

UNIVERSITY OF PENNSYLVANIA *Almanac*

Tuesday
March 15, 2016
Volume 62 Number 26
www.upenn.edu/almanac

Penn Research Team: \$5 Million CURE Grant to Use Big Data to Improve Health

A team of physicians and researchers across Penn Medicine and the University of Pennsylvania have been awarded a four-year \$5 million grant to develop and test algorithms aimed at predicting adverse health events in real time. The project, *Smarter Big Data for a Healthy Pennsylvania: Changing the Paradigm of Healthcare*, is funded by the Commonwealth Universal Research Enhancement (CURE) program and will examine the use of the algorithms in the hospital, at home and in the community.

The researchers will develop strategies to pull and blend information from diverse sources—from insurance claims and electronic health records to social media and patient surveys—in an effort to refocus the health care delivery

system to a more proactive approach that anticipates clinical events before they happen, allowing for the potential to avoid dangerous and costly health events such as heart attacks and chronic disease flare-ups.

“Our overall goal is to make new data assets smart and actionable, combining mathematical, statistical and health economics perspectives to change the way health care is delivered,” said Daniel Polsky, professor of medicine at the Perelman School of Medicine at the University of Pennsylvania, executive director of the Leonard Davis Institute (LDI) and one of the project leads. Dr. Polsky pointed to the unusual combination of institutions, expertise, practitioners,

(continued on page 3)

Ramon Diaz-Arrastia: Presidential Professor

Penn President Amy Gutmann and Provost Vincent Price are pleased to announce the appointment of Ramon Diaz-Arrastia as the ninth Presidential Professor, effective July 1. A world-leading expert in traumatic brain injury, Dr. Diaz-Arrastia will be the Presidential Professor of Neurology in the Perelman School of Medicine.



Ramon Diaz-Arrastia

“At the uncharted frontier of brain science and traumatic injury, few investigators have expanded our knowledge quite like Dr. Ramon Diaz-Arrastia,” said President Gutmann. “Ramon is a pioneering force in exploring the intricacies of neural damage and repair, and as Presidential Professor he will further strengthen Penn’s vital neurological research and exceptional clinical care.”

Dr. Diaz-Arrastia is currently professor of neurology at the Uniformed Services University of the Health Sciences (USUHS) in Bethesda, Maryland. He also serves as director of Clinical Research at the Center for Neuroscience and Regenerative Medicine, a partnership between the USUHS and the National Institutes of Health to promote research about traumatic brain injuries. His path-breaking research focuses on understanding the molecular, cellular and tissue level mechanisms of secondary neuronal injury and neuroregeneration, especially through biomarker development. His most recent work explores using MRI, functional MRI and PET scanning in order to characterize the multiple complex mechanisms involved in traumatic injury to the brain, as well as combining imaging, genomic and tissue biomarkers to better predict patient outcomes after traumatic brain injuries and develop novel therapies.

The author of more than 135 peer-reviewed primary research papers and more than 30 invited reviews and book chapters, he has led major research projects funded by the National Institutes of Health and the Department of Defense, among others, and served on expert panels con-

(continued on page 3)

Penn Wharton Public Policy Initiative: \$5 Million Gift from David Trone and June Malament Trone

The Penn Wharton Public Policy Initiative (Penn Wharton PPI) is pleased to announce a \$5 million commitment from David J. Trone, WG’85, and June Malament Trone, WG’85, which will fuel the growth of the Initiative at the Wharton School of the University of Pennsylvania. Mr. and Mrs. Trone’s gift will establish the Trone Family Public Policy Initiative Fund, providing funding for research and other critical support promoting clear, fact-driven, accessible knowledge to stimulate policies that benefit the American public. The Penn Wharton PPI is a hub for public policy research and education with one overarching goal across its Philadelphia and Washington, DC, offices: to leverage the University’s resources to foster better-informed policymaking on issues related to business and the economy.

“David and June’s generosity adds fantastic momentum to the Penn Wharton PPI,” said Wharton Dean Geoff Garrett. “I am sincerely grateful for their philanthropy and for their partnership in this rapidly expanding and exciting initiative. Their support will benefit Wharton, Penn and the policymaking landscape across the US while growing the community of visionary donors to PPI.”

Mr. and Mrs. Trone’s gift builds upon the support of other leadership contributors to the Penn Wharton PPI, including Marc Rowan, W’84, WG’85, and Marc Spilker, W’86 (*Almanac* September 18, 2012). Mr. Rowan and Mr. Spilker provided foundational funding for the Initiative, as well as resources dedicated to PPI’s first signature product—a new federal budget model that will offer policymakers a compelling alternative to the Congressional Budget Office for considering the budgetary impact of proposed legislation. Among its many other operations and offerings, PPI provides summer internship programming for students to pursue life-changing opportunities in DC; a new honors certificate program for students interested in domestic public policy and the economy; and lectures featuring senators, members of Congress and other policy leaders. The Penn Wharton PPI embodies the Wharton School’s emphasis on the important applications of rigorous data and analytics in today’s dynamic environment and fostering connections between the public and private sectors.

“Our family put careful thought and consideration into finding an opportunity to make a strong impact at Wharton by supporting an area of great interest to us—we’re delighted to have found this in the Penn Wharton PPI,” said Mr. Trone. “It’s our pleasure to be able to work with the PPI, and we look forward to seeing the positive impact of the PPI on both the University’s students and on advancing fact-driven policymaking in Washington, DC.”

Mr. Trone earned his bachelor’s degree *magna cum laude* and Phi Beta Kappa from Furman University and his MBA from the Wharton School. He is the co-owner and president of Total Wine & More, America’s largest independent retailer of fine wine, which employs more than 5,000 individuals and operates over 150 superstores in 21 states. Mrs. Trone earned a degree in engineering *magna cum laude* from Stony Brook University, where she was inducted into Tau Beta Pi, the national honor society for engineers. Following her graduation, Mrs. Trone worked at Scott Paper Company for five years as both a process engineer and an industrial engineer. She also earned her MBA from Wharton.



June Malament Trone and David Trone

IN THIS ISSUE

- 2 Ad Hoc Advisory Committee on Divestment; Quinn Lecture & Memorial Service; Council Agenda; Consultative Committee: PennDesign Dean
- 3 Penn Law Dean of Students; PASEF Lecture
- 4 Honors & Other Things
- 5 Excellence through Diversity Fund; HR: Penn’s Investment in You
- 6 HR: Performance Management; Penn IUR Photo Contest; *Academic Job Search Handbook*; Safety Updates from EHRS
- 7 Update: CrimeStats; Food for Thought Talk at Club; Annual Disability Symposium; 30x30 Challenge
- 8 Research Roundup

Ad Hoc Advisory Committee on Divestment

University policy provides for the establishment of an Ad Hoc Advisory Committee on Divestment when a proposal to divest from the Penn endowment has been received by the Steering Committee of University Council, and found to be sufficiently substantive for further review.

As such, an Ad Hoc Advisory Committee has been convened to consider a divestment proposal submitted by Fossil Free Penn in October 2015 according to the standards of the *Guidelines and Procedures for Consideration by the Trustees of Proposals for Divestment from the University Endowment or Other Holdings Based Upon Social Responsibility Concerns of the Penn Community*.

The Committee's report will be made in writing to the Trustees, who have sole responsibility for making investment decisions for the University.

On behalf of David L. Cohen, Chair of the Board of Trustees, I am pleased to announce his appointees for membership to the Ad Hoc Advisory Committee.

—Leslie Laird Kruhly, Vice President and University Secretary

Membership of the Ad Hoc Advisory Committee on Divestment

Chair and Alumni Representative

David Roberts, W'84, Chair, GSE Overseer Board; senior managing director, Angelo, Gordon

Faculty

Bruce Giantonio, associate professor of medicine, PSOM

Irina Marinov, assistant professor, earth & environmental science, SAS

Mark Alan Hughes, professor of practice, PennDesign and faculty director of the Kleinman Center for Energy Policy

Jennifer Lukes, professor of mechanical engineering & applied mechanics, SEAS

Students

Karen Chen, W'17

Dillon Weber, ENG'16

Stephen Goldstein, BMG, PhD'18

Mary Whitehouse, LPS'16

Alumni

Helen Pudlin, Esq., CW'70, GED'71, L'74, member, Penn Law Overseer Board; former

executive vice president and general counsel, PNC Financial Services Group

Staff

Sharon Brokenbough, director, finance & administration, Division of Public Safety

Tom Hecker, associate dean and chief of staff, PSOM

Jeff Rowland, associate director of staff and labor relations, Division of Human Resources

Marilyn Jost, executive director, administration & finance, Facilities & Real Estate Services

At Large

Sharon Aylor, CW'75, executive director of staff and labor relations, Division of Human Resources

Sara Senior, CW'52, former president of General Alumni Society; former chair, Penn Museum Overseer Board

The Office of the University Secretary will provide administrative support to the Ad Hoc Committee. If you have any questions, please email adhoccomm@exchange.upenn.edu

John A. Quinn Lecture and Memorial Service: March 16

The John A. Quinn Lecture in Chemical Engineering will take place *tomorrow, March 16* from 3:30-4:30 p.m. in the Wu and Chen Auditorium of Levine Hall.

A memorial service for Dr. Quinn, professor emeritus of chemical & biochemical engineering at Penn, who died on February 8 (*Almanac* February 23, 2016), will be held afterwards, from 5-6 p.m. in the Widener Lecture Hall at the University of Pennsylvania Museum of Archaeology and Anthropology.

Everyone from the University community is welcome to attend.

From the Office of the University Secretary

University Council Meeting Agenda

Wednesday, March 23, 2016, 4 p.m.
Bodek Lounge, Houston Hall

- I. Approval of the minutes of February 17, 2016. (1 minute)
- II. Follow up comments or questions on status reports. (5 minutes)
- III. Reports on Budgets and Plans for the Next Academic Year. (50 minutes)
- IV. New business. (5 minutes)
- V. Adjournment.

Final Report of the Consultative Committee for the Selection of a Dean of the School of Design

The Consultative Committee for the Selection of a Dean of the School of Design was convened by Penn President Amy Gutmann and Provost Vincent Price on September 17, 2015. During its three months of work, the full Committee met on 10 occasions and reported its recommendations to the President and the Provost on December 17, 2015.

The Committee members were:

Chair

Michael Delli Carpini, Walter H. Annenberg Dean and professor of communication (ASC)

Faculty

Eugenie L. Birch, Lawrence C. Nussdorf Professor of Urban Research and Education

William W. Braham, professor of architecture

Jeffrey Kallberg, William R. Kenan, Jr. Professor of Music History and associate dean for arts & letters (SAS)

Ken Lum, professor and director of fine arts undergraduate program

Randall F. Mason, associate professor in city & regional planning and chair of historic preservation

Karen M'Closkey, associate professor of landscape architecture

Gwendolyn DuBois Shaw, associate professor of history of art (SAS)

Students

Douglas Breuer (MARCH'17)

William Fleming (city planning PhD)

Ex Officio

Joann Mitchell, vice president for institutional affairs

Alumni

Barbara van Beuren (MARCH'88)

Kevin Penn (School of Design Overseers chair)

Staff

Adam P. Michaels, deputy chief of staff, Office of the President

Consultants

Sheryl Ash, Isaacson, Miller

Benjamin Tobin, Isaacson, Miller

Courtney Tunis, Isaacson, Miller

The Committee was greatly aided in its efforts by Sheryl Ash, Benjamin Tobin and Courtney Tunis of the Isaacson, Miller search firm. The Committee and the consultants each conducted extensive outreach, informational interviews and meetings with individuals and groups throughout the PennDesign community and at other institutions, along with many informal contacts. The consultative activities included full Committee meetings with Dean Marilyn Taylor, the School's associate deans, senior leadership and department chairs; meetings of the Consultative Committee chair with the School's Board of Overseers, faculty, staff and students; and extensive networking by members of the Committee with the School's faculty and students, as well as with colleagues at other institutions. The Committee also solicited advice and nominations from all faculty, staff, students and alumni of the School via email and reviewed a variety of documents about the School. The members of the Committee were especially energetic in soliciting and recommending the names of potential candidates.

Based upon these conversations and materials, the Committee's initial meeting with the President and the Provost, and the Committee's own discussions, a comprehensive document was prepared outlining the scope of the position and the challenges a new Dean will face, as well as the qualities sought in a new Dean. The Committee utilized this document in its discussions and deliberations and also shared it with candidates for the Dean position.

The Committee and the consultants contacted 143 individuals to assess their interest in participating in the search and/or for nominations. The Committee interviewed a group of 10 semi-finalists that included two women, two African Americans and one Asian. The six individuals recommended for consideration to the President and the Provost included one African American, one Asian and one woman and were selected from this group of 10 semi-finalists.

On February 25, 2016, President Gutmann announced the selection of Frederick "Fritz" Steiner, GRP'77, G'86, Gr'86, dean of the School of Architecture and Henry M. Rockwell Chair in Architecture at the University of Texas at Austin, who will assume the deanship on July 1, 2016. Dr. Steiner is an acclaimed scholar and teacher and a proven leader who has a long-standing commitment to and appreciation for interdisciplinary scholarship, teaching and practice in the design professions and the fine arts.

—Michael X. Delli Carpini
Walter H. Annenberg Dean and
Professor of Communication,
Annenberg School for Communication

Monica E. Monroe: Penn Law Dean of Students



Monica Monroe

Continuing a longstanding ethic of fostering a student-centric, collegial and collaborative law school community, the University of Pennsylvania Law School (Penn Law) has appointed Monica E. Monroe as the new Dean of Students.

Ms. Monroe came to Penn Law last month from the George Washington University Law School (GW Law), where she served as associate dean of students and a lecturer in law. In this position, she directed student affairs and academic programming while advising the dean and senior staff on student-related matters in and out of the classroom. In addition to her work in student affairs, she also taught legal research and writing.

"We are exceptionally happy to welcome Monica Monroe to Penn Law," said Ted Ruger, dean of Penn Law. "We know that she will bring commitment and drive to working with and supporting students as part of their educational experience here, and that she will become a vital part of the intellectual and social fabric of the Law School for years to come."

Ms. Monroe earned her BA from Boston University and her JD from GW Law. She clerked for the US Court of Appeals for the Armed Forces and the Superior Court of the District of Columbia.

After completing her clerkships, she spent six years in private practice in Washington, DC, where she focused on real estate, housing, employment and commercial law. She began teaching in the legal research and writing program at GW Law in 2004 and served as assistant dean of student affairs before her promotion to associate dean.

In addition, she is a former member on the Executive Committee of the George Washington University Law School Alumni Board of Directors, past president of GW's Black Law Alumni Association and a founding member of the Young Professional's Group of Covenant House Washington.

"It is an honor to join the community at Penn Law," said Ms. Monroe. "I have had the opportunity to experience first-hand the Law School's collegial and supportive environment. I embrace the role the Dean of Students has in modeling that ethic for our students. I look forward to working with Dean Ruger, faculty, administrators, students and alumni in an effort to ensure students engage deeply in their experience at Penn Law."

Ms. Monroe assumed the role of Dean of Students upon the retirement of Penn Law's long-time Dean of Students, Gary Clinton, who joined Penn Law as a library assistant in 1976 and had led the School's student affairs office since 1992.

"I am delighted that Monica Monroe will be succeeding me as Penn Law's Dean of Students," said Mr. Clinton. "Monica has a wealth of experience in student affairs, a demonstrated commitment to supporting students and the sense of balance between responsiveness and responsibility that is a hallmark of Penn Law. Each meeting with her has left me with an increased certainty that Monica is the right person for this job and this place."

PASEF Lecture: March 24

All are welcome to attend PASEF's next lecture on *Thursday, March 24* from noon-1:30 p.m. in the Hourglass Room of the University Club at the Inn at Penn. You can purchase lunch there at the Club just before entering the Hourglass Room. The speaker is Jeremy Siegel, the Russell E. Palmer Professor of Finance at the Wharton School. He will speak on *The Economy and the Markets—What's Next?*

Dr. Siegel comments extensively on the economy and financial markets on major networks—CNN, CNBC, NPR—and writes regular columns for *Kiplinger's Personal Finance* and *Yahoo!* He has published numerous articles in scholarly journals and several books, including *Stocks for the Long Run* and *The Future for Investors*. In addition, he has been named the Best Business School Professor in a worldwide ranking by *Business Week* and has won the Lindback Award for outstanding teaching (*Almanac* April 9, 2002).

Please contact Jocelyne Waller at (215) 746-5972 or emeritus@pobox.upenn.edu to register.

Ramon Diaz-Arrastia: Presidential Professor

(continued from page 1)

vened by the Institute of Medicine, National Institute of Neurological Disorders and Stroke, National Institute of Aging and the Department of Defense. He taught from 1993 to 2011 at the University of Texas Southwestern Medical Center, where he created one of the largest and most productive clinical centers in the world devoted to traumatic brain injuries. A native of Cuba, he has frequently participated in community outreach and media presentations to the Spanish-speaking community on topics such as epilepsy, Alzheimer's disease and traumatic brain injury.

"Ramon Diaz-Arrastia embodies the deepest values of teaching and learning at Penn," said Provost Price. "His innovative research makes a tangible impact on the lives of patients around the world. At the same time, he is an award-winning teacher, a valued collaborator and a dedicated mentor of students and colleagues."

Dr. Diaz-Arrastia earned an MD (1988) and PhD in biochemistry (1986) from Baylor College of Medicine and a BA *magna cum laude* in biochemistry (1979) from Rice University. From 1989-1992, he was a resident in neurology at Columbia-Presbyterian Medical Center, following a one-year internship in internal medicine at Beth Israel Hospital/Harvard Medical School.

"Dr. Diaz-Arrastia will be an outstanding addition to our already robust research and teaching faculty in the neurosciences who are helping to advance our understanding of the brain biology and physiology that contributes to traumatic brain injury," said J. Larry Jameson, executive vice president of the University of Pennsylvania for the Health System and dean of the Perelman School of Medicine. "He arrives at Penn at a crucial time in the trajectory of our efforts to understand and develop effective treatments for this disease."

Presidential Professorships, originating in the Action Plan for Faculty Diversity and Excellence first issued in 2011 (*Almanac* September 6, 2011) are awarded to exceptional scholars, at any rank, who contribute to faculty eminence through diversity across the University.

Penn Research Team: \$5 Million CURE Grant to Use Big Data to Improve Health

(continued from page 1)

data and hardware brought together in one project as a major key to the success of the initiative.

Penn Medicine will provide the big-data engine through its Penn Signals platform, which has already successfully produced real-time heart failure detection and sepsis predictive algorithms during its piloting phase, and will allow for the scaled processing of millions of patient records.

"Having the support of the health system leadership, and working closely with Penn's Chief Data Scientist Michael Draugelis, has been critical to building a big data research agenda," said co-lead Kevin Volpp, professor of medicine and medical ethics & health policy at the Perelman School, professor of health care management at Wharton and director of Penn's Center for Health Incentives & Behavioral Economics. "This project is a robust collaboration between the data science team at Penn Medicine and our academic team of physicians and social scientists, and has the potential to benefit Pennsylvania's most vulnerable populations by addressing health disparities and moving our health care system beyond the walls of the hospital and into homes and communities where the most vulnerable face the greatest challenges."

The project will deploy three separate research teams to explore predictive algorithms:

- The in-hospital team is led by Amol Navathe, assistant professor of medical ethics & health policy, whose research focuses on the use of advanced health data analytics and technology to improve health care. Dr. Navathe will work closely with the Penn Signals team to develop prediction models of patients at risk for in-hospital complications of common surgical care, including gallbladder surgery, colorectal surgery and total joint replacements.

- The at-home team, led by Mitesh Patel, assistant professor of medicine and health care management, will work to develop models to dynamically predict changes in out-of-hospital risk for 30-day readmission by monitoring medication adherence and physical activity in the home and through the integration of these home data sources with the data from insurance claims and the electronic health record.

- To monitor community health, the third team, led by Raina Merchant, assistant professor of emergency medicine and director of Penn's Social Media & Health Innovation Lab, will integrate social media data with statewide data to build and validate a tool to monitor and predict high-morbidity health conditions (heart disease, cancer, chronic lung disease, stroke and unintentional injury) at a community level. This team will also build computational models to use Twitter data for monitoring and predicting dynamic public health events in the state (e.g., influenza, food-borne illness, infectious outbreaks and acute environmental exposures).

The project also includes a training component to improve the pipeline of minorities entering science and public health careers who are equipped to use Big Data. It will provide opportunities for training in Big Data research through LDI's Summer Undergraduate Minority Research (SUMR) program, now in its 17th year. Undergraduate scholars from Lincoln University, one of Pennsylvania's historically black universities, will participate in this 12-week summer internship.

In addition to collaborators across Penn Medicine and the University of Pennsylvania, the team will also include researchers at both Temple University and Carnegie Mellon.

Honors & Other Things

Lee Bassett: NSF CAREER Award

Lee Bassett, assistant professor in the department of electrical & systems engineering at Penn, is the recipient of a National Science Foundation (NSF) CAREER Award for his proposal, "Coupling Spin, Light, and Charge for Quantum Information Processing and Storage in Diamond."

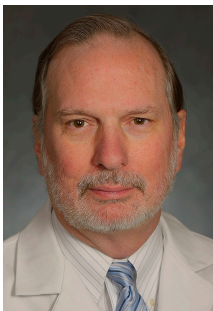


Lee Bassett

The goal of Dr. Bassett's CAREER award is to explore new ways to control single electron spins in diamond, which could form the essential building blocks for quantum computers, secure quantum communication links and other chip-scale quantum technologies. It will also support the construction and deployment of hands-on demonstrations of quantum coherence, in which K-12 students and the general public can actually see quantum physics with their naked eyes in room-temperature devices.

Joseph E. Bavaria: President, Society of Thoracic Surgeons

Joseph E. Bavaria, the Brooke Roberts-William Maul Measey Professor in Surgery and director of the thoracic aortic surgery program in the Perelman School of Medicine at the University of Pennsylvania, has been elected 2016 President of the Society of Thoracic Surgeons (STS).



Joseph Bavaria

"I hope to spend my year as President focusing on expanding the STS National Database to include more cardiothoracic surgery procedures, and I also plan to execute educational opportunities globally," Dr. Bavaria said. His clinical interests involve complex aortic diseases, cardiopulmonary transplantation and cardiac valve surgery. He has also published extensively on issues regarding thoracic aortic surgery and circulation management for complex thoracic aortic reconstruction.

Valerie T. Cotter: NQF Neurology Standing Committee

Valerie T. Cotter, advanced senior lecturer and director of the adult-gerontology primary care nurse practitioner program at the University of Pennsylvania School of Nursing, has been appointed to the National Quality Forum's (NQF) Neurology Standing Committee.

The Neurology Standing Committee will evaluate new measures and measures undergoing maintenance review for NQF's Neurology Project 2015-2016. The committee will make recommendations for which measures should receive NQF endorsement as consensus standards for accountability and quality improvement as they relate to addressing conditions, treatments, interventions or procedures relating to neurological conditions such as stroke, epilepsy, multiple sclerosis, dementia, Parkinson's and Alzheimer's disease and traumatic brain injury.

Ira Harkavy: 2016 Arthur V. Ciervo Award

Ira Harkavy, associate vice president and founding director of the Barbara and Edward Netter Center for Community Partnerships at Penn, is the recipient of the College and University Public Relations and Associated Professionals' (CUPRAP) 2016 Arthur V. Ciervo Award for service to higher education in the Commonwealth.



Ira Harkavy

CUPRAP is one of the nation's largest associations of higher education communications professionals, with 400 members representing over 100 colleges and universities in Pennsylvania, New Jersey and Delaware. The award was presented during CUPRAP's Annual Professional Development Conference last week in Hershey, Pennsylvania.

Gene Janda: Collegiate EMS Advisor of the Year

Gene Janda, chief of fire & emergency services at Penn, received the Collegiate EMS Advisor of the Year Award, 2015-2016, from the National Collegiate Emergency Medical Services Foundation (NCEMSF).



Gene Janda

Mr. Janda accepted the award on behalf of all of the members of Penn's Division of Public Safety who support the operations of the Medical Emergency Response Team (MERT), Penn's student-run emergency service organization. The award was presented at the NCEMSF Conference in Philadelphia last month.

Noam Lior: Fellow, World Academy of Art and Science

Noam Lior, professor in the department of mechanical engineering & applied mechanics at Penn, has been elected to the World Academy of Art and Science. The Academy serves as a forum for reflective scientists, artists and scholars to discuss the vital problems of humankind independent of political boundaries or limits, whether spiritual or physical—a forum where these problems can be discussed objectively, scientifically, globally and free from vested interests or regional attachments, to arrive at solutions that affirm universal human rights and serve the interests of all humanity.

Dr. Lior's research interests are in heat transfer and fluid mechanics, thermodynamics and Second-Law/Exergy analysis, energy conversion, solar energy, combustion, membrane distillation, flash evaporation and water desalination, destruction of hazardous wastes by photocatalysis and supercritical oxidation, scientific sustainability analysis and heat treatment.

Jonathan D. Moreno: 2015-2016 Faculty Award of Merit

Jonathan D. Moreno, the David and Lyn Silfen University Professor at Penn, is the recipient of the Penn Alumni Faculty Award of Merit. This award recognizes a faculty member who has made outstanding contributions to alumni education and engagement at Penn by sharing his or her unique scholarship work with the alumni community.



Jonathan Moreno

Dr. Moreno, one of 17 Penn Integrates Knowledge (PIK) professors at Penn, is a professor of medical ethics & health policy, of history & sociology of science and of philosophy. His latest book is *Impromptu Man: J.L. Moreno and the Origins of Psychodrama, Encounter Culture, and the Social Network* (2014), which Amazon named a "#1 hot new release."

Dr. Moreno frequently contributes to such publications as *The New York Times*, the *Wall Street Journal*, the *Huffington Post* and *Psychology Today*, and often appears on broadcast and online media. In 2008-2009, he served as a member of President Barack Obama's transition team. His work has been cited by Al Gore and was used in the development of the screenplay for *The Bourne Legacy*. His online neuroethics course drew more than 36,000 registrants in fall 2013. *The American Journal of Bioethics* has called him "the most interesting bioethicist of our time."

Dr. Moreno holds a PhD from Washington University in St. Louis, was an Andrew W. Mellon post-doctoral fellow, holds an honorary doctorate from Hofstra University, and is a recipient of the Benjamin Rush Medal from the College of William and Mary Law School and the Dr. Jean Mayer Award for Global Citizenship from Tufts University.

Penn Band: Musicopia Inspire Award

The Penn Band was recognized by Musicopia, a local non-profit organization that offers assemblies, residencies, instrument instruction and performance opportunities in underserved communities and schools. Musicopia presented the Penn Band with the Inspire Award last month at the annual Thank You Reception and String Orchestra Winter Concert and award ceremony hosted by the Catholic Philopatrian Literary Institute.

For the past three years, the Penn Band has assisted Musicopia by offering spaces at Penn's High School Summer Band Camp to students involved in Musicopia-supported percussion ensembles in Philadelphia. In addition, alumni from the Band have sponsored a fundraising campaign that covers the tuition and residency costs so participating Musicopia students can fully enjoy Penn's week-long overnight summer band camp experience.

The student leaders who make up the Band's Fanfare Honor Society take the initiative to organize local school visits, fundraising and instrument drives. Additionally, the annual West Philadelphia Halloween Parade is led exclusively by students, namely the Penn Band's drumline.

Mike Schnur: 2016 Ivy League Women's Coach of the Year

Mike Schnur, head coach of Penn's men's and women's swimming and diving programs, was named the 2016 Ivy League Women's Coach of the Year last month.

Coach Schnur has been at the forefront of a women's program that has steadily improved during his 16-year tenure as head coach.



Mike Schnur

Louis Soslowsky: ORS Outstanding Achievement in Mentoring Award

Louis J. Soslowsky, Fairhill Professor in the department of orthopaedic surgery at Penn's Perelman School of Medicine, is the recipient of the 2016 Outstanding Achievement in Mentoring Award from the Orthopaedic Research Society (ORS).

Dr. Soslowsky is recognized for exceptional dedication to and achievement in mentorship of new investigators in orthopaedic research. He was honored during the 2016 ORS Annual Meeting earlier this month in Orlando, Florida.



Louis Soslowsky

The Wharton School: UT Dallas Top Business School

The University of Texas at Dallas' *Top 100 Business School Research Rankings* were released last month by the university's Naveen Jindal School of Management. Penn's *Wharton School* remained as the top school in the world, as it has for more than a decade, according to the 2016 list, an index that tracks faculty research productivity at management schools.

Arjun G. Yodh: Humboldt Research Award

Arjun G. Yodh, the James M. Skinner Professor of Science and director of the Laboratory for Research on the Structure of Matter (LRSM) at Penn, is the recipient of the Alexander von Humboldt Foundation's Humboldt Research Award. Dr. Yodh, who holds a primary appointment in the department of physics & astronomy and a secondary appointment in the department of radiation oncology at Penn Medicine, was nominated by Hartmut Löwen of the University of Düsseldorf, Germany.

This award is conferred in recognition of lifetime achievements in research. The winner is invited to carry out research projects of his/her own choice in cooperation with specialist colleagues in Germany for a period of up to one year.



Arjun Yodh

Excellence through Diversity Fund: Call for Proposals: April 25

The University is pleased to call for proposals for the Excellence through Diversity Fund. The Fund, announced in the Penn Action Plan for Faculty Diversity and Excellence (*Almanac* September 6, 2011), will provide resources for interdisciplinary projects of University faculty on topics relating to equity, inclusion and diversity, with the goal of strengthening the Penn curriculum in these areas and recognizing excellence in these important fields of inquiry. Funds will be awarded to the Schools competitively, on a matching basis, to provide needed term resources to launch new efforts or strengthen existing ones, beginning July 1, 2016. Proposals should include a description of efforts to obtain funding from other sources. The Fund may support:

- Implementation of the Schools' strategic plans to diversify faculty and student populations;
- Research on equity, inclusion and diversity in higher education;
- Projects that foster and support diversity on the campus;
- Faculty work on projects aimed at advancing the ideals of the Penn Compact as they relate to increased access of students and faculty.

A list of projects funded last year can be found at: <http://www.upenn.edu/almanac/volumes/v62/n02/penn-excellence-through-diversity-projects.html>

Criteria for Review

Review and evaluation will be based on the following criteria:

- Relationship to the aims of the Fund as described above;
- For projects aimed at diversifying the campus environment, clarity of goals and procedures and presence of an evaluation plan;
- Potential for sustainability and/or impact over time with school, center or extramural funding, particularly as demonstrated by matching funds;
- Likelihood of generating new insights about diversity in higher education;
- Presence of a realistic and sufficiently detailed budget;
- Potential for sustainable partnerships among schools, departments or university programs.

Proposals are due by *April 25, 2016*.

Review Process

The Fund will be administered by the Office of the Vice Provost for Faculty. Proposals will be reviewed for scholarly merit and significance for diversity research, teaching and service. Priority will be given to innovative designs and to plans that involve multiple Schools.

Application

Applications must include:

- A completed ETDF Budget Form, available with PennKey at: https://upenn.app.box.com/files/0/f/0/1/f_27011277491
- A completed ETDF Cover Sheet (with all signatures) and Proposal Form, available with PennKey at <https://upenn.app.box.com/s/0sdo5jxh0mzdnelk59xxvzxp7nkp7nkp64> including: background; work to be undertaken; ability to enhance Penn's teaching, research and engagement on issues relating to equity inclusion and diversity; and demonstrated interdisciplinary linkages;
- Brief biographies of faculty members involved in the project. Please limit to key faculty; CVs are not required;
- Evidence of additional funding from institutional or external sources;
- Outlook for the future of the project (continued activity and external funding);
- For conference support: a description of the purpose of the meeting; a proposed program agenda and list of presenters; the names of Penn faculty organizing the meeting; the number of Penn students and faculty expected to attend; an explanation of the benefit to Penn students and faculty; an explanation of the benefit to scholarly or research programs at Penn; an explanation of the relationship of the meeting to department, institute or center programs.

Submission

Email a complete PDF, including signed ETDF Cover Sheet, Proposal Form and Budget Form, to provost-fac@upenn.edu no later than *April 25, 2016*. The name of the PDF must be the last name of the principal investigator. At the conclusion of a project, the PI is expected to submit a DIP Assessment form to report the use of the funding.

Penn's Investment in You

At Penn, faculty and staff earn more than a paycheck. Full-time faculty and staff also receive access to exceptional benefits and services. Your annual Total Compensation Summary shows just how valuable these benefits are, giving you a picture of Penn's complete investment in you.

Your 2015 Total Compensation Summary is in the mail. It's also available for download from the secure Total Compensation Summary website at www.hr.upenn.edu/myhr/payandperform/totalcomp. This personalized statement covers your salary or wages, retirement contributions, tuition benefits, healthcare and other insurance coverage and any additional compensation for the 2015 calendar year.

Many faculty and staff use this important document as a source of information about programs to take advantage of in the future. As your goals evolve, Penn encourages you to make the most of the retirement savings and investment counseling, professional development programs, wellness services and award-winning work and life resources outlined in your summary. At the end of your summary, there's a list of cultural activities and special Penn community discounts that you won't want to miss.

For quick access to your Total Compensation Summary and your benefits information, visit the U@Penn Portal at www.upenn.edu/u@penn

—Division of Human Resources

2016 Performance and Staff Development Program

Open and effective communication is essential when it comes to enhancing performance and achieving goals. The Performance and Staff Development Program (the annual performance appraisal program) provides staff and supervisors with a formal process to enhance communication and promote a productive work environment.

The performance appraisal process provides benefits for both the staff member and the supervisor, such as:

- Providing documented feedback on job expectations, performance and accomplishments from the past year
- Offering positive reinforcement as well as developmental feedback
- Allowing staff members to participate in goal-setting
- Setting performance expectations and goals for the upcoming year
- Encouraging open communication between staff and supervisors
- Promoting discussion of professional development opportunities and the competencies required to be successful in their job
- Ensuring that job performance and accomplishment information is recorded in each staff member's official personnel file

Staff and supervisors should use the Online Performance Appraisal System to complete self-appraisals and annual performance appraisals. Performance appraisals for all eligible regular staff should be completed and entered into the Online Performance Appraisal System by June 1. The Online Performance Appraisal System can be accessed at <https://portal.hr.upenn.edu>

Valuable information on the performance appraisal process can be found on the Human Resources website at <https://www.hr.upenn.edu/myhr/payandperform/appraisal/performance-management-programs>. Here you'll find a variety of materials to guide you in completing quality appraisals and providing effective performance and professional development feedback.

For more information on the Performance and Staff Development Program, contact your school or center Human Resources professional or the Division of Human Resources at (215) 898-6093.

—Division of Human Resources

Penn IUR Photo Contest Winners



The Penn Institute for Urban Research (Penn IUR), in collaboration with the Center for Public Health Initiatives, announced the winner of its photo contest on the theme of *Public Health and the Urban Environmental Landscape*.

The winning photo, "Summer's Day at John Kelly Pool, Fairmount Park, Pa." (above), taken by Ben Chrisinger, a Penn IUR Emerging Scholar who completed his PhD in city & regional planning at PennDesign in 2015, is a nostalgic-feeling image that depicts the recreational and community-building benefits of urban public pools.

The two runners up were Rob Lybeck's "Schuylkill River Trail," a moody and arresting shot depicting a runner on the trail, and "Spruce Street Harbor Park, Philadelphia," a vibrant image of toddlers enjoying the waterfront pop-up parks by Teng Teng, who earned his master's in city & regional planning at PennDesign in 2015.

Three additional submissions received honorable mentions: "Pedestrian Traffic, Italian Market, Philadelphia" by Alexandra Atiyeh; "Natural, Human, and Industrial Landscape, Philadelphia," by Caroline Carney, C'12, a clinical research coordinator in the division of health policy at Penn's Perelman School of Medicine; and "Luxembourg Gardens, Paris, France" by Javier Medina.

The winner and runners up were announced at the "Shaping the Urban Health and Environmental Landscape" symposium, held last month in the Fisher Fine Arts Library at Penn. The contest was judged by the symposium's panel of experts, who looked for compelling images that emphasize ways that urban design has succeeded or failed to promote public health and well-being.

To see the runners up and honorable mentions, visit <http://pennur.upenn.edu/press-room/announcements/view-the-winners-urban-health-and-the-environmental-landscape-photo-contest>

Academic Job Search Handbook

To celebrate the new (fifth) edition of the *Academic Job Search Handbook* (University of Pennsylvania Press, 2016), authored by Penn Career Services graduate student/postdoc advisors Julie Vick and Rosanne Lurie and former Penn Career Services advisor Jenny Furlong (now at the Graduate Center, CUNY), current Penn doctoral students and current Penn post-docs are invited to a reception in the Common Room at the Graduate Student Center on Tuesday, March 22, from 2-3 p.m.

Meet the authors, enjoy a snack and buy a copy of the new edition. Career Services and the Penn Press make it possible for current Penn doctoral students and current Penn postdocs (who have completed at least one year of their postdoc) to purchase the book for the discounted price of \$10 (with PennCard). Others may purchase it through Amazon, other booksellers or the University of Pennsylvania Press, <http://www.upenn.edu/pennpress/book/915.html> at the regular retail price of \$19.95. It is also available to be read in the Career Services library.

The book's sections are entitled "What You Should Know before You Start," "Planning and Timing Your Search," "Written Materials for the Search: Suggestions and Samples," "Conducting the Search," "After You Take the Job," "Additional Considerations" and "Beyond Faculty Careers." This new edition has over 60 new sample job search materials from faculty job seekers (who got jobs) across humanities, social sciences, STEM and professional disciplines.

Safety Updates from EHRS Employee Exposure Records

EHRS monitors employee exposure to toxic substances and harmful physical agents and maintains employee exposure records. The Occupational Safety & Health Administration (OSHA) standard, "Access to Employee Exposure and Medical Records" (29CFR1910.1020), permits access to employer-maintained exposure and medical records by employees or their designated representative and by OSHA.

University employees may obtain a copy of their exposure record by calling EHRS at (215) 898-4453 or by emailing ehrs@ehrs.upenn.edu

EHRS also monitors exposure to individuals working with radioactive material or x-ray machines. Nuclear Regulatory Commission and Commonwealth of Pennsylvania regulations require that exposure results be available. Results are maintained at EHRS and are available online. Instructions for accessing online radiation exposure results can be found at the EHRS website: <http://www.ehrs.upenn.edu/programs/radiation/>

Hazard Communication Program

The University of Pennsylvania's Hazard Communication Program provides information regarding access to Safety Data Sheets, proper labeling of hazardous chemicals and the hazard communication training programs required for all employees who handle hazardous chemicals as part of their work.

Penn's Hazard Communication Program is available on the EHRS website at <http://www.ehrs.upenn.edu/programs/occupat/hazcomm.html> or from the Office of Environmental Health & Radiation Safety, 3160 Chestnut Street, suite 400.

Update

March AT PENN

ON STAGE

17 *The Yeomen of the Guard*; Penn Singers Light Opera Company; 8 p.m.; Zellerbach Theatre, Annenberg Center; pricing & tickets: www.annenbergcenter.org/ Also March 18, 8 p.m. Also March 19, 1 p.m. & 8 p.m. (Platt Performing Arts House).

Continuous Real Women, Fake Stories; Bloomers; 8 p.m.; Class of '49, Houston Hall; pricing & tickets: www.bloomerscomedy.com/ Also March 18, 7 p.m. & 9:30 p.m. Also March 19, 8 p.m. (Platt Performing Arts House).

25 *Over DuReinbow*; Penn DuRe; 6 p.m.; Rainey Auditorium, Penn Museum; pricing & tickets: www.vpul.upenn.edu/platthouse/ Also March 26, 6 p.m. (Platt Performing Arts House).

SPECIAL EVENT

19 *STWing Robotics Fair*; presenters include GRASP Lab; Steve, Will & Nick McGill, KRECH & Penn Engineering alumni; 10 a.m.-5 p.m.; 1938 Lounge, Kings Court English College House; PennCard required (Science and Technology Wing, Kings Court College House).

TALKS

15 *Wharton Leadership Lecture*; Jamie Moldafsky, WG'89, Wells Fargo; 4:30 p.m.; rm. G06, Huntsman Hall; register: bit.ly/ldrshiplec (Wharton).

17 *Yazidis After the Trauma*; Emily Feldman, reporter; noon; rm. 108, ARCH Bldg. (Middle East Center).

21 *Parasitology Seminar Series*; Jude Uzonna, University of Manitoba; noon; rm. 132, Hill Pavilion (Penn Vet).

AT PENN Deadlines

The March AT PENN calendar is online at www.upenn.edu/almanac. The deadline for the April AT PENN calendar is today, March 15.

Info is on the sponsoring department's website; sponsors are in parentheses. For locations, call (215) 898-5000 or see www.facilities.upenn.edu

Food for Thought: March 22

Next Tuesday is a chance for all members of the Penn community to see and taste what the newly renovated University Club has to offer. The *Food for Thought* luncheon talk will be held at the Club on March 22 at noon and is open to members and non-members of the Club with a PennCard. The cost of the full lunch, buffet-style, is \$12.95. RSVP to universityclub@pobox.upenn.edu

The talk will feature Rob Farley of *FactCheck.org* presenting *Presidential Campaign Rhetoric: Separating Fact from Fiction* in the Club's Hourglass Room at the Inn at Penn. Mr. Farley will discuss the current presidential campaign and FactCheck's goal of applying the best practices of both journalism and scholarship, and increasing public knowledge and understanding. Nearly two million people have looked up 6.5 million pages on *FactCheck.org* over the past month to get help sorting through all the politicians' claims.

FactCheck.org is a nonpartisan, nonprofit "consumer advocate" for voters that aims to reduce the level of deception and confusion in politics. FactCheck monitors the factual accuracy of what is said by major US political players in the form of TV ads, debates, speeches, interviews and news releases. *FactCheck.org* is a project of Penn's Annenberg Public Policy Center.

Disability Symposium: Register by March 22

The 15th Annual Disability Symposium, "Thinking and Feeling: Matters of the Brain and Heart," will take place on April 8 from 7:45 a.m.-4:30 p.m. in Houston Hall. This year's theme goes beyond assumptions to shed new understanding on the behavior of the brain and the experience of the heart.

Featured speakers are Frances E. Jensen, professor and chair, department of neurology, University of Pennsylvania Health System and author of *The Teenage Brain* as well as Matt Fuller, director and producer of the feature length documentary, *Autism in Love*.

This event, hosted by the Weingarten Learning Resources Center, is free for those affiliated with Penn. The registration fee for non-Penn students is \$50. The registration fee for all other attendees is \$85. Register by March 22 at www.vpul.upenn.edu/lrc/sds/currentsymposium

30x30 Challenge in April

It is time to get back outside! Join Penn's 30x30 Challenge and challenge yourself to spend at least 30 minutes outdoors each day during the month of April.

Last year, 345 staff and faculty signed up, so Penn has brought back the 30x30 Challenge. The Sustainability Team will host an opening event and guided campus tours. Participants will get a new book this year.

Americans spend approximately 90% of their time indoors, according to the EPA. Over the last decade, researchers have been documenting what many of us know intuitively—that nature is good for our health and well-being. Regularly immersing yourself in a natural setting—like a park, forest or field—can reduce stress while boosting immunity, energy levels and creativity. The 30x30 Challenge is an effort to encourage the Penn community to get outside, learn about local ecology and appreciate the beauty of nature. Optional group activities will be scheduled throughout the month, including a kick-off picnic on April 1 to celebrate the start of the Challenge.

The Challenge is open to all Penn faculty and staff, and runs from April 1-30. To register and participate, please complete this online form before March 25: <http://tinyurl.com/hesc9ja>

Each participant will receive a *Pocket Naturalist™ Field Guide* and may choose between a pocket guide to 'Pennsylvania Trees & Wildflowers' or a pocket guide to 'Philadelphia Birds.' Please see <http://www.upenn.edu/sustainability/get-involved/30x30-challenge> for details.

The Green Campus Partnership appreciates your support in encouraging your coworkers to participate in 30x30. Please spread the word within your offices and departments.

—The Green Campus Partnership

Almanac

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The University of Pennsylvania's journal of record, opinion and news is published Tuesdays during the academic year, and as needed during summer and holiday breaks. Its electronic editions on the Internet (accessible through the Penn website) include HTML, Acrobat and mobile versions of the print edition, and interim information may be posted in electronic-only form. Guidelines for readers and contributors are available on request and online.

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The University of Pennsylvania Police Department Community Crime Report

About the Crime Report: Below are all Crimes Against Persons and Crimes Against Society from the campus report for **February 29-March 6, 2016**. Also reported were 11 Crimes Against Property (6 thefts, 2 other offenses, 1 auto theft, 1 fraud and 1 vandalism). Full reports are available at: www.upenn.edu/almanac/volumes/v62/h26/crreport.html Prior weeks' reports are also online. —Eds.

This summary is prepared by the Division of Public Safety and includes all criminal incidents reported and made known to the University Police Department between the dates of **February 29-March 6, 2016**. The University Police actively patrol from Market Street to Baltimore Avenue and from the Schuylkill River to 43rd Street in conjunction with the Philadelphia Police. In this effort to provide you with a thorough and accurate report on public safety concerns, we hope that your increased awareness will lessen the opportunity for crime. For any concerns or suggestions regarding this report, please call the Division of Public Safety at (215) 898-4482.

02/29/16	10:00 AM	300 S 39th St	Complainant touched inappropriately
03/01/16	11:39 AM	3400 Spruce St	Complainant threatened by patient
03/01/16	12:02 PM	299 S 42nd St	Complainant assaulted by ex-boyfriend
03/02/16	12:44 PM	3400 Spruce St	Threatening messages received
03/02/16	9:33 PM	4000 Ludlow St	Male attempted to take complainant's handbag
03/04/16	1:33 AM	4034 Walnut St	Unknown male broke glass to front door
03/04/16	12:01 PM	3800 Sansom St	Complainant assaulted/Arrest
03/05/16	3:12 PM	3800 Sansom St	PPD officer assaulted by offender/Arrest

18th District Report

Below are the Crimes Against Persons from the 18th District: 4 incidents with 2 arrests (2 assaults, 1 indecent assault and 1 robbery) were reported between **February 29-March 6, 2016** by the 18th District covering the Schuylkill River to 49th Street & Market Street to Woodland Avenue.

02/29/16	2:32 AM	423 S 47th St	Robbery
02/29/16	12:11 PM	300 blk S 39th St	Indecent Assault
03/05/16	3:12 PM	S 38th & Sansom St	Assault/Arrest
03/05/16	5:54 PM	3800 Sansom St	Assault/Arrest

Penn Nursing Study: Is There a Digital Hood? Disadvantaged Youth Can't Get Away from Negative Interactions, Whether on the Street or Online

A new, novel study from the University of Pennsylvania School of Nursing (Penn Nursing) shows that there is an alarming connection between the negative social interactions disadvantaged youth experience in the neighborhoods they live in and on social media. The study, led by Robin Stevens, assistant professor in the department of family & community health and director of the Health Equity & Media Lab, is set for publication in *New Media & Society*.

The team conducted semi-structured interviews with 30 females and 30 males, ranging in age from 18-24 years old, about their social worlds and neighborhoods, both online and offline. The study took place in predominantly African-American and Hispanic neighborhoods. Forty-three percent of the participants were African American; 43 percent were Latino; and 13 percent were of mixed African-American and Latino ethnicity. All of the interviewees were in either high school or community college at the time.

"It is estimated that more than 75 percent of youth across the country are on some sort of social media," said Dr. Stevens. "Teens and young adults who are at the margins of society may have experiences in dealing with social media that others don't. Unfortunately, what we found was that not only do they have to deal with negative social interactions in their neighborhoods, those interactions also seep into their online lives, sometimes in a larger, more problematic, way." The study's findings reveal a dynamic and somewhat concerning interplay between a physical neighborhood and a digital neighborhood, where negative interactions are reproduced and amplified online.

The participants told interviewers of the drama that takes place on social media, which is a byproduct of living in a disadvantaged neighborhood. Researchers not only discovered that the physical negativity that these young people experience in their neighborhoods spills over to their lives on social media, but that the opposite is also true. "Participants told us that drama that starts out on social media can also manifest itself in serious, physical altercations on the streets," added Dr. Stevens. "Social media is an amplified reflection of the real and digital neighborhoods in which they live." The investigators suggest that more research is needed in the use and side effects of social media in diverse populations (i.e. cultural, financial and geographical).

The study team consisted of Stacia Gilliard-Matthews, assistant professor at Rutgers University; Jamie Dunaev, doctoral student at Rutgers University-Camden; Marcus Woods, elementary school teacher in New Orleans, Louisiana; and Bridgette Brawner, assistant professor at Penn Nursing.

Penn Study: Machine Learning at Arraignments Can Cut Repeat Domestic Violence

In one large metropolitan area, arraignment decisions made with the assistance of machine learning cut new domestic violence incidents by half, leading to more than 1,000 fewer such post-arraignment arrests annually, according to new findings from Penn. In the US, the typical pre-trial process proceeds from arrest to preliminary arraignment to a mandatory court appearance, when appropriate. During the preliminary arraignment, a judge or magistrate chooses whether to release or detain the suspect, a decision intended to account for the likelihood that the person will return to court or commit new crimes. This is especially important in domestic violence, which is often a serial offense and directed at a particular individual.

Richard Berk, a criminology and statistics professor in Penn's School of Arts & Sciences and Wharton School, and Susan B. Sorenson, a professor of social policy in Penn's School of Social Policy & Practice, found that using machine-learning forecasts at these proceedings can dramatically reduce subsequent domestic violence arrests. "A large number of criminal justice decisions by law require projections of the risk to society. These threats are called 'future dangerousness,'" Dr. Berk said. "Many decisions, like arraignments, are kind of seat of the pants. The question is whether we can do better than that, and the answer is yes we can. It's a very low bar."

For domestic violence crimes between intimate partners, parents and children or even siblings, there's typically a threat to one particular person, said Dr. Sorenson, who directs Penn's Evelyn Jacobs Ortner Center on Family Violence. "It's not a general public safety issue," she said. "With a domestic violence charge, let's say a guy—and it usually is a guy—is arrested for this and is awaiting trial. He's not going to go assault some random woman. The risk is for a re-assault of the same victim."

To understand how machine learning could help in domestic violence cases, Drs. Berk and Sorenson obtained data from more than 28,000 domestic violence arraignments between January 2007 and October 2011. They also looked at a two-year follow-up period after release that ended in October 2013. They published their work in the March issue of *The Journal of Empirical Legal Studies*.

A computer can "learn" from training data which kinds of individuals

are likely to re-offend. For this research, the 35 initial inputs included age, gender, prior warrants and sentences and even residential location. These data points help the computer understand appropriate associations for projected risk, offering extra information to a court official deciding whether to release an offender. "In all kinds of settings, having the computer figure this out is better than having us figure it out," Dr. Berk said.

That's not to say there aren't obstacles to its use. The number of mistaken predictions can be unacceptably high, and some people object in principle to using data and computers in this manner. To both of these points, the researchers respond that machine learning is simply a tool. "It doesn't make the decisions for people by any stretch," Dr. Sorenson said. These choices "might be informed by the wisdom that accrues over years of experience, but it's also wisdom that has accrued only in that courtroom. Machine learning goes beyond one courtroom to a wider community."

"The algorithms are not perfect. They have flaws, but there are increasing data to show that they have fewer flaws than existing ways we make these decisions," Dr. Berk said. "You can criticize them—and you should because we can always make them better—but, as we say, you can't let the perfect be the enemy of the good."

Penn Engineers Use Network Science to Predict How Ligaments Fail

When doctors diagnose a torn ligament, it's usually because they can see ruptures in the ligament's collagen fibers, visible on a variety of different scans. However, they also often treat patients with many of the symptoms of a tear, but whose ligaments don't show this kind of damage. Researchers from Penn's School of Engineering & Applied Science are using network science to gain new insights into these "subfailure" injuries, which can lead to pain and dysfunction despite the lack of obvious physical evidence. The mechanisms that lead to these symptoms happen on a microscopic level and can't be detected by existing clinical tools.

In a study recently published in the *Journal of the Royal Society Interface*, the Penn team has put human ligament samples to the test, stretching them until they tear, while looking at these microscopic features. Using a polarized-light-based system that can reveal the angles of collagen fibers in the tissue, the researchers have shown how groups of neighboring fibers changing their orientations in tandem prefigures the spots where failure eventually occurs. These insights could help identify regions of ligaments that are prone to tearing, and could eventually be incorporated into new diagnostic techniques or therapies. They could also help explain the painful symptoms patients experience in sub-failure injuries.

The study was conducted by Beth Winkelstein, professor in the departments of bioengineering in Penn Engineering and neurosurgery in Penn's Perelman School of Medicine; Sijia Zhang, a graduate student in the Winkelstein lab; and Danielle Bassett, the Skirkanich Assistant Professor of Innovation, with appointments in the departments of bioengineering and electrical & systems engineering.

Earlier work in the Winkelstein lab showed microscopic evidence of the first tears appearing in a ligament as it was put under strain. These visible ruptures are often initiated by disorganization of ligament fibers amounted to a few pixels on an optical scan, so Ms. Zhang was interested in adding more context to the picture. "We're investigating the mechanisms of how injury, even if it isn't visible, induces pain," she said. "Our hypothesis was that the cells embedded in the collagen matrix are being stretched during ligament loading, affecting cell behaviors, so we set out to see how the matrix is being reorganized under strain."

Ms. Zhang was enrolled in Dr. Bassett's introductory class on network science, in which students are encouraged to bring their own datasets to serve as illustrative examples. Her data were obtained from experiments in the Winkelstein lab during which ligament samples were stretched until failure while they were observed with an imaging system using polarized light. Much like how polarized sunglasses work by blocking all light aligned at a particular angle, this system can show the orientations of collagen fibers in the ligament by measuring how much light they allow through. "With this method," Ms. Zhang said, "you can track changes in collagen fiber orientation during loading, and you can measure the angles of the collagen fibers and tell how strongly they are aligned."

Network science investigates how individual elements of complex systems interact to determine the system's overall behavior. By using analysis techniques derived from this discipline, Ms. Zhang was able to show the degree to which concerted reorientation prefigured the spots where failure first occurred.

"Network science offers a fundamental explanatory mechanism for subfailure damage, a process that we think may lead to pain," Dr. Bassett said. "If a single fiber is turning, a tear is unlikely, as is the activation of pain fibers; but when there is a coordinated change in many fibers, pain and tears may be more likely."