

WTS 2013

Wireless Telecommunications Symposium 2013

*Global Wireless Communications: Future
Directions*

April 17 - 19, 2013



California State Polytechnic University, Pomona

**Ocotillo Golf Resort &
Holiday Inn at Ocotillo
Chandler, Arizona USA**

WELCOME TO WTS 2013

Welcome to the twelfth annual Wireless Telecommunications Symposium, WTS 2013: Global Wireless Communications – Future Directions. We hope that it will be a stimulating and rewarding experience for you. During the next three days of invited speakers' presentations, accepted paper sessions, tutorials and panel discussions, WTS 2013 will explore a wide range of global wireless communications and mobile cloud computing, e-health and telecommunications in healthcare, and new generation media topics in depth.

The WTS 2013 Program Committee received paper submissions from authors around the world. We thank all the authors who submitted papers and proposals to WTS 2013, the many reviewers who reviewed them, and the co-chairs, mini-symposia chairs, track chairs, and session chairs for coordinating the paper and proposal evaluation and selection process. We also thank the WTSI support personnel for their tireless efforts behind the scene. Producing an event like WTS 2013 is not an easy task, and they did a masterful job. In addition, the WTSI Committee is grateful to the IEEE Communications Society and its Communications & Information Security Technical Committee for their technical support for WTS 2013, and to the distinguished invited speakers representing the telecommunications, healthcare, and media industries for having taken time to participate in the conference and help us organize the program.

Finally, special thanks go to many organizations that have contributed to the conference or lent it financial support. Notable among the contributors and donors are Cal Poly Pomona's College of Business Administration and College of Engineering; Cal Poly Pomona's Computer Information Systems Department; Intel Corporation; Nokia; MESAQIN; and the IEEE Phoenix Section's Signal Processing and Communications Chapter.

On behalf of the WTS 2013 Committee -- Welcome to WTS 2013!

Dr. Steven Powell, WTSI General Chair
Dr. Thomas Ketseoglou, WTSI Assistant Chair

WTS 2013 Program April 16-19, 2013
Ocotillo Golf Resort & Holiday Inn at Ocotillo, Chandler, Arizona,
USA

Tuesday, April 16	
Morning	<p>Golf at Ocotillo Golf Resort</p> <p>*Time Slots will be Available from 6:45 am - 7:30am for WTS 2013 Attendees to Play a Round of 18 Holes of Golf (at the Discounted Rate of \$59, Cart Included). Interested Golfers Should Call the Golf Shop at 1-480-917-6660 or E-Mail Brad Hodges at bhodges@OcotilloGolf.com at Least 72 Hours in Advance to Register and be Put Together into Foursomes.</p>
5:00 pm – 7:00 pm	<p>WTS Organizers' Meeting</p>
7:00 pm – 9:00 pm	<p>Intel Tour</p> <p>Visit to Intel Corporation's Ocotillo Campus for a Window Tour of a World-Class, Cutting-Edge Microprocessor Chip Manufacturing Facility</p> <p>Presenter: Dr. Michele St. Louis-Weber, Intel P1270 factory Manager</p> <p>*Note: The Size of the Tour Group for this Free Tour will be Restricted. Early Conference Registration and Tour Sign-up are Recommended.</p>
Wednesday, April 17	
8:00 am - 9:00 am	<p>Registration</p>
9:00 am – 9:15 am	<p>Welcoming Remarks</p>

9:15 am – 10:00 am	Dr. Krish Prabhu President, AT&T Labs and Chief Technology Officer AT&T
10:00 am – 10:30 am	Break
10:30 am – 11:15 am	Matt Grob Executive Vice President and Chief Technology Officer Qualcomm Inc.
11:15 am – 12:00 pm	Dr. Gee Rittenhouse President of Bell Labs Alcatel-Lucent
12:00 pm – 2:00 pm	Lunch Guest Speaker: Michael D. Gallagher President and CEO Entertainment Software Association
2:00 pm – 2:45 pm	“Molecular Medicine and Digital Medicine: Disruptive Technologies in the Future Evolution of Healthcare” Dr. George Poste Chief Scientist, Complex Adaptive Systems Initiative Del E. Webb Chair in Health Innovation Arizona State University
2:45 pm – 3:15 pm	Break
3:15 pm – 4:45 pm	Panel Discussion: “Connected Consumer Electronics (CE) and the Digital Home” Organizer and moderator: Kurt Hoppe , Director of Smart TV Innovation, LG Electronics

4:45 pm – 5:30 pm	<p>“Multi-Authority Attribute Based Encryption Scheme for Mobile Cloud Computing”</p> <p>Dr. Muttukrishnan Rajarajan Leader of the Information Security Group City University of London</p>
5:30 pm – 6:00 pm	<p>Doctoral Students Session</p>
6:00 pm – 6:30 pm	<p>Break</p>
6:30 pm – 9:00 pm	<p>Welcoming Dinner</p> <p>Guest Speaker:</p> <p>“The Radio Frequency Spectrum – Are We Managing Or Mismanaging It”</p> <p>Martin Cooper, “Father of the Cell Phone” Inventor, Executive, Entrepreneur, Futurist</p>
<p>Thursday, April 18</p>	
8:00 am – 9:00 am	<p>Registration</p>
9:00 am – 10:00 am	<p>Tutorial: “Introduction to Mobile Cloud Computing: Part 1”</p> <p>Chetan Sharma, President, Chetan Sharma Consulting</p>
10:00 am – 10:15 am	<p>Break</p>
10:15 am – 11:15 am	<p>Tutorial: “Introduction to Mobile Cloud Computing: Part 2”</p> <p>Chetan Sharma, President, Chetan Sharma Consulting</p>

11:15 am – 12:00 pm	<p>“Intel and Wireless Communications”</p> <p>Aicha Evans Vice President, Intel Architecture Group & General Manager, Wireless Platforms R&D Intel Corporation</p>
12:00 pm - 2:00 pm	<p>Lunch</p> <p>Guest Speaker: Dan Gillmor Director, Knight Center for Digital Media Entrepreneurship Kauffman Professor of Digital Media Entrepreneurship Arizona State University</p>
2:00 pm – 2:45 pm	<p>“Outlook on Mobile Devices”</p> <p>Dr. Hannu Kauppinen VP, Head of Nokia Research Center Nokia</p>
2:45 pm – 3:00 pm	Break
3:00 pm – 4:30 pm	<p>Panel Discussion: “E-health and Telecommunications”</p> <p>Organizer and Moderator: Dr. Upkar Varshney, Associate Professor, Computer Information Systems, Georgia State University</p>
4:30 pm – 5:00 pm	Poster Paper Session
5:00 pm – 5:30 pm	Bus Transportation from Ocotillo Golf Resort to Rockin R Ranch
5:30 pm – 8:30 pm	Dinner & Entertainment at Rockin R Ranch
8:30 pm – 9:00 pm	Bus Transportation from Rockin R Ranch to Holiday Inn Ocotillo
Friday, April 19	

8:00 am – 9:00 am	Registration
9:00 am – 10:45 am	Paper Presentation Session (I)
10:45 am – 1:00 pm	Best Paper Awards Ceremony & Lunch “American Media in a Wireless World” Guest Speaker: Dr. William F. Baker , Director, Bernard L. Schwartz Center for Media, Education, and Public Policy, Fordham University
1:00 pm – 3:00 pm	Paper Presentation Session (II)
3:00 pm – 3:15 pm	Break
3:15 pm – 5:00 pm	Paper Presentation Session (III)

Panel Discussions & Tutorials

Panel Discussion: “Connected Consumer Electronics (CE) and the Digital Home”

Abstract: The promise of the interconnected Digital Home has stood largely unfulfilled for over 10 years now, although American households are actually in the process of moving from 5 Internet-connected CE devices to 10 or more, as an Internet of Things (IoT) promises to arrive within the decade. This panel will investigate the realities of today's Connected Home and discuss the various challenges that need to be addressed in order to deliver on a vision of interconnected wireless devices and sensors seamlessly enabling the delivery of mass-market value-added services such as home monitoring, home control and energy management in and around the modern home.

Organizer and moderator: **Kurt Hoppe**, Director of Smart TV Innovation and New Business, LG Electronics

Panelists:

Jim Hunter

Fellow Technical Staff & Strategic Architect at Motorola Mobility
Google / Motorola Mobility
Sunnyvale, CA

David Moss

CTO
People Power
San Jose, CA

Martin Manniche

Co-Founder, Chairman and Chief Technology Officer
GreenWave Reality
Irvine, CA

Greg Thomson

Business Strategy and Product Development Consultant
TAM Innovations Group
Mill Valley, CA

Tutorial: "Introduction to Mobile Cloud Computing"

Presenter: Chetan Sharma, President, Chetan Sharma Consulting

Panel Discussion: "E-Health & Telecommunications"

Abstract: This panel explores different facets of e-health and telecommunications. The issues may include technologies, applications and solutions; clinical applications and scenarios; adoption and usage of e-health; regulations; mobile health; patient empowerment; cost, efficiency, and access; and future.

Organizer and moderator: **Dr. Upkar Varshney**, Associate Professor of Computer Information Systems, Georgia State University

Panelists:

Dr. Toni Farley

Postdoctoral Fellow, Center for BioIntelligence
Translational Genomics Research Institute (TGen)

Dr. Anantharam Kalya

Assistant Professor of Medicine
Mayo Clinic, Phoenix

Dr. Raj Muttukrishnan

Leader, Information Security Group
City University, London

**WTS 2013 Paper Presentation Sessions
Friday, April 19, 2013**

9:00 am – 10:45 am

Session 1-A

Physical Layer

“Unequal Error Protection for Radiography Image Transmission Using Protograph Double LDPC Codes”, Liangliang Xu (Dept. of Communication Engineering, Xiamen University, P.R. China); Huihui Wu (Dept. of Communication Engineering, Xiamen University, P.R. China); Jiguang He (Xiamen University, P.R. China); Lin Wang (Xiamen University, P.R. China)

“The Approach of Downlink Control Information design for the new Transmission Mode 10,” Jean-Baptiste Yamindi (Beijing University of Post and Telecommunications, P.R. China)

“Shift in speech quality and acceptability level between 2008 - 2012”, Jan Holub (FEE CTU Prague, Czech Republic); Pavel Souček (FEE CTU, Czech Republic)

“LTE-Advanced Channel Coding Generic Procedures: A High-level Model to Guide Low-Level Implementations”, Felipe Augusto P de Figueiredo (UNICAMP, Brazil); Karlo Lenzi (CPqD Telecom & IT Solutions, Brazil); José A. Bianco, Filho

(UNICAMP, Brazil); Fabricio L Figueiredo (CPqD Telecom and IT Solutions, Brazil)

“Impact of antenna spacing at terminals on spatial variation of performances in distributed antenna systems”, Qiang He (Tsinghua University, P.R. China); Zhan Xu (BIT, P.R. China); Xiaofeng Zhong (Tsinghua University, P.R. China); Shidong Zhou (Tsinghua University, P.R. China)

9:00 am – 10:45 am

Session 1-B

Wireless Networks

“Tacit Knowledge Acquisition in Virtual Teams”, Darryl Diptee (Naval Postgraduate School, USA); Jason Diptee (Florida Career College, USA)

“An Improved QoS Awareness Scheduling Scheme for CR Mobile Ad hoc Networks”, Yan Sun (Queen Mary University of London, United Kingdom); Jingwen Bai (Queen Mary, University of London, P.R. China); Siqi Wang (Queen Mary University of London, P.R. China); Chris Phillips (Queen Mary University of London, United Kingdom)

“Quality of Service Differentiation Measurements in 4G Networks”, Amir Esmailpour (University of Toronto, Canada); Seyedmohammad Salehi (University of New Haven, USA); Navid Safavi (University of New Haven, USA)

“Using Wireless Telecommunication Technology to Promote Tele-audiology”, Daoyuan Yao (East Carolina University, USA); Gregg Givens (East Carolina University, USA); Jianchu Yao (East Carolina University, USA)

“Cloud Computing in the Education Environment for Developing Nations”, Willie Ofosu (Penn State Wilkes-Barre, USA); Hamadou Saliah-Hassane (Université à distance, Canada)

10:45 am – 1:00 pm
Lunch

Best Paper Awards Ceremony &

Guest Speaker: Dr. William F. Baker, Director, Bernard L. Schwartz Center for Media, Education, and Public Policy, Fordham University

1:00 pm – 3:00 pm

Session 2-A

Physical Layer

“Orthogonal Wavefront-Multiplexing Architecture for Communications in Non-Contiguous Channels”, Hen-Geul Yeh (California State University, Long Beach, USA); Donald Chang (Spatial Digital Systems, USA); Yulan Sun (California State University Long Beach, USA)

“OFDMA Nonlinear Distortion Recovery using Improved Clipping Localization and Iterative Projections”, Guoguang Chen (University of Illinois at Chicago, USA); Rashid Ansari (University of Illinois at Chicago, USA)

“Demodulation of QAM in Slow Flat Fading based on Data Clustering”, Thomas Ketseoglou (California State Polytechnic University, USA)

“An Adaptive Stochastic-Based M-ary Modulation Extension Algorithm for Short Range Wireless CRs”, Andre Mayers (University of Texas, San Antonio, USA)

“Comparison of UWB and NB RF Ranging Measurements in Homogenous Tissue for BAN Applications”, Jin Chen (Worcester Polytechnic Institute, USA); Yunxing Ye (Worcester Polytechnic Institute, USA); Kaveh Pahlavan (WPI, USA)

1:00 pm – 3:00 pm

Session 2-B

Wireless Networks

“Scalable Addressing of M2M Terminals in 4G Cellular Wireless Network”, Isam Abdalla (University of Texas at Dallas, USA); Subbarayan Venkatesan (University of Texas at Dallas, USA)

“GFSK Phase Estimation Using Extended Kalman Filtering for Non-Gaussian Noise”, Ahmad Nsour (Oakland University, USA);

Alhaj-Saleh Abdallah (Oakland University, USA); Mohamed Zohdy (Oakland University, USA)

“Feedback Delay and its Impact on Adaptive Modulation and Coding in VHF Narrowband Mobile Ad-hoc Networks”, Sebastian Helmle (Rohde & Schwarz GmbH & Co. KG, Germany); Mathias Dehm (Rohde-Schwarz, Germany); Michael Kuhn (University of Applied Sciences Darmstadt, Germany); Dominik Lieckfeldt (Rohde & Schwarz, Germany); Dirk Pesch (Cork Institute of Technology, Ireland)

“Towards Distributed Face Recognition on Self Organized Storage built from Wireless Sensor Nodes”, Paul Gaynor (The University of the West Indies, Jamaica)

“Analytical Estimation of Service Requests Capacity in LTE-A Systems with Heterogeneous Traffic”, Enrique R. Bastidas-Puga (Universidad Autónoma de Baja California, Mexico); Guillermo Galaviz (Universidad Autonoma de Baja California, Mexico); Angel G Andrade (Universidad Autónoma de Baja California, Mexico); David H. Covarrubias (CICESE, Mexico)

“An Outage-Aware Power Saving Cooperative Routing Algorithm in Wireless Networks”, Pouyan Ahmadi (George Mason University, USA); Bijan Jabbari (George Mason University, USA)

1:00 pm – 3:00 pm

Session 2-D

Business, Media, Education, E-Health

“Business Portfolio Analysis in the Telecommunications Services Industry”, Steven Powell, (California State Polytechnic University, Pomona USA)

“National Approaches to Technology Standardization for Mobile Telecommunications”, Michael Murphree (Georgia Institute of Technology, USA); Kevin Love (Georgia State University, USA); J Shim (Georgia State University, USA)

“A Framework for Studying Patterns of Effective Medication Adherence”, Upkar Varshney (Georgia State University, USA); Neetu Singh (Georgia State University, USA)

“A Novel Delay-Based GFSK Demodulator in 65 nm CMOS for High Resolution Epi-retinal Prosthesis”, Meng Fu (University of Melbourne, Australia)

“Reducing Complexity of Data Encryption (Modern Data Security in Crisis - Proposal for an Ultimate Solution)”, Ky Vu (DeVry University, Atlanta, USA); John J Halloran IV (Georgia State University, USA)

“ACTA: An online media content gatekeeper or a facilitator of e/m business? The EU role as global negotiator”, Vassiliki Cossivelou (Aegean University, Youth and Media Lab, Belgium)

3:00 pm – 3:15 pm

Break

3:15 pm – 5:00 pm

Session 3-A

Physical Layer

“An Algorithm for Real-Time Noise Cancellation in Wireless Sensor Networks”, Ehsan Sheybani (Virginia State University, USA); Giti Javidi (Virginia State University, USA)

“Identification of RF devices based on their unintended electromagnetic emissions using Principal Components Analysis”, Shikhar P Acharya (Missouri University of Science and Technology, USA); Ivan G. Guardiola (Missouri University of Science and Technology, USA)

“Transaction based Secure Dynamic Source Routing (TSDSR) Protocol”, Venkataram Pallapa (Indian Institute of Science, India); Sathish Babu (Indian Institute of Science, India); Bharath M (Indian Institute of Science, India)

“MIMO Systems Equalization in Flat Fading”, Amit Grover (Sbsstc, India); Bhanvi Sangar (PTU, India); Rohit Gupta (PTU, India); Neeti Grover (SBSSTC, India)

“A Framework for Mobile Cloud Computing Selective Service System”, Zhefu Shi (University of Missouri - Kansas City, USA); Ruirui Gu (University of Maryland, USA)

“A Linear Downlink Power Control Algorithm for Wireless Networks”, Yisroel Mirsky (Jerusalem College of Technology, Israel); Yoram Haddad (Jerusalem College of Technology, Israel)

“Cell Edge Detection Based Interference Avoidance Scheme for Closed Mode LTE Femtocells”, Syed Muhammad Ali (National University Of Science and Technology, Islamabad, Pakistan); Dr. Adnan Kiani (School of Electrical Engineering and Computer Sciences - NUST, Pakistan)

3:15 pm – 5:00 pm

Session 3-B

Wireless Networks

“K-Centers Min-Max Clustering Algorithm over Heterogeneous Wireless Sensor Networks”, Qingyan Xie (University of Cincinnati, USA); Yizong Cheng (University of Cincinnati, USA)

“An Effective Semi-static Interference Coordination Scheme for Wireless Cellular Systems”, Ruya Yan (Xi'an Jiaotong University, P.R. China); Guomei Zhang (Xi'an Jiaotong University, P.R. China); Bin Li (ZTE Corporation, P.R. China); Pinyi Ren (Xi'an Jiaotong University, P.R. China); Qinghe Du (Xi'an Jiaotong University, P.R. China)

“On the optimality of network assisted power control for a general class of sigmoid functions”, Zory Marantz (NYC College of Technology, USA)

“Semi-automated examination at the university by using wireless and contactless technologies”, Bálint Sódor (Budapest University of Technology and Economics, Hungary); Gergely Fördös (Budapest University of Technology and Economics, Hungary);

Tibor Doktor (Budapest University of Technology and Economics, Hungary); Balázs Benyó (Budapest University of Technology and Economics, Hungary)

“Improving Network Management by XML to Relational Data Translation”, Mahabubul Alam (Cal Poly Pomona, USA); Salam Salloum (Cal Poly Pomona, USA); Mohammad Iftekhar Husain (Cal Poly Pomona, USA) “Small-Scale Fading Characteristics in Cellular Networks in Ghana”, Kwame O. Boateng (Kwame Nkrumah University of Science and Technology, Ghana); Kusi Bonsu (Kwame Nkrumah University of Science and Technology, Kumasi Ghana, Ghana); James Oppong (Kwame Nkrumah University of Science and Technology, Kumasi Ghana, Ghana); Koffi Dotche (Kwame Nkrumah University of Science and Technology, Kumasi Ghana, Ghana)

“Development of wireless signal transmission system for rotating Ladle Turret of Continuous Caster at Rourkela Steel Plant, India”, Indranil Banerjee (Research & Development Centre for Iron and Steel, Steel Authority Of India Ltd, India)

3:15 pm – 5:00 pm

Session 3-C

MAC Layer

“Cacheability Analysis of HTTP traffic in an Operational LTE Network”, Buvanewari A Ramanan (Alcatel-Lucent, USA); Lawrence Drabek (Bell Labs - Lucent Technologies, USA); Mark Haner (Bell Laboratories - Lucent Technologies, USA); Nachi Nithi (Bell Laboratories, USA); Thierry E Klein (Alcatel-Lucent, USA); Chitra Sawkar (Alcatel-Lucent, USA)

“IEEE 802.11n Performance Evaluation of Modified Viterbi Metrics for TxBF, SDM and Spatial Spreading Transceivers”, Roger Pierre Fabris Hoefel (Federal University of Rio Grande do Sul, Brazil)

“Radio Planning And Field Trial Measurement Of A Deployed 4G WiMAX Network In An Urban Sub-Saharan African Environment”, Eric Tchao (Kwame Nkrumah University of

Science and Technology, Ghana); Willie Ofori (Penn State Wilkes-Barre, USA); Kwesi Diawuo (Kwame Nkrumah University of Science and Technology, USA)

“W-AKA: Privacy-Enhanced LTE-AKA Using Secured Channel over Wi-Fi”, Khodor Hamandi (American University of Beirut, Lebanon); Imad Sarji (American University of Beirut, Lebanon); Imad H Elhaggi (American University of Beirut, Lebanon); Ali Chehab (American University of Beirut, Lebanon); Ayman Kayssi (American University of Beirut, Lebanon)

“Blind Calibration of Five-Port Receiver Based on Independent Component Analysis (ICA)”, Francisco Vidal (UFERSA, Brazil); Adriaio Doria (UFRN, Brazil); Allan Medeiros (Universidade Federal do Rio Grande do Norte, Brazil); Bernard Huyart (Ecole Nationale Supérieure de Télécommunications, France)

“A Web-Based Simulator to Train Students in Self-Organizing Wireless Networks”, Alfredo Cristóbal-Salas (Universidad Veracruzana, Mexico); Jed Chang (118 Leroy Street, Apartment B2, USA)

Speaker Biographies

Dr. William F. Baker directs the Bernard L. Schwartz Center for Media, Education, and Public Policy at Fordham University, where he is also Journalist-in-Residence and a professor in the Graduate School of Education. He is a professor at IESE Business School, ranked #1 globally by *The Economist*. Baker is a Senior Research Fellow at Harvard’s Hauser Center for Nonprofit Organizations, Executive-in-Residence at the Columbia University Business School, teaches at the Juilliard School, and is President Emeritus of Educational Broadcasting Corporation (EBC), licensee of America’s flagship PBS station Thirteen/WNET, and WLIW21, New Jersey’s PBS affiliate.

Baker is co-author of the book *Leading with Kindness: How Good People Consistently Get Superior Results* (American Management Association, 2008), and hosts the documentary of the same name which premiered on

public television in 2008.

Baker's career spans four decades. During his twenty years as chief executive officer of EBC, he distinguished himself as one of America's most prolific fundraisers, raising over \$1 billion for the station, and establishing the largest endowment in the history of public television. Among many other accomplishments at EBC, Baker introduced the landmark program *Charlie Rose*, oversaw the station's transition to digital broadcasting, and launched WNET's first cable channel, MetroArts/Thirteen.

Prior to joining EBC, he was president of Westinghouse Television and chairman of their cable and programming companies. At Westinghouse, Baker introduced Oprah Winfrey as a talk show host and established *PM Magazine* as the #1 syndicated program in America in the 1980s. During Baker's tenure, Westinghouse also launched five cable networks, including the Discovery Channel and the Disney Channel.

Baker is the executive producer of the *The Face: Jesus in Art*, a landmark Emmy-winning documentary film that traces the image of Jesus Christ in art around the world and across two millennia. *The Face* premiered nationwide on public television in 2001 and also enjoyed a limited theatrical release.

Baker is the recipient of seven Emmy Awards and is a fellow of the American Academy of Arts and Sciences. In 2007, he was inducted into the National Academy of Television Arts & Sciences (NATAS) Management Hall of Fame and received the *Mark Schubart Award* from the Lincoln Center Institute, given to individuals who most exemplify the Institute's ideal of integrating the arts with education. He has been inducted into *Broadcasting & Cable's* Hall of Fame and the New York State Broadcasters Association Hall of Fame. In addition to numerous other awards, Baker has received the Gabriel Personal Achievement Award, two Alfred I. duPont-Columbia University Journalism Awards and the 1987 Trustees Emmy Award, given in recognition of outstanding contribution to the advancement of television.

Baker is also the co-author of *Down the Tube: An Insider's Account of the Failure of American Television* (Basic Books, 1998) and the author of *Lighthouse Island: Our Family Escape* (Ruder Finn Press, 2004).

In addition to being Chairman of the National Parks System Advisory Board, Baker serves on the boards of Rodale Press and the Intrepid Sea,

Air & Space Museum in New York City. He holds B.A., M.A. and Ph.D. degrees from Case Western Reserve University, and seven honorary doctorates.

Dr. Baker's long standing commitment to promoting education led him to establish WNET's Educational Resources Center, America's most prolific trainer in multimedia teaching techniques. He also established the Bernard L. Schwartz Center for Media, Education, & Public Policy at Fordham University, and he is an annual speaker at WNET's Celebration of Teaching and Learning.

His interests include astronomy, horology, and polar science, and he is believed to be one of only a few people who have stood on both the North and South Poles.

Martin Cooper is an internationally renowned expert on technology and innovation and its impact on business and society. He is widely regarded as one of the leading inventors of our time and has spent most of the past 5 decades creating some of the world's most important business and technological concepts and offerings. He is an activist who seeks to shape public policy in the US and globally having testified before various committees, and been featured in national publications and news shows. He is passionate about the revolution in health care and commerce that wireless technology will engender when networks are finally opened and new technology adopted. Cooper is also an accomplished entrepreneur and futurist.

Martin Cooper is Chairman and Co-Founder of DYNA, LLC. Cooper is also Co-Founder of ArrayComm, LLC, based in San Jose, CA and GreatCall, Inc, the innovator of the Jitterbug cell phone and service. Cooper has been involved in and contributed to virtually every major innovation in personal wireless communications in his over 50-year career. He conceived the first portable cellular phone in 1973 and is widely recognized as an innovator in spectrum management. For 29 years, he led a number of major businesses at Motorola, including high-capacity paging, trunked mobile radio, cellular radio telephone, quartz crystals and oscillators, liquid crystal displays, piezo-electric components, Motorola A.M. Stereo technology, and various mobile and portable two-way radio product lines. Following Motorola, Cooper co-founded Cellular Business Systems, Inc., a cellular billing system company. Cooper has numerous patents in the communications field. He is widely published and continues to write and lecture around the world about wireless communications, technological innovation, the Internet, and R&D management. Cooper was

involved in industry and government efforts to allocate new radio frequency spectrum for the land mobile radio services in the U.S. and has testified before the Federal Communications Commission and the United States Senate. He serves on the U.S. Department of Commerce Spectrum Advisory Committee that advises the President of the United States on spectrum policy. He has received numerous honors and awards, including the 2009 Prince of Asturias Award for Technical and Science Research and induction into the National Academy of Engineering in 2010. Most recently, Cooper was nominated for the “Mikhail Gorbachev: The Man Who Changed the World” Award. He has bachelors and masters degrees from the Illinois Institute of Technology, was awarded an honorary doctorate by that institution, and serves on its board of trustees. Martin Cooper has served on the boards of several public and private companies.

Aicha Evans is vice president of the Intel Architecture Group and general manager of the Wireless Platform Research and Development group within the Mobile and Communications Group. She is responsible for driving platform engineering for multi-comm products and platforms, including modems, RF, Wi-Fi, GPS, Bluetooth, NFC, FM, LTE, WLAN/WWAN as well as emerging wireless technologies to lead this industry going forward.

Previously she was the general manager of the Mobile Wireless Group where she managed the engineering, software, hardware, strategic planning, and product test teams responsible for providing wireless connectivity ingredients and solutions for all Intel platforms.

Evans joined Intel in 2006 as a software integration and test manager. She held a number of management positions responsible for Intel's wireless efforts including software engineering and support for customers deploying WiMAX networks in multiple geographies. Additionally, Evans worked in Israel managing WiFi engineering and product lines.

Prior to Intel, Evans spent 10 years in various engineering management positions at Rockwell Semiconductors, Conexant and Skyworks.

Evans received a bachelor's degree in computer engineering from The George Washington University in 1996.

Toni Farley is a Postdoctoral Fellow in the Center for BioIntelligence at the Translational Genomics Research Institute (TGen). She holds BS and PhD degrees in Computer Science, and is a recipient of the AT&T Labs--Research Graduate Fellowship Program. Her background includes topics

in graph theory, network science, computer and network security, and knowledge management. She is currently advancing a biomedical knowledge computing and learning platform based on a generalized hypergraph model, called the Translational Interoperable Molecular Intelligence Knowledge Integration Network (TIMIKIN). She is also a Faculty Associate in the School of Computing, Informatics, and Decision Systems Engineering at Arizona State University, and Treasurer for the Valley of the Sun Chapter of the International Test and Evaluation Association.

Michael (Mike) D. Gallagher is president and CEO of the Entertainment Software Association (ESA), the trade association representing U.S. computer and video game publishers.

Mr. Gallagher joined ESA in 2007. Under his leadership, ESA engages in activities that demonstrate the influence of entertainment software on areas of daily life such as education, health and the workplace. He frequently appears as the public face of the industry and regularly serves as an expert resource for major media outlets, including CNN, Associated Press, The New York Times, The Washington Post, NBC News and CBS News.

Mr. Gallagher's interest in the broader uses of games helped ESA adopt a focus on highlighting the value of video games as next-generation learning tools, and their increasing incorporation into classrooms. His accomplishments include ESA's sponsorship of the National STEM Video Game Challenge, part of the White House-led Educate to Innovate campaign. In addition, Mr. Gallagher served on the judging panel for the U.S. Department of Agriculture's "Apps for Healthy Kids" competition.

Mr. Gallagher also manages ESA's work with state officials, helping to foster a welcoming operating environment for the high-paying jobs in the video game industry. Additionally, he leads ESA's collaboration with the Congressional Caucus for Competitiveness in Entertainment Technology (E-TECH Caucus), which educates federal policymakers about the economic, educational and social benefits of interactive entertainment technology.

Mr. Gallagher has spoken at numerous venues across the country. He addressed graduating students at educational institutions such as Southern Methodist University and the DigiPen Institute of Technology.

Previously, Mr. Gallagher was the U.S. Department of Commerce's Assistant Secretary for Communications & Information, serving as chief

telecommunications and Internet policy advisor. During his tenure at the Department of Commerce, he led successful efforts to pave the way for a number of ground-breaking spectrum-based technologies and services, and developed and successfully advocated the U.S. government's policies on international Internet governance. Mr. Gallagher also served as Communications Practice chair at leading international law firm Perkins Coie, during which time he co-authored, "21st Century Communications Systems for First Responders: The Right Call," which offered groundbreaking spectrum policy recommendations and championed the private sector's role in enhancing our nation's public safety communications infrastructure.

Several organizations recognized Mr. Gallagher's leadership in telecommunications and technology issues. He received the Telecommunications Industry Association's "Spirit of Innovation" award in 2005 and the Wireless Communications Association's "Leadership in Government" award in 2006. He was also recognized by former Secretary of Commerce Carlos Gutierrez in 2006 for his distinguished leadership in government service.

Mr. Gallagher holds degrees in Economics and Political Science from the University of California, Berkeley and a Juris Doctor from the University of California, Los Angeles. He serves on the Advisory Board for the Guildhall at Southern Methodist University and Spectrum Bridge, Inc. Mr. Gallagher also serves on the Boards of Directors for the Academy of Interactive Arts & Sciences and One Economy Corporation, as well as the Publishing Advisory Board of Sesame Street.

Dan Gillmor is an internationally recognized author and leader in new media and citizen-based journalism, is the founding director of the new Knight Center for Digital Media Entrepreneurship and the Kauffman Professor of Digital Media Entrepreneurship.

Gillmor, a 1981 graduate of the University of Vermont, started his journalism career at the Valley Voice in Middlebury, Vt., before moving to the Times Argus in Barre-Montpelier, Vt. In 1984 he joined the Kansas City Times, where he became a regional correspondent, covering politics and the rural economy. During the 1986-87 academic year, he was fellow at the University of Michigan in what is now called the Knight-Wallace Journalism Fellows program.

In 1988 Gillmor moved to the Detroit Free Press, where he covered transportation, regional affairs and technology. He was an early

practitioner there of computer-assisted reporting, and became one of the first journalists at a traditional media company to use the Internet as part of his work.

Gillmor joined the San Jose Mercury News in 1994, writing a widely read column and blog that chronicled the dot-com revolution in Silicon Valley, and technology's wider impact on policy and society. His blog is believed to have been the first by a journalist for a mainstream journalism organization.

In 2004 he published "We the Media: Grassroots Journalism by the People, for the People," a book on citizen journalism that has been published in many languages, most recently Korean and Arabic. The book is widely recognized as the first to explain how the collision of journalism and technology has democratized the creation of and access to media, and why it matters.

Gillmor is currently working on a new book, "Mediactive," about digital media literacy.

In 2005 Gillmor left the Mercury News to work on grassroots media projects, including Bayosphere, a for-profit citizen-media effort that did not achieve critical mass and was eventually sold. He counts that failure as by far the most valuable learning experience of his career.

Subsequently, he has been an early-stage investor in several new media startups including Silicon Valley-based Wikia Inc., founded by Wikipedia founder Jimmy Wales, and Seesmic, an online video company. Gillmor is co-founder of Helsinki-based Dopplr, a travel-related startup that was acquired by Nokia in September 2009. He also co-founded and continues to advise the Knight-funded Citizen Media Law Project.

He also is an advisor to several media-related ventures including Spot.us, Publish2.com and MediaBugs.org.

Gillmor continues to write in blogs and other media, including a semi-regular column at Salon.com. He speaks frequently at conferences and major universities around the world on media and technology topics. For that purpose, he has traveled to Europe, Asia, Africa and South America, including several trips sponsored by the U.S. State Department.

A member of Investigative Reporters & Editors, Gillmor serves on boards of directors or advisory boards for several media-related nonprofits

including the California First Amendment Coalition, the Knight New Media Center at USC and UC-Berkeley, Global Voices Online and NewsTrust. Before starting his journalism career, Gillmor was a professional musician.

Matt Grob is executive vice president and chief technology officer for Qualcomm Incorporated. In this role, he is responsible for the oversight of Qualcomm's technical path, the coordination of R&D activities across the company and the development of next-generation wireless technologies. Grob also leads Corporate R&D and provides oversight to Qualcomm Corporate Engineering Services.

Matt joined Qualcomm in 1991 as an engineer. His contributions include system design, standardization and project leadership for programs including the early CDMA data services; the Globalstar satellite based mobile voice and data system and later 1x EV-DO high-speed wireless Internet access technology. Matt's focus on cellular data services led to his assignment as co-project engineer for the HDR (High Data Rate) program starting in 1997. This new high-speed Internet access technology became standardized as 1x EV-DO, and commercialized throughout the world. Innovations and techniques from these programs also benefit UMTS evolution including HSPA. In 1998, Matt became the head of Corporate R&D's system engineering department.

In 2006, Matt took the role of leading the Corporate R&D division. The division's mission is to push the boundaries of wireless technology, to innovate and explore new services and technologies - focusing on longer-term and often higher-risk technologies and projects. During the past 5 years, Corporate R&D's efforts have expanded in scale and scope. While maintaining a very strong focus on core cellular WAN technology, Corporate R&D has broadened its mission to include exciting new areas including Augmented Reality, Wireless Charging, processor and applications enhancements, peer-to-peer technologies, position location, and Wireless LAN.

Matt holds a number of patents in the area of wireless data services and technology and holds a BSEE from Bradley University, Peoria, Illinois as well as an MSEE from Stanford University.

Currently Director of Smart TV Innovation at LG Electronics, **Kurt Hoppe** is responsible for driving Home Entertainment innovation as it relates to Pay TV, next-generation input technologies, and device inter-connectivity. Kurt has spent 10+ years building cloud-connected solutions

for Service Providers, CE companies, and Content Owners, delivering value-added services to over 50M users worldwide. He has held business development, product marketing, and product management roles at Digeo, 2Wire, and Amdocs, working with customers such as AT&T, Verizon, Time Warner Cable, Best Buy, and Paramount Pictures, to name a few. Kurt studied Computer Science at the Royal Military College of Canada and Human Computer Interaction at the University of British Columbia.

Jim Hunter is a strategic architect and a Fellow of the Technical Staff at Motorola. He has 20+ years of experience in creating software solutions for the connected home. Jim co-founded 4Home and served as the CTO, responsible for much of 4Home's platform architecture, user interface and intellectual property development, prior to being acquired by Motorola Mobility. Jim continues to guide the long-range vision of that platform. Prior to 4Home, Jim was the founder, Chief Architect, and lead developer for Nearmedia, a home automation software and solutions developer acquired by 4Home. He previously founded Premise Systems, which was acquired by Motorola in 2003 and is generally recognized as the first "installer-grade" IP-based home automation platform. Jim served as a nuclear engineer and master training specialist in the US Navy, earning numerous awards and accommodations. Jim has filed and holds numerous patents in the fields of device provisioning, control, interaction, and user interface.

Dr. Anantharam Kalya is an Assistant Professor of Medicine at Mayo Clinic in Phoenix. He received an MD from KIMS, Bangalore University, Bangalore, India, and did his residency at University of Louisville Hospital. He has also done fellowships in Heart Failure and Transplant, St. Luke's Medical Center, Milwaukee and Adult Cardiology, Medical College of Wisconsin. In addition to being author of several research papers, Dr. Kalya is also board certified in Internal Medicine, Cardiovascular Diseases and Nuclear Cardiology.

Dr. Hannu Kauppinen is currently holding the position of Vice President, Head of Nokia Research Center. In this capacity he is responsible for the long-term research of mobile technologies that will secure product differentiation and long-term profitable growth for Nokia. Hannu Kauppinen has a strong track record in bringing research innovations to products.

Hannu Kauppinen joined Nokia Research Center in 1997 and has since then held key leadership positions in Nokia's wireless research. He has contributed to and overseen research in cognitive radio systems, cellular

systems, wireless local connectivity, networking technologies, software defined radios, RF and antenna design, as well as sensing and positioning radios. During 2007-2008 and 2010-2011 Hannu Kauppinen was the Director of the Radio Systems Laboratory in Nokia Research Center. He was responsible for the research for 3GPP and IEEE radio standards as well as the research for cognitive and sensor radios to ensure innovativeness and competitiveness of wireless communications solutions in Nokia's products.

Hannu Kauppinen holds a Ph. D. degree in Physics from the Helsinki University of Technology (1997) and an Executive MBA from the Helsinki School of Economics (2007).

As a visionary Founder of GreenWave Reality, **Martin Manniche** is responsible for guiding the top-level technology direction of the company. Prior to founding GreenWave Reality, he served as Chief Technology Officer at Cisco Systems' Consumer Business Group, where he headed the Cisco Connected Home architecture team and drove Z-Wave® and ZigBee® technology over TCP/IP, HomePlug, MoCA and WiFi standards. Mr. Manniche was Co-Founder and COO of Denmark's KiSS Technology, where he helped bring the world's first DivX player to market. Other technology firsts he helped enable include the HDD recorder and the world's first connected DVD player. Mr. Manniche's talent, commitment and passion for technological innovation have earned him more than 100 industry accolades, including an IT-Prisen, Denmark's most prestigious award.

As CTO and Co-Founder of People Power, **David Moss** owns the technology vision, product roadmap, and R&D strategy for the company while holding many key patents pending. David is a full-stack developer and entrepreneur with 14 years' experience ranging from hardware development to mobile cloud computing, analytics, and open source software. Prior to People Power, David worked with Rincon Research to architect open source battery-powered wireless mesh sensors deployed in extremely challenging outdoor environments. Before that, David worked with another start-up, Bitfone Corporation, to integrate a revolutionary Over-the-Air Firmware Update capability into tens of millions of Motorola cell phones.

George Poste is Chief Scientist, Complex Adaptive Systems Initiative (CASI), Regents' Professor and Del E. Webb Chair in Health Innovation at Arizona State University. In 2003 he founded the Biodesign Institute at ASU and served as Director until 2009 during which time the Institute

achieved cumulative research funding of \$300 million. From 1992-1999 he was Chief Science and Technology Officer and President, R&D of SmithKline Beecham (SB). At SB he was associated with the successful registration of 31 drug, vaccine and diagnostic products. In 2004 he was named as R&D Scientist of the Year by R&D Magazine; in 2006 he received the Einstein Award from the Global Business Leadership Council; and in 2009 received the Scrip Lifetime Achievement Award voted by the leadership of the global pharmaceutical industry. He has published over 350 research papers and edited 14 books on pharmaceutical technologies and oncology and has received honorary degrees in science, law and medicine for his research contributions. He was honored in 1999 by HM Queen Elizabeth II as a Commander of the British Empire for his contributions to international healthcare and security. Poste is a Fellow of the Royal Society, the Royal College of Pathologists and the UK Academy of Medicine, a Distinguished Fellow at the Hoover Institution, Stanford, and a member of the Council for Foreign Relations. He served as a member of the Defense Science Board from 2003 to 2009 and Health Board of the U.S. Department of Defense and is currently a member of the U.S. Institute of Medicine Board on Global Health.

As President of AT&T Labs and Chief Technology Officer for AT&T, **Krish Prabhu** oversees the company's global technology direction; which includes network planning and innovation road map including product development, AT&T Labs, and also the security and intellectual property organizations.

Before stepping into his current expanded role, Krish served as president and CEO of AT&T Labs, where he oversaw the technical and operational activities in the labs as well as all research and development.

Krish has extensive background in innovation and industry experience from his time at AT&T Bell Laboratories and executive roles at Tellabs, Alcatel USA and Tekelec. He also previously served as a partner at Morgenthaler Ventures, where he assisted in developing information technology and communications start-ups, advised industry-leading telecommunications and semiconductor companies and has also served on several boards.

Krish earned a B.S. in physics from Bangalore University, an M.S. in physics from the Indian Institute of Technology and an M.S. and Ph.D. in electrical engineering from the University of Pittsburgh, where he is a member of the Board of Visitors at the School of Engineering. Krish is a life member of the Development Board of the University of Texas at

Dallas.

Dr. Muttukrishnan Rajarajan leads the information security group at City University London. Before joining City University in 2002 he worked with Logica UK as a Network and Services Management Consultant. In 2010 he was awarded a prestigious Royal Academy of Engineering industrial secondment award to spend a year at the British Telecommunications, UK working in the area of end to end security in telecommunications networks. His current research is in the areas of mobile and cloud computing security, privacy and identity. He has published more than 150 journal and conference papers and has also published 2 books in this area. He is in the programme committees of several international conferences and also in the government committees of cyber security in India and the United Kingdom. He is currently the lead investigator of the security work stream of a 10 million Euro Cloud project. He also holds a patent on the topic of mobile federated identity based access control. He is a regular speaker at major international conferences in the area of cyber security. More details can be found at www.staff.city.ac.uk/~raj

Gee Rittenhouse is the President of Alcatel-Lucent's Bell Labs. Formerly he was Chief Operating Officer of Alcatel-Lucent's Software, Services, and Solutions Group (S3G). The S3G organization works with global operators to transform their business by creating new revenue generating opportunities in areas ranging from Cloud to applications such as mobile commerce and digital music as well as solutions that focus on customer experience. These solutions are backed by a team of services experts who deliver everything from concept planning through full-scale operations support to meet complex customer needs. Before his current role in the S3G organization, Gee was Vice President of Bell Labs Research, overseeing all Alcatel-Lucent research in physics, computer science, mathematics, optics, access, networking, and applications. Prior to leading research he was Vice President of Bell Labs' Technology Integration Group, with the primary mission of taking Bell Labs research innovations and driving them into Alcatel-Lucent's products and services. Before that Gee was Vice President, Bell Labs Wireless Research. He received his Bachelor of Science degree in physics from the University of California, Los Angeles in 1986. Then in 1993 he received his Ph.D. degree in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology. He joined Bell Laboratories as a member of technical staff in 1993 where he worked on high-speed circuits using X-ray lithography for optical networking applications. He later joined the Wireless Research Laboratory at Bell Laboratories where his research

focused on RF front-end radio architectures and cellular system engineering. In 2000 he was promoted to Director of the Wireless Technology Research Department and led several projects including MIMO system development, cellular network optimization, wireless IP networks, and fourth generation wireless systems. In 2002 he received the Bell Labs Fellow Award. . He is currently the Chairman of the Board of Green Touch, a non-profit pre-competitive research consortium focused on dramatic reductions in network energy requirements. He also has numerous publications and patents in the areas of communications and circuits.

Greg Thompson recently founded TAM Innovations Group, a consulting service that helps clients with business strategy and product development related to software systems, applications, app platforms and ecosystems, video products, and automation (Internet of Things/M2M) including energy management and tele-health. Greg previously spent 20 years delivering successful digital media products and strategies at both startups and large corporations. Greg served as head of products at a 500+ person international Internet startup from pre-IPO to post-IPO. He also led product strategy and business development for a 100+ person Internet TV startup, helping achieve an acquisition by a Fortune 100 company and subsequent deployment to tens of millions of video consumers. More recently, as an executive for a Fortune 50 corporation, Greg delivered an industry-wide product strategy and financial plan harnessing new interactive content into a ~\$1B incremental business opportunity. Greg resides in Mill Valley, CA and enjoys hiking, fly-fishing, visiting Napa often, and raising his teenage twins.

Dr. Upkar Varshney is Associate Professor of Computer Information Systems at Georgia State University, Atlanta. His current interests include mobile healthcare technologies, pervasive and ubiquitous computing, and wireless networks. He has authored more than 150 papers including 70 in national and international journals. He is credited with some early papers in mobile and pervasive healthcare. He authored Pervasive Healthcare Computing book in 2009 (Springer). He was the founding co-chair of International Pervasive Health Conference. Upkar was the program co-chair for Americas Conference on Information Systems (AMCIS-2009). Upkar has presented over fifty tutorials, workshops, panels and a few keynotes at major wireless, computing, and information systems conferences. He has served or is serving as an editor/guest editor for several major journals including IEEE Transactions on IT in Biomedicine, ACM/Springer Mobile Networks (MONET), Decision Support Systems

(DSS), and IEEE Computer.

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