PATHWAYS

WORCESTER POLYTECHNIC INSTITUTE

SCHOOL *of* ARTS & SCIENCES

IMAGINE
INNOVATE
INTEGRATE
IMPACT

2020–2021

IMAGINE
INNOVATE
INTEGRATE
IMPACT

VISION

To inspire members of the WPI 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

The darkness of a pandemic. The rays of light beckoning the dawn of renewed hope. In March 2020, we were called to hunker down, amass our resources, and recast how we teach our students and conduct our scholarship while keeping our community well and our campus safe. This ingenuity and tenacity illuminated our path forward as we made a renewed commitment to transforming lives through the arts & sciences.

Light is a fundamental aspect of capturing images on film. And as with cinematography, changing the lens and light source gave us new possibilities. We thank WPI's Coronavirus Emergency Response Team (CERT) for keeping WPI's community safe as we worked to keep our educational mission strong. When the pandemic impacted mental health and well-being, we created the Be Well Initiative, offering virtual yoga classes, meditation sessions, and wellness talks.

Light is necessary to stimulate human vision, and to see color and the vibrancy of our environment. In fall 2020, we asked artists in our community to participate in "Art and Creativity in the Time of COVID," sharing their interpretation of themes like isolation, optimism, and caretaking. This exhibition of the visual, literary, and performing arts encouraged us to express emotions we may not have known we had.

With light, there can be reflection. Our Critical Conversations forums—dialogues that explore emerging topics using expert panels—addressed topics like WPI's COVID response (which included the head of the CDC Dr. Rochelle Walensky), climate science, the complexities of social medi dent mental health (which included Dr. Kerry-Anne Williams of 98.1 FM-"Black Mental Health Matters"). Events like the screening of *Coded Bias*, which explores how facial recognition does not see dark-skinned faces accurately and the impact of biased algorithms, and our subsequent discussion with director Shalini Kantayya gave us a lens by which we could analyze this challenge and reflect light on solutions.

We experienced many successes over the past months. Our faculty taught in new ways, worked on research specifically targeted at COVID, and built new graduate programs. We also celebrated individual achievements including endowed professorships and the retirement of beloved faculty. We are proud to share these milestones in this report.

This year also marked transitions. WPI is grateful to the A&S leaders who completed their terms: Luca Capogna, mathematical sciences department head; Jennifer deWinter, IMGD program director; Joseph Duffy, biology & biotechnology department head; and Arne Gericke, chemistry & biochemistry department head. We also welcome new leaders: Rob Krueger, social science & policy studies interim department head; Sarah Olson, mathematical sciences interim department head; Reeta Rao, biology & biotechnology interim department head; Anita Mattson, chemistry & biochemistry interim department head; Gillian Smith, IMGD program director; and Carolina Ruiz, associate dean of arts & sciences.

Light bounces and bends. It may be absorbed, reflected, and refracted, but its fundamental elements do not disappear. From this new dawn we find ourselves in, we emerge ever so gently from our cocoon with a steadfast commitment to transform the lives of others by focusing on our four beacons: imagine, innovate, integrate, and impact. This coming year will be one of transformation and resilience, inspired by all that our community of faculty, staff, and students has done. We look to the future, emanating light and renewed hope.

Jean King, PhD
Peterson Family Dean of Arts and Sciences

EXPLORING GLOBAL CHALLENGES

WPI's Critical Conversations series—initiated by the School of Arts & Sciences in 2018—uses panels of faculty, students, and external guests to explore emerging topics.

Panelists (L-R) included Sarah Strauss, professor of interdisciplinary & global studies; Laureen Elgert, associate professor of social science & policy studies; and Carrick Eggleston, professor and department head of environmental engineering; Jean King moderated. Joining from Ghana (not pictured) were Rob Krueger, department head and associate professor of social science, and Kofi Gyimah Amoako-Gyimah, executive secretary, Okyeman Environment Foundation, Ghana.

Climate Science

Climate science was the theme of the February 2020 Critical Conversations forum, the last held before the pandemic. Discussion included the impact of climate change and what people and institutions—including WPI—are doing about it.
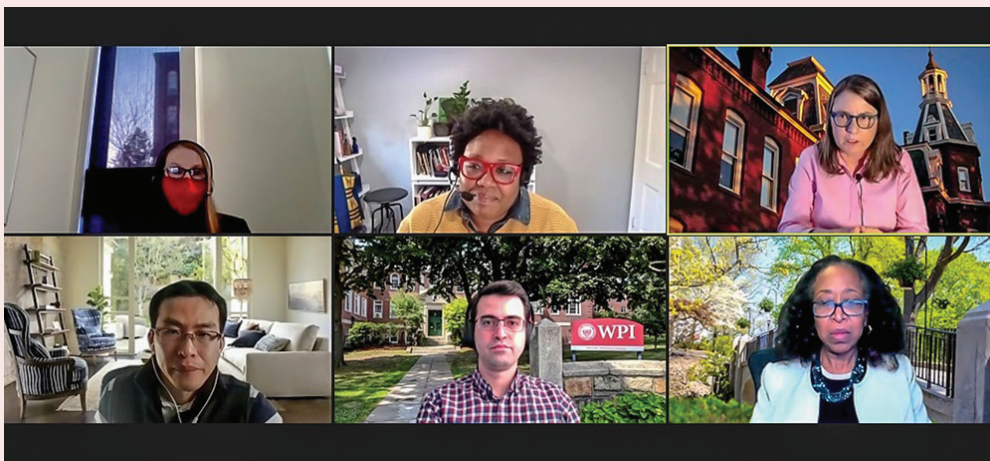
THROUGH CRITICAL CONVERSATIONS

COVID-19 with CDC Director

The Critical Conversations panel, *"WPI's COVID Response: Science and Innovation,"* featured Rochelle Walensky, MD, then-chief of infectious diseases at Mass. General Hospital who was later appointed director of the Centers for Disease Control and Prevention (CDC). Panelists outlined their current research and how it could be used in COVID diagnosis and treatment.

Panelists included (L-R, top row) Haichong Zhang, assistant professor of robotics who built a robotic ultrasound machine to detect lung disease; Reeta Rao, professor of biology & biotechnology whose research focuses on understanding fungal infectious diseases; Andrea Arnold, assistant professor mathematical sciences, whose mathematical modeling can be used to analyze the spread of infectious diseases; (middle row) Jean King, moderator; Dmitry Korkin, professor of computer science whose team created a structural genomics map of the coronavirus; Rochelle Walensky, MD; and (bottom row) Ulkuhan Guler, assistant professor of electrical & computer engineering, who developed a miniaturized wireless oxygen sensor.

Impact of Social Media

The complexity of social media—such as fake news, deception, and social media's influence on consumer and personal behavior—was the subject of *Social Media: The Good, The Bad, and The Ugly.*

Panelists (L-R, top row) Lori Ostapowicz-Critz, associate director, Academic Strategy Library; Adrienne Hall-Phillips, associate professor of The Business School; Carol Stimmel, adjunct instructor of The Global School; (bottom row) Kyumin Lee, associate professor of computer science; Nima Kordzadeh, assistant professor of The Business School; and Jean King, moderator.

Technology and Social Justice

For *"Social Justice at WPI: Technology in the Public Interest,"* faculty shared how technology can sometimes be at odds with, and how it could better serve, social justice.

CRITICAL CONVERSATIONS
Social Justice at WPI: Technology in the Public Interest

CHAIR	MODERATOR	PANELISTS				
Laureen Elgert	Benjamin Nephew	Farley Chery	Gillian Smith	Aaron Sakulich	Angela Rodriguez	Gbetonmasse Somasse

Panelists included Farley Chery, assistant teaching professor of interactive media & game development (IMGD); Gillian Smith, associate professor of computer science and program director of IMGD; Aaron Sakulich, associate professor of civil & environmental engineering; Angela Rodriguez, assistant professor of social science & policy studies; and Gbetonmasse Somasse, assistant teaching professor of social science & policy studies. Ben Nephew, assistant research professor of biology & biotechnology, moderated; Laureen Elgert, associate professor of social science & policy studies, chaired.

CRITICAL CONVERSATIONS: Circular Economy
The Future of The Earth

Laureen Elgert	Elke Rundensteiner	Adrian Burri	Joseph Sarkis	Michael Timko
Associate Professor Social Science & Policy Studies	Professor Computer Science	Head of Centre - Product and Process Development ZHAW School of Engineering	Professor Foisie Business School	Associate Professor Chemical Engineering

Supply chain and the future of the earth

Economy, environment and society

Global collaboration for impact

People-centered sustainability

WPI Graduate training to ensure a sustainable future

Circular Economy: The Future of Earth

As part of The Global School's Virtual Event on Europe, WPI explored issues related to the supply chain, people-centered sustainability, the impact of global collaboration, and how WPI graduate training can help create a more sustainable future.
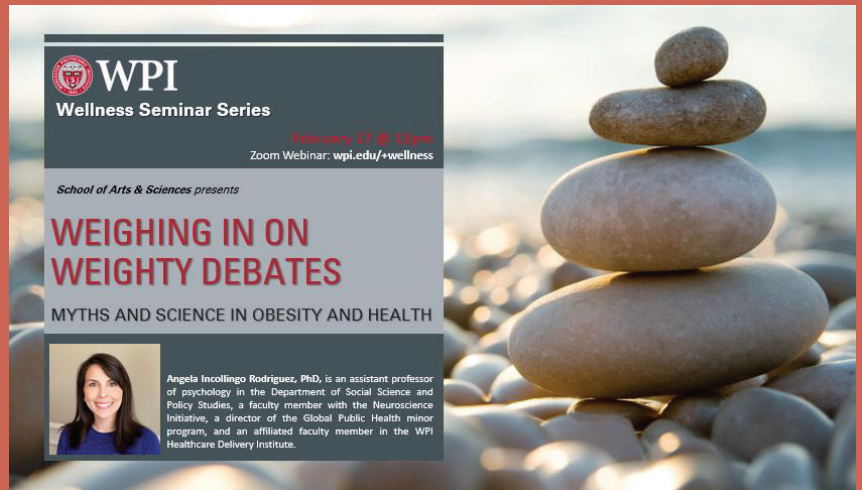
Panelists (L-R) included Laureen Elgert, associate professor of social science & policy studies; Elke Rundensteiner, professor of data science; Adrian Burri, Head of Centre for Product and Process Development, ZHAW School of Engineering, Zurich University of Applied Sciences; Joe Sarkis, professor of management, The Business School; and Mike Timko, associate professor of chemical engineering.

TAKING CARE OF OUR COMMUNITY

After the pandemic hit, WPI implemented a Be Well initiative offering free virtual yoga, meditation classes, and wellness talks to students, faculty, and staff. Envisioned by Jean King, the virtual get-togethers were led by community practitioners and A&S faculty members Angela Rodriguez, assistant professor of social science & policy studies; Jeanine Skorinko, professor of psychology; and Kathryn Moncrief, professor and head of the Department of Humanities & Arts.

WPI Wellness Seminar Series
February 17 @ 11am
Zoom Webinar: wpi.edu/+wellness

School of Arts & Sciences presents

WEIGHING IN ON WEIGHTY DEBATES

MYTHS AND SCIENCE IN OBESITY AND HEALTH

Angela Incollingo Rodriguez, PhD, is an assistant professor of psychology in the Department of Social Science and Policy Studies, a faculty member with the Neuroscience Initiative, a director of the Global Public Health minor program, and an affiliated faculty member in the WPI Healthcare Delivery Institute.

Be Well Together 3.0
Yoga and Meditation to build resilience

Free Live Sessions: February 1 – May 7

Sponsored by WPI's School of Engineering, School of Arts & Sciences, and Division of Talent & Inclusion

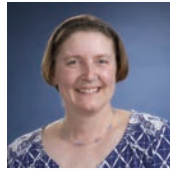| Monday	Tuesday	Wednesday	Wednesday	Thursday	Thursday	Friday
Mindfulness	**Yoga**	**Mindfulness**	**Yoga**	**Mindfulness**	**Yoga**	**Mindfulness**
5:30 - 6:15 pm	5:30 - 6:15 pm	12:15 - 12:30 pm	5:45 - 6:30 pm	2:15 - 2:30 pm	8:00 - 8:45 pm	12:00 - 12:30 pm

Zayda Vallejo, MLitt, has been practicing meditation and yoga since 1978. Her keen interest in meditation took her to Japan, India, Burma, and Nepal, where she lived for three years.

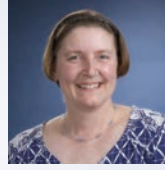**Kate Moncrief, PhD,** is trained in Iyengar-based Hatha yoga and teaches vinyasa flow classes.

Robin Benoit, MS, has been practicing meditation for about five years and is a board member of the Mindfulness Practice Center in Shrewsbury.
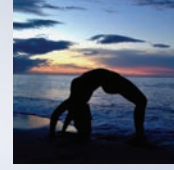
Jeanine Skorinko, PhD, incorporates different styles of yoga, and tries to offer modifications for those at different levels or with different mobilities.

Robin Benoit, MS, has been practicing meditation for about five years and is a board member of the Mindfulness Practice Center in Shrewsbury.

Angela Rodriguez, PhD, is a certified instructor in the Ashtanga and Vinyasa styles and teaches dynamic classes with options for all levels.

Justin Laplante, PhD, bridges the historical traditional practices of meditation with the contemporary science of mindfulness.

Student Mental Health

Even before COVID, college students were facing stressors impacting their mental health. The panel *Student Mental Health: Surviving Isolation, Stress, Depression, and Anxiety* shared ways students could alleviate their own stress and reach out to peers to build trust and community.

(L-R, top row) Participants M. L. Tlachac, data science PhD candidate; Angela Rodriguez, assistant professor of social science & policy studies; Charlie Morse, associate dean and director of counseling; (bottom) Robbie Starr '21, electrical & computer engineering; Jean King, moderator; and Kerry-Ann Williams, MD, medical director of the Justice Resource Institute.

CELEBRATING THE ARTS & SCIENCES AT WPI

WPI

School of Arts & Sciences, Gender, Women's, and Sexuality Studies, and Creative Writing at WPI presents...

Visiting Writer Series

October 6 | 4:00 pm
www.wpi.edu/+ArtsandSciencesWeek

LaTanya McQueen, author of the essay collection *And It Begins Like This,* which weaves together historical and genealogical research, folklore, Biblical passages, literary theory and criticism, and personal memory to examine the legacy of slavery and its relationship to Black female identity in contemporary America.

Moderators

Kate McIntyre
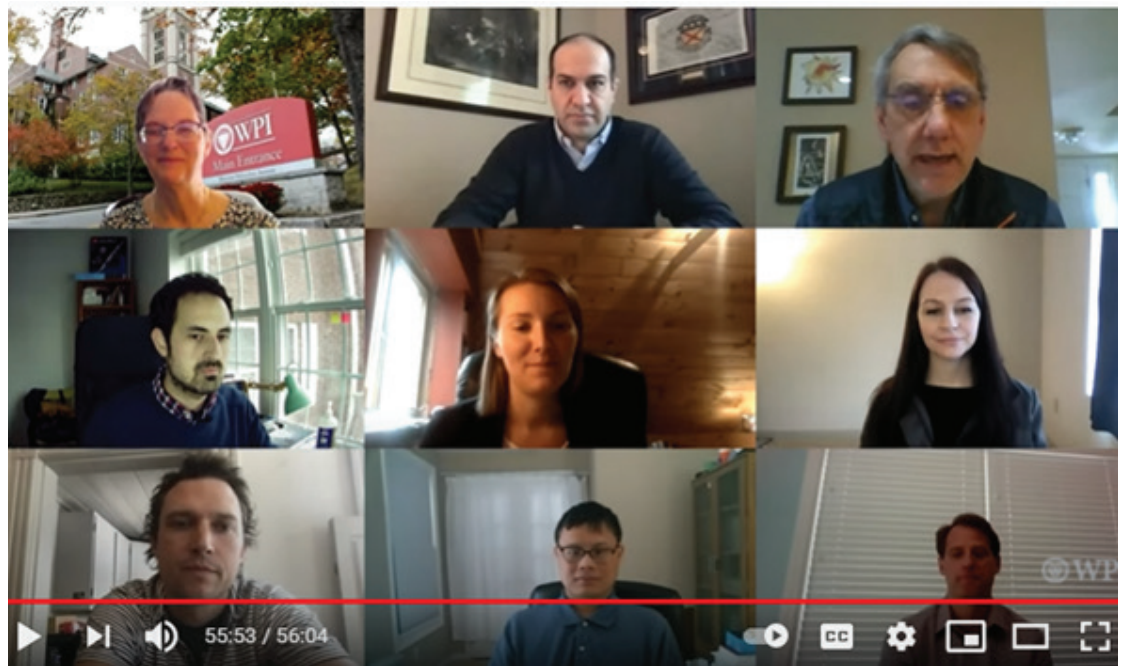Assistant Professor, Humanities & Arts

Michelle Ephraim
Associate Professor, Humanities & Arts

WPI held its Fall Arts & Sciences Week in October 2020, embracing the theme "Innovate, Imagine, Impact 2.0: Hope and Healing." The virtual celebration included an "Art and Creativity in the Time of COVID" competition, visiting writer forum for the Gender, Sexuality & Women's Studies program with author LaTanya McQueen, launch of a virtual art gallery, and Critical Conversations forum on "Social Justice at WPI: Technology in the Public Interest."

Spring Science Week was celebrated in April 2020 with faculty, undergraduate students, and graduate students conducting lightning talks ranging from "Bringing the Light Inside the Body to Perform Better Surgery" to "Understanding the Aha! Moment of Insight" to "Mathematics and Statistics Role in Development of the Next-Generation Treatments for Severe Psychiatric Illnesses."

A&S faculty participate in faculty lightning talks

BIAS AND THE ROLE OF AI

WPI held a screening of *Coded Bias*, which explores the fallout of MIT Media Lab researcher Joy Buolamwini's discovery that facial recognition does not see dark-skinned faces accurately, and her journey to push for the first-ever U.S. legislation to govern against bias in the algorithms that impact us all. A Q&A session followed with the film's director, Shalini Kantayya, and WPI panelists Crystal Brown, assistant professor of social science & policy studies, and Gillian Smith, associate professor of computer science and IMGD program director. The trio discussed the social and political aspects of artificial intelligence (AI). Laureen Elgert, associate professor of social science & policy studies moderated. The Public Interest Technology University Network was a co-sponsor.

IMGD program director and computer science associate professor Gillian Smith and social science & policy studies assistant professor Crystal Brown speak with Shalini Kantayya, director of Coded Bias.
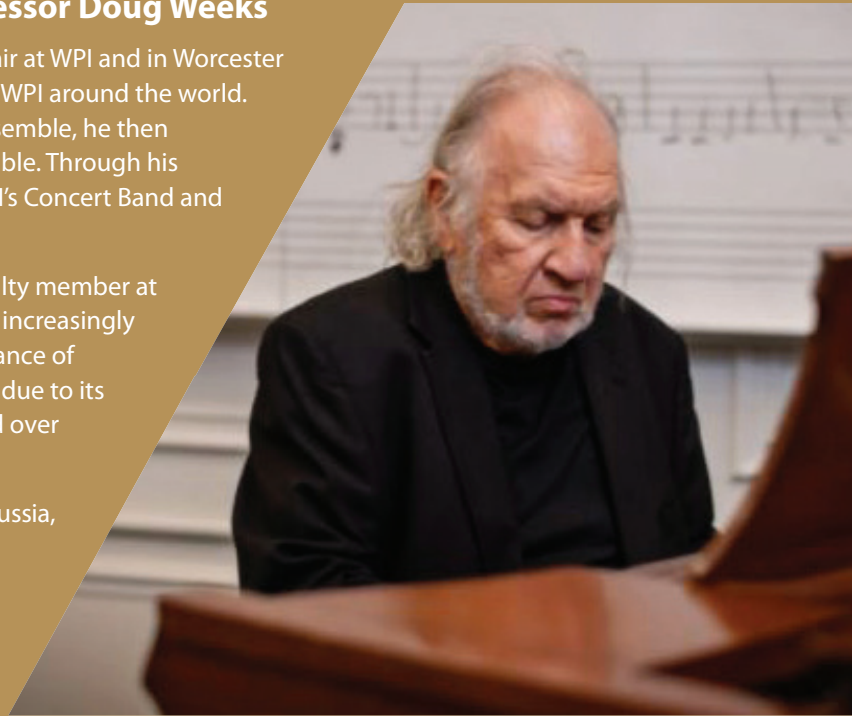
MUSIC AT WPI

Celebration of a Remarkable Career: Professor Doug Weeks

For over 40 years, Professor Douglas Weeks has filled the air at WPI and in Worcester with music; he has also brought music and students from WPI around the world. Initially hired in 1980 to work with the small WPI Brass Ensemble, he then convened a handful of string players into a second ensemble. Through his expertise and dedication, the ensembles evolved into WPI's Concert Band and Symphonic Orchestra each with more than 100 players.

In 1987, Weeks became only the third full-time music faculty member at WPI and was appointed Coordinator of Music. He took on increasingly challenging music selections, including his 2013 performance of Stockhausen's colossal Gruppen, a work rarely performed due to its difficulty and size, requiring three separate orchestras and over 100 musicians.

In addition to multiple concert tours to the UK, Germany, Russia, and Egypt, his international experience included annual teaching and performing trips to the Al Kamandjati Music School in Ramallah, Palestine. His projects here were designed "to help provide positive experiences and education in the arts for students" living in refugee camps and oppressed conditions. He also invited to WPI the school's founder, associated musicians, and author Sandy Tolan (who documented this incredible work in his book *Children of the Stone*).

Weeks built WPI's global music community with regular invitations to Worcester school children to attend concerts and numerous collaborations with musical organizations from around the world. His active role in student recruitment gave him regular contact with prospective students through correspondence or campus visits that frequently resulted in students attending WPI. After graduation, students often say their work with Doug and their experiences playing music are their fondest memories of WPI.
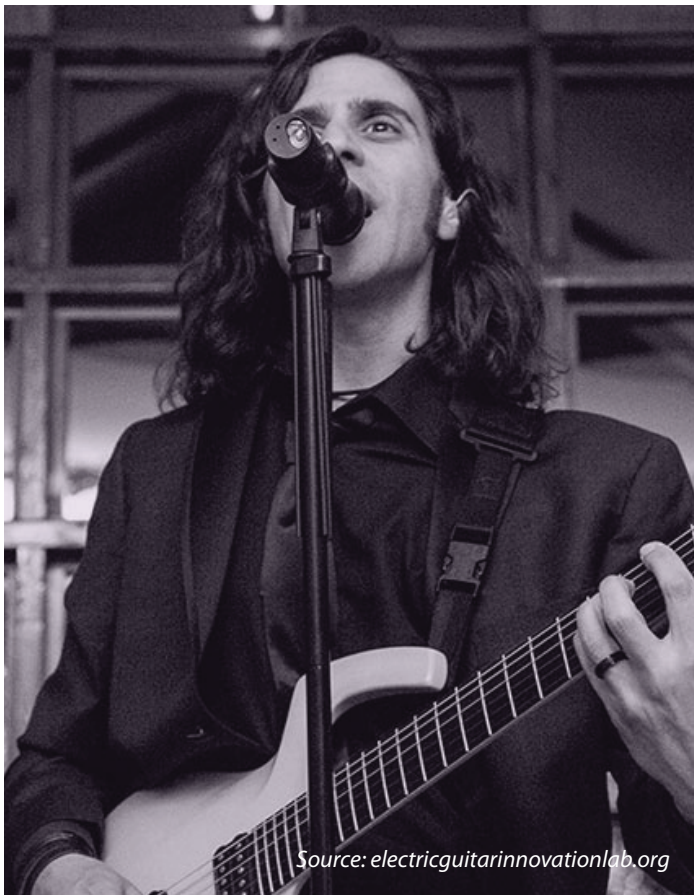

> « *My idea is that there is music in the air, music all around us; the world is full of it, and you simply take as much as you require.* »
>
> Edward Elgar

WPI's music ensembles adapted to the unique challenges of the pandemic so that they could continue to share their considerable talents with the community.

Source: electricguitarinnovationlab.org

Les Paul Foundation Funding

WPI's Electric Guitar Innovation Lab (EGIL) received funding from the Les Paul Foundation—named for the iconic electric guitar innovator and musician. EGIL projects address real-world needs of those who work professionally with guitars. Students are encouraged to experiment with "found materials." One student project—The Rail—is based on Les Paul's first attempt to design an electric pickup to amplify the sound of a vibrating guitar string by using a cast-off section of steel rail and the mouthpiece from a telephone.

WPI HUMANITIES & ARTS DEPT PRESENTS

EVERY BRILLIANT THING

BY DUNCAN MACMILLAN & JONNY DONAHOE

PERFORMANCES
THURSDAY 10/8
@5:30pm
FRIDAY 10/9
@5:30pm
SATURDAY 10/10
@2pm and @5:30pm

RESERVE YOUR SEAT!

SCAN ME

DIRECTED BY
KATE MONCRIEF
&
EMILY BAKER
STARRING
FIONA DOYLE

2020

FINDING HOPE
WITH WPI THEATRE

The Fall A&S Week included a production of *Every Brilliant Thing*, a one-person play that tells the story of a girl who consoles herself after her mother's suicide attempt by creating a list of everything that makes life worth living. This production—held over five performances, all of which met social distancing guidelines—reaffirmed the week's overall message of hope.
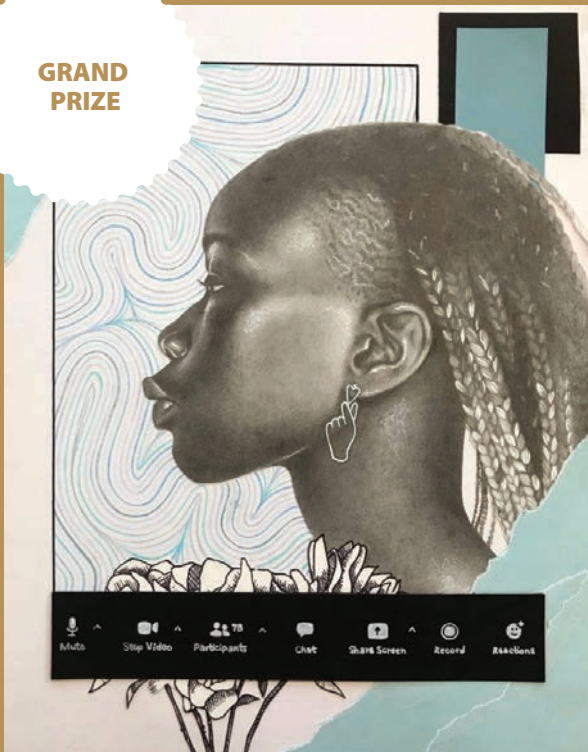
Kate Moncrief (far left), professor and head of the department of humanities & arts, directed *Every Brilliant Thing* and is pictured with the show's student actors

NAVIGATING THE COVID

When the School of Arts & Sciences issued a call for "The Arts and Creativity in the Time of COVID" competition, 48 members of the WPI community responded with musical performances, the written word, welding, painting, and more. Six judges selected top entries and those winners were recognized during A&S Week. (Judges were Erica Mason '96, artist and WPI trustee; Sergio Salvatore '02, pianist/composer, co-chair of the A&S Advisory Board, and senior director of engineering at Vimeo; Elaine McKenna-Yeaw, executive director of Worcester Center for Crafts; Jennifer deWinter, professor and IMGD program director; Kate McIntyre, assistant professor of humanities & arts; and Kate Moncrief, professor and Humanities & Arts Department head.)

GRAND PRIZE

Camryn Berry '21
biomedical engineering major

Title:
"Connecting …"

Medium:
multimedia (graphite, pen, colored pencil, and colored paper)

PERFORMANCE

Ali Saeed '22
IMGD major

Title:
"Fly Away"

Medium:
music

CRAFT BASED

Elizabeth Long Lingo
assistant professor, The Business School

Title:
"My garden withstands the storms"

Medium:
metal sculpture

PANDEMIC THROUGH ART

VISUAL ARTS

Patricia Bergmann
senior executive administrator,
School of Arts & Sciences

Title:
"Dreaming"

Medium:
watercolor

Nasim Mansuri '21
chemical engineering and
professional writing double major

Title:
"Company"

Medium:
poetry

Nasim Mansuri – Class of 2021 – Encarnacion, Paraguay
The most interesting part of quarantine has been seeing how constant company affects my cat. Her habits and personality have changed as a result of the crisis, just like mine have. She follows me around the house and has become incredibly vocal. Who knows if pets are aware that anything is out of the ordinary? But when the isolation and uncertainty feel overwhelming, it's my cat's innocence and softness that keep me grounded, especially when we're just staring at the ceiling, alone together.

Company

My cat
Lies in the center of the living room
I lie with her. We stretch
raise our arms to the sun
In a one-window room

I like the mornings where I don't have to say anything
I lie on the couch and dream that someone makes me breakfast
I lie in bed and feel the emptiness of the town around me
So many empty apartments, so much work left to do.

My cat
Forces me to leave my bedroom
lies down on the carpet. Speaks.
I stare at the ceiling
Hold a soft, clawed paw
Try to focus

Last night I walked out at three am
And saw wild animals in the parking lot
The opossums weren't scared, they just hurried
The skunks bounced around with arched backs

My cat
Watched us from the window
Waiting for me to come home
Made me come back
Instead of walking away

I work hard for a future that looks less certain every day
The government calls to deport my friends
We sleep during the day and work during the night
Try to think of things to look forward to

My cat
Grabs my hand with her paws sometimes
Looks me in the eyes. It could be
An encouragement, to keep trying
Or maybe just a cat
Watching quarantine pass by.

CREATIVE WRITING

VISUAL ARTS

Hannah Miller '22
IMGD major

Title:
"Quarantine"

Medium:
digital illustration

#6
Top 50 Game Design Programs
The Princeton Review (2021)

ADVANCING ARTS & SCIENCES RESEARCH

Members of WPI's Latin American and Caribbean Studies program steering committee (from left): John Galante, assistant teaching professor of humanities & arts; Aarti S. Madan, associate professor of humanities & arts; and Angel Rivera, professor of humanities & arts

Latin American and Caribbean Studies at WPI

Latin American and Caribbean Studies (LACS) is an interdisciplinary initiative that began in 2018 to integrate existing WPI resources and activities related to the region—and build from them. Since then, WPI has launched six new courses, a LACS minor, and a successful event series that included panel discussions and book talks, faculty lightning talks, student presentations from project centers around the region, and Latin American film screenings. A scholarly and cultural showcase for the 2019 Arts & Sciences Week included a mural painting of Abby Kelley Foster (by visiting Brazilian street artist Panmela Castro) and varied discussions.

The LACS steering committee uses the multiyear Undergraduate International Studies and Foreign Language U.S. Department of Education grant awarded in 2020 to enhance and expand its scholarly reach with ongoing development of a library guide and scholarly website and by purchasing LACS-related resources for Gordon Library. The LACS faculty group studies marginalized groups in the Spanish Caribbean, relations between India and Latin America, sustainable development and nitrogen cycle governance in the region, and networks of transatlantic and inter-American migration and mobilities.

STEMinists:
Hacking the Glass Ceiling

WPI's new Gender, Sexuality & Women's Studies (GSWS) program facilitates campus-wide curricular and extracurricular examinations of gender and sexuality, ranging from the history classroom to computer lab to project center. GSWS addresses persistent and pervasive structural inequities by creating the conditions under which women students, queer and non-binary students, and students of color can use these inequities to pursue positions of leadership.

The Gender, Sexuality, and Women's Studies (GSWS) steering committee includes (from left) Crystal Brown, assistant professor of social science & policy studies; Michelle Ephraim, associate professor of humanities & arts, and Rebecca Moody and Lindsay Davis, assistant teaching professors of humanities & arts.

STEM fields find robust job growth and median salaries. However, people of color, women, and queer and nonbinary people continue to be significantly underrepresented and undersupported. The motivating goal of GSWS is to encourage the community to interrogate interlocking systems of oppression such as racism, sexism, homophobia, transphobia, classism, and colonialism.

In 2020–21, we introduced three permanent GSWS courses: Introduction to Gender, Sexuality & Women's Studies; STEMinism; and Topics in Global Feminisms. We are also cultivating resources that highlight the current contributions of underrepresented and marginalized people in STEM fields and their contributions throughout history.

Solving the World's Grand Challenges: InSTeD

Drawing upon WPI's position as 'The Global Polytechnic' the Institute of Science & Technology for Development (InSTeD) provides an inclusive environment to investigate and address the challenges of designing and implementing scientific and technological solutions. InSTeD—led by social science & policy studies professor and department head Rob Krueger—is a leading, transdisciplinary hub whose global posture invites thinker-doers from across academia, government, NGOs, the private sector, and communities to co-create innovative community solutions. By bringing together partners from WPI and around the world, InSTeD facilitates WPI's potential for faculty-driven, agenda-setting, cross-cutting research in the design, analysis, implementation, and evaluation of technological interventions in under-resourced settings—in the US and abroad.

InSTeD collaborates with communities to identify challenges, develop co-produced design solutions, and cultivate the necessary resources (including education and job training) to sustain these solutions. Whether in North America, sub-Saharan Africa, Southeast Asia, Latin America, or Australasia, teams develop authentic partnerships to co-create sustainable outcomes.
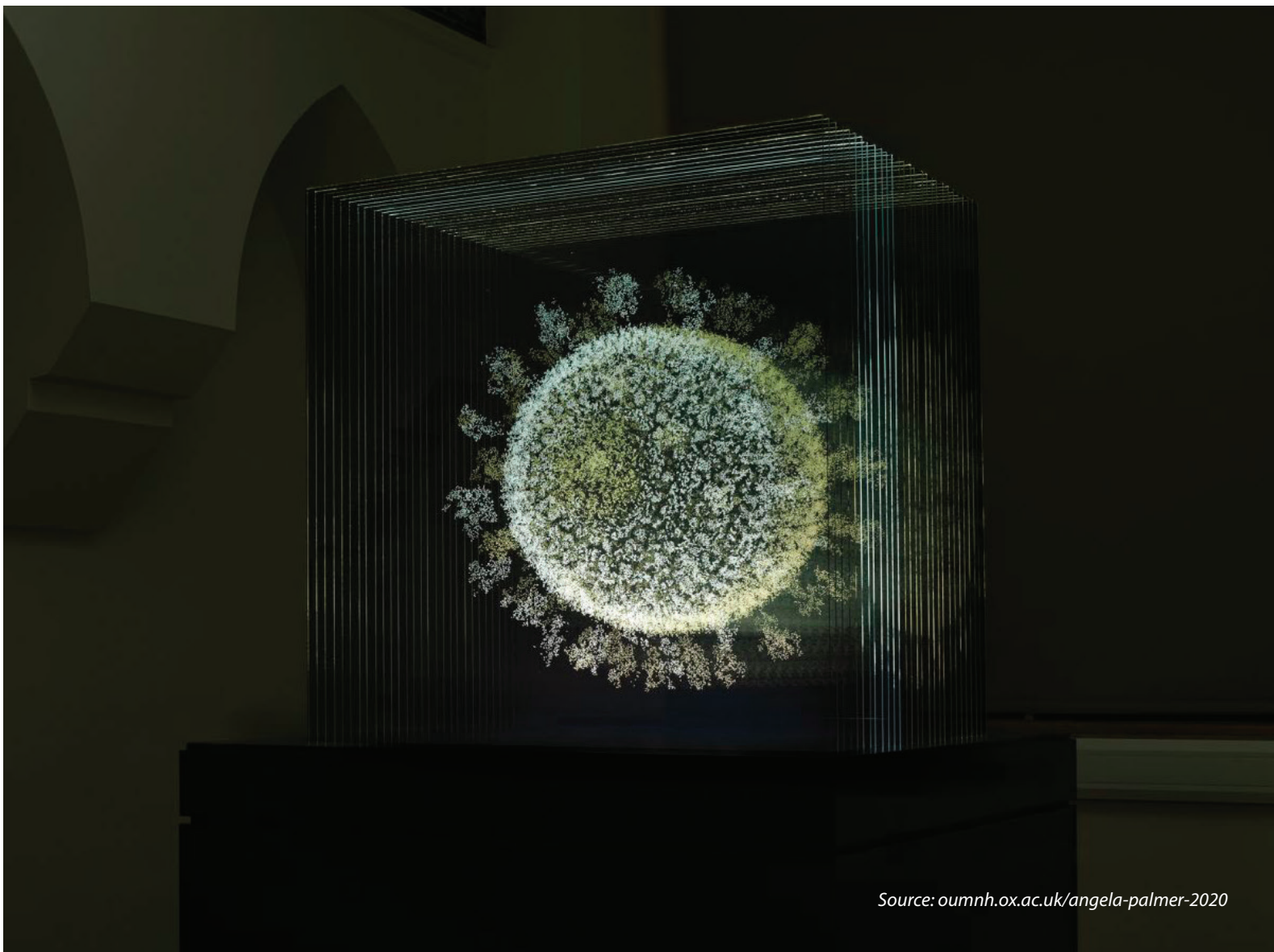
IMAGINE

Research on COVID-fighting Plant

Biology & biotechnology professor Pamela Weathers and a team of researchers from Columbia University and Washington State University have found that extracts from the leaves of medicinal herb *Artemisia annua*, also known as sweet wormwood, inhibit the replication of the SARS-CoV-2 virus and two of its variants. The research, described in the *Journal of Ethnopharmacology*, may point to a safe, low-cost therapeutic treatment.

Old Conjecture About the Formation of the Solar System

Mathematical sciences professor and mathematical physicist Mayer Humi has confirmed a 224-year-old math conjecture about the origins of the solar system, providing insights about the formation process of solar systems across the universe. His peer-reviewed paper on the topic was published in the *Journal of Mathematical Physics*. Humi has studied this question for more than 20 years.

Molecular Model Turned into Art

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. This remarkable work was published in *Viruses*, a leading virology journal. A stunning glass sculpture of the coronavirus particle by Scottish artist Angela Palmer, based on Korkin's model, is on display at the UK's Oxford University Museum of Natural History.

MILESTONES

WPI President Laurie Leshin welcomes MassDigi. Pictured (L-R) are Curtis Abel, Executive Director of Innovation & Entrepreneurship for WPI; Emma Lowry, IMGD BA '21; Jennifer deWinter, professor and former IMGD program director; Gillian Smith, associate professor and IMGD program director; Timothy Loew, MassDigi founder and Executive Director; Leshin; Jean King; and Monty Sharma, MassDigi Managing Director.

Welcome MassDigi

Massachusetts Digital Games Institute (MassDigi), the award-winning center for academic cooperation, entrepreneurship, and economic development across the Massachusetts video games ecosystem, has moved to WPI and will work closely with the university's pioneering Interactive Media & Game Development (IMGD) program. MassDigi will expand its work with students and companies through a MassTech Game Prototype Matching Fund created with a $100,000 grant from the Massachusetts Technology Collaborative (MassTech). Firms will apply to work with students to turn early-stage game concepts into working prototypes.

Pictured (L-R) are Timothy Loew, MassDigi founder and Executive Director and Monty Sharma, MassDigi Managing Director.

TRAINING THE NATION'S CYBERSECURITY WORKFORCE

WPI has been awarded $4.9 million from the National Science Foundation (NSF) and the Department of Defense (DoD) to support the university's cybersecurity scholarship programs in an ongoing effort to fill a critical need for cybersecurity workers in federal government positions.

New A&S Degree Programs

- The **Master's in Cyber Security** will prepare students to be leaders in cybersecurity and computer science and will help combat the global shortage in cybersecurity professionals.

- The **Master of Computer Science** is designed for students with a bachelor's degree who are seeking computer science training for their professional roles.

- The **Master's Degree in Science & Technology for Innovation in Global Development** allows students to combine their passion for technological and scientific innovation with cross-cultural design thinking.

- The **Master of Fine Arts in Interactive Media & Game Design (IMGD)** is a terminal degree that can lead to tenure-track positions in arts- and design-based departments.

- The **PhD in Computational Media** prepares students to be scholars in areas of humanistic expression voiced through computational means.

- The **Bachelor's Degree in Data Science** is designed to meet a growing demand for highly trained data scientists who solve problems at the cutting edge of big data analytics.

Department of Robotics Engineering

Robotics Engineering, a signature program for more than a decade, is now a department. The transition recognizes its distinctive curriculum, strong core faculty, and research excellence. WPI is one of only a handful of institutions to offer both graduate and undergraduate robotics programs. Robotics Engineering is a joint department in both the School of Arts & Sciences and the School of Engineering.

INNOVATE

ASSISTments creators Cristina and Neil Heffernan are working with Jacob Whitehill (right) and colleagues at Lesley University to develop a teacher feedback tool.
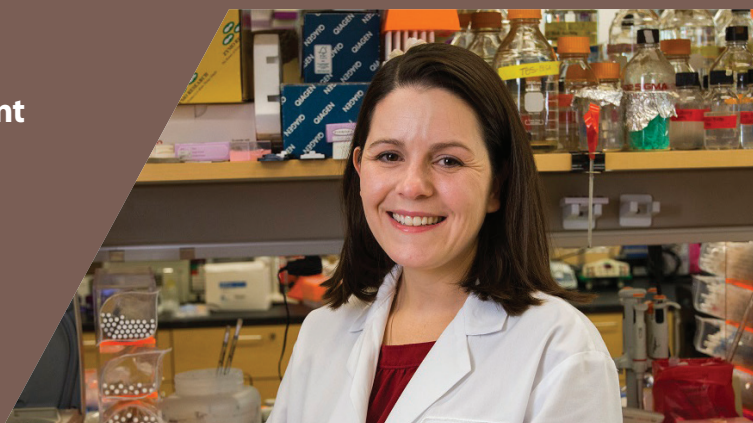
Helping Bridge the Transition to Distance Learning

ASSISTments, a free online math teaching tool developed at WPI, gave teachers the confidence to transition between online and in-person classes amidst the uncertainty of the pandemic. Developed by husband-and-wife team of computer science professor Neil Heffernan and principal education specialist Cristina Heffernan, the tool—which is primarily used by middle school students but has seen growth at all grade levels—allows teachers to assign online math problems to their classes, giving students instant feedback and providing teachers with actionable data to inform instruction.

Researcher Receives American Cancer Society Grant

The American Cancer Society awarded a grant to assistant professor of biology & biotechnology Amity Manning to determine the role a critical tumor-suppressor protein plays in chromosome errors that arise during cancer cell division. The four-year project will lead to a better understanding of how an absence of retinoblastoma protein (pRb), which regulates cellular processes, contributes to missorted genetic information in tumor cells.

In addition, Manning and Sarah Olson, department head and associate professor of mathematical sciences, have been awarded a grant by the National Institutes of Health (NIH) to develop computational models to study a critical piece of cellular machinery that often goes awry in cancer. The three-year study will use mathematical techniques and biological findings to assess how cellular forces influence the geometry of the mitotic spindle, a part of the cell's machinery that is responsible for separating genetic material during cell division.

Innovating to Serve Remote Students

With WPI working hard to keep the university community safe during the pandemic, professors and lab managers took these creative approaches:

- A paper written by Robert Dempski, associate professor of chemistry & biochemistry, about using technology in labs was the inspiration for using augmented reality (AR) in chemical engineering labs. Andrew Teixeira, assistant professor of chemical engineering, used high-definition cameras and students with AR goggles to send live-feed screen sharing to remote students, allowing them to participate as if they were in the lab.

- L Dana, lab manager for the physics department, had to figure out how to teach remote labs for 700 students, with 140 working remotely and the rest staggering their lab time. Dana wanted to keep the remote work as close as possible to in-person without asking students to buy anything extra, so she had them use easily accessible items like a laptop, rulers, smartphones, an ID card, and tennis balls.

- Scott Barton, associate professor of humanities & arts, supplied his students with essential parts like motors, a microcontroller, and a breadboard they needed to build robots for his course "Making Music with Machines." With the tools in hand, they could work on their projects in their residence halls, their homes, or his lab.

L Dana, Physics Lab Manager

Using AI to Help Students Work Better Together

Assistant professor of computer science Jacob Whitehill is collaborating with colleagues at the University of Colorado Boulder to explore how artificially intelligent (AI) teaching agents encourage more meaningful student collaboration. As part of a five-year, $20 million grant from the National Science Foundation to CU Boulder, the team will build and test different forms of "AI Partners" in classrooms across two Colorado school districts—even including animated interactive avatars that interpret students' language, gestures, and facial expressions.

IMPACT

Game On: Virtual Video Game Challenge

WPI and *FIRST*® took their robotics education and competition expertise in a new direction: video game design by creating *FIRST* Game Jam, a free, interactive competition for teams to create a video game concept that celebrates the mission and vision of *FIRST*. With the switch to remote learning, robotics teams weren't able to meet in person to design and build robots, but *FIRST* Game Jam kept remote teams together and attracted new students with diverse skill sets.

❝ *When you only have a few days, only a few tools, and you still have to make something, that's when people really get creative.* ❞

Dean O'Donnell, WPI IMGD teaching professor

#1

most popular Robotics
Engineering program in the nation
College Factual (2021)

Women in Data Science (WiDS) Conference

For the third year, WPI collaborated with Stanford University and the Global Women in Data Science Conference to bring the WIDS conference to Central Massachusetts. WPI participated in this virtual event with more than 150 locations worldwide to inspire and educate data scientists, regardless of gender, and to support women in the field.

Preparing Data-Driven Leaders to Build a More Sustainable Future

With a $3 million NSF grant, WPI will establish a unique graduate curriculum applying chemical sciences, data analytics, mathematics, and computing power to reduce energy usage, waste, and pollution while also strategically reusing products and materials. Part of the NSF Research Traineeship (NRT) program, WPI's five-year program will focus on the advancement of the circular economy in three areas: harmful byproducts from linear production, the benefits of upcycling, and energy-efficient processing.

WPI's team includes (L-R) Laureen Elgert, associate professor of social science & policy studies; Joseph Sarkis, professor of business; Lyubov Titova, associate professor of physics; Yanhua Li, associate professor of computer science; Anita Mattson, professor of chemistry & biochemistry; Michael Timko, associate professor, chemical engineering; Elke Rundensteiner, William B. Smith professor of computer science; Aaron Deskins, associate professor of chemical engineering; and Randy Paffenroth, associate professor of mathematical sciences.
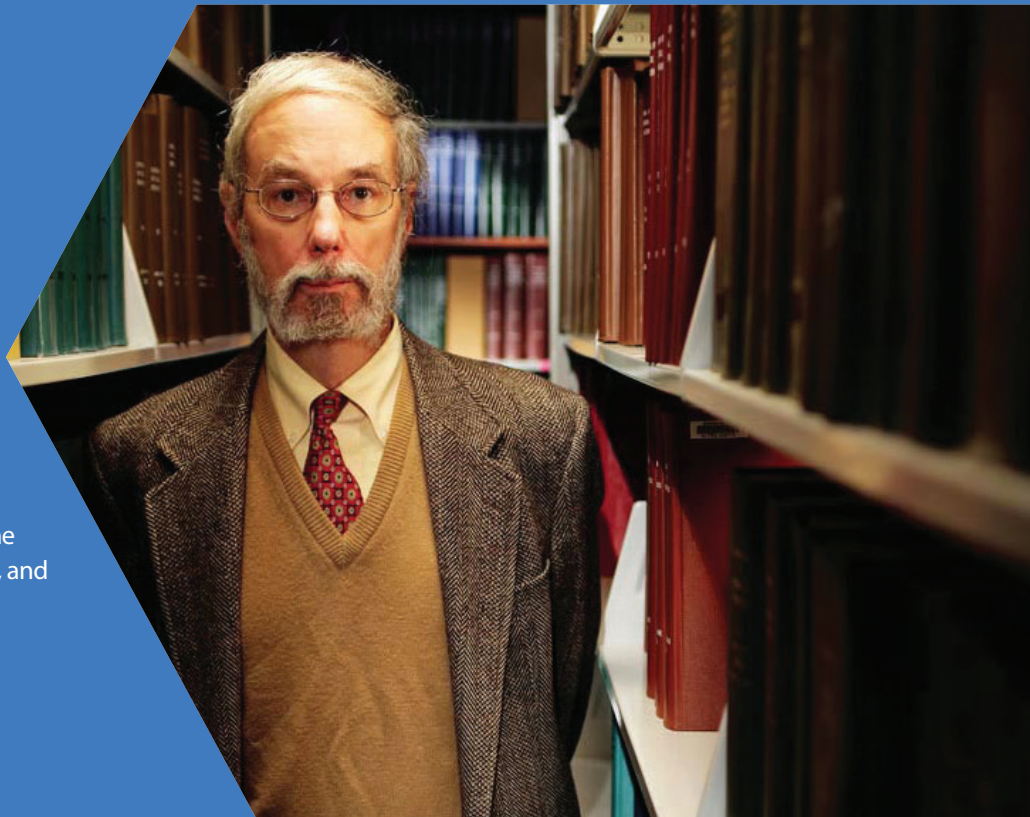
FACULTY HONORS

Gottlieb and Rundensteiner named William B. Smith Professors

Roger S. Gottlieb, professor of philosophy, and Elke Rundensteiner, professor of computer science, have been named William B. Smith Professors. The Professorship was established by the estate of William Binns Smith, a local entrepreneur and 20th century industrialist who passed away in 1952. Rundensteiner is the founding director of the interdisciplinary Data Science Program at WPI and specializes in data intensive systems. Gottlieb is the author or editor of 21 books and more than 150 articles on environmentalism, religious life, contemporary spirituality, political philosophy, ethics, the Holocaust, feminism, and disability.

Professor Celebrates 50 Years

WPI honored Lance Schachterle, professor of humanities & arts, for 50 years of service to the university. His many roles over the years include co-director of the liberal arts and engineering program, chair of the interdisciplinary studies division, director of the London Project Center, assistant dean for academic initiatives, and assistant provost for academic affairs. Schachterle's scholarly expertise includes the works of Charles Dickens, Thomas Pynchon, and James Fenimore Cooper.

AND AWARDS

2020 Board of Trustees' Award for Academic Advising

Gillian Smith, director of the IMGD program and associate professor of computer science, is an award-winning video game designer with expertise in computational creativity, computer science education, and the intersection of traditional crafts and computation.

2020 Board of Trustees' Award for Outstanding Research and Creative Scholarship

Jagan Srinivasan, professor of biology & biotechnology, is an established researcher who uses cutting-edge tools to decipher how the nervous system detects, interprets, and transmits olfactory information that impacts behavior.

2020 Chairman's Exemplary Faculty Prize

Kristin Boudreau, professor of humanities & arts, is the author of three books and numerous articles on American literature as well as articles on engineering education.

2020 Romeo L. Moruzzi Young Faculty Award

Carlo Pinciroli, assistant professor of robotics engineering, uses elements of video game design in his robotics engineering and computer science courses to generate greater student participation and comprehension of the subject.

2021 Trustees' Award for Outstanding Teaching

Esther Boucher-Yip, associate teaching professor of humanities & arts, teaches courses in the professional writing program and academic English for international students.

2021 Romeo L. Moruzzi Young Faculty Award

Joshua Rohde, assistant teaching professor of humanities & arts and director of choral activities, was honored for using music to encourage students' engagement with social justice issues.

OTHER NOTABLE

Andrea Arnold, assistant professor of mathematical sciences, was nominated for full membership in Sigma Xi (The Scientific Research Honor Society).

Marcel Blais, teaching professor of mathematical sciences, was elected to National Professional Science Master's Association (NPSMA) Board.

Crystal Brown, assistant professor of social science & policy studies, was invited to the Russell Sage Foundation Proposal Development Summer Institute (co-sponsored with the Bill and Melinda Gates Foundation).

Kelly Colvin, assistant teaching professor of humanities & arts received WPI Women's Young Investigator Fellowship (2020-2021).

Vladimir Druskin, research professor of mathematical sciences, was elected Vice Chair of the Society for Industrial and Applied Mathematics (SIAM) for the Activity Group on Geosciences.

Roger Gottlieb, William B. Smith Professor of humanities & arts, was a semi-finalist for The Siskiyou Prize for New Environmental Literature.

Edward Gutierrez, assistant professor of humanities & arts had his short film *ESCAPE* chosen as an Official Selection of the Dublin International Short Film and Music Festival (collaboration with Keith Zizza and Adryen J. Gonzalez).

Mayer Humi, professor of mathematical sciences had his article "On the evolution of a primordial interstellar gas cloud" chosen as Editor's Pick for the September 2020 issue of *Journal of Mathematical Physics*.

Michael Johnson, associate teaching professor of mathematical sciences, was awarded first place in the ASEE-NE Faculty paper category for his paper "Fundamental Mathematical Skill Development in Engineering Education" (co-authored with Fiona C. Levey).

Rob Krueger, professor and department head of social science & policy studies, was named Ambassador to West Africa by the Regional Studies Association

Kyumin Lee, associate professor of computer science, received the 2020 Conference on Information and Knowledge Management Test of Time Award.

ACHIEVEMENTS

William Martin, professor of mathematical sciences, was elected a fellow of the Institute for Combinatorics and its Applications. He was also named an Editorial Board Member of both the *Journal of Combinatorial Designs* and the *Bulletin of the Institute of Combinatorics and its Applications*.

Anita Mattson, professor and department head of chemistry & biochemistry, was awarded the 2020 Northern Michigan University Alumni Achievement Award.

Kate McIntyre, professor of creative writing, won the Flannery O'Connor Award for Short Fiction for her collection of stories, *Mad Prairie*.

The birthday of **Umberto Mosco**, Harold J. Gay Chaired Professor of Mathematical Sciences, was celebrated in the Special Issue of the journal *Rend. Mat. Appl.* (7) Volume 41 (2020), 189-192, celebrating Umberto Mosco's birthday.

Sarah Olson, professor and department head of mathematical sciences, received the 2019 Mathematical Medicine & Biology Best Paper Prize (awarded in 2020) and was appointed Topics Editor for the journal *Fluids*.

Joshua Rohde, assistant teaching professor of humanities & arts and director of chorale activities, was appointed Music Director of the Rhode Island Civic Chorale & Orchestra.

Elke Rundensteiner, William B. Smith professor of computer science, received the 2020 Conference on Information and Knowledge Management Best Short Paper Award.

William San Martín, assistant teaching professor of humanities & arts, was awarded a Residency Fellowship to the Rachel Carson Center for Environment & Society in Munich, Germany.

Suzanne Scarlata, Richard Whitcomb Professor of Chemistry & Biochemistry, was elected a fellow of the American Association for the Advancement of Science (AAAS).
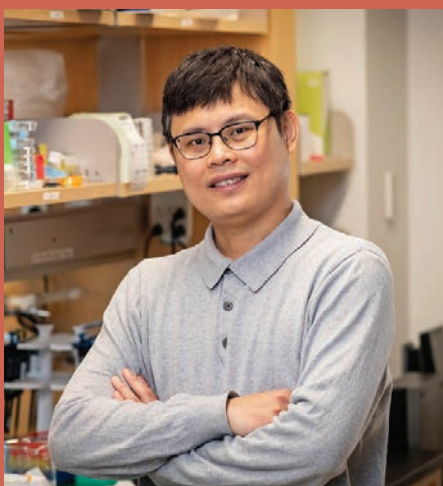
Stephan Sturm, associate professor of mathematical sciences, was elected Secretary of the SIAM Activity Group on Financial Mathematics and Engineering and to the Steering Committee of BIG Math Network.

Burt Tilley, professor of mathematical sciences, was appointed a National Research Council Research Associate of the Air Force Research Laboratory, Kirtland AFB.

BRINGING A&S RESEARCH TO THE NEXT LEVEL

A&S Faculty Receive NSF CAREER Awards

Kun-Ta Wu, assistant professor of physics, received a **$520,895 NSF CAREER Award** to characterize and model how tiny amounts of "active" fluids move and flow while mixing together on their own. His project could have implications for the miniaturization of industrial processes and greater efficiency in fields such as chemical, biological, and pharmaceutical engineering. Wu will collaborate with researchers at Brown University, Michigan State University, Brandeis University, and National Cheng Kung University in Taiwan.

Yanhua Li, associate professor of computer science, received a **$529,537 NSF CAREER Award** to develop, implement, and evaluate a unified framework to learn the decision-making strategies of human agents from their generated mobility data. Understanding and incorporating human decision-making strategies will bring significant benefits to the growing gig-worker population and transportation marketplace.

Jacob Whitehill, assistant professor of computer science, received a **$691,980 NSF CAREER Award** to develop new scientific instruments for classroom observation using a multi-modal machine learning approach. This project seeks to harness artificial intelligence to improve the quality of classroom teaching and the precision of educational research through new methods of observing the interpersonal dynamics between teachers, students, and their peers.

Other Major Research Grants

The School of Arts & Sciences had nearly $14.6 million in research expenditures in FY 21 (40% of all research expenditures at WPI).

Shawn Burdette, Christopher Lambert. National Science Foundation, "Targeted Zinc Photocages for Studying Biological Signaling," **$451,687**.

Tanja Dominko, Glenn Gaudette. New Harvest, Inc., "Scaling the Production of In Vitro Bovine, Avian, and Fish Meat Using Edible Scaffolds in Suspension Reactor Systems," **$136,068.**

Laureen Elgert, Yunus Telliel. New Venture Fund, "Supporting and Showcasing PIT: Building Community Through Signature Projects," **$180,000.**

John Galante, Laureen Elgert, Angel Rivera, William San Martin, Aarti Madan. Department of Education, "Enhancing STEM Curriculum with Latin American and Caribbean Studies," **$198,281.**

Tian Guo. National Science Foundation, "Collaborative Research: NGSDI: CarbonFirst: A Sustainable and Reliable Carbon Centric Cloud-Edge Software Infrastructure," **$193,963.**

Yanhua Li. Carnegie Mellon- National Science Foundation, "SCC-IRG Track 1: Empowering and Enhancing Workers Through Building a Community-Centered Gig Economy," **$265,989.**

David Medich, Germano Iannacchione, Izabela Stroe, Snehalata Kadam, Blake Currier. Nuclear Regulatory Commission, "WPI Nuclear Science and Engineering (NSE) Faculty Development Program," **$450,000.**

Patricia Musacchio. Pfizer Inc., U.S. Pharmaceutical Group, "A New Strategy for Mild Hydroxylation and Fluorination of Aliphatic Csp3-H Bonds and Its Application to Lead Diversification," **$126,000.**

Sarah Olson, Amity Manning. National Institutes of Health/NIH/DHHS, "Modeling of Dynamics of Spindle Behavior in Cells with Supernumerary Centrosomes," **$916,956.**

Erin Ottmar, Gillian Smith. University of Massachusetts Amherst, "Developing Computational Thinking by Creating Multiplayer Physically Active Math Games," **$330,506.**

Randy Paffenroth. Synoptic Engineering, LLC, "Fata Morgana," **$204,874.**

Ramdas Ram-Mohan. UES, Inc., "Modeling Topological Insulators and Their Optical Properties and Phononic Crystals," **$118,313.**

Elke Rundensteiner. Department of Agriculture, "FACT: Innovative Big Data Analytics Technology for Microbiological Risk Mitigation Assuring Fresh Produce Safety," **$240,092.**

Elke Rundensteiner. National Science Foundation, "Collaborative Research: ELEMENTS: Tuning-free Anomaly Detection Service," **$259,651.**

Elke Rundensteiner, Lane Harrison. National Science Foundation, "III: Small: Fair Decision Making by Consensus; Interactive Bias Mitigation Technology," **$499,999.**

Elke Rundensteiner, Randy Paffenroth, Joseph Sarkis, Laureen Elgert, Anita Mattson, Lyubov Titova, Michael Timko, N. Deskins , Yanhua Li. National Science Foundation, "NRT- HDR: Data-Driven Sustainable Engineering for a Circular Economy," **$2,999,289.**

Adam Sales. Institute of Education Sciences/Department of Education, "Fully Latent Principal Stratification: A New Framework for Big, Complex, Implementation Data from Education RCTs," **$397,667.**

Scarlet Shell. Weill Medical College of Cornell University-(National Institutes of Health/NIH/DHHS), "Defining the RNA processing and degradation pathways of Mtb," **$134,707.**

Scarlet Shell, Joshua Kellogg, Pamela Weathers. National Institutes of Health/NIH/DHHS, "The mechanistic basis of Artemisia annua activity against Mycobacterium," **$434,787.**

Craig Shue, Lorenzo DeCarli, Robert Walls, Craig Wills. National Science Foundation, "CyberCorps SFS Renewal: Supporting the Federal Government Workforce," **$4,836,782.**

Lyubov Titova. Department of the Army, "Fundamental Study of the Charge Carrier Dynamics of Novel 2D MXenes Using Terahertz Spectroscopy: Insight Towards Electromagnetic Shielding Applications," **$270,000.**

Lyubov Titova, Jeannine Coburn, Winston Soboyejo, Ronald Grimm, Douglas Petkie, Christopher Lambert. National Science Foundation, "MRI: Acquisition of a Time-Resolved Spectrometer Spanning UV to THz Spectral Range for Investigations in Photonics, Energy, and Therapeutics," **$568,262.**

Fangfang Wang. National Aeronautics & Space Administration, "Valid Time-series Analyses of Satellite Data," **$174,762.**

Jacob Whitehill. National Science Foundation, "AI Institute: Institute for Student-AI Teaming," **$691,980.**

Seyed Zekavat, Randy Paffenroth, Oleg Pavlov, Elke Rundensteiner, Douglas Petkie, Kaveh Pahlavan. National Science Foundation, "SII Planning: Broad Explorations on Spectrum Technologies for Navigation, Environment, Surveillance, and Transportation (BEST NEST)," **$300,000.**

STUDENT ACHIEVEMENTS

A&S Student Achievements and Contributions

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

Olivia Atkins '23
biology &
biotechnology

Advisor:
Scarlet Shell, assistant professor of
biology & biotechnology

Eugena Choi '23
environmental &
sustainability studies and
environmental engineering

Advisor:
William San Martin, assistant teaching
professor of humanities & arts

Elizabeth Koptsev '22
psychological
science

Advisor:
Angela Rodriguez, assistant
professor of social science
& policy studies

Brock Jolicoeur '22
physics

Advisor:
David Medich, associate
professor of physics

Michelle Pan '22,
biology &
biotechnology

Advisor:
Inna Nechipurenko, assistant
professor of biology & biotechnology

Mohammed Mohammed, '22
chemistry and
international studies

Advisor:
Crystal Brown, assistant professor
of social science & policy studies

AND CONTRIBUTIONS

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 **Victoria Mirecki '22**, who is working on the "Code Crafters" project investigating the use of procedural generation and generative design for teaching computational thinking to adult women who design and make quilts (advisor Gillian Smith) and **Katie Houskeeper '23** whose project is "Machine Learning for Mental Health Screening" (advisor Elke Rundensteiner).

WPI Presidential Fellowship

The WPI Presidential Fellowship launches the PhD career of highly talented WPI students. **Kiara Sanchez**, Presidential Fellow, is a PhD student in mathematical sciences.

Other Fellowships

- **Dayna Mercadante**, PhD candidate, bioinformatics & computational biology, NSF Graduate Research Fellowship Program.

- **Avery Harrison**, PhD candidate, learning sciences & technologies, NSF Graduate Research Fellowship Program.

- **Michael Yereniuk**, PhD student, mathematical sciences, SMART (Science, Mathematics, and Research for Transformation Scholarship-for-Service Program) fellowship, sponsored by the TRAC-White Sand Missile Range (WSMR).

- **Alicia Howell-Munson**, PhD student, bioinformatics & computational biology, Alden Fellowship.

ARTS & SCIENCES STUDENT ADVISORY COUNCILS

The A&S student advisory councils advise the dean on initiatives that have a direct impact on students including those that increase the visibility of the Arts & Sciences at WPI.

2020-21 A&S UNDERGRADUATE ADVISORY COUNCIL

Members of the 2020-21 A&S Undergraduate Student Advisory Council

2021-22 A&S UNDERGRADUATE ADVISORY COUNCIL

Sarah Doherty
biology & biotechnology

Sophia Marcus
interactive media & game development

Justin Moy
bioinformatics & computational biology

Ally Salvino
mathematical sciences

Catherine Reynolds
chemistry & biochemistry

Laura Staugler
mathematical sciences

Ashley Schuliger
computer science

Morgan Kaler
physics

Robbie Oleynick
humanities & arts

Jada Hinds-Williams
social science & policy studies

2020-21 A&S GRADUATE ADVISORY COUNCIL

Members of the 2020-21 A&S Graduate Student Advisory Council

2021-22 A&S GRADUATE ADVISORY COUNCIL

Sabine Hahn
biology & biotechnology

Karen Royer
interactive media & game development

Androniqi Qifti
chemistry & biochemistry

Avery Harrison
learning sciences & technologies

Samuel S. Ogden
computer science

Elisa Negrini
mathematical sciences

Geri Dimas
data science

Riugi Sato
mathematical sciences

Tom Hartvigsen
data science

Teagan Bate
physics

Leo Bunyea '19
interactive media & game development

Abhishek N. Kulkarni
robotics engineering

Shano Liang (Hongyuan Liang)
interactive media & game development

Kristophe Zephyrin
social science & policy studies

WHO WE ARE

DEAN'S OFFICE

Jean King
DEAN OF ARTS & SCIENCES

Carolina Ruiz
ASSOCIATE DEAN OF ARTS & SCIENCES

Rebecca Ouellette
DIRECTOR OF OPERATIONS

Patricia Bergmann
SENIOR EXECUTIVE ADMINISTRATOR

Pamela Paskalis
ADMINISTRATIVE ASSISTANT

DID YOU KNOW?

The School of Arts & Sciences hosts two A&S Weeks each year—
to highlight the arts in the fall and the sciences in the spring.

#14

Best Science Lab Facilities
The Princeton Review (2019)

DEPARTMENT HEADS

Rob Krueger
SOCIAL SCIENCE
& POLICY STUDIES

Anita Mattson
CHEMISTRY &
BIOCHEMISTRY

Kathryn Moncrief
HUMANITIES
& ARTS

Sarah Olson
MATHEMATICAL
SCIENCES

Douglas Petkie
PHYSICS

Reeta Rao
BIOLOGY &
BIOTECHNOLOGY

Craig Wills
COMPUTER
SCIENCE

Jing Xiao
ROBOTICS
ENGINEERING

Dean King with current and past A&S department heads

PROGRAM DIRECTORS

Peter Hansen
INTERNATIONAL &
GLOBAL STUDIES

Neil Heffernan
LEARNING SCIENCES
& TECHNOLOGIES

Dmitry Korkin
BIOINFORMATICS &
COMPUTATIONAL BIOLOGY

Ryan Madan
WRITING
CENTER

Michael Radzicki
SYSTEM
DYNAMICS

Sarah Riddick
PROFESSIONAL
WRITING

Elke Rundensteiner
DATA
SCIENCE

Jeanine Skorinko
PSYCHOLOGICAL
SCIENCE

Gillian Smith
INTERACTIVE MEDIA &
GAME DEVELOPMENT

WPI NAMES NEW GLOBAL SCHOOL DEAN

Following an international search, **Mimi Sheller, PhD,** was named the inaugural dean of The Global School. Sheller comes to WPI from Drexel University where she was head of the Department of Sociology and an internationally recognized scholar who co-founded the interdisciplinary field of mobilities research. The Global School, launched in 2020, serves as a platform for academic and research programs and global partnerships aimed at meeting a host of pressing global challenges, and was designed to forge linkages with WPI's other schools, including the School of Arts & Sciences.

Transitions

Several A&S leaders completed their terms over the past year including **Luca Capogna**, department head of mathematical sciences; **Jennifer deWinter**, director of the IMGD program; **Joseph Duffy**, department head of biology & biotechnology; and **Arne Gericke**, department head of chemistry & biochemistry. WPI thanks them for their many years of service and dedication to ensuring the growth and success of their academic departments.

Dean Jean King with outgoing department heads Arne Gericke (chemistry & biochemistry) and Joseph Duffy (biology & biotechnology)

Jennifer deWinter

Luca Capogna

A&S WELCOMES

Professor **Rob Krueger** has been appointed interim head of the Department of Social Science & Policy Studies. Krueger has been at WPI for nearly 20 years where he has directed the Worcester Community Project Center, developed WPI's first Bachelor of Arts degree (Environmental Studies), and founded project centers in Ghana and Worcester, UK. He facilitated the development of WPI's Institute of Science & Technology for Development (InSTeD) and shepherded WPI's first new Master of Science degree, Science & Technology for Innovation in Global Development.

Professor **Sarah Olson** has been appointed interim head of the Department of Mathematical Sciences, and is the first woman to lead the department in WPI's 156-year history. Olson, who joined WPI in 2011, received a coveted NSF CAREER Award in 2015 to develop several computational modeling frameworks to simulate and study sperm motility to aid in fertility treatments and has received other funding to develop algorithms that can simulate the movement of cells and to develop computational models for cancer research.

Professor **Reeta Rao** has been appointed interim head of the Department of Biology & Biotechnology. Rao, who joined WPI in 2004, conducts research on emerging infectious diseases, with a focus on the understanding and management of fungal diseases. She is a fellow of the American Academy of Microbiology and a recipient of the Waksman Outstanding Teacher Award from the Society of Industrial Microbiology and Biotechnology.

NEW LEADERS

Professor **Anita Mattson** has been appointed interim head of the Department of Chemistry & Biochemistry. Mattson, who came to WPI in 2016, is an organic synthetic chemist with a strong medicinal chemistry component in her research. She has completed groundbreaking work on catalysts to produce dimeric chomanones—a class of naturally occurring compounds that hold strong biomedical potential.

Gillian Smith, professor of computer science, has been appointed director of the Interactive Media & Game Development (IMGD) Program. An award-winning game designer, Smith's research interests are in computational creativity, game design, computer science education, and the intersection of traditional crafts and computation.

Carolina Ruiz, professor of computer science, has been named associate dean of the School of Arts & Sciences. Ruiz's research interests are in machine learning, artificial intelligence, and data mining. She is a founder and core member of WPI's bioinformatics & computational biology program, the data science program, and the neuroscience program. As associate dean, Ruiz leads existing and new student-related initiatives including new pathways and partnerships with other universities.

NEW A&S FACULTY JOIN WPI

2020-2021 New Full-Time Faculty

Francesca Bernardi
ASSISTANT PROFESSOR,
MATHEMATICAL SCIENCES

Areas of interest:
small-scale fluid mechanics and microfluidics

Crystal Brown
ASSISTANT PROFESSOR,
SOCIAL SCIENCE & POLICY STUDIES

Areas of interest:
comparative politics, international relations, human rights, immigration policies, women's rights, and race/ethnicity and politics

Kelly Colvin
ASSISTANT TEACHING PROFESSOR,
HUMANITIES & ARTS

Areas of interest:
intersection of gender, culture, and politics, and how those factors impacted events and conflicts of the 20th century

Mitchell Lutch
ASSISTANT TEACHING PROFESSOR,
HUMANITIES & ARTS

Areas of interest:
music education, instrumental conducting, band direction

Doug Olsen
INSTRUCTOR/LECTURER,
HUMANITIES & ARTS

Areas of interest:
jazz studies

Guanying Peng
ASSISTANT PROFESSOR,
MATHEMATICAL SCIENCES

Areas of interest:
partial differential equations with a focus on applications to the sciences

DID YOU KNOW?

Since 2018, WPI's Critical Conversations Series has invited community dialogue around the tough questions posed by the world's myriad complex issues—even pivoting to Zoom presentations during the pandemic

#14

mathematical sciences major in the nation
College Factual (2020)

Dina Rassias
ASSISTANT TEACHING PROFESSOR, MATHEMATICAL SCIENCES

Areas of interest:
molecular mechanisms that drive malignancies, novel drug delivery, and treatment strategies for cancers

Sarah Riddick
ASSISTANT PROFESSOR, HUMANITIES & ARTS

Areas of interest:
relationship between rhetorical tradition, digital rhetoric and writing cultures, and emerging media

Adam Sales
ASSISTANT PROFESSOR, MATHEMATICAL SCIENCES

Areas of interest:
methods for causal inference using administrative or high-dimensional data, especially in education

Stacy Shaw
ASSISTANT PROFESSOR, SOCIAL SCIENCE & POLICY STUDIES

Areas of interest:
creative thinking in mathematics, mathematical cognition and reasoning, and how classroom experiences impact learning and performance

Raisa Trubko
ASSISTANT PROFESSOR, PHYSICS

Areas of interest:
experimental quantum physics, using ensembles of nitrogen-vacancy quantum defects in diamond to image magnetic fields with high spatial resolution

Barfuor Adjei-Barwuah

DISTINGUISHED STATESMAN
IN RESIDENCE,
SOCIAL SCIENCE & POLICY STUDIES

Areas of interest:
projects with a focus on
Africa and new courses on
development and evidence-
based policy

Gizem Arslan

ASSISTANT TEACHING
PROFESSOR, GERMAN

Areas of interest:
post-war literatures in German,
French and Turkish, translation
studies, migration studies,
theories of language, literary-
mathematical experiments, and
writing systems of the world

Brandon Bohrer

ASSISTANT PROFESSOR,
COMPUTER SCIENCE

Areas of interest:
making sure computers can
correctly control physical sys-
tems, including transportation
and power systems, in order to
keep their human users safe

Laura Eckelman

ASSOCIATE PROFESSOR,
THEATRICAL DESIGN
AND TECHNOLOGY

Areas of interest:
design, stage management,
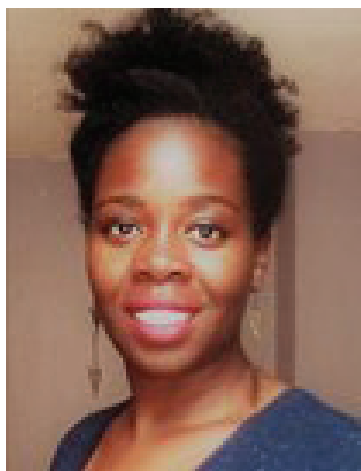production management,
arts administration

Jeanne Essame
ASSISTANT PROFESSOR OF AFRCANA STUDIES, HUMANITIES & ARTS

Areas of interest:
experience of people of African descent in the Americas with specialization in the movement of people and ideas, cultural productions, gendered experiences, and oral history

Torumoy Ghoshal
ASSISTANT TEACHING PROFESSOR, DATA SCIENCE

Areas of interest:
feature engineering, deep learning, natural language processing

Emily Gioielli
ASSISTANT TEACHING PROFESSOR, EUROPEAN HISTORY

Areas of interest:
Central and Eastern European history (especially Hungary), the history of women, gender, and sexuality, and the history of violence and regime change from a transdisciplinary perspective

Sixian Jin
POSTDOC SCHOLAR, MATHEMATICAL SCIENCES

Areas of interest:
stochastic calculus, stochastic differential equations, and related applications in quantitative finance

Abigail Koo
ASSISTANT TEACHING PROFESSOR, DIRECTOR OF ORCHESTRAL ACTIVITIES

Areas of interest:
Passionate for humanitarian work, founded two music schools, one in Cambodia and another branch in Myanmar, to help underprivileged students, continues to work with NGOs to provide relief for Cambodia and Myanmar through music education and food assistance
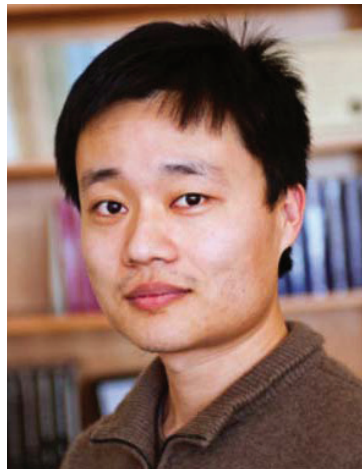
Mahamadou Lamine Sagna
ASSOCIATE PROFESSOR, SOCIAL SCIENCE & POLICY STUDIES

Areas of interest:
social meaning of exchanges and money in globalization, sociology of poverty as well as monetary and financial practices in relation to economic innovation and the dynamics of social trust and risk

Xiaozhong Liu
ASSOCIATE PROFESSOR, DATA SCIENCE

Areas of interest:
natural language processing (NLP), machine/deep learning, information retrieval and recommendation, personalization, graph mining, data heterogeneity, computational social science, information security

Lina Muñoz
ASSISTANT TEACHING PROFESSOR, HUMANITIES & ARTS

Areas of interest:
links among culture, race, mobility, and politics in Latin America, narratives and aesthetics in Latin American indigenous films and audiovisual productions in South America

Benjamin Pollard
ASSISTANT TEACHING PROFESSOR, PHYSICS

Areas of interest:
physics education research with focus on teaching and learning in laboratory courses, community building to promote diversity, equity, inclusion, and social justice in STEM

Dan Schimmel
VISITING ARTIST, HUMANITIES & ARTS

Areas of interest:
painting, contemporary art trends and intersections between art, technology, and science

Ben Schneider
PROFESSOR OF PRACTICE IN NARRATIVE DESIGN FOR GAMES, INTERACTIVE MEDIA & GAME DEVELOPMENT

Areas of interest:
narrative and storytelling in games and interactive media, procedural narrative systems, adaptation and worldbuilding, folklore and mythology
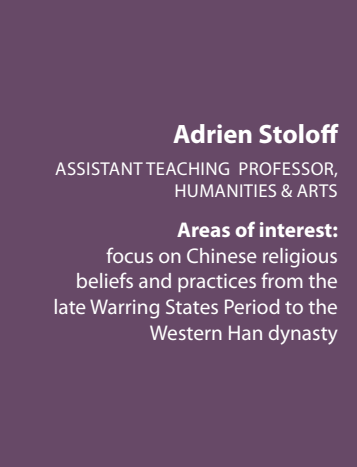
Michael Smith
ASSISTANT TEACHING PROFESSOR, MATHEMATICAL SCIENCES

Areas of interest:
geometric analysis and partial differential equations, applications of mathematics to theoretical computer science, deep learning theory

Adrien Stoloff
ASSISTANT TEACHING PROFESSOR, HUMANITIES & ARTS

Areas of interest:
focus on Chinese religious beliefs and practices from the late Warring States Period to the Western Han dynasty

Shubbhi Taneja
ASSISTANT TEACHING PROFESSOR, COMPUTER SCIENCE

Areas of interest:
energy-efficient computing and big data systems

Walter Yarbrough
PROFESSOR OF PRACTICE, INTERACTIVE MEDIA & GAME DEVELOPMENT

Areas of interest:
creating his signature Live Studio classes, partnered with industry professionals to refine and update released software at professional levels
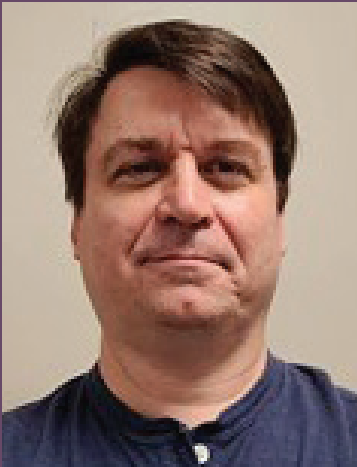
Qiao Zhuang
POSTDOCTORAL SCHOLAR, MATHEMATICAL SCIENCES

Areas of interest:
unfitted/immersed finite element methods for interface problems, including both algorithm design and error analysis
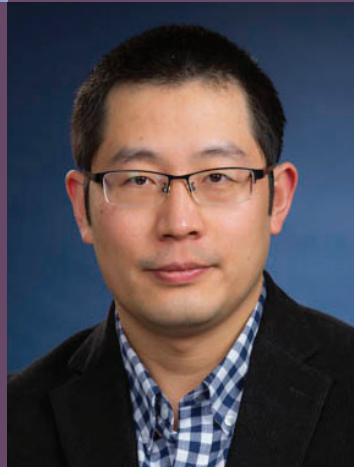
FACULTY PROMOTION & TENURE

The following faculty were promoted or received tenure in 2021.

Marcel Blais was promoted to teaching professor of mathematical sciences. Blais has been associate head of the mathematical sciences department since 2017, is the co-director of WPI's FinTech Collaborative, and serves on the board of the National Professional Science Master's Association.

Ulrike Brisson was promoted to teaching professor of humanities & arts. Brisson teaches German language, culture, and literature courses, has advised WPI project centers in Namibia and Switzerland, and directs an exchange program with the University of Applied Sciences in Konstanz, Germany.

Michael Buckholt was promoted to teaching professor of biology & biotechnology. His research focuses on the best application of technology to laboratory teaching, methods of teaching students how best to communicate, and the development of research-based courses.

Farley Chery was promoted to associate teaching professor of interactive media & game development. His research interests focus on visual technologies such as real-time rendering engines, performance capture, dynamic simulation, and Afro-futurism.

Robert Dempski was promoted to professor of chemistry & biochemistry. His research focuses on the structure and function of membrane proteins, including a zinc transporter that has been implicated in pancreatic cancer and a class of light-sensitive proteins that have been used to control neuronal cell function.

Fatemeh Emdad was promoted to teaching professor of data science. Emdad has helped develop 75 research projects for graduate students in data science since 2015, attracting corporate partners to collaborate with students.
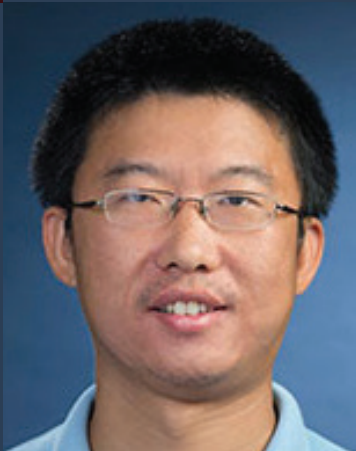
Lane Harrison was awarded tenure and promoted to associate professor of computer science. Harrison is an expert in visualization and human-computer interaction, teaching courses in data visualization and web development.

Rudra Kafle was promoted to associate teaching professor of physics. His research interests focus on theoretical studies of atom interferometers and gyroscopes with Bose-Einstein condensates, DNA biophysics, and physics education research.

Yanhua Li was awarded tenure and promoted to associate professor of computer science. Li is a data science expert who focuses his research on spatial-temporal data science and artificial intelligence with applications in smart cities.

Ingrid Matos-Nin was promoted to teaching professor of humanities & arts. A Spanish teacher, she served six years as administrator of Hispanic studies activities and in 2017 was named Faculty Advisor of the Year by WPI's Insight Program for first-year students.

Svetlana Nikitina was promoted to teaching professor of humanities & arts. She is founding director of the WPI Moscow project center and serves as a trustee of the Museum of Russian Icons in Clinton, MA.

Sarah Olson was promoted to professor of mathematical sciences. Olson focuses her research on the development of novel computational methods, fluid dynamic issues in biology, and models that bring together mechanics and chemical regulatory mechanisms.

Randy Paffenroth, an associate professor of mathematical sciences, was awarded tenure. His research focuses on deep learning, signal processing, compressed sensing, and the interaction between mathematics, computer science, and software engineering.

Buddika Peiris was promoted to associate teaching professor of mathematical sciences. His research focuses on developing new statistical methodologies and their applications in restricted interference, meta-analysis, and Bayesian computations.

Joshua Rosenstock was promoted to professor of humanities & arts. One of the university's first art instructors, his artwork has been exhibited at the Harvard Museum of Natural History, the Peabody Essex Museum, the Santa Fe International Biennial, and the Cabaret Voltaire.

Elizabeth Ryder was promoted to professor of biology & biotechnology. Ryder's most recent research has focused on science education as well as computational modeling of biological systems.

Scarlet Shell was awarded tenure and promoted to associate professor of biology & biotechnology. Her research uses genetics, genomics, transcriptomics, and biochemistry to investigate how bacteria survive stressful conditions, with a focus on tuberculosis.

Gbetonmasse Somasse was promoted to associate teaching professor of social science & policy studies. Somasse's research focuses on public policy, development, and impact evaluation, with an interest in education, technology, environment, inequality, and Africa.
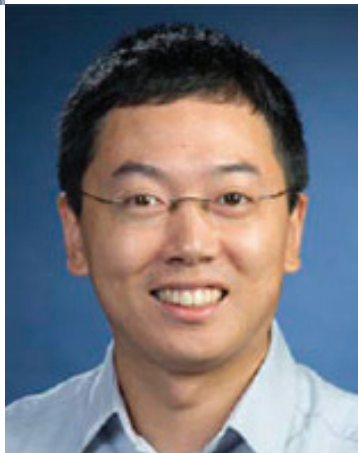
Burt Tilley was promoted to professor of mathematical sciences. Tilley's research focuses on the development or implementation of models in fluid dynamics, porous media flows, electromagnetic energy, and the collection and storage of geothermal energy.

Darko Volkov was promoted to professor of mathematical sciences. His research focuses on integral equations and inverse problems in partial differential equations, with applications in computational electromagnetic theory and seismology.

Gu Wang was awarded tenure and promoted to associate professor of mathematical sciences. His research focuses on building probabilistic models of the behavior of financial market participants and developing theories about those behaviors.

Zheyang Wu was promoted to professor of mathematical sciences. Wu is a biostatistician who has produced research on theoretical statistics and statistical genetics and genomics.

ARTS & SCIENCES ADVISORY BOARD

WPI's Arts & Sciences Advisory Board advises and assists the dean in continually 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.

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

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Kimberly Warren, Portfolio Director, MITRE

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

" Who we are as human beings are the fundamental and foundational skills that the arts, humanities, and social sciences and policy studies bring to us—the basic tenets of being human: critical thinking, creativity, communication, curiosity. "

Jean King

100%

of undergraduates complete the equivalent of a minor in Humanities & Arts

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