

The National Academies of Sciences, Engineering, and Medicine's
ResilientAmerica Roundtable and the Board on Infrastructure and the Constructed Environment
In collaboration with the SEI/ASCE Advances in Information Technology Committee

The Role of Advanced Technologies in Structural Engineering for More Resilient Communities

September 26, 2017
Beckman Center
Irvine, Ca



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Speaker and Panelist Biographies

SETTING THE STAGE – 8:40- 9:00 AM

Chris Poland (NAE) is an internationally recognized authority on earthquake engineering and champion of disaster resilience. His passion for vibrant, sustainable, and healthy communities drives his consulting practice. He focuses on community resilience and the buildings and systems that contribute to it. Poland is currently a Community Resilience Fellow at the National Institute of Standards and Technology (NIST) and member of the NIST Community Resilience Panel. Poland is the past Chair of the Advisory Committee to the National Earthquake Hazards Reduction Program, and current Chairman of the Advisory Committee on Structural Safety of Department of Veterans Affairs Facilities. As Chair of the 100th Anniversary Earthquake Conference in San Francisco in April 2006, he shared the stage with California Governor Arnold Schwarzenegger and Senator Dianne Feinstein in an internationally covered event that brought the nation to think proactively about earthquake danger. He served as the Chair of the American Society of Civil Engineers Seismic Rehabilitation of Existing Buildings Standards Committee completing both ASCE 31 and ASCE 41, standards for the evaluation and rehabilitation of existing buildings that are used worldwide. Poland served on the Board of Directors for SPUR, co-chaired their Resilient City Initiative, and led the publication of “The Disaster Resilient City.” He serves on the Board of the ASCE Structural Engineering Institute, has a leadership position in the ASCE Infrastructure Resilience Division, and is a member of the Board of the US Resiliency Council. He served on the Board for the San Francisco Chamber of Commerce and was the co-chair of the San Francisco Lifelines Council with City Administrator Naomi Kelly. Poland was inducted into the National Academy of Engineering in 2009. He received EERI’s Alquist Award in 2006 and the Housner Medal in 2017. He is a Fellow of the American Council of Engineering Companies and the American Society of Civil Engineers Structural Engineering Institute. He is an honorary member of the Earthquake Engineering Research Institute and the Structural Engineers Association of California. His structural engineering career spans 40+ years and includes new design work, seismic analysis and strengthening of existing buildings, structural failure analysis, and historic preservation. Until his retirement, he was a Senior Principal, Chairman and CEO of Degenkolb

Engineers during his 40 years with the firm from 1974 through 2014. Poland received his M.S. in structural engineering from Stanford University.

**ENABLING COMMUNITY RESILIENCE: INNOVATIVE TECHNOLOGIES
IN THE BUILT ENVIRONMENT – 9:00 -10:15 AM**

Dr. Janice Barnes is Principal and Global Resiliency Director at Perkins+Will. As Principal and Global Resiliency Director Janice works with public and private clients to identify their risks and vulnerabilities and to meet their resiliency goals. With nearly 30 years of design experience bridging practical applications with empirical research, Janice recognizes critical organizational processes and links these to appropriate design responses. Internationally recognized for this expertise, Janice co-chairs the firm's Resiliency Task Force linking environmental, social and economic indicators to advance resiliency principles in design and to connect expertise across communities. She also oversees the Resiliency Lab of AREA, a 501(c)(3) focused on integrating research into design practice. In the last two years, she has worked extensively with the Rockefeller Foundation on the National Disaster Resiliency Competition, a HUD-sponsored, \$1 Billion, effort to strengthen resiliency in communities with federally-declared disasters. Working with the City of New Orleans, the State of California, the State of New York and the State of New Jersey among others, Janice guided the teams through critical self-assessments to develop unique strategies that ultimately enabled them to secure significant funding. Following the work with the NDRC, Janice worked with the City of Chicago on the development of its first Resilience Americorps VISTA program, focusing attention on Chicago's near west side where chronic flooding, coupled with underemployment and ongoing crime, challenge residents to meet their basic needs. Drawing from these experiences, Janice then worked once again with the Rockefeller Foundation on the first Global Resilience Academy in which the Foundation sought to broaden the exposure of resiliency strategies across its many departments and to understand how the resiliency toolkits applied to the various programs and initiatives underway. This was followed with further testing of the toolkits with the World Bank Yemen Programs. In her work with the District of Columbia District Department of the Environment, Janice led a team including Dr. Katherine Hayhoe who developed the climate projections and Kleinfelder who analyzed infrastructure vulnerabilities, in the development of the District's first Climate Adaptation Plan. A summary report and the accompanying technical reports are posted on the DOE website. Beyond the work with these clients, Janice also participates on the board of several organizations focused on improving overall resiliency and sustainability in our cities. These include the Urban Land Institute New York City Chapter where she participates on the Advisory Board, the Tri-State Land Use Committee, the ULI Excellence Awards and the Technical Advisory Panel Committee. In 2016, the ULI New York Chapter was awarded a \$100,000 New York Community Trust Grant to focus on resiliency planning in New York. She also is on her second term with Urban Green, the New York City chapter of the USGBC. Additionally she participates in the AIA New York City Design for Risk and Recovery committee.

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

Mr. Steve Moddemeyer is a thought leader with more than 22 years of experience leading governments, land owners, and project teams towards increased sustainability. He specializes in creating tools and policies that lead to resilient infrastructure systems for neighborhoods, cities and new town developments. He has extensive experience with complex public/private development issues and the development of sustainable strategies for major capital improvement projects. As a consultant, Steve led and authored Phase 1 of the Seattle Pre-Disaster Recovery Plan for the City of Seattle Office of Emergency Management. Disaster recovery planning requires a broad range of skills that span restoration of infrastructure, strategic land use decision-making, collaboration between government agencies, high interactivity with the public, and a deep understanding of the relationship between resilience and sustainability. Steve also helped to create the global program called Cities of the Future for the International Water Association (IWA). The effort brought together experts from around the world on the challenges and responses that cities are taking in light of global population growth, resource constraints, new technology, and climate change. He helped to launch a partnership between IWA and the Turkish Ministry of the Environment to assist Istanbul, Kayseri, and Trabzon to implement City of the Future strategies. In Seattle, Steve led the Sustainable District Study for the Yesler Terrace redevelopment in Seattle. His multi-disciplinary team identified cost-effective district scale approaches for sustainable energy, water and solid waste systems. Steve was also the principal author of the Seattle Green Factor, a powerful regulation that accelerates the use of green roofs, vegetated walls, and porous pavement in districts throughout the city. Steve's practice blends sustainability and resilience thinking. He participated with FEMA officials in the development of the National Mitigation Framework called for in the Presidential Policy Directive 8: National Preparedness. He co-authored the Benefit Cost Analysis for Seattle officials on policies to address seismic risk from unreinforced masonry buildings and is working with FEMA Region IX on the National Academy of Sciences' Resilient America Pilot Project in Seattle.

Reggie DesRoches, chair of the School of Civil and Environmental Engineering at the Georgia Institute of Technology, will become dean of Rice University's George R. Brown School of Engineering July 1. His primary research interests are in design of resilient infrastructure systems under extreme loads. He has published more than 250 articles in the general area of resilience and seismic risk assessment. Dr. DesRoches has served as Chair of the ASCE Seismic Effects Committee (2006-2010), Chair of the executive committee of the Technical Council on Lifeline Earthquake Engineering (2010), and Board of the Earthquake Engineering Research Institute (EERI). He is currently a member of the National Science Foundation (NSF) Engineering Directorate Advisory Committee, and is a member of the National Academies Board on Army Science and Technology (BAST). Dr. DesRoches has received numerous awards, including the Presidential Early Career Award for Scientists and Engineers (PECASE) in 2002 — the highest honor bestowed upon scientists and engineers in the early stages of their careers. Most recently, he was a recipient of the 2007 ASCE Walter L. Huber Civil Engineering Research Prize, the 2015 ASCE Charles Martin Duke Lifeline Earthquake Engineering Award, the Georgia Tech Outstanding Doctoral Thesis Advisor Award (2010), and the Georgia Tech ANAK Award (2008). The ANAK award is the highest honor the undergraduate student body can bestow on a Georgia Tech faculty member. Dr. DesRoches earned his Bachelor of Science in Mechanical Engineering in 1990, a Master of Science in Civil Engineering in 1992, and a Ph.D. in Structural Engineering in 1998 — all from the University of California, Berkeley. He was inducted into Berkeley's Academy of Distinguished Alumni from Civil and Environmental Engineering in 2015.

Moderator:

Ms. Arrietta Chakos is a consultant in urban resilience policy. Her specialties include disaster risk assessment, disaster loss estimates, public policy development, multi-party negotiations, and municipal government operations. She recently served as director of the Acting in Time Advance Disaster Recovery project at the Harvard Kennedy School, which was involved with disaster policy research and application. A seismic safety advocate, she was assistant city manager in Berkeley, California until 2007 and managed the city's intergovernmental coordination and hazard mitigation initiatives. She directed California's first municipal hazard mitigation plan aimed at sustainable risk reduction. Berkeley's mitigation efforts are nationally recognized and use innovative tax incentives and locally funded programs to promote community resilience. Chakos worked with the Federal Emergency Management Agency (FEMA) for its report to the Congress on all hazards risk mitigation, and with the California Governor's Office of Emergency Services (CalEMA) on natural hazards projects and seismic safety legislation. She served as a technical advisor to the Organization for Economic Cooperation and Development (OECD) on its international seismic safety program for schools; the World Bank on disaster risk reduction and sustainable development in the metropolitan Istanbul region; and with the National Research Council's research on community disaster resilience. She has also advised on a recent Ford Foundation study on Stafford Act implementation in the Gulf Coast region; as well as with the Association of Bay Area Governments; the Earthquake Engineering Research Institute; GeoHazards International; the Center for Biosecurity; and the Natural Hazards Center on disaster policy issues. Publications include papers on disaster risk reduction for technical conferences; the American Society of Civil Engineers; Spectra, an engineering professional publication; the Natural Hazards' Observer; the United Nations journal, Regional Development, and as a contributor to Keeping Schools Safe in Earthquake Country (OECD, 2004) and Global Warming, Natural Hazards, and Emergency Management (2009). She received a B.A. from California State University, Humboldt and a M.P.A. from the Harvard Kennedy School.

INNOVATIVE TECHNOLOGIES: WHAT ARE THEY NOW, WHAT COULD THEY BE IN THE FUTURE?

10:45 – 12:15 PM

Dr. Oral Buyukozturk is a Professor of Civil and Environmental Engineering, and Director of the Laboratory for Infrastructure Science and Sustainability, at Massachusetts Institute of Technology (MIT). He received his Ph.D. degree in Structural Engineering from Cornell University in 1970. He joined MIT faculty in 1976. His early work prior to joining MIT involved design and safety analysis of nuclear power structures, and at Brown University, he pioneered development of non-linear finite elements for modeling of heterogeneous materials and structures. He was involved in the development of a major general purpose computer program for civil, mechanical, aerospace structures. His early research at MIT included design and analysis of major energy facilities including nuclear energy and offshore oil production structures, and thermo-mechanical analysis of coal gasification vessels. His work at MIT has also included design and assessment of concrete structures, nuclear containment systems, earthquake engineering, interface fracture mechanics, and fiber-reinforced polymer (FRP) composites in structural rehabilitation. His current research interests, in the context of large scale multi-team multi-disciplinary projects, include infrastructure sustainability, multiscale analysis and design of durable and energy efficient materials, intelligent structures and materials, innovative sensing and data analytics, structural

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

health monitoring (SHM), and nondestructive testing (NDT). His recent work in these areas have led to ground-breaking developments and innovations in multiscale mechanical-chemical interaction processes in cementitious materials, and in novel computer vision techniques for structural sensing incorporating motion magnification. The overall integration of the effort is directed toward building quantitative sustainability from bottom-up contributing to establishment of a new paradigm in infrastructure engineering. He has published nearly 300 technical papers in refereed journals, edited books and conference proceedings, made more than 200 invited and keynote presentations around the world, and served in different capacities in over 20 technical committees. His awards include Golden Mirko Roš Medal of the Swiss Federal Research Laboratory for Materials Science and Technology; Fellow (non-resident) Royal Society of Edinburgh, Scotland's National Academy of Science and Letters; 2008 and 2011 ASNT National Faculty Fellowship Awards; Fellow, American Concrete Institute (ACI), and various Best Paper Awards jointly with his students. (<http://web.mit.edu/liss>)

Dr. Maria Feng received her B.S. from Southeast University in China in 1982 and Ph.D. in mechanical engineering from the University of Tokyo in 1992. She started her academic career at Princeton University in 1990 as a Research Associate. She joined the faculty at the University of California, Irvine (UCI) in 1992 where he served at first as an Assistant Professor, then an Associate Professor, a Professor, and most recently as a Chancellor's Professor. She was the founding Director of the Center for Advanced Monitoring and Damage Inspection at UCI. Professor Feng joined the Columbia faculty in 2012 as Renwick Professor of Civil Engineering, an endowed professorship. Professor Feng's research is on the forefront of multidisciplinary science and engineering in sensors, structural health monitoring, smart structure and system control for civil infrastructure and military applications, with an emphasis on structural safety and system resilience against natural and man-made hazards. She has made a number of original contributions to the state-of-the-art in both academic research and engineering practice through the development of novel fiber optic dynamic sensors, vision-based remote sensors, microwave imaging technology, vibration-based system identification algorithms for damage assessment, as well as the friction-controllable sliding isolation system and mega-sub structures for wind and seismic hazard mitigation. Professor Feng's achievements have been recognized by her election as a Fellow of the American Society of Civil Engineers (ASCE) and numerous national and international awards. The honors include the CAREER Award by the National Science Foundation, the Collingwood Prize by ASCE, and the Alfred Noble Prize awarded jointly by the ASCE, the American Society of Mechanical Engineers, the Institute of Electrical and Electronics Engineers, the American Institute of Mining, Metallurgical, and Petroleum Engineers, and the Western Society of Engineers. Professor Feng also received the Water L. Huber Civil Engineering Research Prize from ASCE "for innovative, interdisciplinary and practical research on sensing, monitoring and controlling dynamic response of civil engineering systems subjected to earthquake and wind loads. "In addition, she has received the Best Paper Award and the Best Presentation Award by the Japan Society of Instrument and Control Engineers, along with recognitions from other professional journals and conferences. Her work has been reported by national media, including a special feature "The Bridge Doctor" on *NBC Nightly News with Brian Williams*. She was named the Top Researcher on Wearable Sensors by *MIT Technology Review*.

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

Daniel Hiller is head of Strategic Management at Fraunhofer Institute for High-Speed Dynamics, Ernst-Mach-Institute EMI, Germany. In his position at Fraunhofer EMI, Mr. Hiller has initiated and managed numerous national and international projects related to applied security and resilience solutions in various environments. Before taking up his current position, Mr. Hiller served as the managing director of the Fraunhofer-Group for Defence and Security Research (VVS) under the leadership of Prof. Dr. Klaus Thoma, former Director of Fraunhofer EMI. In that role, Daniel Hiller managed the political network of the VVS and engaged with key stakeholders in both the civil and the military domains. Currently, Mr. Hiller is the managing director of the Sustainability Center Freiburg, a joint initiative of all five Fraunhofer Institutes in Freiburg together with the Albert-Ludwigs-University in Freiburg, Germany. Internationally, Mr. Hiller represents the interests of Fraunhofer EMI in different expert groups and industry networks in Brussels, focusing on European Research Networks and Initiatives. Before joining the Fraunhofer Society in 2009, Mr. Hiller served in the market research and competitive intelligence department of Rheinmetall Defence. As part of his graduate program, Mr. Hiller resumed various functions at the German Council on Foreign Affairs (DGAP), the Washington D.C. branch of the International Institute for Strategic Studies (IISS), as well as the office of the chief of staff of the majority Speaker of the German Bundestag, Mr. Volker Kauder MdB. Mr. Hiller concluded his undergraduate studies in political science, modern history as well as conflict studies at the Philipps-University in Marburg, Germany, before acquiring his graduate degree at his alma mater and Pennsylvania State University.

Dr. Jerome Lynch is the Donald Malloure Department Chair of Civil and Environmental Engineering; he is also a Professor of Electrical Engineering and Computer Science by courtesy. In addition, he serves as Director of the University of Michigan Urban Collaboratory, a campus-wide research initiative focused working directly with city stakeholders on the advancement of smart and health city technologies. Dr. Lynch completed his graduate studies at Stanford University where he received his Ph.D. in Civil and Environmental Engineering in 2002, M.S. in Civil and Environmental Engineering in 1998, and M.S. in Electrical Engineering in 2003. Prior to attending Stanford, Dr. Lynch received his B.E. in Civil and Environmental Engineering from the Cooper Union in New York City. His primary research interests center on the areas of wireless cyber-physical systems, cyberinfrastructure tools for monitoring data, and asset management strategies for infrastructure resiliency. He has co-authored one book and over 200 articles in peer reviewed journal and conferences. Dr. Lynch has been awarded the 2005 ONR Young Investigator Award, 2009 NSF CAREER Award, 2009 Presidential Early Career Award for Scientists and Engineers (PECASE), 2012 ASCE EMI Leonardo da Vinci Award and 2014 ASCE Huber Award.

Dr. Robert D. Moser is a Senior Research Civil Engineer in the Engineering Systems and Materials Division – Research Group, Geotechnical and Structures Laboratory, U.S. Army Engineer Research and Development Center (ERDC). In this position, he leads the Advanced Materials Engineering and Analysis Team at the ERDC. He also leads ERDC's Materials Science Community of Practice, regularly participates in Department of Defense, Tri-Service, and Army-level committees and strategy sessions, and leads many of ERDC's extramural research programs in materials science, advanced mechanics, and remote sensing. He conducts research in a variety of areas focused on the development and characterization of materials and material systems with the goal of improving the performance and durability of military

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

and civil infrastructure. Robert is an active member of the American Concrete Institute (ACI), National Association of Corrosion Engineers (NACE), and American Ceramics Society (ACerS). Dr. Moser also serves in a joint appointment as an Adjunct Professor of Civil Engineering and Mechanical Engineering at Mississippi State University where he teaches courses on materials science and infrastructure durability. Dr. Moser has received multiple awards for his work including the U.S. Army Corps of Engineers (USACE) Innovation of the Year Award in 2014, U.S. Army Research and Development Achievement Award in 2015, National Academy of Engineering's Frontiers of Engineering participant in 2015, and USACE Researcher of the Year Award in 2016. He received his PhD degree in Civil Engineering from the Georgia Institute with a focus on structural engineering and materials science.

Dr. Alexander Stolz is head of the department of protective structures and security technologies at Fraunhofer EMI. He is also head of the business unit security. He studied civil engineering at University of Wuppertal and wrote his doctoral thesis about mobilization of bedding stresses in granular soil at the Professorship for Geotechnique. As head of the business unit security and the head of the department Safety Technologies and Protective Structures he is specialized in the experimental investigation and numerical modeling of materials, components and structures under dynamic loads. Additionally, he is substantial experienced in the contribution and management of national and European research projects, amongst are SKRIPT (Security of bridges and Tunnels), AURIS (Autonomous risk and information system for structural analysis and monitoring of critical infrastructure) and SPRIRIT (Safety and Protection of built Infrastructure to Resist Integral Threats). Currently Dr. Stolz coordinates the Thematic Group "Resistance of structures to explosion effects" in the ERNCIP (European Reference network for Critical Infrastructure protection) framework and is since this year also appointed international member of the ABR10 Committee on Critical Infrastructure Protection.

Moderator:

Dr. Seymour M.J. Spence is an Assistant Professor at the University of Michigan. Previously to joining the University of Michigan in 2014, he spent three years as a Research Assistant Professor in the NatHaz Modeling Laboratory at the University of Notre Dame. He earned his M.S. in Civil Engineering in 2005 from the University of Perugia, Italy, and received a joint Ph.D. from the University of Florence, Italy and the University of Braunschweig, Germany in 2009. His main research interests are centered on the areas of performance-based design and optimization theory applied to large-scale and uncertain structural systems. He is currently focusing on the development of a framework for the performance-based topology/design optimization of structural systems subject to wind loads, with combined time-variant/-invariant uncertainties, as well as on the definition of methodologies and procedures for the efficient CFD-based aerodynamic shape optimization of tall buildings. Spence has authored over 60 publications in leading journals and conferences proceedings over the past six years and has given a number of invited talks at leading institutions around the world. In 2015 he was the recipient of the American Society of Civil Engineers (ASCE) J. James R. Croes Medal.

FEATURED SPEAKER – HOW ARE CITIES THINKING ABOUT THE ROLE OF TECHNOLOGIES AND STRUCTURAL ENGINEERING FOR THE FUTURE? 1:30 – 2:00 PM
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Mr. Paul Brown has nearly 40 years' experience in project development, project finance, and the planning and management of public utilities and environmental facilities. From 1975 to 2013, he worked for CDM Smith, most recently as Executive Vice President and member of the firm's Board of Directors. In addition, he was the Founding Technical Director of CDM Smith's Centre for Integrated Urban Solutions in Singapore. Brown is co-author (with Vladimir Novotny and Jack Ahern) of the book *Water Centric Sustainable Communities*, published by John Wiley & Sons.

A member of the American Institute of Certified Planners (AICP) and a Fellow in the International Water Association (IWA), he is a former chair of the IWA Cities of the Future program committee. Brown was a Visiting Professor at the University of South Florida (USF) Patel College of Global Sustainability, where he also served as Director of Applied Research. He is currently providing program management support for the Regional Recycled Water Program being developed by the Metropolitan Water District of Southern California and the Los Angeles County Sanitation Districts.

VISIONS OF THE FUTURE: ENABLING DESIGN AND INTEGRATION OF EMERGING TECHNOLOGIES – 2:00-3:30 PM

Craig A. Davis, Ph.D., P.E., GE, M.ASCE, is the trunk line design manager and the seismic manager for the Los Angeles Department of Water and Power water system. He is responsible for the trunk line design office, project management, and design management duties for the most critical large diameter water lines operated by LADWP. He formerly held the position of LADWP geotechnical engineering manager and supervised approximately \$1.2 billion in major geotechnical projects, managing 12 professional services contracts totaling approximately \$100 million. Additionally, Davis manages the LADWP Seismic Resilience Program. He coordinates with the Los Angeles City mayor's office, various city agencies, public and private utilities, and the U.S. Geological Survey to identify seismic and operational resilience gaps, prioritize projects to enhance seismic protection, and communicate technical issues with the public. Davis has been responsible for many important public works developments. He made critical improvements in the seismic safety program for LADWP dams through a systematic assessment of seismic hazards, establishment of a rigorous external review process, and the promotion and development of advanced computational analyses for key reservoirs and lifelines. His team led the design of the Headworks Reservoir using advanced computational simulation and while under tight schedule conditions. He championed the use of seismic resilient pipelines and developed demonstration programs for a new generation of segmental pipelines with special joints that accommodate large ground deformation associated with liquefaction and surface faulting. This program has had a national impact, with similar demonstration programs being implemented in San Francisco, Portland, and Seattle. His work has stimulated many national and international pipeline companies to develop innovative seismic designs for a new generation of seismic-resilient products. Davis is a member of the National Earthquake Hazards Reduction Program and is part of the Advisory Committee on Earthquake Hazards Reduction, providing guidance for the National Institute of Standards and Technology and its oversight of NEHRP. He is chair of the ASCE Infrastructure Resilience Division, the founding vice president of the International Society of Lifeline and Infrastructure Earthquake Engineering, and is member of many other national and international professional committees focused on geotechnical and lifeline

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SCIENCES • ENGINEERING • MEDICINE

earthquake engineering. He has organized and coordinated numerous international workshops and symposiums on geotechnical and lifeline earthquake engineering. Davis has participated in numerous earthquake reconnaissance missions, including post-earthquake missions for the Canterbury Earthquake Sequence (2010-2011) in New Zealand, 2011 Tohoku, Japan earthquake, and 2013 Lushan, China earthquake. These missions are in addition to his active participation in LADWP water supply emergency operations and recovery after the 1994 Northridge earthquake. His expertise has been sought globally, including several trips to China, Japan, and New Zealand to advise on seismic risk reduction and to organize and participate in conferences and workshops.

Mr. Peter Marx holds the position of Adjunct Professor at the University of Southern California. As Vice President, Predix, for General Electric, Marx had responsibilities for evangelism, standards, and technology development for the industrial Internet of Things. Before coming to GE, Marx was the first Chief (Innovative) Technology Officer for the City of Los Angeles and a variety of executive and engineering positions with the world's leading companies. His tasks at the City of Los Angeles include driving technology strategy across the City's departments and agencies, working with the local and worldwide technology industries, and using data to upgrade performance throughout City government. Prior to coming to the Mayor's Office, Marx was Vice President, Business Development, for Qualcomm Labs where he was a leading member of the founding teams on Gimbal (BTLE beacons and context awareness) and Vuforia (augmented reality) as part of his overall work on driving the development of new technologies. He previously held the position of Vice President at Mattel handling digital and online products and services. He was the CTO for Vivendi-Universal Games (Blizzard, Sierra Online, Universal) and was the Vice President, Emerging Technologies for Universal Studios where he focused on digital delivery of filmed content. He was the Senior Research Engineer for Electronic Arts where he developed technology and produced games for worldwide audiences. Marx has been an engineer for 3M, Apple, and the UCLA Department of Medicine, all in the areas of computer video, computer vision, 3D/4D graphics, morphometric analysis, tomography, and computational photography. He has been an author on reports for the President's Council of Advisers in Science and Technology (PCAST) and a number of papers in biomedical research.

Mr. David Mar believes the key to successful design is seeing and optimizing projects as a whole while controlling construction costs. To this end, his designs are inventive and technically ingenious. Some of his many creative contributions to seismic engineering include vertically post-tensioned shear walls and rocking braced frames that return to plumb; tilting rigid spines; and skin-reinforced straw bale shear walls. David has a keen interest in Lean design and in set-based design, and he actively applies these principles to all of his work. David's focus on seismic and sustainable design has positioned him at the forefront of the green-building movement. His enthusiasm for "deep green" innovation has fueled the expansion of his repertoire from traditional steel, concrete, and wood construction to the use of such materials as rammed earth, bamboo, straw bale, timber frame, and structural insulated panels. In 2013, David served as technical director for [FEMA P807](#): Guidelines for the Seismic Retrofit of Weak-Story Multi-Unit Wood-Framed Structures. His out-of-the-box thinking resulted in a comprehensive design methodology that yielded high-performance retrofits at a low cost—thus solving one of structural engineering's most vexing problems. David received his undergraduate and master's degrees from the University of California, Berkeley. He has lectured at numerous institutions, including UC Berkeley, Cal

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Poly San Luis Obispo, Stanford University, and the Lean Construction Institute. In 1998, David was honored with SEAONC's H.J. Brunnier Award for Outstanding Achievement in Structural Design. David is also an accomplished songwriter and guitarist. He is currently writing material for his third album.

Moderator:

Mr. Ron Eguchi is President and CEO of ImageCat, Inc. He has over 30 years of experience in risk analysis and risk management studies. He has served on several Editorial Boards in the past including the Natural Hazards Review published by the American Society of Civil Engineers (ASCE) and the Natural Hazards Research and Applications Information Center, and the Earthquake Engineering Research Institute's (EERI) Journal, Earthquake Spectra. He is a past member of the following national committees: the National Research Council's Disaster Roundtable, the Scientific Advisory Committee of the U.S. Geological Survey, and the Executive Committee of the ASCE Technical Council on Lifeline Earthquake Engineering. He is currently starting a new committee for the Structural Engineering Institute of ASCE that will encourage the advancement and application of information technologies in structural engineering. In 2006, he accepted an ATC Award of Excellence on behalf of the ATC-61 project team for work on An Independent Study to Assess Future Savings from Mitigation Activities that showed that a dollar spent on hazard mitigation saves the nation about \$4 in future benefits for every dollar spent. He was recognized by EERI as the 2008 Distinguished Lecturer where he discussed the topic of "Earthquakes, Hurricanes, and other Disasters: A View from Space". He has authored over 300 publications, many of them dealing with the seismic risk of utility lifeline systems and the use of remote sensing technologies for disaster response.