

Faculty Features

Faculty Awards in the past year include the Presidential Medal of Freedom and the IEEE Medal of Honor to Mildred Dresselhaus, and more

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Faculty Fellowships, Chairs, New Faculty, Leadership Appointments

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**In Memory of Seth Teller
Shaoul Ezekiel, and Jack Ruina**

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Faculty Awards



Dimitri Antoniadis

2014 SRC Aristotle Award;
2015 IEEE Jun-ichi Nishizawa Medal



Arvind

Elected to India National Academy of
Sciences (Foreign Fellow)



Hari Balakrishnan

2015 National Academy of Engineering



Dimitri Bertsekas

2014 American Automatic Control Council
Richard Bellman Heritage Award



Sangeeta Bhatia

2014 Winner of \$500,000 Lemelson-MIT
Prize; 2015 National Academy of En-
gineering; One of Foreign Policy's 100
Leading Global Thinkers



Rodney Brooks

2014 Engelberger Award for Leadership
Robotics Industries Association;
2014 IEEE Robotics and Automation



Anantha Chandrakasan

2015 National Academy of Engineering



Jesús del Alamo

2014 Fellow American Physical Society;
Recipient of 2015 Bose Research Grant



Srin Devadas

Elected 2014 Fellow of Association for
Computing Machinery (ACM)

Faculty Awards, *continued*



Mildred S. Dresselhaus

2014 Presidential Medal of Freedom;
IEEE 2015 Medal of Honor



James Fujimoto

Awarded Honorary Doctorate at Nicolaus
Copernicus University, Poland;
2015 OSA Frederic Ives Medal



W. Eric L. Grimson

Elected 2014 Fellow of Association for
Computing Machinery (ACM)



Polina Golland

2014 ECEDH Diversity Award



Qing Hu

2015 Optical Society (OSA) Nick Holonyak
Jr. Award



Franz Kaashoek

2014 MIT Earl M. Murman Award for Ex-
cellence in Undergraduate Advising



Charles E. Leiserson

2014 ACM/IEEE Computer Society Ken
Kennedy Award



Sanjoy Mitter

2015 IEEE Eric E. Sumner Award



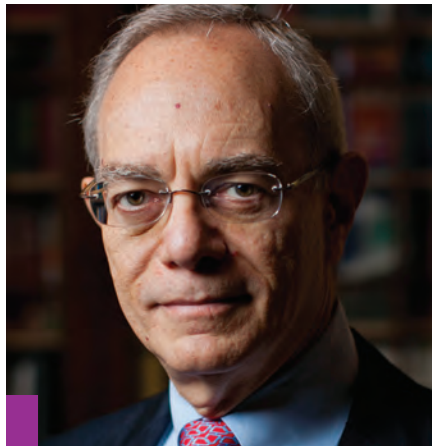
Robert Morris

Elected 2014 Fellow of Association for
Computing Machinery (ACM)



Rajeev Ram

Elected 2014 Fellow of the Optical Society (OSA); Recipient of 2015 Bose Research Grant



L. Rafael Reif

2015 National Academy of Engineering



Ronitt Rubinfeld

Elected 2014 Fellow of Association for Computing Machinery (ACM)



Daniela Rus

Elected 2014 Fellow of Association for Computing Machinery (ACM);
2015 National Academy of Engineering



Daniel Sanchez

2015 NSF Faculty Early Career Development (CAREER) Award



Madhu Sudan

2014 Infosys Prize in Mathematical Sciences



Vivienne Sze

2014 DARPA Young Faculty Award



Vinod Vaikuntanathan

2014 Microsoft Research Faculty Fellow



Nickolai Zeldovich

2014 Harold E. Edgerton Faculty Achievement Award

Faculty Awards, *continued*

Five EECS Faculty are elected to the NAE and ACM, and Mildred Dresselhaus receives the Presidential Medal of Freedom and the IEEE Medal of Honor

In January 2015, a record five MIT Computer Science and Artificial Intelligence Lab (CSAIL) EECS faculty members were elected as Fellow to the Association for Computing Machinery. **Srini Devadas**, **Eric Grimson**, **Robert Morris**, **Ronitt Rubinfeld** and **Daniela Rus** were selected for “providing key knowledge” to computing.

In February 2015, a record five members of the MIT EECS Department (out of eight total MIT faculty) were elected to the National Academy of Engineering. **Hari Balakrishnan**, the Fujitsu professor in Electrical Engineering and Computer Science, was cited for his contributions to wired and wireless networks and distributed systems; **Sangeeta Bhatia**, the John and Dorothy Wilson Professor of Health Sciences and Technology and Electrical Engineering and Computer Science, was cited for her work in tissue engineering and tissue-regeneration technologies, stem-cell differentiation, and preclinical drug evaluation; **Anantha Chandrakasan**, the Joseph F. and Nancy P. Keithly Professor in Electrical Engineering, was cited for his work on the development of low-power circuit and system design methods; **L. Rafael Reif**, President of MIT was cited for his technical and educational contributions, and for university leadership; and **Daniela Rus**, the Andrew and Erna Viterbi Professor in the Department of Electrical Engineering and Computer Science and the Director of CSAIL, was cited for contributions to distributed robotic systems.



In November 2012 Institute Professor **Mildred Dresselhaus** was recognized by the US Department of Energy with the Enrico Fermi Award — for her leadership in condensed matter physics, in energy and science policy, in service to the scientific community, and in mentoring women in the sciences — followed a few months later by the Kavli Prize for her pioneering contributions to the study of phonons, electron-phonon interactions and thermal transport in nanostructures.

In December 2014, as Dresselhaus was receiving the Presidential Medal of Freedom in the White House from President Obama, the IEEE announced the recipient for its highest award. In honoring Dresselhaus with the 2015 IEEE Medal of Honor, the IEEE cited her “For leadership and contributions across many fields of science and engineering.” She is the first woman to receive this honor.

Dresselhaus continues her research with dedication and excitement. “Throughout my career,” she notes, I have been interested in finding out how the unique properties of new materials beyond silicon could contribute to electronics. My recent research interests involve layered materials like the semimetal graphene, the related wide gap semiconductor hexagonal boron nitride in its few layered form, the few layered transition metal dichalcogenides which offer a wide variety of properties from semiconductors to metals, to Phosphorene which is a puckered layer semiconductor.”

Faculty News: FRIFs

Faculty Research and Innovation Fellowships

Two new FRIFs are awarded in 2014



Professor **Rob Miller** '95 (top image left) is a member of CSAIL where he heads the User Interface Design Group and focuses his research on human-computer interaction and crowd computing. He has contributed to professional programming by designing tools with appropriate user interfaces such as Theseus, a new type of JavaScript debugger that makes dynamic information visible in the code editor. A MacVicar Faculty Fellow, Professor Miller has been at the core of developing and adapting online education on campus. With the launch of the XSeries courses, for example, members of his group have been studying how to make video lectures more effective for learning, how to develop self-generating tutoring systems based on students' trial-and-error problem solving and how to improve in-class activities.

Professor **Collin Stultz** (middle image, left) is a principal investigator in RLE and a member in the Institute for Medical Engineering and Science (IMES). A practicing cardiologist, Professor Stultz focuses on conformational changes in macromolecules and the effect of structural transitions on common human diseases such as Parkinson's and heart disease. Under his leadership, the Computational Biophysics Group uses an interdisciplinary approach in this work, utilizing techniques drawn from computational chemistry, signal processing, and basic biochemistry. Professor Stultz has co-lead the department's recent undergraduate curriculum development, creating 6.S02, a medical-based technology introduction to EECS. He is a recipient of the Burroughs Wellcome Fund Career Award in Biomedical Sciences and the James Tolbert Shipley Prize.

Three 2014-2015 Faculty Research Innovation Fellowships (FRIF) were announced by Department Head Chandrakasan in early October. The FRIF was established in 2011 to recognize mid-career EECS faculty members for outstanding research contributions and international leadership in their fields. The FRIF provides tenured, mid-career faculty in the department with resources to pursue new research and development paths, and to make potentially important discoveries through early stage research. "We are grateful to the generous contributors who have made these awards possible," Chandrakasan said.

The *Peter Levine Faculty Research Innovation Fellow* donated by **Peter Levine**, a partner at the venture capital firm Andreessen Horowitz, was awarded to Professor Rob Miller. The *Frank Quick Faculty Research Innovation Fellow*, donated by EECS alumnus **Frank Quick '69, SM '70**, was awarded to Professor Joel Voldman. Professor Collin Stultz is the recipient of this year's *Steven G. '68, SM '69, EE '70, ScD '75*, and *Renée Finn Faculty Research Innovation Fellowship*, donated by **Steven and Renée Finn**.

Professor **Joel Voldman** (lower image left) is a principal investigator in MTL and RLE and works to understand the most basic interactions between single cells – building on various disciplines including electrical engineering, microfabrication, bioengineering, transport modeling, biology and medicine. Under his leadership, members of the Biological Microtechnology and BioMEMS Group engineer cutting-edge approaches to stem cell signaling, point of care therapeutics and neuroengineering. As one of three co-founders and co-directors of the Medical Device Realization Center (MEDRC) at MIT, Professor Voldman has directed the use of microfluidics technologies to detect protein biomarkers using portable all-electronic immunoassays. Professor Voldman has also served the EECS department as faculty advisor for the new undergraduate research conference known as EECScon.

Faculty News: Chair Appointments

Munther A. Dahleh is appointed to the William A. Coolidge Professorship



Electrical Engineering and Computer Science (EECS) Department Head Anantha Chandrakasan announced the appointment of Professor Munther A. Dahleh to the William A. Coolidge Professorship at MIT in late May 2014.

William A. Coolidge, a Harvard College graduate (1924) and founder and chair of the National Research Corporation, was a devoted member of the MIT Corporation (from 1948, as a term member, to his appointment as a Life Member Emeritus in 1976). The professorship was established in 1988 in recognition of Mr. Coolidge's years of thoughtful advice and generosity to MIT.

A star in his research field, Munther Dahleh has driven new problem areas in large-scale, heterogeneous, interconnected systems. He is an exceptional teacher and mentor. He has also made outstanding contributions to service in the past few years as the Associate and Acting Director of LIDS, Associate Head of EECS, and currently as the Acting Director of ESD, and Director-designate of a potential new organization that would incorporate the people and programs of ESD, LIDS, and a significant new initiative in statistics.

Prof. Dahleh's research is broadly in the area of systems and control, with specific interest in distributed systems. He was already recognized early in his career as an exceptional talent in this field, particularly through his ground-breaking theoretical work in robust feedback control and his practical applications in autonomous systems, automotive systems, and neuroscience. These accomplishments led to his winning the prestigious Donald P. Eckman Award in 1993, for the best control engineer under the age of 35.

Prof. Dahleh has made foundational contributions in at least three areas of control: (a) robust control theory, especially through the L^1 -optimal control paradigm; (b) fundamental performance limitations for feedback control in the presence of communication constraints; and (c) learning and control in networked environments. His contributions with his students and collaborators in these areas were recognized by three Axelby Outstanding Paper Awards for papers in the IEEE Transactions on Automatic Control.

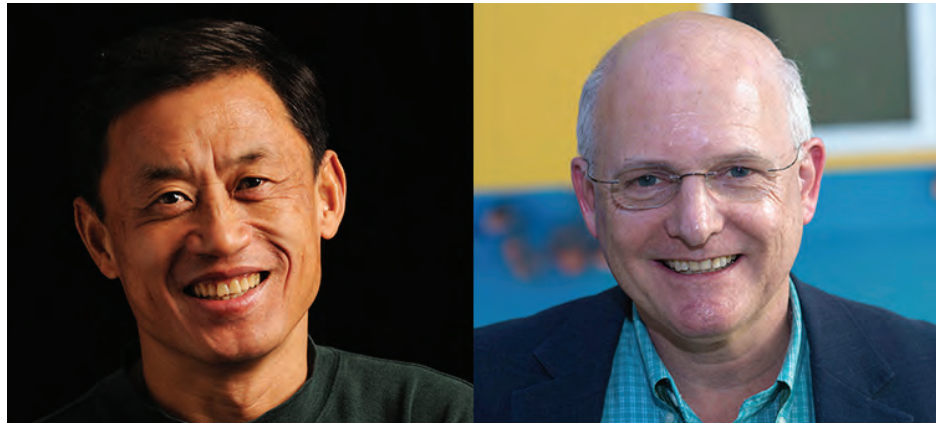
In his current research, Prof. Dahleh focuses on the foundational theory necessary to understand systemic risk in interconnected systems. He is also involved in a number of related application domains, including transportation systems, financial systems, the future power grid, and social networks. His work draws from various fields including game theory, optimal control, distributed optimization, information theory, and distributed learning. His collaborations include faculty from all five schools at MIT.

Munther Dahleh is an outstanding teacher and has made important educational contributions. He was recognized with the MIT Graduate Council Teaching Award (1995). He has been the lead instructor in 6.003 Signals and Systems and 6.041 Probabilistic Systems Analysis, and has helped create subjects that span traditional areas, including 6.435 Statistical Inference and Systems Identification. In collaboration with Prof. Asu Ozdaglar he developed 6.207 Networks, which is jointly listed with economics.

As EECS Associate Head (2011–2013), Prof. Dahleh helped develop strategic hiring directions for EECS, created a more unified EE structure, and in collaboration with Professor Leslie Kolodziejski solidified guaranteed support for all incoming EECS graduate students. He has also done a tremendous job in his current role to define the vision for a new entity combining ESD, LIDS and Statistics. He currently serves as the chair of the Committee on Discipline, and has contributed deeply to the MIT student community.

Two Chair Appointments are announced in EECS

*Qing Hu is inaugural holder of new chair: the Distinguished Professor of Electrical Engineering and Computer Science
Charles Leiserson becomes the Edwin Sibley Webster Professor*



EECS Department Head Anantha Chandrakasan announced in early fall 2014 the appointments of Qing Hu as Distinguished Professor of Electrical Engineering and Computer Science and of Charles E. Leiserson as Edwin Sibley Webster Professor of Electrical Engineering and Computer Science.

Professor Hu, [photo left] the inaugural holder of the Distinguished Professor of Electrical Engineering and Computer Science, has made significant contributions to physics and device applications over a broad electromagnetic spectrum, from millimeter wave, through terahertz (THz), to infrared frequencies. His research has involved technology development for detectors and sources, as well as system-level imaging and sensing applications. A most distinctive contribution is his development of high-performance THz quantum cascade lasers. This breakthrough has already found applications in sensing and real time THz imaging, which was also pioneered by his group. He is a Fellow of the Optical Society of America (OSA), of the American Physical Society (APS), of the IEEE, and of the American Association for the Advancement of Science (AAAS). He is the recipient of the 2012 IEEE Photonics Society William Streifer Scientific Achievement Award. He has been an Associate Editor of Applied Physics Letters since 2006, and was the co-chair of the 2006 International Workshop on Quantum Cascade Lasers.

In addition to his research, Professor Hu has also made important contributions to the department in service and teaching. He has served on the EECS faculty search committee during 2008-2011, the EECS ABET committee during 2012-2013, and the personnel committee since 2012. He has taught a broad range of courses, including signals and systems (6.003), microelectronic devices and circuits (6.012), electromagnetics (6.013/6.014), quantum mechanics (6.017 prior to 1995), and solid-state physics (6.730 and 6.732).

Professor Leiserson [photo right] will be occupying a chair held over its sixty years by a succession of distinguished faculty in the department, including Ernst Guillemin in 1960, Lan Jen Chu in 1963, Peter Elias in 1974, Ronald Rivest in 1992, and most recently Alan Willsky. The Edwin Sibley Webster chair is also currently held by Professor Srinu Devadas. Professor Leiserson's research centers on algorithms and parallel computing. He wrote the first paper on systolic architectures, devised the retiming method of digital-circuit optimization, invented the fat-tree interconnection network, introduced the notion of cache-oblivious algorithms, and developed the Cilk multithreaded programming technology, which incorporated the first provably efficient work-stealing scheduler. Many of Professor Leiserson's inventions have been embodied in industrial artifacts.

In parallel with his seminal contributions to computer science and engineering, Professor Leiserson has made important contributions in education within the MIT community and beyond. His annual workshop on Leadership Skills for Engineering and Science Faculty has educated hundreds of faculty at MIT and around the world in the nontechnical issues involved in leading technical teams in academia. He has taught widely in the EECS undergraduate curriculum — including 6.001, 6.002, 6.004, 6.032, 6.033, 6.042, 6.045, 6.046, 6.172 — and led the development of 6.042, 6.046, and 6.172. He has also taught graduate subjects in algorithms, VLSI theory, and parallel computing, as well as led the Singapore-MIT Alliance distance-education program in computer science. He is well known for coauthoring Introduction to Algorithms, one of the most cited and best selling textbooks in computer science. Professor Leiserson has been recognized for his educational and research contributions with the ACM/IEEE Computer Society 2014 Ken Kennedy High-Performance Computing Award, the IEEE Computer Society 2014 Taylor L. Booth Education Award, and the ACM 2013 Paris Kanellakis Theory and Practice Award.

New Faculty in EECS

Welcoming Six new Faculty in EECS



Mohammad Alizadeh will join the EECS department as an Assistant Professor of Computer Science in September 2015. He completed his graduate studies at Stanford University, earning his MS and PhD degrees in Electrical Engineering in 2009 and 2013, respectively. Before that, he received his BS in Electrical Engineering from Sharif University of Technology, Iran. In April 2012, he joined networking startup, Insieme Networks, where he developed algorithms for Insieme's next generation datacenter network products. He was a principal engineer at Cisco Systems following its acquisition of Insieme Networks in December 2013.

Mohammad's research interests are in the areas of computer networks and systems. His research strives to improve the performance, scalability, and ease of management of future networks and cloud computing systems. His recent projects focus on architectures and algorithms for large-scale datacenters, particularly, high performance networks for real-time web and big data applications. He is also broadly interested in the modeling and analysis of computer systems and bridging theory and practice in computer system design. His research has garnered significant industry interest: his work on datacenter transport mechanisms has been implemented in commercial (Windows Server 2012) and open source (Linux) operating systems and was used in the development of the IEEE 802.1Qau standard; most recently, his research on adaptive network load balancing has been implemented in Cisco's flagship Application Centric Infrastructure products.

Mohammad is a recipient of the Caroline and Fabian Pease Stanford Graduate Fellowship, the Numerical Technologies Inc. Prize and Fellowship, a Stanford Electrical Engineering Departmental Fellowship, and a SIGCOMM Best Paper award.



Tamara Broderick is an Assistant Professor in the Department of Electrical Engineering and Computer Science at MIT. She is also a member of the MIT Computer Science and Artificial Intelligence Laboratory (CSAIL). She completed her PhD in Statistics at the University of California, Berkeley in 2014. Previously, she received an AB in Mathematics from Princeton University (2007), a Master of Advanced Study for completion of Part III of the Mathematical Tripos from the University of Cambridge (2008), an MPhil by research in Physics from the University of Cambridge (2009), and an MS in Computer Science from the University of California, Berkeley (2013).

Tamara's recent research has focused on developing and analyzing models for scalable, unsupervised machine learning using Bayesian nonparametrics. One side of her research demonstrates how to retain the strengths of the Bayesian paradigm (such as flexible modeling and coherent treatment of uncertainty) and nonparametric analysis while simultaneously enabling fast, and even streaming, inference on large data sets. Additionally, her work provides a broader perspective on the kinds of models that populate a toolbox for Bayesian nonparametric analysis. Much of unsupervised learning has focused on clustering, where the goal is to discover a collection of latent groups, called clusters, such that each data point belongs to exactly one such group. Tamara has developed theory and methodology for a variety of extensions to clustering. For instance, *feature allocations* allow data points to belong to multiple groups—an idea which more accurately captures that an individual might belong to multiple friend groups in a social network, a document in a corpus might be described by multiple themes, or a customer's purchases might correspond to multiple interests.

Tamara has been awarded the Evelyn Fix Memorial Medal and Citation (for the PhD student on the Berkeley campus showing the greatest promise in statistical research), the Berkeley Fellowship, an NSF Graduate Research Fellowship, a Marshall Scholarship, and the Phi Beta Kappa Prize (for the graduating Princeton senior with the highest academic average).

Ruonan Han joined the EECS department at MIT as an assistant professor in July 2014. He received his BSc degree in microelectronics from Fudan University in 2007 and his MSc degree in electrical engineering from the University of Florida in 2009. In 2014, he received the PhD degree in electrical and computer engineering (ECE) from Cornell University, where he also won the ECE Innovation Award and the Director's Best Thesis Research Award. He is the recipient of IEEE Solid-State Circuits Society Pre-Doctoral Achievement Award and IEEE Microwave Theory & Techniques Society Graduate Fellowship Award.

Ruonan's research interest is ultra-high-speed integrated circuits and systems. At MIT, his research group will investigate microelectronic approaches to bridge the least explored Terahertz Gap (0.1–10THz) between microwave and infrared spectrum. Such effort is expected to revolutionize the electronic infrastructures for tera-scale communications, biomedical imaging and chemical sensing. Meanwhile, it helps us to better understand and push the fundamental limits of electronics, such as radiation power, detection sensitivity and energy efficiency, under extremely high frequency conditions.



Stefanie Jegelka joined the EECS Department in January 2015 as an Assistant Professor and a member of CSAIL. She studied Computer Science (Bioinformatics) at the University of Tuebingen in Germany and at the University of Texas at Austin, and received a Diploma with distinction in 2007. In 2012, she received a PhD in Computer Science from ETH Zurich, in collaboration with the Max Planck Institute for Intelligent Systems and the University of Washington. From 2012 to 2014, she was a postdoctoral researcher in the EECS Department at the University of California Berkeley. In addition, she has been a research visitor at Microsoft Research Redmond, Georgetown University Medical Center and INRIA Paris.

Stefanie's research interests lie in machine learning. Her work focuses on the computational challenges that arise from learning problems with complex variable interactions and discrete structure. In particular, her research has addressed scalable and parallelizable algorithms for discrete optimization problems in machine learning and computer vision, kernel methods, and the design of new models that exploit the mathematical structure of submodular set functions, a discrete analog of convex functions.

Stefanie has given several tutorials on Discrete Optimization and Submodular Functions in Machine Learning at conferences and summer schools, and has organized five workshops on the topic. Among other fellowships, she has been a fellow of the German National Academic Foundation, and has received a Best Paper Award at the International Conference on Machine Learning.



Faculty News, *continued*

Welcoming Six new Faculty in EECS, *continued*



Aleksander Madry joined the EECS Department in February 2015 as an Assistant Professor of Computer Science and a member of CSAIL. He received his SM and PhD in Computer Science from MIT in 2009 and 2011, respectively. Prior to joining the MIT faculty, he spent a year as a postdoctoral researcher at Microsoft Research New England and then almost three years as a faculty at the Swiss Federal Institute of Technology in Lausanne (EPFL).

Aleksander's research centers on tackling fundamental algorithmic problems that are motivated by real-world optimization. Most of his work is concerned with developing new ideas and tools for algorithmic graph theory. His focus in this context is on applying a mix of combinatorial and linear-algebraic techniques to tackle central challenges in the area. This approach enabled him, in particular, to make the first progress in decades on classic graph questions such as the maximum flow problem and the bipartite matching problem.

In addition to his work on algorithmic graph theory, Aleksander is also keenly interested in understanding uncertainty in the context of optimization — how to model it and cope with its presence.

Aleksander has received a variety of awards for his research, including the Association for Computing Machinery (ACM) Doctoral Dissertation Award Honorable Mention, the George M. Sprowls Doctoral Dissertation Award, and a number of best paper awards at the Foundations of Computer Science, the Symposium on Discrete Algorithms, and the Symposium on Theory of Computing meetings.



Matei Zaharia joined the EECS Department in March 2015 as an Assistant Professor and a member of CSAIL. He received his B.Math. in Computer Science from the University of Waterloo in 2007, and his PhD in Computer Science from the University of California, Berkeley in 2013. Starting in 2013, he has been serving as CTO of Databricks, the big data analysis startup commercializing the popular open source platform Apache Spark.

Matei's research is in systems and programming models for large-scale distributed computing. He developed scheduling algorithms that are widely used in data processing software such as Hadoop, as well as the Apache Spark cluster computing engine, which is now one of the largest open source projects in big data, and the Apache Mesos cluster manager, now used at Twitter and other large Internet companies.

Matei has received multiple awards including the David J. Sakrison Prize for research at UC Berkeley in 2013, Best Paper awards at SIGCOMM 2012 and NSDI 2012, the University of Waterloo Faculty of Mathematics Young Achievement Medal in 2014, a Google PhD Fellowship, and the National Sciences and Engineering Research Council of Canada (NSERC) Julie Payette Research Scholarship.

Faculty Leadership News

EECS co-Education Officers Amarasinghe and White are succeeded by Lee and Miller; Berggren succeeds Leeb as UG Laboratory Officer



EECS Department Leadership Group turnover in 2014 included co-Education Officers Saman Amarasinghe (upper left) and Jacob White (top, middle), who served for three years and succeeded by (lower left) Hae-Seung (Harry) Lee and Rob Miller (middle lower). Karl K. Berggren (lower right) succeeded Steven Leeb (upper right) as Undergraduate Laboratory Officer.

In July 2014, Anantha Chandrakasan, EECS Department Head acknowledged the contributions of three faculty members who served as part of the Department Leadership Group (DLG) since July 1, 2011. Saman Amarasinghe and Jacob White, both served as co-education officers and Steven Leeb, as Undergraduate Laboratory Officer. Chandrakasan also welcomed the new DLG members (since July 1, 2014) including co-Education Officers Hae-Seung “Harry” Lee, Rob Miller and Undergraduate Laboratory Officer Karl Berggren.

In his first year as co-Education Officer, **Saman Amarasinghe** developed and deployed a web-based portal for course administration allowing students to apply for TA positions online, faculty to provide teaching and TA preferences, education officers to make class assignments TA selections and provide faculty and students up-to-date information about course staffing. He has continued to expand this online accessibility. As these online tools have been used since 2012, multi-year planning based on TA evaluations has also become available.

Amarasinghe was the first chair of the newly formulated Education Curriculum Committee, and under his leadership, an orderly process for updating the curriculum was created. With the dramatic increase in enrollment over the past few years, Amarasinghe helped alleviate the shortage of TAs by creating the Undergraduate Teaching Assistant (UTA) program in spring 2013. His creation of Course 6 class overviews at EECS faculty lunches provided a wider understanding of the latest curricular thinking and application to department teaching.

With fellow co-Education Officer Amarasinghe, **Jacob White** led the education task force of the 2012 EECS Strategic Plan. Under White’s leadership, educational innovation across the department resulted in nearly a dozen new classes, and a new level of transparency and load balancing on teaching nurtured the educational enterprise throughout the department. By creating the Extraordinary Educators in EECS (EE-EECS) White helped the department address the enrollment increase. Through this program, six highly motivated and experienced

(next page)

Faculty News, *continued*

Faculty Leadership News, *continued*

educators, each with a three-year contract have additionally provided creative input on curriculum development. With Dennis Freeman, professor of electrical engineering and MIT Dean for Undergraduate Education, White worked with Eta Kappa Nu to enable the move of the department to the Institute on-line class evaluation system.

As EECS Undergraduate Laboratory Officer, **Steven Leeb** co- led the Undergraduate Committee in development of the 2012 Strategic Plan, paving the way for significant improvements in the undergraduate laboratory safety procedures and facilities. Based on his personal goal for EECS to have an advanced prototyping facility, Leeb built the infrastructure needed for the creation and realization of the 2500 square foot space now known as the Cypress Engineering Design Studio. His collaboration with faculty in EECS (and from across the Institute and beyond) in running the Department Teaching Laboratories has provided the context for creatively connecting deep analytical tools with practice for countless students. Leeb not only built the potential for the new design studio—but in the process helped EECS faculty realize innovative ways to benefit from the new facility. EDS is now being used in a number of classes and in design competitions.

Hae-Seung Lee, the Advanced Television and Signal Processing (ATSP) Professor of Electrical Engineering and member of the MIT EECS Department since 1984, is well known for his contributions to greater efficiency in modern analog integrated circuits, his leadership in the Microsystems Technology Laboratories (MTL) and his teaching excellence in the department. He served as Associate Director of MTL from 2009 to 2011. As a graduate student at UC Berkeley, he developed the now-widely used self-calibration techniques for A/D converters. Professor Lee works in the area of analog integrated circuits focusing on data converters, bio-medical circuits and systems, and sensor systems. He has directed the Center for Integrated Circuits and Systems (CICS) since 1998. He is the recipient of the 1988 Presidential Young Investigators' Award and a Fellow of the IEEE. He has served on a number of technical program committees including the International Electron Devices

Meeting, the International Solid-State Circuits Conference and the IEEE Symposium on VLSI Circuits. Professor Lee has taught 6.002, 6.775 Design of Analog MOS LSI and will teach 6.301 Solid-State Circuits this coming term. Prof. Lee received the Louis D. Smullin (1939) Award for Teaching Excellence in 2013.

Rob Miller, professor of computer science and member of the Computer Science and Artificial Intelligence Laboratory, was named a MacVicar Faculty Fellow in 2013 for outstanding contributions to undergraduate education. Professor Miller's research interests lie at the intersection of programming and human computer interaction including crowd computing, online education, software development tools and end-user programming. Rob's teaching has included 6.813, User Interface Design and Implementation, 6.005 Elements of Software Construction, 6.811 Principles and Practice of Assistive Technology, and 6.MITx Building MITx Courseware. Professor Miller received the 2011 Jamieson Prize for excellence in teaching. Professor Miller has been program co-chair for UIST 2010 and Learning at Scale 2015, general chair for UIST 2012, associate editor of ACM TOCHI, and associate director of MIT CSAIL.

Karl K. Berggren is a member of the Research Laboratory of Electronics (RLE), where he directs the Nanostructures Laboratory, and is a core faculty member in the Microsystems Technology Laboratories (MTL). From December of 1996 to September of 2003, Professor Berggren served as a staff member at MIT Lincoln Laboratory in Lexington, Massachusetts, and from 2010 to 2011, was on sabbatical at the Technical University of Delft. Professor Berggren's current research focuses on methods of nanofabrication, especially applied to superconductive quantum circuits, photodetectors, and high-speed superconductive electronics. His thesis work focused on nanolithographic methods using neutral atoms. In fall 2014 Professor Berggren was the head lecturer for 6.002, Circuits and Electronics, a class for which he has served many times on the teaching staff. This spring he was recipient of the Jerome Saltzer Award, given to a faculty member for sustained excellence in teaching of recitations.

Micali Succeeds Freeman as Associate Dept. Head



Professor Silvio Micali, left, has succeeded Professor Bill Freeman in the role of Associate Department Head in EECS effective January 15, 2015.

Electrical Engineering and Computer Science Department (EECS) Head Anantha Chandrakasan announced the appointment of Professor Silvio Micali as Associate Department Head (ADH) of EECS effective January 15, 2015. Micali succeeds Professor Bill Freeman, who served as ADH and member of the Department Leadership Group (DLG) since July 2011.

Micali, a graduate of University of California, Berkeley (1982), is best known as a visionary for his fundamental and foundational work on public-key cryptography, pseudorandom number functions, digital signatures, oblivious transfer, secure multiparty computation, zero knowledge proofs and mechanism design.

Professor Micali has been recognized for his work with many honors including the Gödel Prize in 1993 and the RSA Prize in Cryptography in 2004. He was elected to the American Academy of Arts and Sciences in 2003, and elected in 2007 to both the National Academy of Sciences and the National Academy of Engineering. Silvio Micali and Shafi Goldwasser received the 2012 Turing Award for their work in cryptography — developing new mechanisms for encrypting and securing information — methods that are widely applicable and applied today in communication protocols, Internet transactions and cloud computing.

Micali has been awarded over 50 patents on practical implementations of his inventions for encryption, digital signa-

tures, electronic cash, certified transactions, key-escrow and more. He established two start-up companies: Peppercorn (for micro-payments, launched in 2002 with Ron Rivest and acquired by Chockstone in 2007), and CoreStreet (for real-time credentials) and acquired by ActiveIdentity in 2009.

Chandrakasan said in his announcement to the EECS faculty: “I know that Silvio will bring to his new position the clarity, creativity and passion that characterize his research work and teaching, and the department will be the stronger for it.”

Chandrakasan also extended his appreciation to Professor Freeman for his tremendous service as ADH. Freeman played a key role in the faculty search and hiring process. Along with former ADH Munther Dahleh, Freeman co-chaired the Strategic Hiring Areas planning, leading to the hiring of 12 faculty members and he also worked towards successfully establishing a student committee for the faculty search process.

Prof. Freeman was instrumental in creating Postdoc6 — a dedicated community for the postdoctoral associates in the department. For this initiative, he organized and launched an annual workshop for postdocs (held in January), as well as periodic lunches, with speakers for the group during the semester (see pages 22-23).

Remembering Seth Teller, 1964 - 2014



Seth Teller: expert of computer vision, robotics, and human-robot interaction and member of the MIT Electrical Engineering and Computer Science Department faculty since 1994

“Seth had a unique ability to envision new approaches to problems, then assemble, motivate, and guide large research teams to accomplish things far beyond what they thought possible.”

“Seth was a champion of the MIT Undergraduate Research Opportunities Program, and supervised well over one hundred UROP students and hundreds of UROP projects.”

“He excelled at bringing people together to increase understanding and to tackle complex challenges.”

Seth Teller passed away on July 1, 2014. The MIT News Office obituary included remarks from many of MIT’s faculty including Seth’s colleague and former EECS Department Head and now MIT President, L. Rafael Reif, who announced the news to the MIT community: “I knew Seth as a person of great human warmth and intellectual intensity,” Reif wrote in his message. “He was a brilliant engineer and a gifted advisor with a passion for new challenges. His loss is difficult to grasp.”

As a member of the Computer Science and Artificial Intelligence Laboratory (CSAIL), Teller led CSAIL’s Robotics, Vision, and Sensor Networks group, whose work aims to enable machines to become aware of their surroundings and interact naturally with people in health-care, military, civilian, and disaster-relief settings. CSAIL Director Daniela Rus and EECS Department Head Anantha Chandrakasan wrote in a joint letter to their communities:

“Seth Teller had a unique ability to envision new approaches to problems, then assemble, motivate, and guide large research teams to accomplish things far beyond what they thought possible. As a colleague his reflexive openness and friendliness were a delight; he always seemed to have something new to talk about and he shared it in a way that drew you into the excitement that bubbled up from him.”

On September 29, 2014, a celebration to honor the life of Seth Teller was held at the MIT Stata Center. An academic symposium and research displays paid tribute to the wide range of his research and consequent outreach and impact during his time at MIT. These events were followed by a memorial service and reception.

A few excerpts from the text in the September 29 celebration booklet titled “Remembering Seth Teller” are reprinted below and under his photo left.

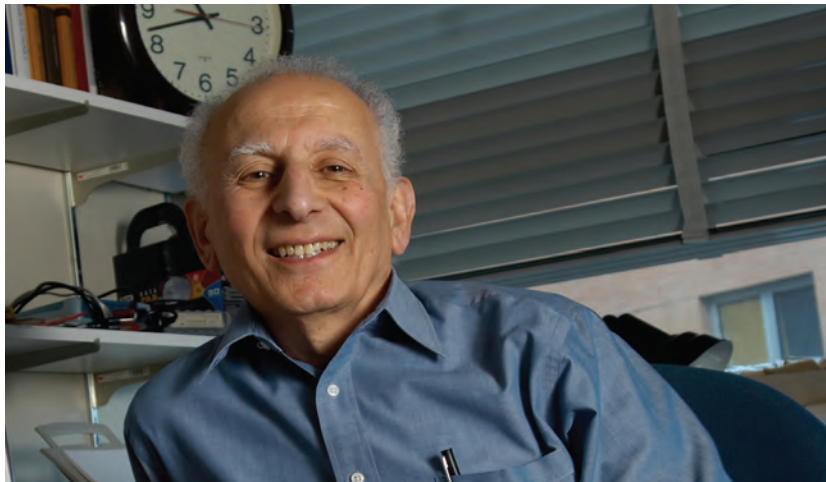
“Seth Teller was a technological visionary who pursued grand challenges throughout his career. Full of ideas and enthusiasm, Seth was driven to make bold rather than incremental advances. When faced with the choice between “an easy way” and “the right way” to pursue a technologically ambitious problem, Seth always chose the more difficult path, relishing the scientific challenge and recognizing the greater potential benefits.”

“Seth was motivated by the goal of enabling robots to work with, for, and as extensions of people, to improve their daily lives. He sought to create robots that had an awareness of their surroundings and that could interact naturally with people in health-care, military, civilian, and disaster-relief settings.”

“A major theme of Seth’s work has been the development of assistive technologies to help the disabled. One of Seth’s favorite projects was work with Nicholas Roy to create a robotic wheelchair operated by voice commands. This system has been repeatedly deployed in the Boston Home, a specialized-care residence for adults with multiple sclerosis and other progressive neurological conditions.”

“Seth was also an inspirational teacher. With Daniela Rus, Nicholas Roy and Una-May O’Reilly, he created 6.141 Robotics: Science and Systems, a cornerstone of MIT’s robotics curriculum. Seth also recently developed MIT’s first class in assistive technologies with his colleague Rob Miller, to bring his mission of helping people with disabilities to MIT’s undergraduates.”

Remembering EECS faculty



Shaoul Ezekiel, longtime AeroAstro and EECS professor, dies at 79

Professor Emeritus Shaoul “Ziggy” Ezekiel, an MIT alumnus who spent 46 years at the Institute as a professor in the departments of Aeronautics and Astronautics (AeroAstro) and Electrical Engineering and Computer Sciences (EECS), died from soft-tissue sarcoma cancer on Jan. 7. He was 79.

Ezekiel was born in Baghdad, and moved to London with his family in 1948. He received a BS in electrical engineering from Imperial College London in 1957. Ezekiel joined MIT as a graduate student in 1962, receiving an SM in 1964 and ScD in 1968, both in aeronautics and astronautics. He was appointed as an assistant professor in AeroAstro in 1968 and a full professor in AeroAstro and

in Electrical Engineering 10 years later. He taught classes in dynamics, optics, laser fundamentals, basics of measurement systems, and optical sensors.

In 1986, Ezekiel was appointed director of the MIT Center for Advanced Engineering Study. Ezekiel’s research interests were in the fields of lasers and optics and their applications in atom-field interactions; ultra-high resolution spectroscopy; optical frequency/wavelength standards; and sensors, including optical/fiberoptical gyroscopes, magnetic field sensors, and spectroscopic sensors. He exploited nonlinear optical effects to create a variety of new sensors and optical devices, and novel high frequency sources.

EECS Professor Erich Ippen, a principal investigator in the Research Laboratory of Electronics, says, “Ziggy had a marvelous ability to engage students, demonstrate laser phenomena with simple experiments, and make complicated concepts seem intuitive. Always upbeat and positive, he was active professionally well into retirement. Everyone who knew him, discussed laser physics with him, attended one of his classes, or saw him ballroom dancing, has fond memories. We already miss him.”

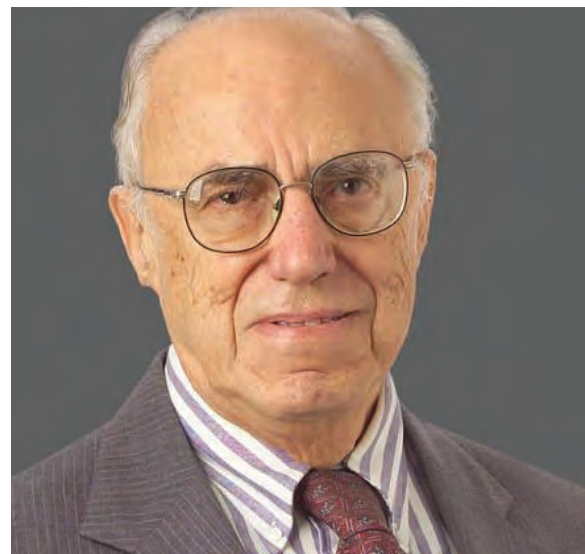
Read more in the MIT News: <http://newsoffice.mit.edu/2015/shaoul-ezekiel-longtime-aeroastro-eeecs-professor-dies-0112>

Jack Ruina, Professor Emeritus in EECS and first director of MIT’s Security Studies Program, 1923 - 2015

Jack Ruina, professor of electrical engineering and computer science at the Massachusetts Institute of Technology from 1963 to 1997 and emeritus thereafter, died on Feb. 4, 2015 at the age of 91.

Emigrating from Poland in 1926 at age three and a half, Jack Ruina grew up, as the youngest of nine children, in Brooklyn, NY, eventually attending the City College of New York. Following receipt of his PhD degree in electrical engineering from the Polytechnic Institute of Brooklyn in 1948, Ruina joined the faculty at Brown University. As his interests in defense-related areas increased, Ruina joined the faculty at the University of Illinois, Champaign-Urbana in 1953. While on leave from the University of Illinois, Ruina served in several senior positions at the Department of Defense’s radar division in the Control Systems Laboratory and as Director of Defense Research and Engineering in the Air Force and Assistant Director for Air Defense.

For nearly three years, starting in 1961, Jack Ruina was the Director of Advanced Research Projects Agency, ARPA, now called DARPA, in the Defense Department under President Kennedy and Secretary of Defense Robert McNamara. Some projects under Ruina’s supervision at the time included development of technologies for seismic detection of nuclear tests, contributing to the Partial Test Ban Treaty of 1963, research on missile defense systems and radar, and hiring J.C.R. Licklider in creating the project that would become ARPANET, one of three early progenitors of the global Internet.



Read more about Jack Ruina in the MIT News at: <http://newsoffice.mit.edu/2015/jack-ruina-dies-at-91-0212>

Photo above courtesy MITRE Corp and the Ruina family.