PLENARY SPEAKERS

WAIT WHAT
A FUTURE TECHNOLOGY FORUM
DARPA

Ashton B. Carter is the 25th Secretary of Defense.
Secretary Carter has spent more than three decades leveraging his knowledge of science and technology, global strategy and policy as well as his deep dedication to the men and women of the Department of Defense to make our nation and the world a safer place. He has done so in direct and indirect service of eleven secretaries of defense in both Democratic and Republican Administrations. Whether in government, academia, or the private sector, Secretary Carter has been guided by pragmatism and his belief in the boundless opportunities of the United States and has worked tirelessly to contribute to the ideas, policies, and innovations that assure our global leadership.

Gunnar Carlsson
An algebraic topologist developing insights about how to handle and visualize big data

Gunnar Carlsson is the Anne and Bill Swindells Professor of Mathematics at Stanford University. He specializes in a branch of mathematics called topology, the study of shape. Theoretical study of topology started in the 1700s but starting in the late 1990s, Carlsson pioneered the applied use of topology to solve complex real-world problems. In the early 2000s, this work led to research grants from the National Science Foundation (NSF) and DARPA to study the application of topological data analysis (TDA) to problems of interest within the U.S. government. In 2008, based on the success of these efforts, Gunnar, along with two other Stanford mathematicians, co-founded Ayasdi, a company that is commercializing topological methods for data analysis.

Carlsson has a Ph.D. in mathematics from Stanford University and B.A. in mathematics from Harvard University.

R. Alta Charo
A scholar of the legal and ethical implications of emerging technologies

R. Alta Charo is the Warren P. Knowles Professor of Law and Bioethics at the law and medical schools of the University of Wisconsin. Her expertise includes biotechnology regulation, bioethics, public health law, food and drug law, stem cell policy, torts and legislative drafting.

Charo served on President Obama's transition team, where she was a member of the HHS review team, focusing her attention particularly on transition issues related to the National Institutes of Health (NIH), the Food and Drug Administration (FDA), bioethics,

stem cell policy and women's reproductive health. From 2009–2011, she served as a senior policy advisor on emerging technology issues in the Office of the Commissioner at the U.S. Food & Drug Administration. A member of the National Academy of Science's Institute of Medicine (IOM) and Committee on Science, Technology and Law, she co-chaired the committee that drafted the National Academies' Guidelines for Embryonic Stem Cell Research.

Charo has a J.D. from Columbia University and a B.A. in biology from Harvard University.

Craig Clark

An entrepreneur on the cutting edge of space production and a pioneer of CubeSat technology

Clark is the founder/CEO of Clyde Space Ltd and regarded by many as a pioneer of the 'Newspace' revolution that is currently changing the face of the space industry. In 2005, and after 11 years designing and building small satellites with Surrey Satellite Technology Ltd, Clark founded Clyde Space Ltd., which focuses on the development of cutting-edge products for the space market, particularly in the area of tiny satellites called CubeSats. The company's successes include the design, launch and operation of Scotland's first satellite, UKube-1. He is a member of the American Institute of Aeronautics and Astronautics (AIAA), the United Kingdom's Space Leadership Council and the British Interplanetary Society. Clark earned his M.Sc. in satellite engineering from the University of Surrey (UK), and a B.Eng. in power engineering from the University of Glasgow (UK).

Karl Deisseroth

A pioneer in optogenetics, using light to turn individual working neurons on and off at will

Karl Deisseroth is the D.H. Chen Professor of Bioengineering and of Psychiatry and Behavioral Sciences at Stanford University.

His laboratory has worked on developing and applying high-resolution tools for controlling (optogenetics.org) and mapping (clarityresourcecenter.org) specific well-defined elements within intact and fully-assembled biological systems. His research laboratory continues to develop and apply these and other tools (integrated with optical, electrophysiological, computational, molecular, and behavioral approaches) for the study of neural physiology and behavior in freely moving mammals. His research group is interested both in natural behaviorally relevant neural circuit dynamics, and in pathological dynamics underlying neuropsychiatric disease symptomatology and treatment.

Deisseroth has an M.D. from Stanford University Medical School, a Ph.D. in neuroscience from Stanford University and a B.A. in biochemical sciences from Harvard University.

Tom Dietterich

A pathfinding computer scientist applying human intelligence to choices about artificial intelligence

Tom Dietterich is President of the Association for the Advancement of Artificial Intelligence and Distinguished Professor of Computer Science at Oregon State University. As one of the earliest researchers in machine learning, he has made contributions to many aspects of the field including multiple-instance learning, multi-class learning, structured prediction, hierarchical reinforcement learning, and end-to-end learning in AI systems.

He earned his A.B. in Mathematics from Oberlin College (1977), M.S. in Computer Science from the University of Illinois (1979), and Ph.D. in Computer Science from Stanford (1985). He is a Fellow of the ACM, AAAS, and AAAI.

Jeff Gore

A physicist discovering the fundamental rules of population dynamics, collapse and tipping points through microbes

Jeff Gore joined the Physics Department at the Massachusetts Institute of Technology (MIT) as an Assistant Professor in January 2010 after spending the previous three years in the Department as a Pappalardo Fellow working with Alexander van Oudenaarden. With the support of a Hertz Graduate Fellowship, in 2005 he received his Ph.D. from the Physics Department at the University of California, Berkeley. His graduate research in single-molecule biophysics was done in the laboratory of Carlos Bustamante, focusing on the study of twist and torque in single molecules of DNA.

Dr. Gore was named the 2013 Allen Distinguished Investigator, was a recipient of the 2012 NIH New Innovators Award, was named 2011 Pew Scholar in the Biomedical Sciences and is the recipient of a 2011 Sloan Research Fellowship and 2011 NSF CAREER Award.

Mark Norell

A paleontologist and molecular geneticist shattering preconceptions about dinosaurs

Mark Norell is Division Chair and Curator-in-Charge, Division of Paleontology at the American Museum of Natural History and Professor, Richard Gilder Graduate School. Dr. Norell works in several areas of specimen-based and theoretical research. He works on the description and relationships among coelurosaurs and studies elements of the Asian Mesozoic fauna. He analyzes important new “feathered” dinosaurs from Liaoning, China, and develops theoretical methods for better understanding phylogenetic relationships and patterns in the fossil record.

Dr. Norell’s theoretical work focuses on developing methodology for evaluating the effect of missing data on large data sets, sensitivity methods for character weighting, and using phylogeny to estimate patterns in the fossil record such as diversity and

extinction. Much of his new research focuses on the evolution of the avian brain. He also studies the relationship between stratigraphic position and phylogenetic topology.

Dr. Norell received his bachelor's degree from California State University, his masters from San Diego State University and his M.Phil and Ph.D. from Yale University.

Ramesh Raskar

A researcher using femtosecond photography to see around corners

Ramesh Raskar is an associate professor at the Massachusetts Institute of Technology (MIT) Media Lab. Raskar joined the Media Lab from Mitsubishi Electric Research Laboratories in 2008 as head of the Lab's Camera Culture research group. His research interests span the fields of computational photography, inverse problems in imaging and human-computer interaction.

In 2004, Raskar received the TR100 Award from Technology Review, which recognizes top young innovators under the age of 35, and in 2003, the Global Indus Technovator Award, instituted at MIT to recognize the top 20 Indian technology innovators worldwide.

Raskar has a Ph.D. in computer science from the University of North Carolina at Chapel Hill, an M.S. in computer science from the University of Iowa and a B.S. in electronics and telecommunications from the Government College of Engineering (India). He holds more than 50 U.S. patents and has received four Mitsubishi Electric Invention Awards. He is currently co-authoring a book on computational photography.

Alberto Sangiovanni-Vincentelli

An engineer inventing design tools for the trillion-device future

Alberto Sangiovanni-Vincentelli holds the Buttner Chair of Electrical Engineering and Computer Sciences at the University of California at Berkeley. His research covers design methodologies, and tools for wireless sensor networks, embedded systems, hybrid systems, cyber physical systems (CPS), systems of systems (SoS) and electronic design automation.

Sangiovanni-Vincentelli was a co-founder of Cadence and Synopsys, the two leading companies in electronic design automation. He is Chairperson of the Comitato Nazionale dei Garanti per la Ricerca (CNGR).

He received the Distinguished Teaching Award of the University of California and the IEEE Graduate Teaching Award for "inspirational teaching of graduate students." He has received numerous research awards, including the Kaufman Award and the IEEE/RSE Maxwell Medal.

Sangiovanni-Vincentelli has a Ph.D. in electrical engineering and computer science from Politecnico di Milano (Italy). He is an author of more than 850 papers, 17 books and two patents. He holds honorary doctorates from the University of Aalborg (Denmark) and KTH (Sweden).

Zach Serber

An entrepreneur engineering living cells to create materials and chemistries the world has never seen

Zach Serber, recent co-founder of Zymergen, is a scientist and entrepreneur devoted to finding alternatives to petroleum. His goal is to expand the impact and reach of industrial microbial fermentation. He recently co-founded Zymergen to expand the impact and reach of industrial microbial fermentation. Zymergen applies radical new methods to design and improve microbes by rewriting their DNA. This capability allows the company to generate novel chemicals and advanced materials far faster, at lower costs, and with less risk than ever before.

Serber was previously the Director of Biology at Amyris where he worked on manufacturing bio-derived transportation fuels, on lowering the cost of the anti-malarial drug Artemisinin, and on developing advanced tools for engineering biology.

Serber has 15 peer-reviewed publications, 5 filed patents, and has worked as a research fellow at Stanford University Medical School. He has a Ph.D. in biophysics from UCSF, an M.Sc. in neuroscience from the University of Edinburgh, and a B.A. from Columbia University. He lives on a 50 year-old wooden sailboat in Sausalito CA with his wife and daughter.

Lucianne Walkowicz

An astronomer with a biologist's bent, studying stellar influences on planetary habitability

Lucianne Walkowicz is an astronomer at the Adler Planetarium in Chicago and Henry Norris Russell Fellow in the department of astrophysical sciences at Princeton University. She studies stellar magnetic activity and its effects on planetary habitability using data from NASA's Kepler Mission.

Selected Honors: Kavli Fellow Frontiers of Science (2012); TED Senior Fellow (2012); TEDGlobal Fellow (2011); SpokeStar of the Year; Light Pollution Advocacy; Astronomical League (2012); and NSF Graduate Research Fellowship, Honorable Mention (2004).

Walkowicz has a Ph.D. and M.S. in astronomy from the University of Washington and a B.S. in physics from Johns Hopkins University.

Jun Ye
A physicist herding atoms colder than the coldest spot in the known universe

Jun Ye is a professor of physics at the University of Colorado at Boulder (CU) and a fellow of both the National Institute of Standards and Technology (NIST) and JILA, a joint institute between NIST and CU. His research focuses on the frontier of light-matter interactions and includes ultrasensitive laser spectroscopy, optical frequency metrology, quantum optics using cold atoms and the science behind ultrafast lasers.

Awards and honors include three Gold Medals from the U.S. Commerce Department, a Frew Fellowship from the Australian Academy of Science, the I. I. Rabi Prize from the American Physical Society, the European Frequency and Time Forum Award, and the Carl Zeiss Research Award.

Ye has a Ph.D. in physics from the University of Colorado at Boulder, an M.S. in physics from the University of New Mexico and a B.S. in applied physics from Jiao Tong University in Shanghai. He has co-authored more than 300 technical papers and has delivered more than 400 invited talks.