

PATHWAYS

WORCESTER POLYTECHNIC INSTITUTE

SCHOOL *of* ARTS & SCIENCES



**IMAGINE
INNOVATE
IMPACT**

IMAGINE INNOVATE IMPACT



VISION

To inspire members of the Arts and Sciences community to be creators, scholars, inventors, and responsible global citizens.

MISSION

To bring together cross-disciplinary and diverse perspectives to promote discovery and communication, advance knowledge, and improve the human condition.



FROM THE DEAN

Imagine. Innovate. Impact. These three concepts lie at the heart of WPI's School of Arts & Sciences. The interdisciplinarity of the arts and sciences at WPI—seamless interactions between and among the arts and sciences as well as engineering and business—allows what our imagination sparks to come to life through scientific, technological, artistic, and humanistic innovation. The arts and sciences do not just overcome barriers between disciplines but eliminate them such that the specter of what is possible is limitless.

Overcoming barriers between disciplines has allowed WPI to tackle the unprecedented global challenge of the COVID-19 crisis. As you will read in the following pages, WPI computer science professor Dmitry Korkin brought together a team of students to create a structural 3D genomics roadmap of the new coronavirus—a feat accomplished in just 10 days—to help other scientists accelerate and advance desperately needed treatment options. This is but one example of how our faculty and students utilize their imagination and creativity to tackle important challenges and innovate in extraordinary ways. This is not a new approach but one that lies within the fabric of our institution and school. Take, for example, the accomplishments of one of WPI's notable alumni, Robert Goddard. The “Father of Modern Rocketry” published his first paper in *Scientific American* as an undergraduate student in 1907. He graduated from WPI in 1908 as a general science major and his cumulative achievements laid the foundation for world-changing innovations including long-range rockets, satellites, and spaceflight. Fast forward more than a century to another challenge like COVID-19, and WPI faculty and students continue to imagine a world where we play a critical part in addressing not just the needs of the moment but those that will define our future.

I am honored to be part of this amazing community without boundaries. Where music, art, and design-thinking allow our scientists and engineers to have long-lasting and eternal impact, inspiring and exciting the imagination to reach their own stars, regardless of what they choose to research or study. As you will see in this edition of Pathways, the students and faculty of WPI's School of Arts & Sciences are making an impact not only here on campus and nationally, but throughout the world.



Jean King, PhD
Peterson Family Dean of Arts and Sciences

“It is difficult to say what is impossible,
for the dream of yesterday is the hope of
today and the reality of tomorrow.”

Robert H. Goddard '08
inventor of the liquid-fueled rocket



ARTS & SCIENCES WEEK



Members of the Latin American Studies Initiative steering committee (from left) Angel Rivera, associate professor; Aarti Madan, associate professor; William San Martin, assistant teaching professor; John Galante, assistant teaching professor.



Jean King, dean of arts & sciences, opens A&S Week with her State of the Arts and Sciences presentation.

The 2019 Arts & Sciences Week celebration included events that embodied the theme of "Imagine, Innovate, Impact!" This campus-wide event showcased the array of A&S programs and included activities that launched WPI's Latin American Studies Initiative, such as student and faculty lightning talks, the inaugural Latin American Studies Project Awards, and invited Latin American scholar talks. Other events included a visual art showcase and gallery walk, student lightning talks and graduate student poster session, a laboratory open house, and a seminar on social justice and urban design, among others.



Jennifer McWeeny, associate professor of philosophy, gives a lightning talk, "Situated Bodies, Situated Minds."

A FOCUS ON LATIN AMERICA AND VISUAL ARTS



The Sheila del Bosque Trio entertains at Latin America Live!, an evening of Latin American art and music.



The Latin American Studies Initiative brings together students, faculty, and staff from across the university's four divisions—Arts & Sciences, Business, Engineering, and The Global School—to confront critical issues affecting the region and the wider world. By integrating ongoing on- and off-campus activities that relate to Latin America, the initiative organized around sustainability, mobility, and intercultural competency and amplifies diverse forms of engagement between WPI and the region.



Farley Chery, assistant teaching professor, conducts a display for the interactive media & game development (IMGD) program during the Visual Art Design Showcase & Gallery Walk.



IMAGINE INNOVATE IMPACT



Gillian Smith, associate professor of computer science, demonstrates her work that blends computation and traditional crafts.

*“The true sign
of intelligence is
not knowledge
but imagination.”*

Albert Einstein ,
physicist and founder of
the theory of relativity



PUTTING THE ART IN ARTS & SCIENCES



Pamela Castro, a grafiteira and performance artist from Rio de Janeiro, Brazil, was a featured guest during A&S Week. Her work focuses on female empowerment and destigmatizing the role of women in society. While at WPI, Castro painted a mural of Worcester native Abby Kelley Foster, a prominent suffragist and abolitionist, in the first-floor lounge of Salisbury Labs. The stunning mural was made possible through support from WPI's Global Lab.

DID YOU KNOW?

WPI has a solid footprint in Latin, Central, and South America. For example, in 2018, 167 students completed off-campus projects at the HUA Project Centers in Buenos Aires; the IQP Centers in Costa Rica, Paraguay, Panama, Ecuador, Puerto Rico, and Argentina; and the MQP Centers in Panama and Brazil.



IMAGINE

The Artistry of Gaming

Local gaming industry experts attended Showfest, an end-of-year display of games created by graduate and undergraduate students from WPI's interactive media & game development (IMGD) program. They interviewed students about their games, offered feedback, and discussed employment.



Choral Masterpiece

Joshua Rohde, WPI's choral director, conducted the first New England presentation of contemporary Scottish composer James MacMillan's choral masterpiece, "St. Luke Passion," at Trinity Lutheran Church in Worcester in April 2019. Rohde presided over a 30-person chamber orchestra, a 134-person chorus of Trinity choir, WPI's Festival Chorus, and a 39-person Children's Chorus augmented by a professional core and trained by its director, Pamela Mindell.



Source: Worcester Telegram & Gazette

ARTS & SCIENCES IN THE COMMUNITY

Robot-Human Sound Fusion

Scott Barton, associate professor of music, produced Sound Fusion, a first-of-its-kind concert at Worcester's Mechanics Hall, pairing human musicians with artificially intelligent musical robotics. The concert blended the venue's 3,504-pipe Hook organ with autonomous and human-controlled 21st century robots Barton created with undergraduate and graduate students.



Moth Radio Hour Presentation

Michelle Ephraim's "To Thine Own Self Be True" appeared in the Peabody Award-winning Moth Radio Hour in 2019. The associate professor of humanities & arts and Shakespeare scholar tells the tale of an unexpected run-in with an ex's mother. Her award-winning blog, *Everyday Shakespeare*, co-written with Caroline Bicks of Boston College, became the inspiration for their literary humor book, *Shakespeare, Not Stirred: Cocktails for Your Everyday Dramas* (Penguin, 2015 and Scribe, 2015).



ENSEMBLES

Orchestra
Stage Band
Concert Band
Brass Ensemble
String Ensemble
Jazz Ensemble
Glee Club
Alden Voices Women's Chorus
Chamber Choir
Festival Chorus

EXTRACURRICULAR ENSEMBLES

Flute
Saxophone
Percussion
Trombone
Afro-Percussion

A CAPPELLA GROUPS

Simple Harmonic Motion
Technicords
Audiophiles
Ketones
Sound Logic

THE IMPACT OF MUSIC AT WPI



“ Here, music is raised to an academic level beyond that of an extracurricular activity. There are elements of a club, but there’s also an academic credibility to it because it can satisfy a degree requirement. It brings everything to a different level. ”

Douglas Weeks, teaching professor
and administrator of music



Alden Voices performs at the Worcester Art Museum in October 2019

“If I were not a physicist, I would probably be a musician. I often think in music. I live my daydreams in music. I see my life in terms of music.”

Albert Einstein, physicist and founder of the theory of relativity

300+

students are enrolled in music classes at any given time

500+

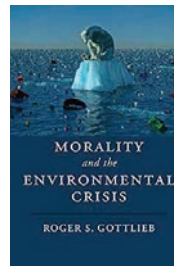
students participate in WPI music ensembles

PUBLICATIONS AND LITERARY WORKS

These are just a few of the many books and literary works published by A&S faculty in the past year.



Professor of social science & policy studies **Rob Krueger** published his latest book, *Adventures in Sustainable Urbanism*, which offers a global view of what sustainable urbanism looks like in different cultures and how social justice is an important, yet often neglected, part of the conversation.



Morality and the Environmental Crisis by **Roger Gottlieb**, professor of philosophy, was listed as one of the best new environmental books of the month by EcoWatch, a leading environmental news site.



The Soft Path, a new book by **Joshua Harmon**, associate teaching professor of humanities & arts, appeared in the Akron Series in Poetry, published by the University of Akron Press. Harmon's third volume of poetry takes its title from a 1970s term promoting an alternative energy future.

Kathryn Moncrief, professor and department head of humanities & arts, published "Child Loss, Grief, and Recovery in Shakespeare's Late Romances," in *Literary Cultures and the Child*, edited by Naomi J. Miller and Diane Purkiss. Palgrave, 2019.

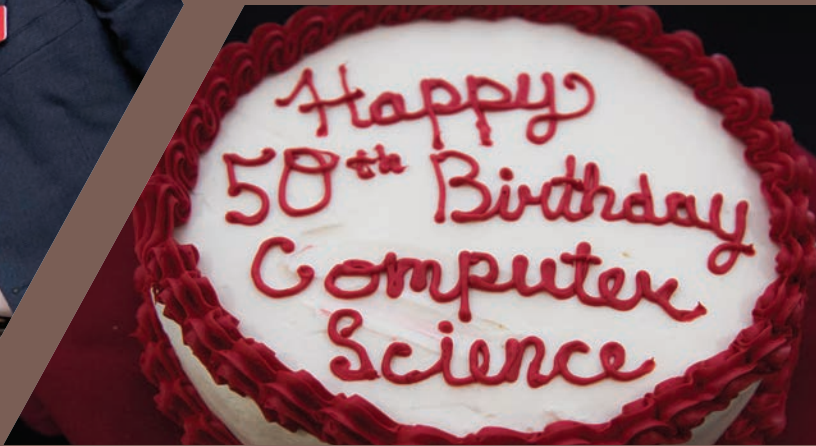
Kate McIntyre's story "Prairie Vision," published in *The Cincinnati Review*, was selected for Special Mention in the new Pushcart anthology. The assistant professor of humanities & arts is editor of the literary magazine *The Worcester Review*, an annual print journal supported by the Worcester County Poetry Association since 1972.

Angel Rivera, associate professor of international & global studies, had his story "La sonrisa de su padre" ("Her Father's Smile") accepted for publication in *Tragedias ejemplares: antología de horror cotidiano*; Ediciones Sangrefría.

CONNECTING THE PAST

25%

of WPI undergrads pursue a computer-related degree



Computer Science Marks Five Decades of Impact

More than 200 faculty, staff, friends, and alumni gathered on March 16, 2019, to celebrate the 50th anniversary of WPI's CS department. The event included historical displays, student posters, and a panel discussion on the past, present, and future of computer science at WPI. The panel featured President Laurie Leshin, Dean of Arts & Sciences Jean King, and alumni panelists representing each decade of the CS program.



From left, Carolina Ruiz, professor of computer science and associate department head; Jean King, dean of arts & sciences; Craig Wills, professor of computer science and department head; Laurie Leshin, WPI president; and Elke Rundensteiner, professor of computer science and director of WPI's data science program

AND THE FUTURE



Boston Dynamics demonstrates its robot Spot® for symposium attendees.

Symposium Celebrates RBE Program

"Launching to a Robotic Future," an October 2019 symposium, celebrated more than a decade of robotics engineering innovation and excellence at WPI. The event featured distinguished robotics researchers and members of the robotics industry from the United States, Europe, and Asia and showcased various robots and competition wins that have made WPI a leader in the robotics field.

“What is now proved was once only imagined.”

William Blake, poet and artist

one

of Money's Most
Transformative Colleges (2019)



New Data Science Program

WPI launched an undergraduate degree program in data science, making WPI one of the few schools in the nation to offer undergraduate, graduate, and doctoral degrees in this field. The program will meet a growing demand for highly trained data scientists with technical and scientific expertise.

A&S PROGRAMS OF EXCELLENCE

top 25

WPI's Biology program was named one of the top 25 best colleges with a Bachelor's in Biology by GradReports (2020)

#3

WPI's Interactive Media & Game Development (IMGD) program was ranked third of the 25 Best Bachelor's in Game Design Degree Programs for 2019 by the Bachelor's Degree Center.

#2

Computer Science major in the nation and Top 1% nationwide *College Factual* (2020)

#10

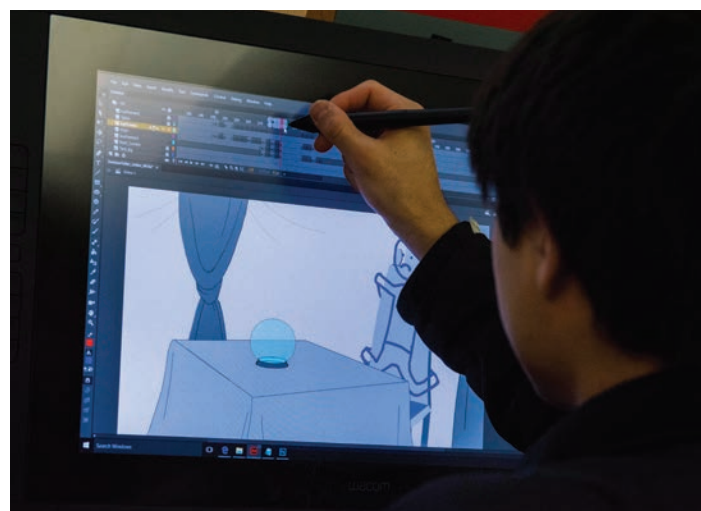
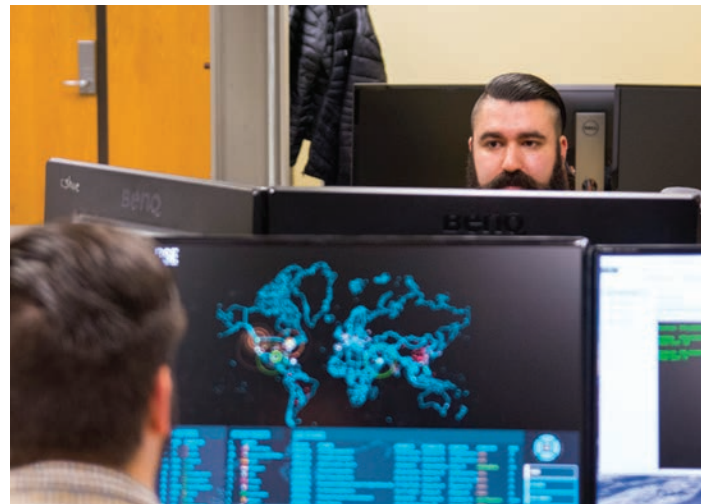
Physics major in the nation *College Factual* (2020)

#14

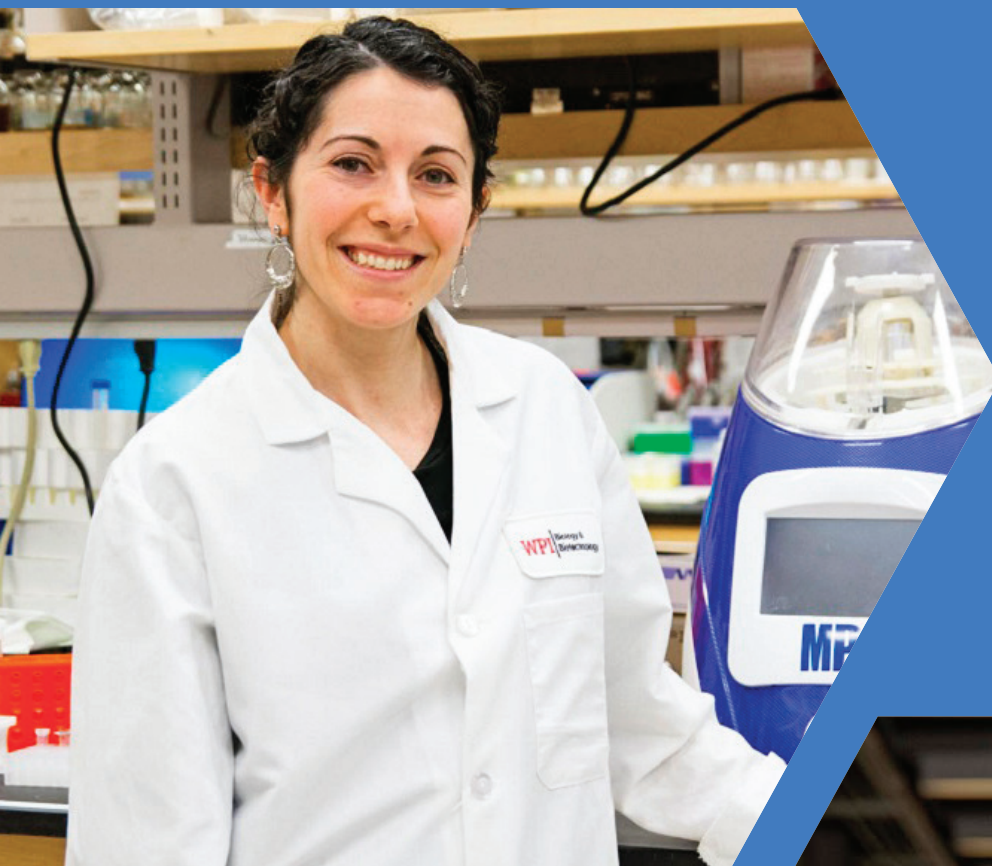
Mathematical Sciences major in the nation *College Factual* (2020)

#5

Data Science online master's degree *Guide to Online Schools* (2020)



HONORS AND



Board of Trustees' Award for Academic Advising

Scarlet Shell, assistant professor of biology & biotechnology

recognizes the important role that academic advisors play in guiding and mentoring students through stages of professional and personal development

Neil Heffernan

was named William Smith Dean's Professor in Computer Science, in recognition of excellence in scholarship. Heffernan also directs the learning sciences & technologies graduate program.



NATIONAL RECOGNITION



Dmitry Korkin

professor of computer science, was elected a senior member of the International Society for Computational Biology (ISCB).

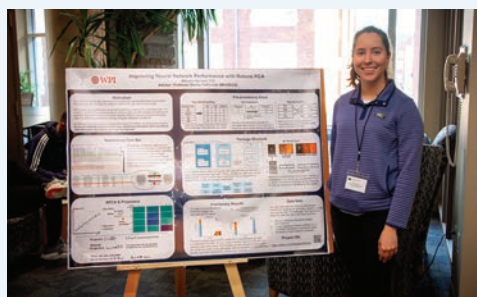
Suzanne Weekes

professor of mathematical sciences and associate dean for undergraduate studies, was elected to the Council of the Society for Industrial and Applied Mathematics (SIAM).



WPI President Laurie Leshin and professor Elke Rundensteiner show off WPI's WiDS shirts, along with students.

For the third year, WPI collaborated with Stanford University and the Global Women in Data Science (WiDS) Conference to bring the Women in Data Science (WiDS) conference to Central Massachusetts. WPI participated with more than 150 other locations worldwide to inspire and educate data scientists, regardless of gender, and to support women in the field. This one-day technical conference provided an opportunity to hear about the latest data science-related research and applications in a number of domains, and to connect with others in the field.



*“ Nothing in life is to be feared,
it is only to be understood.
Now is the time to understand
more, so that we may fear less.”*

Marie Curie,
pioneering physicist and chemist



Emily Douglas

professor and head of social science & policy studies,
received the 2019 Linda Saltzman Memorial Intimate
Partner Violence Researcher Award, which honors those
making substantial contributions to the field of intimate
partner violence.

Stephan Sturm

associate professor of mathematical sciences, was
elected secretary of the Society for Industrial and
Applied Mathematics (SIAM) Activity Group on Financial
Mathematics and Engineering.



1 in 200

The National Security Agency and the Department of Homeland Security renewed WPI's designation as a National Centers of Academic Excellence in Cyber Defense (CAE-CD), one of about 200 nationwide.



William San Martín

assistant teaching professor of global history, was awarded the 2019 EHCA Prize for Interdisciplinary Research in Environmental History for his paper "The Place of National Science in Transnational Environmental Governance. Chile's Nitrogen Revolution and the Global Nitrogen Challenge."

Bruce Bursten

professor of chemistry & biochemistry, was selected to receive the 2020 ACS Award for Distinguished Service in the Advancement of Inorganic Chemistry by the American Chemical Society (ACS). The award, given to one person per year worldwide, recognizes individuals who have advanced inorganic chemistry by significant service and outstanding research.



INNOVATE



Helping NASA Spacecraft Travel Faster and Farther

Randy Paffenroth, associate professor of mathematical sciences, computer science, and data science, combines cutting-edge machine learning with 19th-century mathematics to make NASA spacecraft lighter and more damage tolerant by developing methods to detect imperfections in carbon nanomaterials used to make composite.

Weight Stigma Toward Pregnant Women Is Widespread and Damaging

Angela Incollingo Rodriguez, assistant professor of psychology, published two articles on weight stigma toward pregnant and postpartum women. The first, in the journal *Stigma and Health*, reports nearly two-thirds of pregnant and postpartum women experience weight stigma from friends, family, and even healthcare providers. The second, in the journal *Social Science & Medicine*, reveals that when pregnant and postpartum women experience weight stigma, they are at risk for depressive symptoms, unhealthy eating behaviors, and stress.



RESEARCH THAT BREAKS THROUGH BOUNDARIES



A New Development in the Novel Coronavirus Research Approach

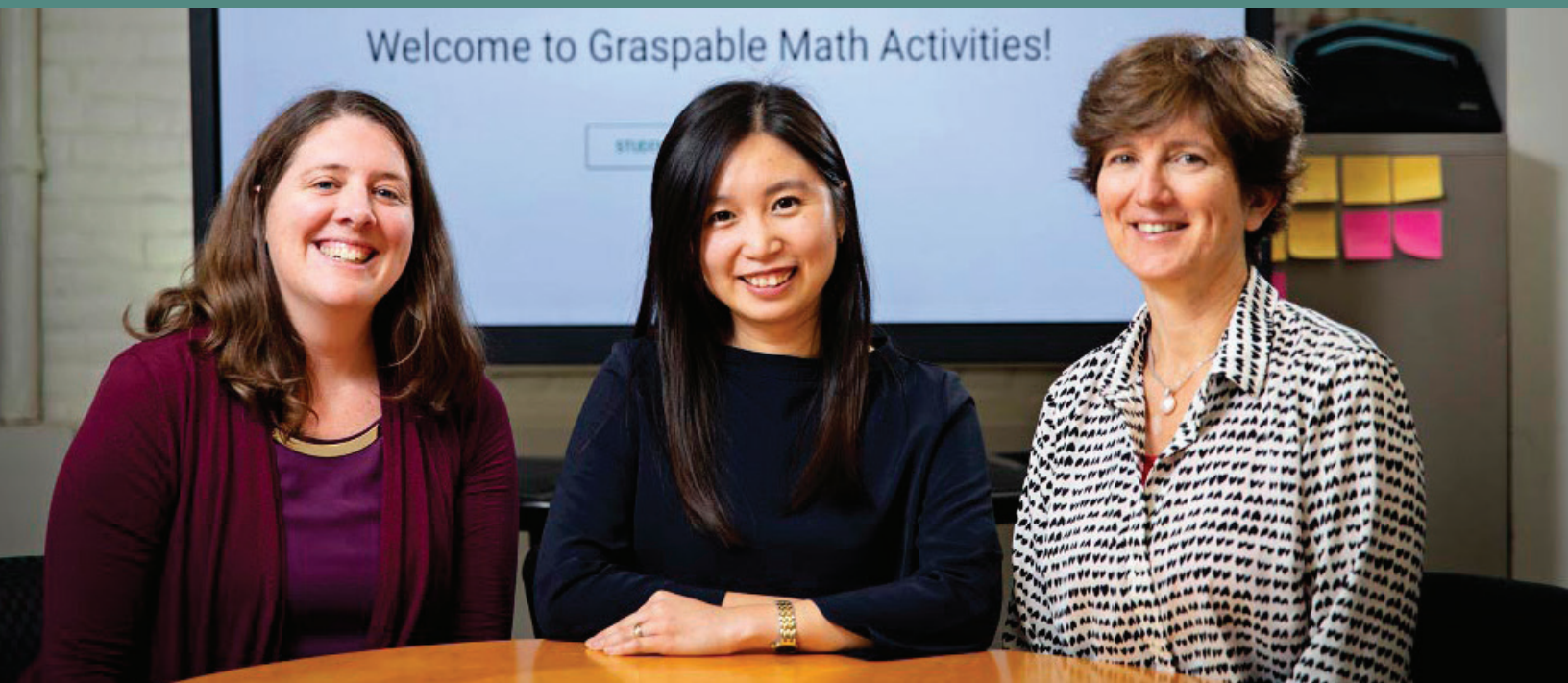
Using a viral genome of the coronavirus (COVID-19) published on the National Center for Biotechnology Information website, **Dmitry Korkin**, professor of computer science, and a team of graduate students used molecular modeling to reconstruct the 3D structure of major viral proteins and their interactions with human proteins, a major development that potentially holds the key to understanding the spread and treatment of the deadly virus. The complete 3D structural roadmap dataset can be found at Korkin's lab website (korkinlab.org/wuhan). Joining Korkin on the research are WPI PhD students Hongzhu Cui, Ziyang Gao, Ming Liu, Senbao Lu, from China; Oleksandr Narykov from Ukraine; Suhas Srinivasan from India; master's student Mo Sun from China, and master's Fulbright scholar Winnie Mkandawire from Malawi.

*“Discovery is seeing what everybody has seen
and thinking what nobody has thought.”*

Albert Szent-Gyrgyi, MD, PhD,
Nobel Prize winner for the study of Vitamin C

#6

best career placement
Princeton Review (2019)



Digital Tools to Help Young Students Understand Math

Erin Ottmar, assistant professor of learning sciences and psychology (above, left) and postdoctoral fellows in learning sciences & technologies **Jenny Yun-Chen Chan** and **Katharine Sawrey** are co-principal investigators on a new subcontract for the second phase of development and testing of Graspable Math, a digital platform that helps students learn algebra and is funded by a grant from the U.S. Department of Education's Institute of Education Sciences.

Researchers also received a \$745,612 grant from the National Science Foundation (NSF) to develop a website that children can use to design and play math games that develop computational thinking skills. Ivon Arroyo, affiliate professor in learning sciences & technologies, is principal investigator. Co-principal investigators are Erin Ottmar, and Gillian Smith, associate professor of computer science and interactive media & game development.



Pioneering New Mathematical Methods

Christopher Larsen, professor of mathematical sciences, received a grant from the Division of Mathematical Sciences (DMS) at the National Science Foundation, titled "New Mathematical Methods for Dynamic Fracture Evolution."

What Worms Can Tell Us About Evolution and Drug Interactions

Jagan Srinivasan, associate professor of biology & biotechnology, has shown that a key biological component in a worm's communication system can be repurposed to take on a different job, a critical finding about the workings of evolution that could have implications into drug interactions, agricultural bio-engineering, and a better understanding of genetic inheritance through multiple generations.



Jagan Srinivasan, associate professor of biology and biotechnology and director of WPI's neuroscience graduate program, works with biology doctoral candidate, Douglas K. Reilly.



Emmanuel Agu (left), professor of computer science, works with students in his lab to research and develop smartphone apps that patients with health ailments can use to better manage their conditions, including in the areas of wound management, behavioral health, and substance abuse.

“Genius is in the idea. Impact, however, comes from action.”

Simon Sinek,
American author and speaker

31

current faculty members
have won the
NSF Career Award



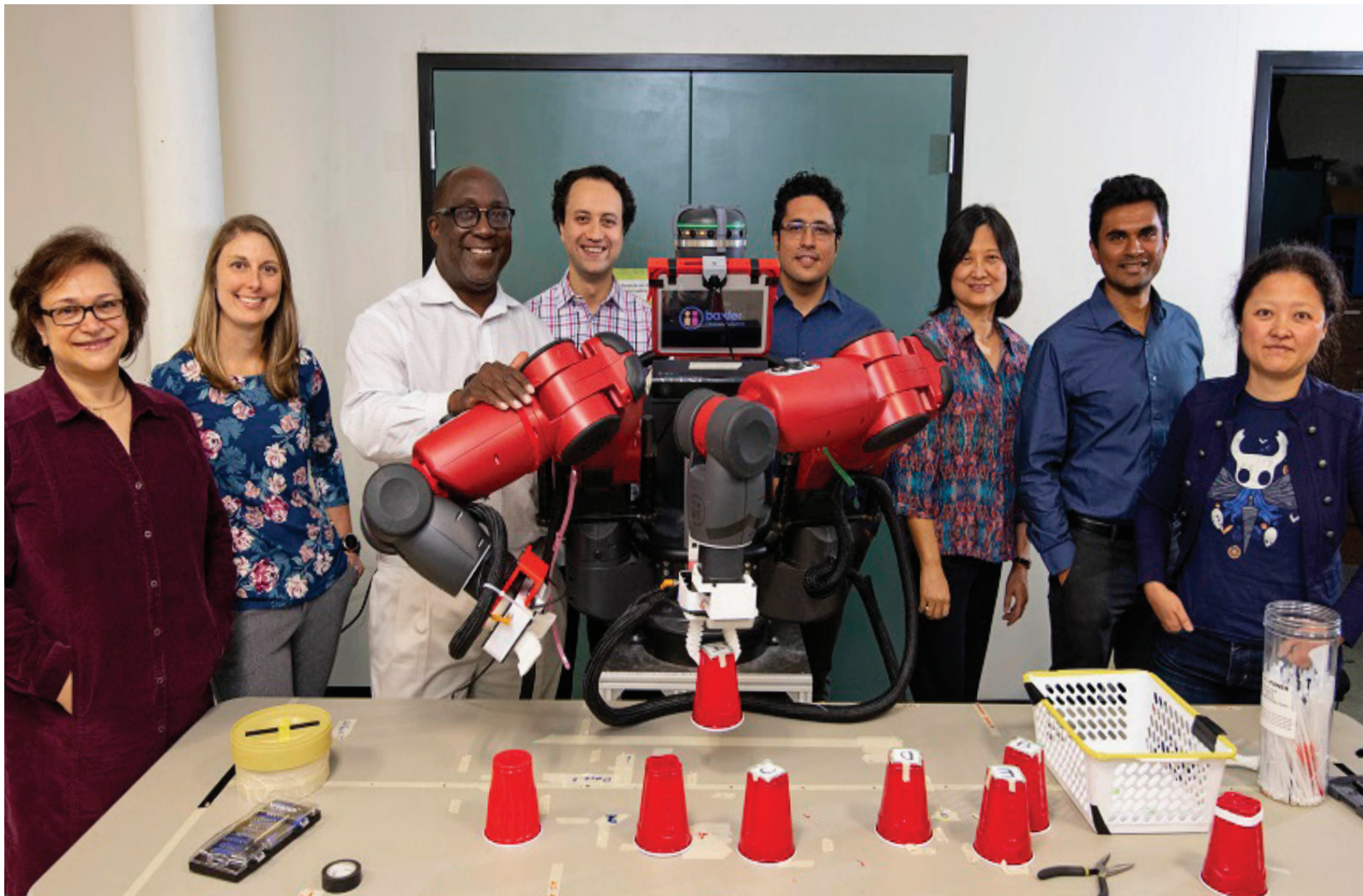
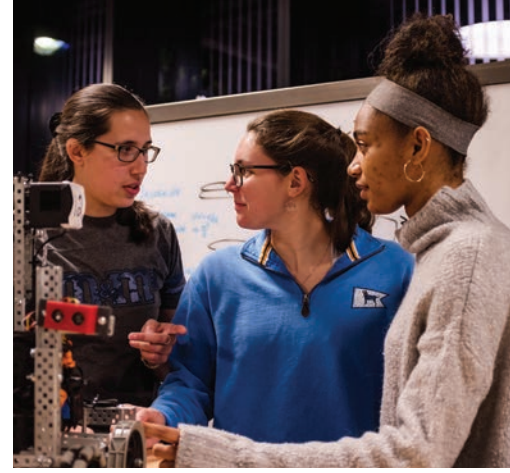
Both Men and Women Take a Negative View of Women Who Drink

In a study examining perceptions of women who drink alcohol, Jeanine Skorinko, professor of psychology, and colleagues found that both men and women view women who drink alcohol in a social setting to be “less human.” The study explored how and why people dehumanize women who drink alcohol and is the first to investigate a connection between alcohol consumption and dehumanization of others.

The Intertwined Response of Pathogen and Host During Fungal Infections

A study by researchers at WPI and the Broad Institute shows that gene expression in cells of an infectious fungus and the host’s immune cells appear to be linked, which may provide clues to more effective remedies for difficult-to-treat and sometimes deadly infections. The WPI team includes **Reeta Rao**, associate dean of graduate studies, professor of biology & biotechnology, and a visiting scientist at the Broad Institute of MIT and Harvard, and Toni Delorey, PhD candidate.





From left, Soussan Djasasbi, professor of information systems; Jeanine Skorinko, professor of psychology; Winston Soboyejo, provost and senior vice president; Cagdas Onal, associate professor of mechanical engineering and principal investigator; Yunus Telli, assistant professor of anthropology and rhetoric; Jing Xiao, head of the robotics engineering program; Pratap Rao, associate professor of mechanical engineering; and Jane Li, assistant professor of mechanical engineering.

Human-Robot Interaction in the Workplace

WPI researchers have secured a five-year, \$3 million National Science Foundation (NSF) grant focusing on research and training related to the adoption of robotic assistants in the workplace. The project's goal is to develop and implement graduate education traineeship models in science, technology, engineering, and mathematics (STEM) fields.

“If you’re walking down the right path and you’re willing to keep walking, eventually you’ll make progress.”

Barack Obama, 44th president of the United States

#16

Best Alumni Network
Princeton Review (2019)

Laser Focused Photonics Initiative

WPI, in collaboration with Quinsigamond Community College, has established the AIM Photonics Academy Lab for Education & Application Prototypes (LEAP). The lab will support the development of the integrated photonics manufacturing sector in Central Massachusetts. Photonics, the science of light, is embedded in technologies of daily life, such as smartphones, medical devices, and autonomous vehicles. LEAP is located in WPI's Gateway Park and contains approximately 2,000 square feet of cleanroom and laboratory facilities equipped with state-of-the-art equipment.



Massachusetts Lt. Gov. Karyn Polito, center, tours a WPI lab with Quinsigamond Community College president Luis G. Pedraja and WPI president Laurie Leshin.

Cutting-Edge Neurotech Suite

The Neurotech Suite at PracticePoint opened in February in 2020; it represents an exciting interdisciplinary collaboration. The neuroscience research facility includes state-of-the-art equipment for neural data collection, including electroencephalography (EEG), functional MRI (fMRI), eye tracking, fMRI compatible functional near-infrared spectroscopy (fNIRS), and virtual reality (VR), which will be harnessed to advance our understanding of critical topics in neuroscience, including depression, anxiety, cognition, brain injury, addiction, and pain.





Assistant professor Berk Calli will work with students on the project to develop robotics technologies for recycling centers. From left, James Akl, Fadi Alladkani, Arianna Kan, Kyle Heavey, Mikayla Fischler, Calli, and Snehal Dikhale.

Robotics for Recycling Centers

Berk Calli, assistant professor of computer science and robotics engineering, and eight other researchers (including co-principal investigator Jacob Whitehill, assistant professor of computer science) received \$2.5 million from NSF's Future of Work at the Human-Technology Frontier program to develop robotics technology that could help recycling center workers sort waste in a safer, cleaner, and more profitable manner.

WPI Breaks Ground on "Smart World" Building

In October 2019 WPI kicked off construction of its new, state-of-the-art facility that will focus on connecting technology and humanity. With a focus on health, energy, transportation, and the built environment, the new teaching and research facility advances the university's commitment to lead the Fourth Industrial Revolution. The \$80 million, 100,000-square-foot building will be situated at the base of Boynton Hill and will include versatile and flexible learning, research, and collaboration spaces, as well as student space and faculty offices.



Patent Honors

Marko Popovic, assistant research professor of physics and robotics engineering, and **Ermal Toto**, PhD student in computer science, were honored for their patented innovations by the Boston Patent Law Association (BPLA). Just 12 patents were selected from more than 10,000 granted last year in New England. Popovic's Variable Stiffness Device, nicknamed **HydroBone**—a wearable device that works in tandem with the user and varies between being a soft, bendable column and a rigid, steel-like pole—was recognized. Toto was honored for his digital instruction system that analyzes users' eye movement during a complex learning task to determine if they are missing important information.

IMPACT

Using Games to Bridge Activism and Academics

Leo Bunyea, 2019 graduate of WPI's IMGD program, created Gotta Go, a game where players are characters with different gender identities whose mission is to find a bathroom quickly.

Bunyea's goal for the game is to show non-transgender people some of the daily hurdles that could be faced by transgender people. Bunyea, who is currently pursuing a master's degree in IMGD at WPI, presented Gotta Go at the 2019 Southwest Popular and American Culture Association conference.



Building Robotic Systems to Safely Detonate Landmines

Under the guidance of Craig Putnam, senior instructor of computer science, student teams are developing an autonomous rover and payload-deploying drone that work together to search for and detonate landmines. The autonomous rover detects and marks the mines—hidden munitions that kill or maim as many as 20,000 people around the world each year—and the drone can drop payloads onto the mines to safely detonate them.



CHANGING THE WORLD WITH PROGRESS



From left, Hank Phillippi Ryan, Carrie Johnson, Margot Livesey, and Anita Diamant engage in a panel discussion.

Women Author's Evening Raises Funds for Domestic Violence Program

WPI hosted the annual Women Authors Evening, which Jean King, Peterson Family Dean of Arts & Sciences, created 13 years ago along with others in the community, including Linda Looft, WPI's assistant vice president for government and community relations. The event featured Boston author Anita Diamant (*The Red Tent*) who also visited assistant professor of creative writing Kate McIntyre's "Travel Writing" class. New England authors Carrie Johnson (the Muriel Mabley mystery series), Margot Livesey (*The Hidden Machine*), and Hank Phillippi Ryan, mystery author and investigative reporter for 7News Boston, were also on the panel. The event raised funds for Daybreak, the Central Mass. YWCA's domestic violence service program.



CRITICAL CONVERSATIONS



From left, Craig Shue, associate professor of computer science; Jennifer Rudolph, professor of Asian history and director of WPI's China Hub; Steven Taylor, professor and interim dean of the Foisie Business School; Wole Soboyejo, WPI Provost; Doug Petkie, professor and head of WPI's physics department; and Alex Wyglinski, professor of electrical and computer engineering and director of WPI's Wireless Innovation Laboratory; and Jean King, dean of arts & sciences. Shue, Rudolph, Taylor, Petkie, and Wyglinski were panelists for the forum on the impact of 5G technology.



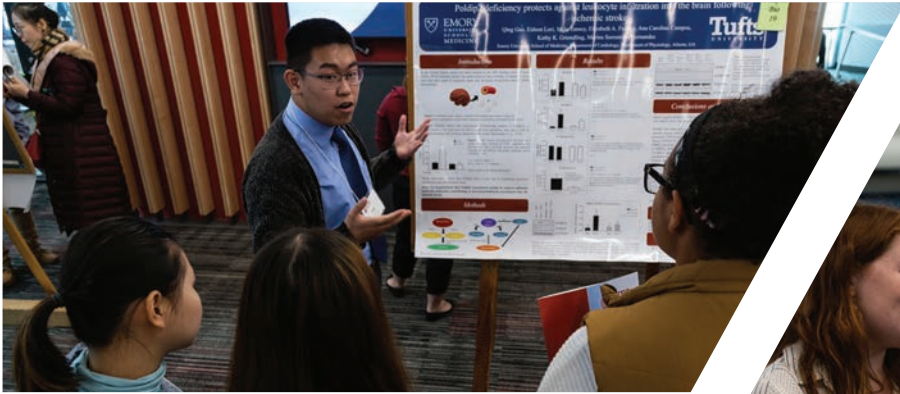
Provost Wole Soboyejo offers a response to audience questions on 5G.



The School of Arts & Sciences continues to host its popular Critical Conversations Forums, with recent forums on genetically altered humans, artificial intelligence, 5G technology, and climate change. The forums explore emerging topics using faculty panels and audience participation through moderated questions.

A faculty panel discusses the science and ethics of using technology to create genetically altered humans. Panelists include Patricia Stapleton, assistant professor of social science and policy studies; Natalie Farny, assistant professor of biology and biotechnology; Destin Heilman, associate teaching professor of chemistry and biochemistry; Reeta Rao, professor of biology and biotechnology; and Bethel Eddy, associate professor of humanities & arts. Dean Jean King moderated.

NEXT-IN-BIO



Undergraduates from New England institutions participated in WPI's 4th annual Next-in-Bio Undergraduate Research Symposium, showcasing their research during a poster session and observing a panel on careers in the life sciences.



Provost Wole Soboyejo discusses an undergraduate research project with a Next-in-Bio participant.



Reeta Rao, professor of biology & biotechnology and associate dean of graduate studies, provides an overview of WPI's graduate programs in the life sciences.



Kenneth Maynard, Senior Director at Takeda Pharmaceuticals, provided the Next-in-Bio keynote address. He is also a member of the A&S Advisory Board.

STEM FACULTY LAUNCH



WPI President Laurie Leshin welcomes STEM Faculty Launch participants and shares her experiences with the academic job search.



WPI hosted 37 graduate students and postdoctoral researchers for the 5th annual STEM Faculty Launch Workshop in October. In the last five years this workshop, which emphasizes increasing diversity in STEM, has provided guidance on pursuing faculty careers to over 170 participants.

GLOBAL SPOTLIGHT: WPI AND ZURICH

Jean King, dean of arts & sciences; Karen Oates, professor of biology & biotechnology;
and Nancy Burnham, professor of physics, visit colleagues at ZHAW



The School of Arts & Sciences is continually called on to help expand WPI's global reach. The School is actively enhancing a collaboration with Zurich University of Applied Sciences (ZHAW) focused on fostering an exchange of cultural experiences, and providing opportunities for research and project work with industry partners. The vision of this expanded partnership includes a global project center with advanced technology and scientific capabilities for research collaborations as well as joint graduate degree programs, exchanges for graduate and undergraduate students, and faculty research collaborations.

WPI's presence in Switzerland includes the Zurich Switzerland Project Center where students have been conducting Interactive Qualifying Projects (IQPs) since 2016.

Examples of past project work at the Switzerland Project Center:

- Corporate Volunteering in Swiss Parks
- The Future of Swiss Transmission Grid
- Market Trends in Financial Telecommunications for Banks
- Exploring the Benefits and Drawbacks of Shale Gas
- Facilitating a Public Dialogue on Biotechnology

BUILDING SUPPORTIVE



WPI REU students visit the MathWorks headquarters in Natick, Mass.

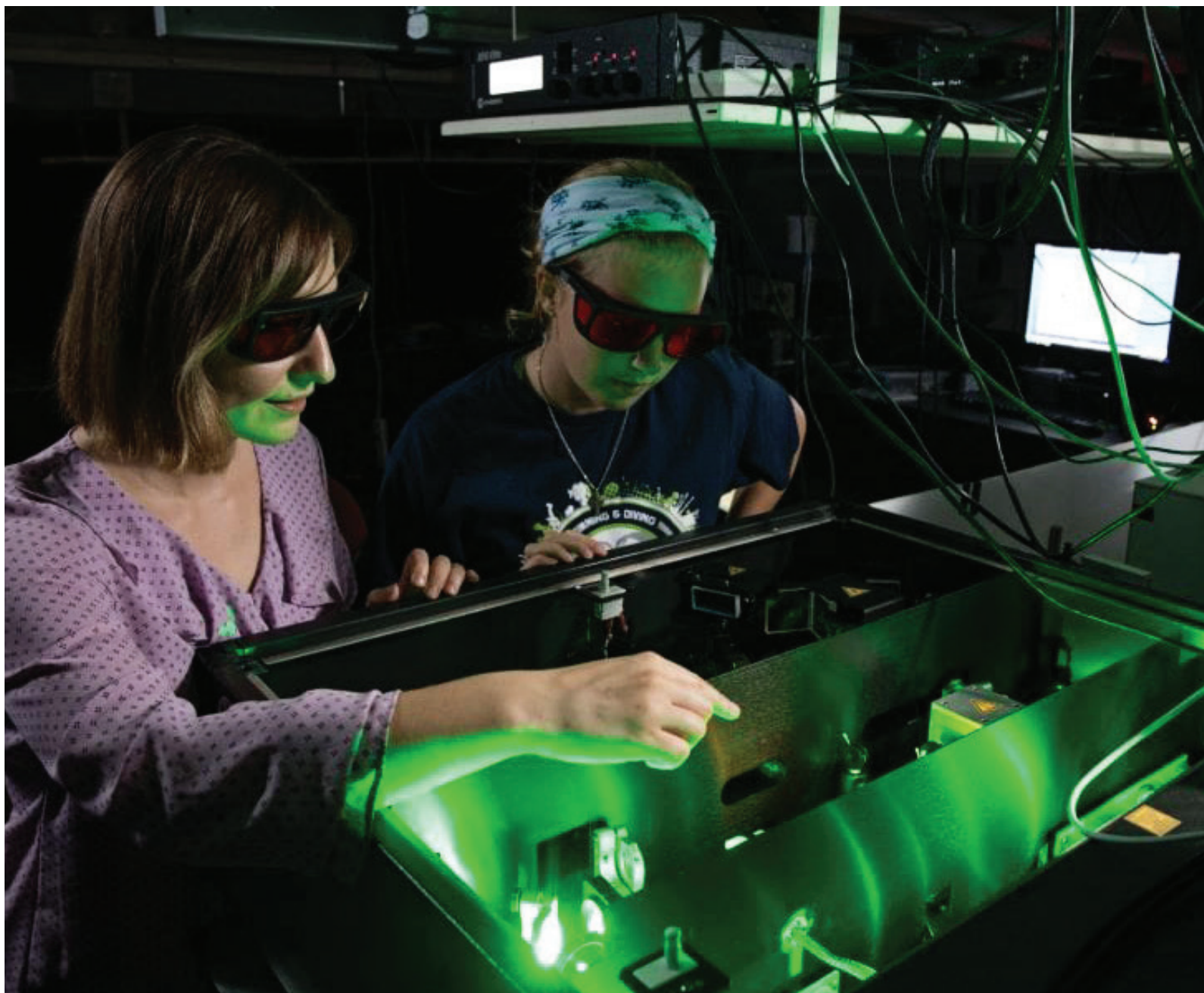
Summer Undergraduate Research Opportunities

WPI's Data Science Research Experience for Undergraduates (REU) program hosted 19 undergraduates from universities across the country during the summer of 2019. Sponsored by the NSF, the REU offers students opportunities to network with alumni and industry partners to learn about exciting career paths in data science.

“Never be limited by other people's limited imaginations.”

Mae Jemison, first African American woman in space

RESEARCH COMMUNITIES



Lyubov Titova, associate professor of physics, works with a student in her Ultrafast THz and Optical Spectroscopy Lab.

WPI's REU site in Clean Energy Science and Technology offered chemistry, physics, and engineering undergraduates the opportunity to work with one of WPI's interdisciplinary Energy Research Group teams. Students pursued cutting-edge projects in biomass conversion to fuels, solar energy materials and devices, photophysics of energy materials, and energy-efficient devices for high-bandwidth communications.

2019-2020 CLARE BOOTHE LUCE RESEARCH SCHOLARS

Through a Clare Boothe Luce Research Scholar grant from the Henry Luce Foundation, the School of Arts & Sciences provides research awards to support traditionally underrepresented undergraduate women in math, computer science, physics, and robotics engineering.



Hope Clairmont '20

PHYSICS

Mentor & research advisor:
Lyubov Titova

29

Luce research
awards provided
by WPI since 2016



Caroline Jaeger, '22

PHYSICS

Mentor & research advisor:
Lyubov Titova



Alissa Ostapenko '20

COMPUTER SCIENCE AND MATHEMATICAL SCIENCES

Mentor:
Carolina Ruiz; research advisor:
Rodica Neamtu



Katherine Hudek '21

PHYSICS

Mentor:
Lyubov Titova; research advisor:
L. Ramdas Ram-Mohan

Megan Varney '21

PHYSICS

Mentor & research advisor:
Lyubov Titova

SUMMER TRAINING IN ARTS & SCIENCES RESEARCH (STAR)

The Summer Training in Arts & Sciences Research (STAR) program supports undergraduate students as they conduct summer research projects and is generously funded by WPI's Arts & Sciences Advisory Board.

Olivia Hunker '20

CHEMISTRY

Advisor:

Arne Gericke, professor
and department
head of chemistry
& biochemistry

Nicole Jutras '21

PSYCHOLOGY AND
COMPUTER SCIENCE

Advisor:

Jeanine Skorinko,
professor of psychology

Daniel McDonough '20

COMPUTER SCIENCE AND
BIOINFORMATICS &
COMPUTATIONAL BIOLOGY

Advisor:

Amity Manning,
assistant professor of
biology & biotechnology

#14

Best Science Lab Facilities
Princeton Review (2019)

Julia Noel '21

CHEMISTRY AND SOCIETY,
TECHNOLOGY & POLICY

Advisor:

Anita Mattson,
professor of chemistry
& biochemistry

#5

Best Career Services
Princeton Review (2019)

Dung Pham '20

PHYSICS AND ELECTRICAL &
COMPUTER ENGINEERING

Advisor:

L. Ramdas Ram-Mohan,
professor of physics

Annalise Robidoux '20

BIOLOGY & BIOTECHNOLOGY AND
CHEMISTRY & BIOCHEMISTRY

Advisor:

Jagan Srinivasan,
associate professor of
biology & biotechnology

Megan Varney '21

MATHEMATICAL SCIENCES

Advisor:

Kun-Ta Wu,
assistant professor of physics

DraftKings Undergraduate Fellowship for Summer Research

The DraftKings Fellowship is made possible by a generous gift from the DraftKings corporation to support work that elevates the impact of advanced research in information science and technology. This year's DraftKings scholars are Hannah Borges '20, biology & biotechnology, and Yihan Lin '20, computer science. Both are advised by Erin Solovey, assistant professor of computer science.

STUDENT ACHIEVEMENTS



A&S Student Spotlight

Alissa Ostapenko '20

Computer Science and Mathematical Sciences

- Winner of the 2019 The Two Towers Prize, which is awarded to students who, through general academic competence, campus leadership, regular course work, and special work in research and projects, best exemplify a combined proficiency in the theoretical and practical that is at the heart of the WPI educational tradition.
- 2019-2020 Clare Boothe Luce Scholar
- For Alissa's humanities project, she helped develop a chat application that would help musicians communicate with listeners.
- Summer internship as a computer vision researcher at Smartvid.io, an artificial intelligence (AI) company.
- Plays the flute in WPI's Concert Band
- Member, WPI Art and Design Club

Erin Morissette '19, physics, received a best poster award at the biennial Optical Terahertz Science and Technology Conference, where the latest research performed with optical techniques to access the terahertz spectral range is presented.



Above, Erin and Katy Kushnir (second author and Erin's graduate student mentor) discuss their work with Thomas Elsaesser, director of Max-Born-Institute for Nonlinear Optics;in. At right, Erin receives her award from Andreas Roelofs, Director of Center for Integrative Nanotechnologies (LANL/Sandia).



Juliet Spitaels '22, mathematical sciences, was awarded the Charles O. Thompson Scholars Outstanding Member of the Class of 2022, which recognizes first-year students for excellence in their academic work.



Claire Dickson-Burke '19, a double major in international & global studies and biology & biotechnology, was awarded a Fulbright English Teaching Assistant Award for Germany.

“Just don't give up what you're trying to do. Where there is love and inspiration, I don't think you can go wrong.”

Ella Fitzgerald, American jazz singer

Recipients of the Class of 1879 Awards

Neel Dhanaraj '19, “An Analysis of the Potential Endangerment of Immigrants Due to Merit-Based Immigration,” major: mechanical engineering, minor: robotics engineering, advisor: Jennifer McWeeny

Jared Grier '19, “Acquired Disability and Disruption of the Self,” major: mechanical engineering, minor: philosophy, advisor: Jennifer McWeeny

Jessica Hatt '20, “The Drug that Shattered the Nuclear Family,” major: chemistry, advisor: Constance Clark



Lilly-Beth Linnell '22, psychology, is the recipient of the Julia Kasparian Endowed Scholarship. Harry A. Kasparian '73 established this scholarship in memory of his daughter, Julia, to honor and celebrate her memory by supporting female students studying neuroscience, with the hope that they may go on to make discoveries and develop treatments for mental illness.

EXPERTISE ACROSS DISCIPLINES

DEAN'S OFFICE



Jean King
PETERSON FAMILY DEAN OF ARTS & SCIENCES



Rebecca Ouellette
DIRECTOR OF OPERATIONS



Pamela Paskalis
ADMINISTRATIVE ASSISTANT



Patricia Bergmann
SENIOR EXECUTIVE ADMINISTRATOR

DEPARTMENT HEADS



Emily Douglas
SOCIAL SCIENCE & POLICY STUDIES



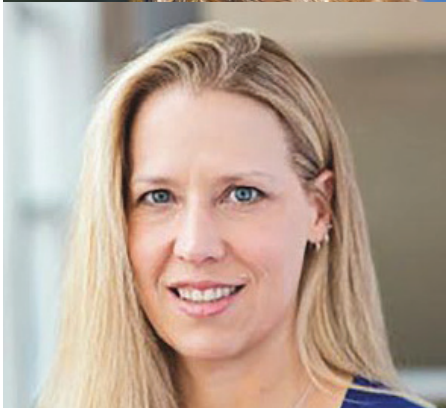
Luca Capogna
MATHEMATICAL SCIENCES



Joseph Duffy
BIOLOGY & BIOTECHNOLOGY



Arne Gericke
CHEMISTRY & BIOCHEMISTRY



Kathryn Moncrief
HUMANITIES & ARTS



Douglas Petkie
PHYSICS



Craig Wills
COMPUTER SCIENCE

PROGRAM DIRECTORS



Jennifer deWinter

INTERACTIVE MEDIA & GAME DEVELOPMENT



Peter Hansen

INTERNATIONAL & GLOBAL STUDIES



Neil Heffernan

LEARNING SCIENCES & TECHNOLOGIES



Robert Krueger

ENVIRONMENTAL & SUSTAINABILITY STUDIES



Dmitry Korkin

BIOINFORMATICS & COMPUTATIONAL BIOLOGY



Lisa Stoddard

ENVIRONMENTAL & SUSTAINABILITY STUDIES



Elke Rundensteiner

DATA SCIENCE



Ryan Madan

WRITING CENTER



Michael Radzicki

SYSTEM DYNAMICS



Alexander Smith

ECONOMICS



Jing Xiao

ROBOTICS ENGINEERING



Crystal Brown

SOCIETY, TECHNOLOGY & POLICY



Sarah Riddick

PROFESSIONAL WRITING PROGRAM



Jeanine Skorinko

PSYCHOLOGICAL SCIENCE



WPI Names New Provost

In 2019, WPI named Winston Oluwole (Wole) Soboyejo, PhD, Provost and Senior Vice President. His research focuses on biomaterials and the use of nanoparticles for the detection and treatment of disease, the mechanical properties of materials, and the use of materials science to promote global development.

WPI Welcomes Humanities & Arts Department Head

Kathryn Moncrief joined WPI as the Paris Fletcher Distinguished Professor of Humanities and head of the Department of Humanities & Arts. Before coming to WPI, she was professor and chair of the Department of English at Washington College in Maryland, where she taught courses in Shakespeare, Milton, and early modern literature and culture.



NEW A&S FACULTY JOIN WPI



Floyd Brownnewell Jr.

PROFESSOR OF PRACTICE,
BIOLOGY & BIOTECHNOLOGY

Areas of interest:
biomimetic structures,
modified amino acids,
modified nucleic acids,
non-bonded interactions



Natalie Farny

ASSISTANT PROFESSOR,
BIOLOGY & BIOTECHNOLOGY

Areas of interest:
synthetic biology, biosensors,
cellular stress response

Michael Engling

ASSISTANT TEACHING
PROFESSOR,
COMPUTER SCIENCE

Areas of interest:
algorithms, computational
complexity, discrete
structures, theory of
computation



Daniel Reichman

ASSISTANT PROFESSOR,
COMPUTER SCIENCE

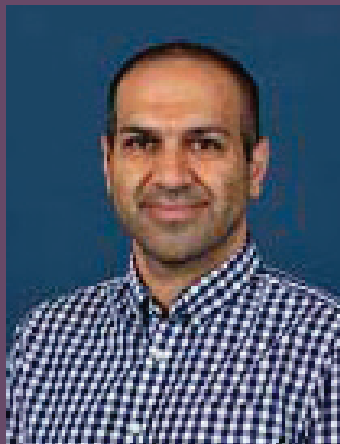
Areas of interest:
theoretical computer
science, machine learning,
artificial intelligence



Jonathan Weinstock

ASSISTANT TEACHING
PROFESSOR,
COMPUTER SCIENCE

Areas of interest:
social implications of
information technology,
computer science education,
distributed systems



Ali Yousefi

ASSISTANT PROFESSOR,
COMPUTER SCIENCE

Areas of interest:
computational neuroscience,
neuroscience data analysis,
neural engineering





Patricia Musacchio

ASSISTANT PROFESSOR,
CHEMISTRY & BIOCHEMISTRY

Areas of interest:

intersection of chemical
biology and organic
chemistry



Patrick Crowe

INSTRUCTOR AND LECTURER,
HUMANITIES & ARTS

Areas of interest:

theatre technology

Holger Droessler

ASSISTANT PROFESSOR,
HUMANITIES & ARTS

Areas of interest:

modern U.S. history, Pacific
history, Samoa, imperialism,
capitalism, global
labor history



Shana Lessing

ASSISTANT TEACHING
PROFESSOR, HUMANITIES
& ARTS

Areas of interest:

medical humanities; culture
and psychiatry; military
mental healthcare; global
health; critical bioethics



Yunus Doğan Telliel

ASSISTANT PROFESSOR,
HUMANITIES & ARTS

Areas of interest:

translation and translatability;
science, religion, and
secularism; design
ethics; social and ethical
implications of robotics
and AI



Keith Zizza

INSTRUCTOR, INTERACTIVE
MEDIA & GAME DEVELOPMENT

Areas of interest:

game audio, interactive audio
production in new media



Mihnea (Mike)

Stefan Andrei

POSTDOCTORAL SCHOLAR,
MATHEMATICAL SCIENCES

Areas of interest:

statistics and
applied probability



Gonzalo Contador

POSTDOCTORAL SCHOLAR,
MATHEMATICAL SCIENCES

Areas of interest:

statistics



*“Every great dream begins with a dreamer.
Always remember, you have within you the
strength, the patience, and the passion to reach
for the stars to change the world.”*

Harriet Tubman, abolitionist

#9

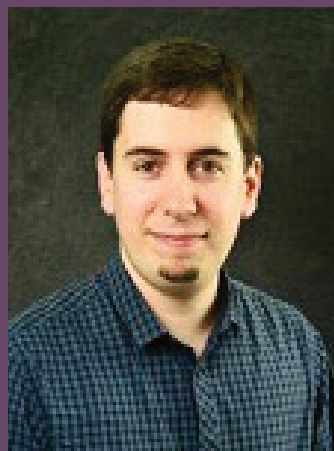
Game Design Programs
(Undergraduate)
Princeton Review (2019)



Oren Mangoubi

ASSISTANT PROFESSOR,
MATHEMATICAL SCIENCES
AND DATA SCIENCE

Areas of interest:
machine learning,
optimization algorithms,
theoretical computer science,
Markov chains



Xavier Ramos Olivé

POSTDOCTORAL SCHOLAR,
MATHEMATICAL SCIENCES

Areas of interest:
geometric analysis,
differential geometry,
partial differential equations

William Sanguinet

SENIOR INSTRUCTOR
AND LECTURER,
MATHEMATICAL SCIENCES

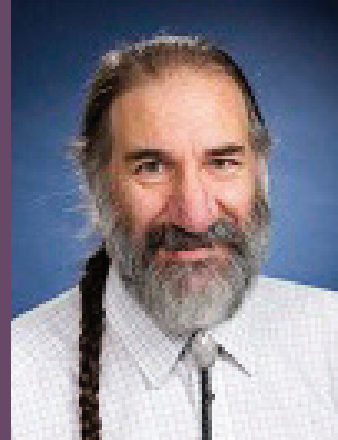
Areas of interest:
applied mathematics,
numerical analysis and
scientific computation



Herman Servatius

SENIOR INSTRUCTOR
AND LECTURER,
MATHEMATICAL SCIENCES

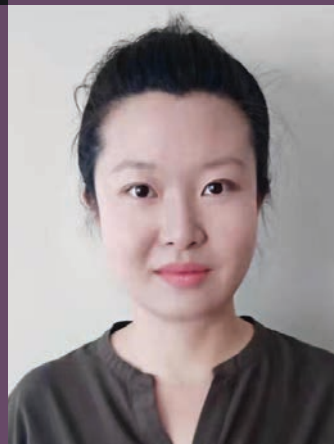
Areas of interest:
rigidity of graphs,
tensegrities, motions
in molecules



Samuel Walcott

ASSOCIATE PROFESSOR AND
SINCLAIR PROFESSOR
OF MATHEMATICAL SCIENCES

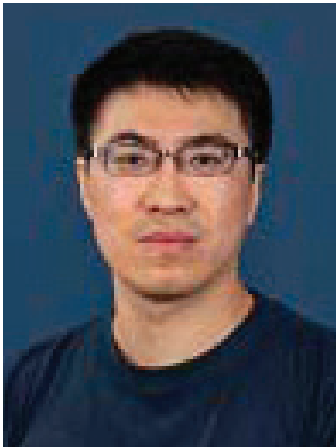
Areas of interest:
biology, theoretical and
applied mechanics,
applied mathematics



Fangfang Wang

ASSOCIATE PROFESSOR,
MATHEMATICAL SCIENCES

Areas of interest:
time series analysis,
spatial statistics,
financial econometrics



Chaozhen Wei

POSTDOCTORAL SCHOLAR,
MATHEMATICAL SCIENCES

Areas of interest:

applied and
computational
mathematics



Duncan Wright

POSTDOCTORAL SCHOLAR,
MATHEMATICAL SCIENCES

Areas of interest:

mathematical biology,
neuronal networks,
quantum information

Hridaya Shah

ASSISTANT TEACHING
PROFESSOR, PHYSICS

Areas of interest:

Newtonian mechanics
modeling, instrument design,
assessment, classroom
behavior, motivation in
mathematics education

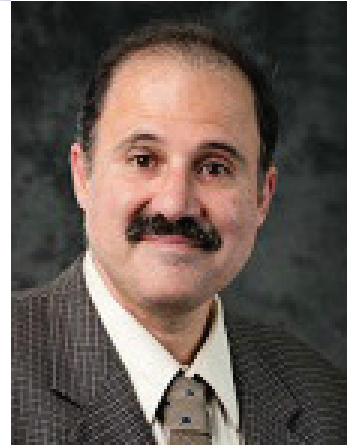


Seyed (Reza) Zekavat

PROFESSOR, PHYSICS

Areas of interest:

wireless local
positioning systems



Gregory Lewin

ASSISTANT TEACHING
PROFESSOR, ROBOTICS
ENGINEERING

Areas of interest:

electromechanical
systems, mechatronics,
integrated system design,
robotic demonstrators



Crystal Brown

ASSISTANT TEACHING
PROFESSOR, SOCIAL SCIENCE
& POLICY STUDIES

Areas of interest:

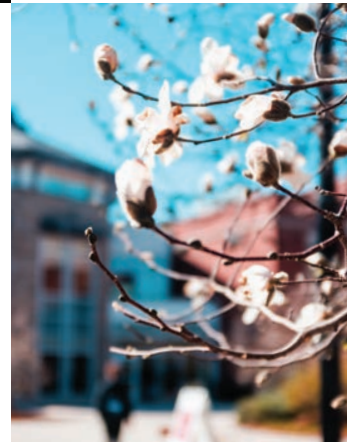
international relations,
comparative politics, human
rights, immigration policy,
security studies, and the role
of politics in technological
development and migration

Janice Kookan

ASSISTANT RESEARCH
PROFESSOR, SOCIAL SCIENCE
& POLICY STUDIES

Areas of interest:

research methodology, validation
in measurement, structural
equation modeling, growth mixture
modeling, multilevel modeling,
instrument design, assessment,
classroom behavior, motivation in
mathematics education



FACULTY PROMOTION & TENURE



“ On behalf of the WPI Board of Trustees, I offer my sincere congratulations to this remarkable group of talented and accomplished educators, scholars, and researchers who are changing the world in positive ways and preparing our students to be tomorrow’s leaders. ”

WPI President Laurie Leshin

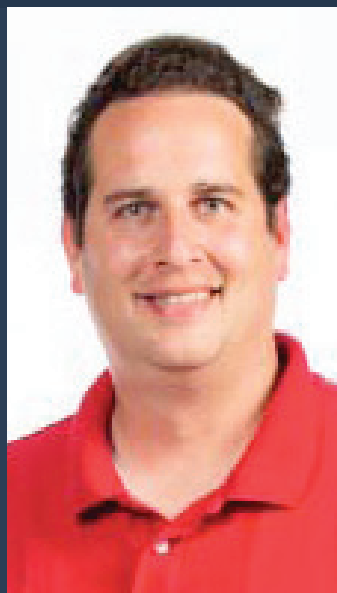


Nancy Burnham

has been promoted to professor of physics. She is one of the leading researchers in the field of atomic force microscopy (AFM). In addition to advancing the science of nanotechnology and AFM, she teaches others to use AFM for their own studies.

Barry Posterro

has been promoted to associate teaching professor of mathematical sciences. His focus as an educator is actuarial mathematics, and he advises students in WPI's actuarial mathematics and financial mathematics programs.



Michael Johnson

has been promoted to associate teaching professor of mathematical sciences. His research interests include industrial organization, game theory, and graph theory and probability. At WPI, he has taught calculus, statistics, and probability at the undergraduate and graduate levels.





Jennifer deWinter

has been promoted to professor of humanities & arts. She is director of WPI's interactive media & game development program and co-director of the professional writing program. Her research interests include computer game theory, computer game development, and cultural studies.



Jennifer Rudolph

has been promoted to professor of humanities & arts. A scholar of modern Chinese political history, she is the author of *Negotiated Power in Late Imperial China: The Zongli Yamen and the Politics of Reform* (2008, Cornell East Asia Series) and an editor of *The China Questions: Critical Insights into a Rising Power* (Harvard University Press, 2018). She is also director of WPI's China Hub.

Kristin Wobbe

has been promoted to professor of chemistry & biochemistry. Her research interests include the molecular interactions that determine the outcomes of plant/pathogen interactions using a model system consisting of *Arabidopsis thaliana*, a relative of cruciferous crop plants, and turnip crinkle virus.



Reeta Rao

has been promoted to professor of biology & biotechnology. She studies the biology of fungal diseases, particularly those caused by *Candida*, a species of fungi prevalent in humans that are a leading cause of serious illnesses and death among hospitalized patients.



Lyubov Titova

has been granted tenure and promoted to associate professor of physics. A member of WPI's Energy Research Group, she conducts research that makes use of ultrafast terahertz and optical spectroscopy.



Jeanine Skorinko

has been promoted to professor of social science & policy studies. The director of WPI's undergraduate psychological science program, she is a social psychologist who explores how factors in our social environment influence decisions and interpersonal interactions.

ARTS & SCIENCES

UNDERGRADUATE



From left, Kate Mary Alice Olguin, Robert Wondolowski, Karin Plante,
Jean King, Leah McNally Mitchell, Megan Varney

Joshua Driscoll '20, biology & biotechnology

Emily Flavin '20, biology & biotechnology

Leah McNally Mitchell '20, mathematical sciences

Kate Mary Alice Olguin '20, interactive media & game development

Karin Plante '20, biochemistry

Frankie Schripsema '21, mechanical engineering; society, technology & policy

Catherine Sherman '20, biology & biotechnology; bioinformatics & computational biology

Grace Seiche '20, computer science

Adriana V. Alvarado Blanco Uribe '20, environmental & sustainability studies; international studies

Megan Varney '21, physics

Robert Wondolowski '20, actuarial mathematics

STUDENT ADVISORY COUNCILS

GRADUATE



From left, Dayna Mercadante, Geri Dimas, MaryAnn VanValkenburg, Jean King, Avery Harrison, Lynette Robinson, Karen Royer, Leo Bunyea

Leo Bunyea, interactive media & game development

Geri Dimas, data science

Tom Hartvigsen, data science

Avery Harrison, learning sciences & technologies

Kateryna Kushnir, physics

Dayna Mercadante, bioinformatics & computational biology

Elisa Negrini, mathematical sciences

Samuel S. Ogden, computer science

Androniqi Qifti, chemistry & biochemistry

Lynette Robinson, mathematical sciences

Karen Royer, interactive media & game development

Diego Vargas Blaco, biology & biotechnology

Abhishek Kulkarni, robotics engineering

MaryAnn VanValkenburg, computer science

A group of seven WPI Arts & Sciences faculty members posing on a staircase. A central banner reads "WPI Arts & Sciences" and features a collage of images related to arts and sciences, including a piano, a person at a computer, a chemistry diagram, a person in a lab coat, and a group of students.

From left, Lyubov Titova, associate professor of physics; Jeanine Skorinko, professor of social science & policy studies; Jennifer Rudolph, professor of humanities & arts; Nancy Burnham, professor of physics; and Reeta Rao, professor of biology and biotechnology. Not pictured is Kristin Wobbe, professor of chemistry & biochemistry.

ARTS & SCIENCES ADVISORY BOARD

WPI's Arts & Sciences Advisory Board advises and assists the dean in continuously improving the quality and direction of opportunities for undergraduate and graduate students in the Arts & Sciences through educational advances, research opportunities, and connections to external stakeholders.

Richard Resnick '98 (Co-Chair), CEO, Cureatr

Sergio Salvatore '02 (Co-Chair), Senior Director, Core Infrastructure, Vimeo

Lauren Baker '82, President & CEO, Boston Biomedical Associates

Douglas Borden III '96, Lead Program Analyst, Office of Workers Compensation Programs, US

Steven Davi '85, Senior Vice President, Synacor, Inc.

John Gabranski '75, Consultant

Arjan "Ari" Giaya, PhD '01, Founder and President, LaunchBay, LLC

Maryann Goebel '73, Member of the Board of Directors, Seacoast National Bank

Mary Ellen Lane, PhD, Dean of the Graduate School of Biomedical Sciences
and Professor of Neurobiology, University of Massachusetts Medical School

Kenneth I. Maynard, PhD, Senior Director at Takeda Pharmaceuticals

Ellen McCaskill '89, Business Partner, ExxonMobil Development Co.

Linda McGoldrick, President and CEO, Financial Health Associates International

Marilyn Pifer, PhD, former Director of Research and Innovation, CRDF Global

Chad Pytel '02, Co-founder and CEO, thoughtbot

Eliza Jane Reilly, PhD, Executive Director, National Center for Science and Civic Engagement

Joseph Rock '90, Clinical Innovation Scientist, Philips Healthcare

Sharon Savage, MD '91, Chief, Clinical Genetics Branch, Division
of Cancer Epidemiology and Genetics, National Cancer Institute

Naveen Selvadurai '02, Partner, Expa

Urvashi Tyagi, Vice President, Global Commercial Payments, American Express

Michael Wallent '91, Director of Program Management, Microsoft Corporation

Kimberly Warren, Portfolio Director, MITRE

Kristin Deming Wheeler '93, Senior Patent Counsel, Acushnet Company





WPI

SCHOOL of
ARTS & SCIENCES

100 Institute Road | Worcester, MA 01609
wpi.edu/+pathways