Two Thousand Eleven

Celebrating Faculty Excellence

Acclaiming the awards, honors, and recognitions that our faculty received during the past year.
As we approach the 150th anniversary of the School’s founding in 1864, we continue to build on the scientific breakthroughs of all our exceptional professors who have served this School since its inception and whose accomplishments, like those of our current faculty, have an impact on the way we live our lives.

The School’s first dean, renowned chemist Charles F. Chandler, enforced purity standards for milk and water; electrical engineering pioneer Michael I. Pupin developed devices essential to telegraphy and telephony; Edwin H. Armstrong invented FM radio; Elmer Gaden developed a method to mass produce antibiotics; and Dimitris Anastassiou developed digital compression techniques essential to the MPEG-2 patent pool. These faculty members and their contemporaries comprise the intellectual legacy of Columbia Engineering, a legacy of excellence, leadership, and impact.

Please join us in honoring the outstanding faculty cited within these pages for the recognitions they have received this past year. We are privileged to be able to honor the holders of nine new endowed chairs and are grateful to the donors who have made this possible. As we salute this year’s honorees, we also acknowledge the achievements of our faculty in past years and are ready to celebrate the distinctions of our faculty in the future.
“Inspired by the scientific breakthroughs of their predecessors, our faculty continue to inspire our students throughout our classrooms and laboratories, educating them to become engineering and applied science leaders who will change the world, solving some of the most challenging issues we face today, tomorrow, and into the future.”

—FENIOSKY PEÑA-MORA
Mihalis Yannakakis
Percy K. and Vida L. W. Hudson Professor of Computer Science

National Academy of Engineering
elected a member of the National Academy of Engineering for his contributions to algorithms and computational complexity
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Named Professors

DIMITRIS ANASTASSIOU
Charles Batchelor Professor of Electrical Engineering
Electrical Engineering

KATAYUN BARMAK
Philips Electronics Professor of Applied Physics and Applied Mathematics
Applied Physics and Applied Mathematics

KEREN BERGMAN
Charles Batchelor Professor of Electrical Engineering
Electrical Engineering

SHIH-FU CHANG
The Richard Dicker Professor of Telecommunications
Electrical Engineering

MICHAEL J. COLLINS
Vikram S. Pandit Professor of Computer Science
Computer Science

JACOB FISH
Robert A. W. and Christine S. Carleton Professor of Civil Engineering
Civil Engineering and Engineering Mechanics

JINGYUE JU
Samuel Ruben–Peter G. Viele Professor of Engineering
Chemical Engineering

ANDREW LAINE
Percy K. and Vida L. W. Hudson Professor of Biomedical Engineering
Biomedical Engineering

GORDANA VUNJAK-NOVAKOVIC
The Mikati Foundation Professor of Biomedical Engineering
Biomedical Engineering
Named Professors

**Dimitris Anastassiou**  
Charles Batchelor Professor of Electrical Engineering  
*Electrical Engineering*

**Katayun Barmak**  
Philips Electronics Professor of Applied Physics and Applied Mathematics  
*Applied Physics and Applied Mathematics*

**Keren Bergman**  
Charles Batchelor Professor of Electrical Engineering  
*Electrical Engineering*

**Shih-Fu Chang**  
The Richard Dicker Professor of Telecommunications  
*Electrical Engineering*

**Michael J. Collins**  
Vikram S. Pandit Professor of Computer Science  
*Computer Science*

**Jacob Fish**  
Robert A. W. and Christine S. Carleton Professor of Civil Engineering  
*Civil Engineering and Engineering Mechanics*

**Jingyue Ju**  
Samuel Ruben–Peter G. Viele Professor of Engineering  
*Chemical Engineering*

**Andrew Laine**  
Percy K. and Vida L. W. Hudson Professor of Biomedical Engineering  
*Biomedical Engineering*

**Gordana Vunjak-Novakovic**  
The Mikati Foundation Professor of Biomedical Engineering  
*Biomedical Engineering*
**Presidential Early Career Award for Scientists and Engineers (PECASE)**

**Dirk R. Englund**  
*Assistant Professor, Electrical Engineering*  
**Presidential Early Career Award for Scientists and Engineers (PECASE) (Department of Defense Nominee)**  
for his pioneering contributions to the theory and experiment of photonic nanostructures for controllable light/matter interactions at the level of single photons and single emitters, and for his development of quantum optics in semiconductor chips for applications in quantum information processing, quantum metrology, and novel optoelectronic devices and systems for optical interconnects.

**Faculty Early Career Development Awards**

**Simha Sethumadhavan**  
*Assistant Professor, Computer Science*  
**NSF Faculty Early Career Development Award**  
to support his ongoing research on techniques to build trustworthy hardware systems, even with untrustworthy, malicious hardware components.

**Junfeng Yang**  
*Assistant Professor, Computer Science*  
**NSF Faculty Early Career Development Award**  
to support his research on making threads more deterministic by memoizing schedules.

**Recognition/Achievement Awards**

**Guillaume Bal**  
*Associate Professor, Applied Physics and Applied Mathematics*  
**The Calderón Prize**  
given by the Inverse Problems International Association for a researcher under the age of 40 who has made distinguished contributions to the field of inverse problems broadly defined.

**Simon Billinge**  
*Professor, Applied Physics and Applied Mathematics*  
**J. D. Hanawalt Prize**  
awarded by the International Center for Diffraction Data for contributions to x-ray powder diffraction.

**Harish Krishnaswamy**  
*Assistant Professor, Electrical Engineering*  
**DARPA Young Faculty Award**  
to support his work on active waveguides on silicon for sub-mm wave/terahertz electronics.

**Ah-Hyung (Alissa) Park**  
*Lenfest Junior Professor in Applied Climate Science, Earth and Environmental Engineering*  
**James Lee Young Investigator Award**  
given by the Korean Institute of Chemical Engineers for her work in novel organic-inorganic hybrid nanomaterials for application in CO₂ capture and storage.
**Presidential Early Career Award for Scientists and Engineers (PECASE)**

**DIRK R. ENGLUND**  
*Assistant Professor, Electrical Engineering*  

*Presidential Early Career Award for Scientists and Engineers (PECASE) (Department of Defense Nominee)*  

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**HARISH KRISHNASWAMY**  
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Assistant Professor, Industrial Engineering and Operations Research

ERLANG Prize
given by INFORMS Applied Probability Society to an outstanding probabilist under the age of 35

SHIH-FU CHANG
The Richard Dicker Professor of Telecommunications, Electrical Engineering

2011 ACM SIGMM Technical Achievement Award
for outstanding technical contributions to multimedia computing, communications, and applications

XI CHEN
Associate Professor, Earth and Environmental Engineering

SIA-NEMAT NASSER Award
given by the American Society of Mechanical Engineers (ASME) for research excellence in the areas of experimental, computational, and theoretical mechanics and materials

FRANK DIMAGGIO
Robert A. W. and Christine Carleton Professor Emeritus, Civil Engineering and Engineering Mechanics

The Raymond D. Mindlin Award
given by the American Society of Civil Engineers (ASCE) for his lifetime contributions in research, teaching, and consulting in applied solid mechanics, including fluid-structure interaction, shock and vibration effects on submerged structures, and constitutive modeling of soils

STEVEN K. FEINER
Professor, Computer Science

2010 Lasting Impact Award

ELIZABETH M. HILLMAN
Assistant Professor, Biomedical Engineering

Adolph Lomb Medal
given by the Optical Society of America for contributions to optics by scientists under the age of 35

JULIA B. HIRSCHBERG
Professor, Computer Science

International Speech Communication Association (ISCA) Medal for Scientific Achievement
for her outstanding contributions to text-to-speech synthesis, prosody research, and many other topics in spoken language processing

JEFFREY W. KYSAR
Professor, Mechanical Engineering

International Journal of Plasticity Young Researcher Award
for his impacts on the field of plasticity and on the corresponding scientific community and his citations during the last five years as measured using Scopus data
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Columbia Engineering Faculty Excellence Celebration
Recognition/Achievement Awards

**Upmanu Lall**
*Alan and Carol Silberstein Professor, Earth and Environmental Engineering*

*The Arid Lands Hydraulic Engineering Award*  
given by the American Society of Civil Engineers (ASME) for his significant contributions to changing the perception and understanding of numerous topics critical to water resource management.

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**Henning G. Schulzrinne**
*Julian Clarence Levi Professor, Computer Science*

*William Terry Award*  
given for lifetime distinguished service to Institute of Electrical and Electronics Engineers (IEEE) Region 1.

---

**Rene B. Testa**
*Professor, Civil Engineering and Engineering Mechanics*

*Roebling Award*  
given by the American Society of Civil Engineers (ASCE) for his lifetime of excellence in the structural engineering of bridges, along with advances in the state-of-the-art, and a commitment to the advancement of the structural engineering profession.

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**Gordana Vunjak-Novakovic**
*The Mikati Foundation Professor, Biomedical Engineering*

*BioAccelerate NY Prize*  
for her breakthrough research for those suffering the physical and psychological scars of a damaged jaw.

---

Recognition/Achievement Awards

**Y. Lawrence Yao**
*Professor, Mechanical Engineering*

*Service Appreciation Award*  
given by the North American Manufacturing Research Institution for his dedicated service.

---

**Shih-Fu Chang**
*The Richard Dicker Professor of Telecommunications, Electrical Engineering*

*Fellow, American Association for the Advancement of Science*  
elected for pioneering contributions to multimedia content analysis and search.

---

**Patricia Culligan**
*Professor, Civil Engineering and Engineering Mechanics*

*Member, American Society of Civil Engineers Geo-Institute*  
elected to the Board of Governors of the American Society of Civil Engineers Geo-Institute.  
*Member, National Academies Board of Earth Sciences and Resources Committee on Geological and Geotechnical Engineering.*
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Professor, Computer Science
Member, Association of Computing Machinery (ACM)
Special Interest Group on Computer Human Interaction (CHI) Academy
elected for extensive contributions to the study of human-computer interaction and for shaping the field

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Professor, Electrical Engineering
Fellow, Institute of Electrical and Electronics Engineers (IEEE)
for contributions to analog and radio frequency integrated circuits
Member, Governing Board of IEEE Solid-State Circuits Society
elected to governing board of this IEEE society, which focuses on the design of integrated circuits, for 2011–2013

Andrew F. Laine
Percy K. and Vida L. W. Hudson Professor, Biomedical Engineering
Fellow, Institute of Electrical and Electronics Engineers (IEEE)
for contributions to wavelet applications in digital mammography and ultrasound image analysis

Helen H. Lu
Associate Professor, Biomedical Engineering
Fellow, American Institute for Medical and Biological Engineering (AIMBE)
for groundbreaking research and extraordinarily high levels of attention to mentoring in interface tissue engineering

Peter Schlosser
Vinton Professor, Earth and Environmental Engineering
Fellow, the American Association for the Advancement of Science
elected for his important scientific accomplishments in ocean and hydrological sciences

Simha Sethumadhavan
Assistant Professor, Computer Science
Associate Member, the European Computer Architecture and Compiler researchers group (HiPEAC)
first junior faculty in the U.S. to be appointed to this group
Election to Professional Societies

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**Simon Billinge**  
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*Fulbright Research Scholar*  
To study spatially and temporally resolved local structure studies in advanced fundamental materials

**Dirk R. Englund**  
*Assistant Professor, Electrical Engineering*  
*Alfred P. Sloan Research Fellowship*  
in recognition of and to support his work in chip-based networks for quantum optics

**Helen H. Lu**  
*Associate Professor, Biomedical Engineering*  
*Kavli Fellow*  
Participated in the Japanese-American Frontiers of Science Symposium that brings together the best young scientists, under age 45, to discuss advances in their fields

**Latha Venkataraman**  
*Associate Professor, Applied Physics and Applied Mathematics*  
*Alfred P. Sloan Research Fellowship*  
in recognition of and to support her work in examining the interplay of physics, chemistry, and engineering at the nanometer scale and on probing, manipulation, and control of single molecules as active elements in electrical circuits

**Y. Lawrence Yao**  
*Professor, Mechanical Engineering*  
*Fulbright Fellowship*  
to collaborate on research in Spain on laser materials processing

**Notable Professional Recognitions**

**Xi Chen**  
*Associate Professor, Earth and Environmental Engineering*  
*Honorary Professor, Chongqing University, China*

**Emanuel Derman**  
*Professor, Industrial Engineering and Operations Research*  
*Appointed a member of the Chicago Mercantile Exchange Interest Rate Swap Risk Committee (CME IRS Risk)*

**Henry S. Hess**  
*Associate Professor, Biomedical Engineering*  
*Selectee, National Academies 2010 U.S. Frontiers of Engineering Conference*  
Recognizing young engineers from industry, academia, and government who are performing exceptional engineering research and technical work
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Assistant Professor, Biomedical Engineering
RISING STAR, SOCIETY FOR PHYSICAL REGULATION OF BIOLOGY AND MEDICINE
delivered one of the “Rising Stars” conference lectures, titled “Rigidity Sensing by Mouse Lymphocytes”

PAUL SAJDA
Associate Professor, Biomedical Engineering
EDITOR IN CHIEF, IEEE TRANSACTIONS ON NEURAL SYSTEMS AND REHABILITATION ENGINEERING
selected editor in chief of Institute of Electrical and Electronics Engineers’ premier journal in neural engineering, to serve from January 2012 to January 2015

GORDANA VUNJAK-NOVAKOVIC
The Mikati Foundation Professor, Biomedical Engineering
HONORARY PROFESSOR, UNIVERSITY OF BELGRADE, SERBIA

D avid D. yao
Professor, Industrial Engineering and Operations Research
HONORARY PROFESSOR, XI’AN JIAOTONG UNIVERSITY, CHINA

KATAYUN BARMAK
Philips Electronics Professor, Applied Physics and Applied Mathematics
EDITOR SELECTION, PHYSICAL REVIEW B
for a viewpoint on “Critical Events, Entropy, and the Grain Boundary Character Distribution”

M ARCO J. CASTALDI
Assistant Professor, Earth and Environmental Engineering
ACS ENVIRONMENTAL DIVISION BEST PAPER, IN APPLIED CATALYSIS B: ENVIRONMENTAL
for “Steam Reforming of Ethanol/Gasoline Mixtures: Deactivation, Regeneration and Stable Performance”

X I CHEN
Assistant Professor, Computer Science
BEST PAPER AWARD, FOURTH INTERNATIONAL FRONTIERS OF ALGORITHMICS WORKSHOP
for “On Tractable Exponential Sums”

M ICHEL J. COLLINS
Vikram S. Pandit Professor, Computer Science
FRED JELINEK BEST PAPER AWARD, EMNLP 2010—CONFERENCE ON EMPIRICAL METHODS IN NATURAL LANGUAGE PROCESSING
for “Dual Decomposition for Parsing with Non-Projective Head Automata”
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**Eitan Grinspun**  
Associate Professor, Computer Science  
*Computer Aided Geometric Design’s Most Cited Paper Award, 2010*  
for “Discrete Quadratic Curvature Energies”  
*Highlighted paper, Association for Computing Machinery’s Special Interest Group on Computer Graphics and Interactive Techniques*  
for “Asynchronous Contact Mechanics,” published in *Communications of the ACM*, the journal of the Association for Computing Machinery

**Hoe I. Ling**  
Professor, Civil Engineering and Engineering Mechanics  
*Best Paper, Geotextiles and Geomembranes, the official journal of the International Geosynthetics Society*  
for “Equivalent Seismic Coefficient in Geocell Retention Systems”

**Shree K. Nayar**  
*T. C. Chang Professor, Computer Science*  
*Best Paper Award at the IEEE International Conference on Computational Photography*  
for “Spectral Focal Sweep: Extended Depth of Field from Chromatic Aberrations”

**Henning G. Schulzrinne**  
Julian Clarence Levi Professor, Computer Science  
*Best Paper Award, IPTComm 2010*  
for “Reliability and Relay Selection in Peer-to-Peer Communication Systems”

**Salvatore Stolfo**  
Professor, Computer Science  
*Best Paper Award, Insider Threat Workshop, 2010*  
*Best Paper Award, Annual Computer Security Applications Conference (ACSAC), 2010*  
for “A Quantitative Analysis of the Insecurity of Embedded Network Devices: Results of a Wide-Area Scan”

**Peter R. Kinget**, Professor of Electrical Engineering;  
**Ioannis Kymissis**, Assistant Professor of Electrical Engineering;  
**Daniel S. Rubenstein**, Associate Professor of Computer Science;  
**Xiaodong Wang**, Professor of Electrical Engineering; and  
**Gil Zussman**, Assistant Professor of Electrical Engineering  
*Co-authors, Outstanding Paper on New Communication Topics, IEEE Communications Society Award*  
for an outstanding paper published in any Institute of Electrical and Electronics Engineers Communications Society publication in the previous 15 calendar years, for “Energy Harvesting Active Networked Tags (EnHANTS) for Ubiquitous Object Networking”
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Computer Science; Xiaodong Wang, Professor of Electrical
Engineering; and Gil Zussman, Assistant Professor of Electrical
Engineering

Co-authors, Outstanding Paper on New Communication
Topics, IEEE Communications Society Award
for an outstanding paper published in any Institute of Electrical and
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Special Recognitions

**Peter N. Belhumeur**

*Professor, Computer Science*

[Image 35x447 to 105x532]

**Eitan Grinspun**

*Associate Professor, Computer Science*

One of *Popular Science’s “Brilliant 10”*

designated one of 10 “promising young researchers at labs across the nation, who represent the best of what science can achieve”

**Elizabeth M. Hillman**

*Assistant Professor, Biomedical Engineering*

**Top 10 Innovations of 2010**

for DyCE (Dynamic Contrast Enhancement), a new optical technique for small animal imaging, recognized as a top innovation by The Scientist, Faculty of 1000’s magazine of the life sciences

**Samuel K. Sia**

*Associate Professor, Biomedical Engineering*

**One of NASA’s Top 10 Innovators in Human Health and Sustainability**

for development of mChip, a handheld device that takes a drop of blood and analyzes it for quick diagnosis of a variety of diseases

**Cliff Stein**

*Professor, Industrial Engineering and Operations Research*

Co-author, *Introduction to Algorithms* (MIT Press), which has sold a half million copies since its initial publication in 1990, including 15 translations by foreign publishers

**Chris H. Wiggins**

*Associate Professor, Applied Physics and Applied Mathematics*

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recognized for founding HackNY and efforts to foster engineering talent in New York City

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Professor, Computer Science
Named to NetExplorateur 100, list of the 100 most significant innovations of the year for “Digital Field Guide,” a digital collection of the Smithsonian’s library of specimens with text and photos of plants for portable computing devices in the field.

EITAN GRINSPUN
Associate Professor, Computer Science
One of Popular Science’s “Brilliant 10” designated one of 10 “promising young researchers at labs across the nation, who represent the best of what science can achieve.”

ELIZABETH M. HILLMAN
Assistant Professor, Biomedical Engineering
Top 10 innovations of 2010 for DyCE (Dynamic Contrast Enhancement), a new optical technique for small animal imaging, recognized as a top innovation by The Scientist, Faculty of 1000’s magazine of the life sciences.

SAMUEL K. SIA
Associate Professor, Biomedical Engineering
One of NASA’s Top 10 innovators in human health and sustainability for development of mChip, a handheld device that takes a drop of blood and analyzes it for quick diagnosis of a variety of diseases.

CLIFF STEIN
Professor, Industrial Engineering and Operations Research
Co-author, Introduction to Algorithms (MIT Press), which has sold a half million copies since its initial publication in 1990, including 15 translations by foreign publishers.

CHRIS H. WIGGINS
Associate Professor, Applied Physics and Applied Mathematics
Named as one of Business Insider’s Silicon Alley 100: New York’s Coolest Tech People in 2010 recognized for founding HackNY and efforts to foster engineering talent in New York City.

20 Columbia Engineering Faculty Excellence Celebration

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Shree K. Nayar
T. C. Chang Professor, Computer Science
Fellow, American Academy of Arts and Sciences
elected to this prestigious academy of more than 4,000 fellows,
for his research on the creation of novel vision sensors, the
design of physics-based models for vision, and the development
of algorithms for scene interpretation
Shree K. Nayar
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Excellence

“Columbia University’s Fu Foundation School of Engineering and Applied Science seeks to educate socially responsible global engineering and applied science leaders whose work results in the betterment of the human condition, locally, nationally, and globally.”

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