 STEM videos during the U.S.A. Science and Engineering Festival (16 April). The videos themes were "The World You Want To See," and can be viewed on-line at: **https://www.youtube.com/user/IEEEUSA**.

★ A student team from Hyde Park Middle School (Nevada), competing as national finalists in the IEEE-USA-supported Future Cities Competition, was invited to participate in the 6th Annual White House Science Fair (13 April).

2013 IEEE-USA President, Marc Apter, with Best Communication System and Third Place Overall Winners, at the 2017 Future City Competition, in Washington, D.C.

★ On 16-18 June, IEEE-USA exhibited at Awesome-Con, as part of a special "Science Fair" that The Discovery Channel sponsored, featuring Bill Nye, the "Science Guy." A popular culture, gaming and comic book convention, some 50,000 people attended. AwesomeCon has emerged as the largest East-Coast equivalent to the popular San Diego-based, ComicCon.

★ Partnering with Region 1 and IEEE Educational Activities, IEEE-USA exhibited at the 2016 Maker-Faire, in New York City, on 1-2 Oct. Described as "part science fair, part county fair, and part something entirely new," Maker-Faire celebrates the "Maker Culture." And it provided a venue for IEEE-USA to help raise IEEE visibility, and promote engineering careers—to an estimated audience of more than 95,000 attendees.

SHAPING PUBLIC POLICY

PROGRESS ON OUR 2016 PUBLIC POLICY ADVOCACY PRIORITIES	
Research/Innovation	**IEEE-USA worked with Sens. Gardner, Peters and Thune to craft provisions of the Senate's *America Competes* reauthorization bill; and opposed the House version of the *Competes* bill.** **IEEE-USA also successfully supported development/introduction of legislation designed to reduce administrative burdens on federally-funded researchers, that appeared in several bills (e.g., S.3084, HR. 5583, the *National Defense Authorization Act*, and the *Cures Act*)**
Energy	**A comprehensive, bipartisan, energy bill was introduced in the Senate, with IEEE-USA-supported provisions; but no final action was taken.**
K-12 STEM Education	**IEEE-USA supported K-12 STEM education provisions in the *Elementary and Secondary Education Act* reauthorization legislation, which passed with IEEE-USA-backed computer education and Noyce Scholarship provisions intact.**
Patent Reform	**IEEE-USA successfully opposed several patent reform bills introduced in the House and Senate; which stalled, due to broad opposition.**
Skilled Immigration Reform	**Despite the introduction of several bills, Congress took no action on high-skill immigration reform. Attempts to increase the H-1B visa quota, independent of reforms, were effectively blocked. IEEE-USA's push for investigation of H-1B/outsourcing abuses gained some traction. IEEE-USA also commented on a White House proposal for "parole" immigration, to aid entrepreneurs' entry and investment.**
Federal Travel Restrictions (Impact on S&T)	**IEEE-USA worked with a coalition of science and engineering societies, national laboratories, and others concerned with proposed legislation that would add further restrictions for federal scientists and engineers to travel to conference-related activities. Two House bills (HR 2032 and HR 2810), introduced to further restrict travel, failed to see action; while Senate sponsors of the *American Innovation and Competitiveness Act* (S.3084), agreed to include language directing federal agencies to streamline approval authority for conference travel, with the goal of processing all requests within 30 days. Of related interest, NASA released updated guidance in March 2016, exempting a list of eight specific conferences/events from the requirement of a waiver; raising the waiver amount for other conferences to $90K, and increasing the cut-off for NASA participation in foreign conferences.**

★ Working with concerned IEEE members in California, IEEE-USA helped successfully oppose adoption of **Assembly Bill AB 1681**, state legislation that would have prohibited the sale of smartphones with unbreakable encryption, within the state's jurisdictional borders.

★ IEEE-USA joined a dozen engineering organizations in supporting an 11 Feb. briefing on Capitol Hill for the **Congressional Manufacturing Caucus,** on the subject of Advanced Manufacturing. IEEE Fellow and NSF Asst. Director for Engineering, Dr. Pramod Khargoneka, served on the briefing panel.

★ Forty-nine U.S. IEEE members visited 78 congressional offices, as part of the **2016 Science, Engineering and Technology Congressional Visits Day (13 April)**, which IEEE-USA leads.

Top: President Pete Eckstein enjoys the training session, to prepare for IEEE-USA's Congressional Visits Day (CVD). Bottom: President Pete Eckstein with fellow CVD participants.

Our participants joined more than 200 scientists and engineers from other participating professional societies, in promoting congressional awareness of the importance of science and technology, and to push Congress to fund science & technology research programs.

★ IEEE-USA organized a meeting between IEEE members in Houston and Rep. John Culberson. Rep. Culberson is a senior appropriator, and Chair of the Appropriations Subcommittee on Commerce, Justice and Science, which has jurisdiction over most of the federal government's research initiatives. The Congressman used the meeting to send a message to the National Institute of Standards and Technology about his concerns regarding **NIST security procedures**.

★ In May, IEEE-USA filed an amicus curiae brief with the United States Supreme Court, supporting a petition for grant of certiorari in ***MCM Portfolio LLC vs. HP and USPTO***, a case concerning the constitutionality of the USPTO's post-grant inter partes patent reviews. The Supreme Court decided not to hear the case.

★ With input from IEEE's IoTS Committee and IoTS community, IEEE-USA provided comments on 2 June, in response to a request for public input by the U.S. National Telecommunications and Information Administration, on the benefits, challenges and potential roles of government in fostering the advancement of the **Internet of Things**.

★ IEEE-USA hosted three briefings for the U.S. Congress in June, observing the **5th Anniversary of the National Robotics Initiative (9 June)**— partnering with the National Science Foundation on the importance of research in developing patents (15 June), and examining the regulation of research (22 June). IEEE-USA sponsored the National Robotics Initiative Anniversary Event, in partnership with Carnegie Mellon University, the American Chemical Society and Georgia Tech. The event featured a briefing, reception

and interactive exhibit, highlighting the work of federally funded robotics investigators. The speaker panel included IEEE members Dr. Henrik Christensen, of the Institute for Robotics and Intelligent Machines at Georgia Tech University; and Dr. Lynne Parker, Division Director of the Information and Intelligent Systems Division at the National Science Foundation, who heads the NRI Interagency Working Group on Robotics, at the National Science Foundation.

★ IEEE-USA recommendations for reducing administrative burdens on federally-funded researchers were incorporated into two bills: the **American Innovation and Competitiveness Act** (S.3084) and the **University Regulation Streamlining and Harmonization Act of 2016 (H.R. 5583)**. A congressional briefing, in late June, on "Regulating Research: Improving Government Oversight to Enhance America's Competitiveness," highlighted the issues, and IEEE-USA's proposals. Congress added portions of these bills to legislation President Obama signed into law, in early January 2017.

★ IEEE-USA President Pete Eckstein joined U.S. Rep. Pascrell (D-N.J.), in an 18 July press conference, highlighting the introduction of Pascrell's **H-1B and L-1 Visa Reform Act (H.R. 5657)**, a companion bill to legislation (S. 2266) that Sens. Charles Grassley (R-Iowa) and Dick Durbin (D-Il.) introduced in the Senate.

★ IEEE-USA awarded **2016-17 Government Fellowships** to Dr. Thomas Colvin (Sunnyvale, Calif.); Mr. Jonathan Raymer (Washington, D.C.); Mark Olive (Derby, Kan.); and Yan Zheng (Washington, D.C.).
  • Colvin served as an Engineering and Inter-national Development Fellow, with the U.S. Agency for International Development, in the Office of the Inspector General.
  • Raymer served as IEEE-USA's Engineering and Diplomacy Fellow, and the U.S. State Department assigned him to its Global Engagement Center's Data Analytics Office.

A demonstration at the National Robotics Initiative 5th Anniversary Event.

  • Olive accepted a Congressional Fellowship placement in the office of U.S. Senator Michael Rounds (R-S.D.).
  • Zheng accepted a Congressional Fellowship placement in the office of Senator Christopher Coons (D-Del.).

★ At the request of the State Department, IEEE-USA agreed to extend the **Engineering & Diplomacy Fellowship** awarded last year to Dr. Benjamin Schmitt, who was assigned to serve as the State Department's Energy Diplomacy Officer for Europe.

★ In July, IEEE-USA also extended its Fellowship support for Dr. Greg Shannon, of Carnegie-Mellon University, who is serving as Assistant Director for Cybersecurity Strategy in the White House's Office of Science and Technology Policy. During his tenure at OSTP, Dr. Shannon was responsible for coordinating the development of the updated **Federal Cybersecurity R&D Strategic Plan**, as well as advising on administration efforts to promote cybersecurity innovation and work-force development.

★ In July, IEEE-USA agreed to lead the **Energy Sciences Coalition Stakeholder Outreach Group**, responsible for building a network of National Labs and industry groups, funded by the Department of Energy's Office of Science.

★ In August, IEEE's **2016 WISE Interns** completed their summer public policy program, and their research is now available online in the WISE Journal of Engineering and Public Policy. Michael Crenshaw (Liberty University) outlined a proposal for "License Plates for Drones: Resolving Privacy Concerns Using Remote Identification Technology." Logan DiTullio (Clemson University) examined "Safety and Privacy Policy Regarding Unmanned Aircraft Vehicles (UAVs)." Jen Madary (Penn State) offered recommendations on "Addressing Cybersecurity Vulnerabilities and Threats to Implantable Medical Devices." Copies of all WISE Intern papers are available at: **http://www. wise-intern.org/journal/2016/WISE2016.html**.

★ IEEE-USA formed an ad hoc committee on Artificial Intelligence in August, to provide input to the **IEEE Global Initiative for Ethical Considerations in the Design of Autonomous Systems**.

★ IEEE-USA joined with the National Science Foundation, Howard University and the University of Illinois Information Trust Institute to provide support for IEEE's focused workshop on **"Exploring Cybersecurity Challenges in Electrified Transportation,"** held on 24-25 Feb., in Washington, D.C.

★ IEEE-USA organized a 21 Sept. briefing and reception for the **Congressional Inventions Caucus** on **"Inventing Our Way to National Wealth."** Representatives from NASA, Enventys, and the U.S. PTO, as well as representatives from USInventor.org, Carnegie Mellon University and University of California-Irvine, gave featured presentations at the briefing. During the reception, Members of Congress interacted with a host of individual inventors, highlighting their work in such areas as self-healing electroplated aluminum layers, a breast cancer surgery recovery shirt, wearable pepper spray, waterproof drones, gesture-driven computer interfaces, and more.

★ In Sept., IEEE-USA began exploring collaborations on advocacy and outreach events, to promote research and entrepreneurship with the **National Council of Entrepreneurial Tech Transfer (NCET2)**, an organization composed predominantly of university tech transfer officers.

★ On 11 Oct., IEEE-USA organized a site visit for U.S. Senators Bill Nelson (D-Fla.) and John Thune (R-S.D.), of the **Sanford Underground Research Facility in Lead, South Dakota**. The Dept. of Energy-affiliated lab, located nearly 5,000 feet underground, in the former Homestake gold mine, has supported research related to dark matter, neutrinos and geological aspects of energy extraction. In conjunction with the visit, former IEEE President Richard Gowen presented Senator Thune with the U.S. engineering community's 2016 George E. Brown Award for leadership in advancing federal S&T.

★ On 6 Dec., the STEM Education Coalition, in which IEEE-USA participates, delivered a post-election congressional briefing on **"Connected STEM Learning: Transitioning to a New Vision of Delivering STEM Education."**

★ On 14 Dec., IEEE-USA delivered an industry panel session on "IoT Governance in the USA—Policy Challenges & Issues" for the **IEEE World Forum on the Internet of Things Conference**, held 12-14 Dec. in Reston, Virginia.

★ In response to requests, IEEE-USA continues to actively support both IEEE's Internet Initiative and the Global Connect partnership, with the U.S. State Department, to promote global internet access. IEEE-USA has also provided comments on draft positions of the **IEEE European Public Policy Initiative**.

★ During 2016, IEEE-USA released eight new or up-
dated **position statements** on the following topics:
  • Continued Professional Competence of IEEE's
    U.S. Members
  • Educational Requirements for Engineering
    Licensure
  • Federal Support for Fundamental Research
  • K-12 STEM Education
  • Multiple Patent Claims Forms
  • Patent Prior Art and Grace Period
  • Reverse Engineering
  • The Use of the Title "Engineer"

★ IEEE-USA released 23 **policy communications**
to Congress and the executive branch, including
statements for a Senate Judiciary Committee
hearing on skilled immigration; and for a House
Appropriations Committee hearing on the 2017
S&T budget.

★ During 2016, **IEEE-USA Government Relations**
staffers delivered talks to 13 local IEEE groups,
including: the University of Illinois (6 Jan.),
Winston-Salem, N.C. (10 Feb.), Indianapolis
(16 Feb.), Sierra Vista, Ariz. (Two talks - 24 Feb.),
Austin (26 Feb.), Houston (31 March), Norfolk,
Va. (1 April), Manassas, Va. (8 June), St. Louis,
Mo. (8 June), Denver (21 Sept.), Rockport, Il.
(7 Oct.), and Amarillo, Texas (27 Oct.).

★ IEEE-USA staff met with **Idaho National Lab,
Ames National Laboratory and Sanford Under-
ground Research Facility** leaders, to discuss
closer ties between IEEE-USA, IEEE members
and the national labs. Further meetings are
planned for 2017.

★ IEEE-USA held its annual **Small Technology
Business Symposium**, on 9 Dec., in Washington,
D.C. Organized in partnership with the federal
Small Business Administration and the Senate
Small Business and Entrepreneurship Committee,
the Symposium brings together representatives
from federal agencies/programs charged with
supporting small technology business, along
with business representatives and others, to
discuss issues affecting small technology
businesses, and opportunities for useful
federal collaborations.

IEEE-USA AND THE AMERICAN ASSOCIATION OF ENGINEERING SOCIETIES

The American Association of Engineering Societies received a 2016 American Society of Association Executives (ASAE) Power of A (association) Gold Award for its role in developing an *Engineering Competency Model* for inclusion in the U.S. Department of Labor's *Competency Model Clearinghouse.* The model provides a general introduction to the basic knowledge, skills and abilities needed to successfully perform a work role, function, or task in the generic field of engineering.

On behalf of the American Association of Engineering Societies (AAES), IEEE-USA President Peter Eckstein presented the John Fritz Medal for "outstanding scientific or industrial achievements" to IEEE Fellow Dr. H. Vincent Poor (Princeton), during an April 18th awards ceremony hosted at the National Academy of Engineering. At the same ceremony, the AAES National Engineering Award was presented to IEEE Fellow Dr. Sarah Rajala (Iowa State).

IEEE-USA arranged for an IEEE-EA representative to participate in an AAES Committee on Engineering Education, working in partnership with an NSF-funded NAE study, exploring the role of professional engineering societies in supporting engineering education.

IEEE-USA 2016 BOARD OF DIRECTORS

Front Row (L-R): Ron Jensen, Timothy Kurzweg, Bala Prasanna, Jim Jefferies, Peter A. Eckstein, Karen Pedersen, James Conrad, Devon Ryan, Maura Moran, Scott Tamashiro. **Back Row (L-R):** Francis Grosz, Jr., Kathy Land, Mauro Togneri, Chris Brantley, Guru Madhavan, Daniel Donahoe, Ronald Tabroff, Robert Parro, and Thomas Coughlin.

2016 PRESIDENTIAL ENGAGEMENTS

In addition to chairing the IEEE-USA Board of Directors, and overseeing volunteer and staff structure responsible for implementing the activities described in this report, IEEE-USA President Pete Eckstein participated in a full calendar of outreach activities and events, in his role as IEEE-USA President—to advance IEEE-USA's member engagement and public visibility goals, including:

DATE	OUTREACH EVENT	LOCATION
1-4 January	IEEE (Region 6) Rising Stars Conference	Las Vegas, Nev.
26 February	Meeting With U.S. State Dept. Science and Technology Advisor	Washington, D.C.
27 February	Discover Engineering Family Day	Washington, D.C.
11-13 March	IEEE Region 2 Meeting	Pittsburgh, Pa.
1-3 April	IEEE SoutheastCon	Norfolk, Va.
11-12 April	Engineering Societies' Congressional Visits Day	Washington, D.C.
17-19 April	AAES Spring Assembly	Reston, Va.
1 May	New Jersey Coast Section Awards Banquet	Middletown, N.J.
19 May	New Jersey Coast Section Milestone Event	Middletown, N.J.
4 June	Princeton/Central Jersey Section Awards Banquet	Princeton, NJ
18 July	News Conference with Rep. Pascrell	New Jersey
27-31 July	IEEE-USA Future Leaders Forum	New Orleans, La.
5-7 August	Region 1 Board Meeting	Mystic, Conn.
30 September -2 October	Maker Faire	Astoria, N.Y.
14-16 October	IEEE Region 7 (Board and Collaboration Meeting)	Canada
1-3 December	IEEE Women in Engineering Forum East	Boston, Mass.

2016 IEEE-USA AWARDS AND RECOGNITIONS

IEEE-USA 2017 President-Elect Karen Pedersen and 2016 IEEE-USA President Pete Eckstein present Charles Alexander, with IEEE-USA's esteemed Robert S. Walleigh Award.

Robert S. Walleigh Distinguished Contributions to Engineering Professionalism Award

Dr. Charles Alexander (Region 2)

For leadership in professional activities, the development of professional and student programs, and the support and mentorship of IEEE-USA volunteers

Award for Distinguished Public Service

Kevin Johnson (Region 1)

For sustained leadership in furthering reform of non-compete agreements in employment contracts

George F. McClure Citation of Honor

Mary Ellen Randall (Region 3)

For long term contributions to IEEE's professional aims in the United States, including the IEEE-USA MOVE Community Outreach Initiative

Dr. Sherali Zeadally (Region 3)

For outstanding research and educational contributions to promote and strengthen cybersecurity awareness in the United States

K-12 STEM Literacy Educator-Engineer Partnership Award

Desiree Awiszio and Olga Serebrennikov

For collaboration supporting the development of K-12 student math skills, and its application in engineering

Jim Watson Student Professional Awareness Achievement Award

Steve Watkins (Region 5)

For sustained contributions to the professional development of students, and for outreach to precollege students

Entrepreneur Achievement Award for Leadership in Entrepreneurial Spirit

William Hurley (Region 5)

For furthering entrepreneurship in the United States

Regional Professional Leadership Award

Emilio Salguiero (Region 2)

For dedicated leadership in support of professional activities in Region 2

Professional Achievement for Individuals Award

Ademola Peter Adejokun (Region 5)

For contributions to IEEE professional activities, and for his efforts to professionalize software engineering

Dr. Samee U. Khan (Region 4)

For outstanding leadership and service contributions to IEEE committees, conferences, workshops and journals, in the area of computer systems

Harry Diamond Award

Dr. Bruce Suter (Region 3)

For contributions to the theory and practice of big data for aerospace systems

Award for Distinguished Literary Contributions Furthering Public Understanding and the Advancement of the Engineering Profession

John Toon (Region 3)

For journalistic efforts to expand the public understanding, and the advancement of science and technology, in the United States

2016 IEEE-USA-SPONSORED CONFERENCES

Working in partnership with IEEE Technical Societies, U.S. Regions and Sections, IEEE-USA sponsored, or technically co-sponsored, 15 technical/ professional meetings in 2016:

2016	CONFERENCE
21 March	IEEE International Symposium on Medical Information and Communications Technology
7-8 April	IEEE Green Technologies Conference
2-5 May	IEEE PES Transmission and Distribution Conference & Expo
10-12 May	IEEE International Symposium on Technologies for Homeland Security
13-14 May	IEEE International Symposium on Ethics in Engineering, Science and Technology
5-10 June	IEEE Photovoltaics Conference
18 August	IEEE Region 4 Smart Grid Workshop
12-16 September	International Conference on Connected Vehicles & Expo
25-29 September	Digital Avionics Systems Conference
26-29 September	IEEE International Conference on Wireless for Space & Extreme Environments
9-11 October	IEEE Conference on Technologies for Sustainability
14-16 October	IEEE Global Humanitarian Technologies Conference
20 October	IEEE Ubiquitous Computing, Electronics and Mobile Communications Conference
1-3 December	IEEE Women in Engineering (WIE) Forum East
3 December	Signal Processing in Medicine & Biology Symposium

IEEE-USA also sponsored exhibits at the IEEE Power and Energy Society's Transmission and Distribution Conference (2-5 May) and General Meeting (17-21 July).

2016 IEEE-USA VOLUNTEER ORGANIZATIONAL CHART

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(inactive)

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Nominations & Appointments
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Communications
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Communications Policy
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Intellectual Property
Keith Grzelak

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Guru Madhavan

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Mike Behnke

Energy Policy
Fred Denny

R&D Policy
Brendan Godfrey

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K–12 STEM Literacy
Joe Burns

Entrepreneurship & Innovation Policy
James Jefferies

Transportation & Aerospace Tech Policy
Phillip Hall

Student Professional Activities
Nicole Skarke

Government Fellows
Steve Bonk

WISE Task Force (ad hoc)
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ABOUT THE ANNUAL REPORT

The *2016 IEEE-USA Annual Report* highlights IEEE-USA's mission, goals and programs, and its activities and achievements, in 2016. This Report was developed, produced and published as a benefit to members—to increase both member and non-member awareness of the programs and services IEEE-USA provides to advance the profession—and for the benefit of U.S. IEEE members. It also serves as a reference for members seeking information on specific programs or issues; or for those seeking opportunities to volunteer their time and expertise, in support of their profession.

Compiled by Chris. J. Brantley,
IEEE-USA Managing Director,
with input from IEEE-USA staff and volunteers

Edited and produced by Georgia C. Stelluto,
IEEE-USA Publishing Manager

ABOUT IEEE-USA

IEEE-USA advances the public good, and promotes the careers and public policy interests of the 200,000 engineering, computing and technology professionals, who are U.S. members of IEEE. With more than 400,000 members, in over 160 countries, IEEE is dedicated to advancing techno-logical innovation and excellence, for the benefit of humanity. More information about IEEE-USA can be found online at: **https://ieeeusa.org/.**

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