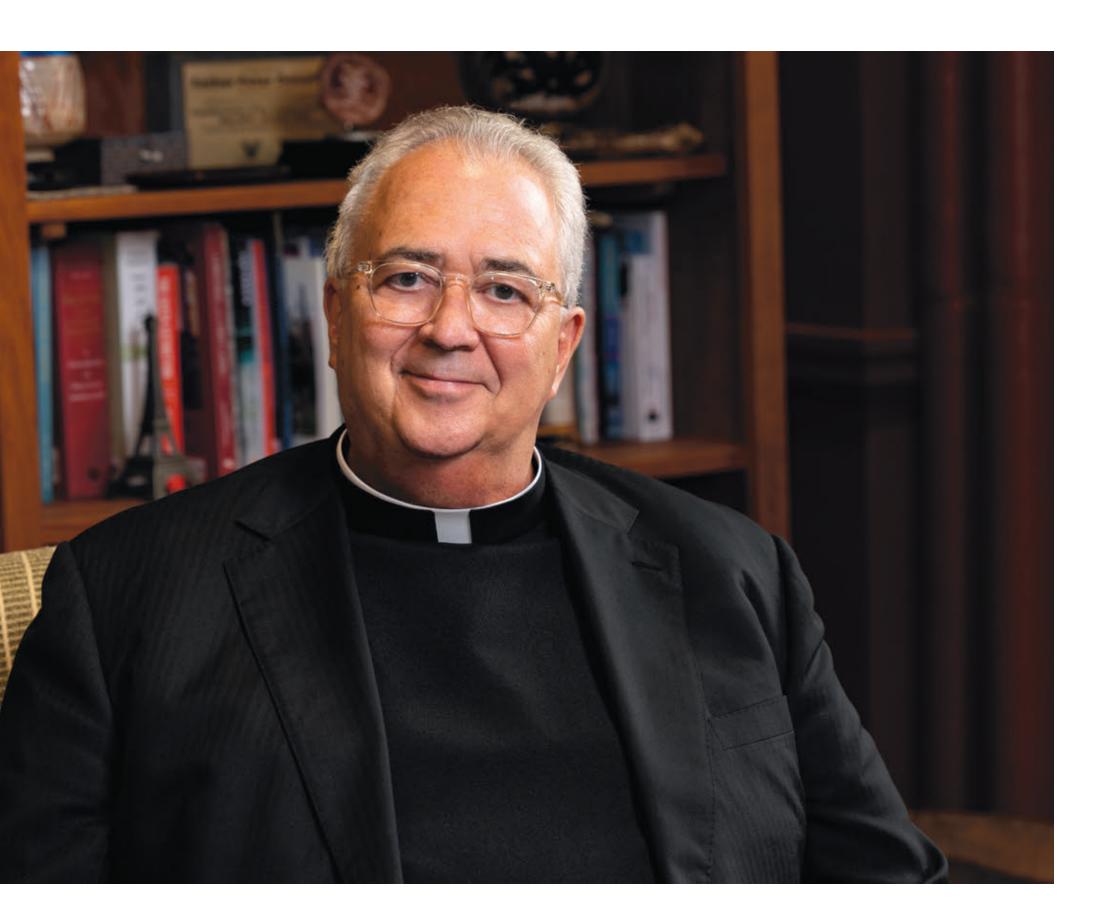
SCHOLARSHIP INOVATION

PRESIDENT'S REPORT 2021-22

VILLANOVA UNIVERSITY



Dear Friends,

Villanova's exceptional faculty members are the cornerstone of our vibrant academic community. They are leading researchers, celebrated experts, trusted thought leaders and, above all, skilled teacher-scholars who have a profound impact on the lives of Villanova's students.

Here, the collaborative pursuit of knowledge and the application of important discoveries are designed to better our world, while simultaneously providing partnerships for faculty and students to participate in groundbreaking innovations.

In this *President's Report*, we celebrate the scholarly work of our faculty, with representatives from each of our six schools and colleges. They highlight the excellence that distinguishes Villanova and roots us in the Augustinian Catholic intellectual tradition.

These professors—some who are early in their careers and some whose work spans decades—are advancing knowledge both in their fields and for the common good. They draw on their insights, expertise and passions to provide cutting-edge educational experiences for our students, and they share their incredible work to the benefit of communities both nearby and around the world.

We are fortunate to have many such remarkable and committed faculty who call Villanova their academic home, and whose scholarship, discoveries and innovations have such impact. They are truly igniting change that reverberates well beyond our campus.

Sincerely,

The Rev. Peter M. Donohue, OSA, PhD, '75

Peter Worker an

President



Sylvie Lorente, PhD

Associate Dean for Research and Innovation and College of Engineering Chair Professor in Mechanical Engineering

A globally renowned authority in thermal engineering, Sylvie Lorente, PhD, has the distinction of being among the top 2 percent of most-cited scientists worldwide.

A sought-after scholar and speaker, she has earned numerous international accolades, including her appointment in 2022 to the governing body of the European Research Council by the European Commission and her election in 2019 to the prestigious Academia Europaea—an association of European scientists and scholars whose members include 80 Nobel laureates.

Much of Dr. Lorente's research and scholarship is steeped in a relatively new fundamental law of physics known as constructal law. At its core, constructal law describes and predicts how a flow system, whether it is animate or inanimate—people, rivers, trees, machines, even financial structures—adapts or evolves over time. An early adopter of constructal law, Dr. Lorente says, "Once we start thinking in terms of how natural flow systems morph and evolve, we can start imagining how to configure man-made designs more efficiently."

She notes that constructal law principles could be used to improve just about anything, from the flow of goods in a supply chain to better management of thermal structures and enhanced platforms for the dissemination of knowledge. Dr. Lorente joined Villanova in 2019 as College of Engineering Chair Professor in the Department of Mechanical Engineering and became associate dean for Research and Innovation in 2021.

She's excited to continue to find new avenues for her work at Villanova, engaging students in her Constructal Theory and Design class to view flow architectures as a way to better engineering. "This is the beauty of being a scholar and a teacher—you're able to be creative and explore novel problems and new ways of solving them," she says. "We're discovering new applications for constructal law all the time, and it's just amazing."

REAL-WORLD IMPACT

The Physics of Healing

For most of her career, Dr. Lorente has helped develop the potential of constructal law in a range of fields, from electronics cooling systems to thermal engineering to medicine. Recently, she was part of an international team that studied the blood vessel network of the liver.

When surgeons perform a liver transplant, Dr. Lorente notes, they rely on their experience and surgical skill to reconstruct the connections between the body's existing blood vessel network and the new liver. "There hasn't been any established theory for how this system works, so surgeons draw on what they know," she says.

The team discovered that the liver's circulatory system is a combination of superimposed tree-shaped networks and a porous system that has evolved in accordance with constructal law to facilitate blood flow in and out. By better understanding all the ways that the different branches of the liver's blood flow system interact, surgeons can re-form those networks in ways that facilitate a healthier, longer-lasting transplant.

James Ijames, MFA

Associate Professor of Theatre

Earlier this year, James Ijames (pronounced Imes) cemented his status as a defining playwright in American theater when he received the 2022 Pulitzer Prize for Drama for his most recent play, Fat Ham—a modern take on Shakespeare's Hamlet. He joins the ranks of legends like Eugene O'Neill, Tennessee Williams, Arthur Miller, Neil Simon, Wendy Wasserstein and Lin-Manuel Miranda in attaining this coveted distinction, the highest national honor in literary achievement.

It was a watershed moment for the prolific playwright, director and educator, whose works have been produced nationally to critical acclaim. Writing plays since age 14, Professor Ijames first rose to prominence in the Philadelphia performing arts scene in 2011 when he was named the recipient of the F. Otto Haas Award, given to an emerging theater artist. Since that time, the list of distinctions and prizes has been long and extensive, including four Barrymore Awards, two each for acting and directing; a 2019 Kesselring Prize for his play *Kill Move Paradise*; the 2015 Pew Fellowship for Playwriting; and the 2015 Terrence McNally New Play Award for his witty and provocative *White*.

Professor Ijames' plays take on big, complicated issues dissecting race, gender and class differences in American society with humor that keeps audiences engaged. "I'm interested in disturbing the canon," explains Professor Ijames. "I'm often looking at things from the past, whether it's a play like *Hamlet* or an event from history, and saying 'What about this is useful now?""

With the Pulitzer Prize comes an even wider interest in Professor Ijames' past plays, several of which are being staged in major cities like Philadelphia, Chicago and New York. He has also had a number of new works commissioned and is excited to bring those to audiences, along with continuing to teach the next generation of theatre professionals at Villanova. "It's just in my DNA to want to educate people and try to pull out their untapped potential," says Professor Ijames. "I come from a family of educators and teaching will always be a major part of my life."

REAL-WORLD IMPACT

Playwriting With Purpose

Universally lauded by critics for taking Shakespeare's most famous and beloved tragedy and removing the tragedy, Professor Ijames' most recent play, *Fat Ham*, was described by the Pulitzer Committee as "a funny, poignant play that deftly transposes *Hamlet* to a family barbecue in the American South to grapple with questions of identity, kinship, responsibility and honesty."

Performed live at New York City's Public Theater in collaboration with the National Black Theater this past spring, *Fat Ham* had its world premiere during the COVID-19 pandemic as a digital production in 2021. It was originally mounted by The Wilma Theater in Philadelphia, where Professor Ijames is a co-artistic director.

In its review, *The New York Times* praised *Fat Ham* for refusing "the tropes of Black suffering even as it engages the seriousness of Shakespeare. It is the rare takeoff that actually takes off—and then flies in its own smart direction."

"I hope when audiences see my work that they are challenged," Professor Ijames says. "I hope they reconsider—I want people to feel like they need to talk to somebody about what they just watched."



Christine Speidel, JD

Associate Professor of Law and Director of the Federal Tax Clinic

Recognized as one of the country's top tax attorneys, Christine Speidel, JD, was elected in June as a Fellow of the American College of Tax Counsel. She is among this elite group of leaders who promote sound tax policy and engage in thoughtful discussion with the government about matters affecting the tax system.

A respected thought leader on poverty, law and tax, Professor Speidel is a frequent speaker and panelist for the American Bar Association (ABA) and a widely published scholarly author who is often cited by national news media, including *The New York Times*, *Bloomberg* and *Law360*. She is also the co-editor of the ABA's two-volume practice manual *Effectively Representing Your Client Before the IRS*, a widely used reference for tax professionals nationwide.

Professor Speidel always knew she wanted to serve those in need. While representing survivors of domestic violence at the start of her career, she noticed a common thread emerge: The complex tax system presented many of her clients with another burden to endure, often wielded by abusers as a tool of financial control. "My clients were intimidated by a system that seems dense and impenetrable," she explains. "They had strong cases, but without someone to help them understand and navigate the system, they were at a disadvantage."

When Professor Speidel joined the Charles Widger School of Law in 2018 as director of the Federal Tax Clinic, it gave her the opportunity to make a broader impact in this area. She and her students provide free legal representation to low-income individuals in disputes with the IRS to educate them on their rights and responsibilities and help them navigate the complexity of the tax system. She also works with the Taxpayer Advocate Service, an independent organization within the Internal Revenue Service, to identify and remedy the systemic tax problems their clients face, such as deciphering the complex language used by the IRS and knowing what documentation they need to submit to prove a case.

"There is a lot of frustration and sometimes serious hardship happening—people call us in pretty desperate straits," says Professor Speidel. "By amplifying the voices of low-income taxpayers and bringing their concerns to the attention of policymakers, I hope to mitigate the barriers they face and improve the system overall."

REAL-WORLD IMPACT

The Power of the Pen

Professor Speidel recently co-authored an amicus brief to the US Tax Court regarding the interpretation of a recent tax law change for innocent spouse petitions. She is currently working on a scholarly article on the same topic, arguing that the change should be urgently reconsidered or mitigated by the IRS to prevent devastating consequences for thousands of taxpayers across the US.

As stipulated by the Internal Revenue Code, these petitions allow an "innocent spouse" to seek relief from a tax obligation that is actually the responsibility of their current or former spouse. Professor Speidel and students working in Villanova Law's Federal Tax Clinic have won a significant number of innocent spouse cases in the Tax Court—but the new evidence limitations imposed by the Taxpayer First Act of 2019 could hamper the success of future cases.

"Taxpayers who deserve relief under the law will be burdened with this crushing financial obligation," says Professor Speidel. "I'm writing about this problem, and I hope Congress or the IRS will take action so that people have a realistic chance of successfully presenting their cases."



Stephen Strader, PhD

Associate Professor of Geography and the Environment and Geography Program Director

A hazards geographer, meteorologist and geographic information systems analyst, Stephen Strader, PhD, is a trusted research partner and go-to authority for federal agencies, international scientific and professional organizations and national media outlets.

He takes an interdisciplinary approach to understanding extreme weather and its societal impact, frequently collaborating with teams of meteorologists, emergency managers, engineers and social scientists. He employs techniques that span the social and physical sciences—from qualitative, survey-based research to remote sensing and the use of GIS data in advanced weather modeling.

The pivotal moment that led Dr. Strader to this robust career in research came in 2005, when a tornado with winds exceeding 158 mph swept through a mobile home park in his hometown of Evansville, Ind., destroying hundreds of homes and taking dozens of lives. In the 17 years since, Dr. Strader has been dedicated to exploring and improving the societal implications of extreme weather in a changing climate.

"One side of the coin is the science behind severe weather, which has connections to climate change, and the other is what's happening in our built environment," says Dr. Strader, associate professor of Geography and the Environment and Geography Program director. "Expanding cities with single-family homes, townhomes, apartments and condos creates more targets that can be hit by hail, tornadoes and flooding and puts more people in the path of destruction."

Since arriving at Villanova, Dr. Strader has been awarded numerous federally funded research grants and published 15 papers in highly respected peer-reviewed journals. He is a sought-after speaker at national conferences for scientific groups and federal agencies, such as the American Meteorological Society and the American Association of Geographers, and he has provided expert commentary, often in the wake of catastrophic storms, to numerous national media outlets, including *The New York Times*, FOX Weather, CNN, NPR and *USA Today*.

REAL-WORLD IMPACT

Preparing for the Storm

Extreme weather events have taken the lives of nearly 1,000 Americans and caused roughly \$150 billion in damages in the US in the last year alone. Dr. Strader works to supply government and industry stakeholders, policymakers and the public with the information necessary to mitigate this costly and deadly problem and build resilience in the face of rapid environmental and societal change.

As the principal investigator of a study funded by the National Oceanic and Atmospheric Administration, Dr. Strader researched the impact of tornadoes on mobile homes and how to reduce vulnerabilities and improve emergency response for mobile home residents in the Southeastern US, where these storms are especially frequent and deadly. The research provides insights into many factors that aim to improve safety during storms, including changes to manufacturing and building codes for mobile homes, land-planning policies and improved access to emergency shelters.

Dr. Strader has published these findings in several peer-reviewed journals and has presented at workshops around the US to improve preparedness for increasingly volatile weather conditions. That included serving on a National Weather Service integrated warning team in Alabama, where he shared this knowledge with federal, state and local emergency management agencies with the goal of reducing weather-related fatalities, injuries and property loss.



Corinne Post, PhD

Fred J. Springer Endowed Chair in Business Leadership and Professor of Management

Corinne Post, PhD, has spent more than two decades of her career carving a niche in research on workplace diversity. A prominent scholar and thought leader in the field, she's shared her work in cities across the globe as a presenter at internationally renowned academic management conferences and professional organizations.

Her research has far-reaching impact for academic and general audiences alike—appearing in leading scholarly journals like the *Academy of Management Journal, Organization Science*, the *Journal of Applied Psychology* and the *Journal of Business Ethics,* as well as in media outlets including *Financial Times, The Washington Post, The Wall Street Journal, Forbes* and BBC News.

In May, Dr. Post received the 2022 Sage Award for Scholarly Contributions from the Academy of Management's division of Gender and Diversity in Organizations. Recognizing her lifetime body of work, the award honored the enduring contributions she has made in advancing knowledge on gender and diversity and the significance of her work in impacting the direction of future research in this area.

"Adding diversity to a team is not just some pixie dust that you throw into the mix, and then the magic happens," says Dr. Post, the Fred J. Springer

Endowed Chair in Business Leadership and professor of Management at the Villanova School of Business. "I'm interested in the specific conditions that enable diversity in organizations to lead to higher innovation and performance or prevent it."

Dr. Post's research addresses questions related to diversity and diversity management, with a focus on women in leadership roles, on top management teams and on organizational boards. She also examines how gender, race and ethnicity impact individual work experiences and career trajectories. Her work explores the dynamics that emerge in teams and organizations that are diverse in nature—with an emphasis on how those dynamics shape the innovativeness and performance of the group as a whole.

"The evidence is not always neat and tidy—there's much more nuance to it," she says. "It's important to understand that nuance and how it fits into the bigger picture so that we can identify the conditions that need to be in place to produce positive outcomes on teams."

REAL-WORLD IMPACT

Executive-Level Findings

"What changes after women enter top management teams?" Dr. Post answered that very question as lead author of a paper by that title in the February 2022 issue of the international Academy of Management Journal.

She and her colleagues found that as women joined a top management team, executives were more willing to invest in developing innovation and were less likely to take big risks on mergers and acquisition deals. They arrived at these conclusions after analyzing 13 years of data collected from 163 multinational companies in a wide range of industries.

An earlier study, on the relationship between women on boards and firm financial performance, was cited in a research report by the European Parliament earlier this year. The report resulted in EU legislation this summer that requires firms listed on European stock exchanges to ensure that at least 40 percent of non-executive directors or at least 33 percent of all directors are women.



Bridgette M. (Brawner) Rice, PhD, MDiv

The Richard and Marianne Kreider Endowed Professor in Nursing for Vulnerable Populations

A lauded expert in behavioral health and intervention development, Bridgette M. (Brawner) Rice '03, PhD, MDiv, APRN, FAAN, is a nurse scientist advancing the way research is conducted in community health.

This year, Dr. Rice was selected as one of just 250 nurses in the world to be inducted as a Fellow of the American Academy of Nursing, a society that recognizes nursing's most accomplished leaders in policy, research, practice, administration and academia. Among her many honors, she recently received the Diversity and Equity Award from the International Society of Psychiatric-Mental Health Nurses for outstanding leadership in driving the development of culturally sensitive mental health services for diverse individuals, families and groups.

Dr. Rice's novel approach integrates innovative methodologies such as geographic information systems mapping and mixed methods research design—a combination of qualitative and quantitative studies. Shedding light on the role of geography in health, her work aims to promote health equity and break down the individual, social and structural drivers of health disparities.

"Because these inequities are avoidable, I use research as an advocacy tool to inform interventions as well as policies that can help improve health and reduce risk," explains Dr. Rice, who is the Richard and Marianne Kreider Endowed Professor in Nursing for Vulnerable Populations.

Using these innovative methods, Dr. Rice's work addresses multiple issues, including youth mental health service access and use, gun violence, cardiovascular disease risk among young Black men, and HIV/STI risk in youth with mental illnesses and difficulties with emotional regulation. As a community-engaged researcher, she collaborates closely with youth, faith-based institutions and policymakers.

"I am a doer and an interventionist by nature. When I see something disturbing, I want to be in a position where I can do something now to make it better," says Dr. Rice.

REAL-WORLD IMPACT

Putting Communities First

In 2021, Dr. Rice received a City of Philadelphia Community Expansion Grant to help address the local gun violence crisis through an innovative youth boxing program in North Philadelphia.

Created in partnership with Epiphany Fellowship Church, the 22nd Police District, Community Behavioral Health and Penn Nursing, the "Guns Down, Gloves Up" program invites 12- to 24-year-olds from one North Philadelphia neighborhood to meet twice a week for comprehensive sessions that include workouts, formal boxing instruction, life-skills training, tools for regulating anger and sadness, conflict resolution and more.

Bringing her unique expertise as a psychiatric-mental health advanced practice nurse and researcher,

Dr. Rice will ensure that the boxing coaches are equipped to handle the complex challenges Philadelphia's youth are facing, and that the necessary data to determine the program's impact are collected and analyzed.

Under the grant, she will be principal investigator and project lead for program evaluation.

"With this being a community-led initiative, we are able to meet youth where they are, train boxing coaches to screen for behavioral health concerns, link youth to care and help to break the cycle by tackling the drivers of gun violence from multiple angles," Dr. Rice says.



Michael F. Palladino, PMP

Faculty in Project Management Program, College of Professional Studies

Michael Palladino has established a global reputation over the last three decades as a thought leader in Agile methodology and an authority on project management. An adjunct professor with Villanova's College of Professional Studies and sought-after keynote speaker who has presented for audiences in more than three dozen countries, Professor Palladino has taught thousands of business leaders and decision-makers strategies to strengthen teamwork, increase production and optimize efficiency in projects.

"Agile principles enable high-performing teams to accelerate decision-making and increase transparency, accountability and engagement while improving employee retention," he explains. "It boils down to breaking work into smaller pieces, bringing teams together to function better and eliminating wasteful steps that don't add value."

After working for some of the top pharmaceutical corporations worldwide, including GlaxoSmithKline, Sanofi-Aventis and Pfizer, Professor Palladino was recruited by Bristol Myers Squibb in 2018 to implement the adoption of Agile practices for its more than 30,000 employees worldwide.

The Agile approach of working has been gaining momentum in a wide range of industries, but the advantages were made abundantly clear in 2020 when COVID-19 suddenly changed the way the world does business. One of the world's largest pharmaceutical companies, Bristol Myers Squibb had to adapt to a new way of working virtually overnight. "The Agile teams didn't skip a beat," says Professor Palladino. "They already had the structure and the capability needed to adapt."

As director of Enterprise Agility at Bristol Myers Squibb, Professor Palladino has the opportunity to influence drug discovery and manufacturing processes that could change millions of lives. "We're developing transformational medicines that have the potential to save lives if they can reach the market sooner," he says. "It's my mission to help teams work smarter, faster and more cost-effectively to produce higher-quality results so we can make that happen."

REAL-WORLD IMPACT

Legos as Learning Tools

What is the Agile methodology and how does it work? An expert in simplifying complex theories into more comprehensible parts, Professor Palladino has chosen quite an unexpected medium to demonstrate the answer to those questions: Legos.

During a four-hour workshop that Professor Palladino developed, participants use Agile techniques to gain hands-on learning as they simulate a start-up project by building a tropical resort using more than 10,000 Lego bricks. He's hosted the training nearly 120 times at 16 sites across Bristol Myers Squibb, with more than 1,800 employees completing it in the last three years.

This year, Professor Palladino offered the Agile Lego workshop for the first time in collaboration with the Project Management Institute, a not-for-profit professional organization with almost 700,000 members and more than 300 chapters internationally. This fall, he hosted the training exercise in Lisbon, Belfast, Birmingham and London.

"My approach to teaching and managing is to incorporate experiential knowledge so that theories can be applied immediately at work," says Professor Palladino. "Those I'm instructing, mentoring and collaborating with learn firsthand what the Agile mindset is by moving, thinking and grasping an understanding very quickly."



Vaswati Chatterjee, PhD

A rising star early in her research career, Vaswati Chatterjee, PhD, is already a highly in-demand scholar, presenter and consultant in the field of emergency management. Her dissertation work literally became textbook research—it was featured in Case Studies of Suburban Sustainability in 2020, just one year after she completed her doctorate in Public Administration and Management at the University of North Texas.

Dr. Chatterjee's study focused on how urban planning policies adopted by local governments in Florida impact a community's economic resilience in the face of natural disasters, and it earned her the Emerging Young Scholar award at the Southern Political Science Conference in 2019. "I realize how powerful academic research can be when we integrate our knowledge with real-life challenges that our cities are facing," she says.

Dr. Chatterjee, an assistant professor of Public Administration, examines local government policies in disaster planning, mitigation and response. By conducting thorough analyses of these policies and their outcomes, she is able to gather empirical evidence that can help leaders prioritize their planning efforts.

"My focus is specifically on city and local governments because they are uniquely suited to devise effective policy solutions that address some of the most pressing challenges of our society," Dr. Chatterjee says.

The Association for Pennsylvania Municipal Management—an affiliate of the world's leading association of professional city and county managers and local government employees—invited Dr. Chatterjee to present a workshop on "Leadership During Crisis" at its Executive Development Conference earlier this year. In addition

REAL-WORLD IMPACT

Lessons in Emergency Management

Over the past two years, Dr. Chatterjee and Villanova colleague Theodore Arapis, PhD, have been studying local government responses to the COVID-19 crisis in Pennsylvania and Florida.

"By identifying the significant factors that helped local governments to adopt effective comprehensive response policies, we are proposing guidelines for community leaders," Dr. Chatterjee says. Her research showed those jurisdictions that were led by professional city managers and had a pandemic preparedness plan in place were more likely to adopt comprehensive public health and socioeconomic strategies in response to COVID-19. "The importance of having plans might seem obvious, but this research provides empirical evidence demonstrating which preparedness capabilities led to a more comprehensive COVID-19 response among local governments," she explains.

This fall, she and Dr. Arapis presented their findings in Washington, D.C., at the Association for Public Policy Analysis and Management Conference, an international meeting of accomplished scholars and practitioners that attracts the highest-quality researchers on current and emerging policy and management issues.



A pioneer in black hole astrophysics, Joey Neilsen, PhD, has established himself as a foremost expert in X-ray observations of these cosmic bodies. His research has been extensively cited in the literature and featured in esteemed scientific journals, including Science, Nature, The Astrophysical Journal

Scientists are just beginning to understand the power and force of these astronomical objects—and Dr. Neilsen's work has been pivotal in expanding that knowledge base. Although black holes are invisible, astronomers can still observe them indirectly by examining the way their gravity affects stars and pulls

"I use space telescopes, primarily from NASA, to study what's happening around black holes in the universe," says Dr. Neilsen, assistant professor of Physics. "They're among the most prolific sources of energy in the universe, and as an observational astronomer, most of my work deals with collecting and

His work with NASA officially began nearly a decade ago, with some of the most prestigious fellowships in astrophysics: an Einstein Postdoctoral Fellowship at Boston University and a Hubble Postdoctoral Fellowship at the MIT Kavli Institute for Astrophysics and Space Research. His collaboration

REAL-WORLD IMPACT

Shedding Light on Dark Matters

In 2019, Dr. Neilsen was part of the international team of 200 scientists who made history by capturing the first-ever image of a black hole. A triumph of engineering, observations, data analysis and theory, their photograph marked a new era in black hole astrophysics.

As a member of the Event Horizon Telescope (EHT) Collaboration, Dr. Neilsen shared the \$3 million Breakthrough Prize—sometimes referred to as the "Oscars of Science"—in the field of fundamental physics in 2020.

And their work continues. Collaborating with EHT researchers from more than 80 institutions worldwide, Dr. Neilsen helped to produce an image of a supermassive black hole at the center of our own Milky Way galaxy earlier this year. He provided data analysis that has been critical to understanding the rapid, energetic variability of this black hole, known as Sagittarius A. The team's results appeared in a special issue of The Astrophysical Journal Letters, the premier journal for high-impact astronomical research.

"This is the first view of the closest supermassive black hole, our black hole," Dr. Neilsen says. "It's one of only two black holes whose shadow can be detected, so it's an important test of Einstein's theory of general relativity."

Benjamin Scheick, PhD

Associate Professor and Associate Chair of the Department of Finance and Real Estate

With deep expertise in commercial real estate and finance, Benjamin Scheick '03, PhD, earned a spot among the world's top 25 most productive real estate researchers in the 2021 Real Estate Academic Leadership (REAL) Rankings.

This distinction recognizes the wealth of research that he contributed over the past five years in the top three peer-reviewed real estate journals—The Journal of Real Estate Finance and Economics, Journal of Real Estate Research and Real Estate Economics. It was the second time the associate professor and associate chair of the Department of Finance and Real Estate had appeared in the REAL rankings.

Currently, Dr. Scheick is conducting research that investigates the costs and benefits of maintaining financial flexibility through innovative capital market access and the influence of geographic proximity and information access on the value of commercial real estate. "Once you start thinking about the forces that influence your built environment, the world presents interesting questions for exploration wherever you look," he says.

Dr. Scheick is particularly interested in the growing impact that technology infrastructure has on urban design and the way people think about the possible uses of leasable space. He views technology infrastructure—the fiber-optic cables, routers and switches that connect our devices—as the "highway" along which digital information travels.

"It is no longer just the physical access to traditional infrastructure like train stations, roadways and airports that makes urban space desirable—it's now access to the physical hubs of the 'information highway' that impacts demand," Dr. Scheick explains. "And that access has the potential to affect a whole range of other things, including what kinds of jobs are available in an area and nearby real estate values."

REAL-WORLD IMPACT

A Brave New Infrastructure

Dr. Scheick is currently working with colleagues from the University of Florida to illuminate the hidden ways in which technology shapes our physical environment. In their working paper "The Need for Speed: Internet Infrastructure Location and Real Asset Values," they analyzed the establishment of tech hubs known as internet exchange points (IXPs) and subsequent trends in the use of leasable space within a defined radius of each IXP

An IXP is a physical location through which internet infrastructure companies connect to exchange internet traffic. Dr. Scheick likens it to an airport for data, where information travels first before it branches off to its final destination.

They discovered that demand for office space in the immediate vicinity of an IXP shot up drastically upon its placement, and technology- and knowledge-intensive firms were willing to pay a premium for that space. Dr. Scheick's findings provide valuable insights for the commercial real estate industry: Geographic location of technical infrastructure has an extraordinary impact on the composition of and competition for adjacent commercial real estate.





Tina Agustiady

Faculty in Lean Six Sigma Program, College of Professional Studies

As an industrial performance engineer at Nestle Foods just a year out of college, Tina Agustiady used the skills and knowledge she gained from her first Lean Six Sigma certification to save the company \$400,000. Over the last decade, she has used these principles to enhance operational excellence and save millions of dollars for many other leading corporations, such as Tyco Healthcare, MetLife and Philips Healthcare.

The American Society for Quality presented Professor Agustiady, an adjunct professor and course designer of professional certification programs in Villanova's College of Professional Studies, with its Feigenbaum Medal in 2016. The award recognized the substantial ways in which she has applied her Lean Six Sigma expertise as an educator and leading practitioner in industry.

A combination of two gold-standard approaches to process improvement—Lean and Six Sigma—this methodology improves quality and efficiency in any industry by minimizing variation in processes and eliminating defects and waste. "It's about the pursuit for perfection—always striving to get better, often through small, incremental improvements that build on one another and lead to transformational changes," Professor Agustiady explains.

In 2021, she took on a new role as vice president of Learning and Development at JPMorgan Chase & Co. Leading training efforts for the multinational investment giant, she serves as an expert trainer to executive and front-line leaders and deploys Lean tools, methodologies and principles to a workforce of more than 270,000 financial-service employees.

Since joining the College of Professional Studies in 2015, Professor Agustiady has shared this knowledge and expertise with thousands of professionals in a wide range of industries. She has seen her students use Lean Six Sigma to drive significant business impact—from major manufacturing corporations and financial-service firms to the US government and nationally recognized health care facilities.

"The applications are endless," says Professor Agustiady. "It starts with knowledge transfer and building a leadership culture that empowers and encourages people to identify areas for improvement. Then you can implement the methodologies and tools to put systems in place that can transform the way you do business."

REAL-WORLD IMPACT

Textbook Knowledge

Attaining the highest designation of expertise in the field as a Certified Lean Six Sigma Master Black Belt, Professor Agustiady literally wrote the book on the subject-seven, in fact, including her most recent, Building a Sustainable Lean Culture: An Implementation Guide, which was published in July.

Design for Six Sigma: Practical Approach through Innovation, a book that she co-authored with Elizabeth Cudney, received the Crosby Medal from the American Society for Quality in recognition of its impact in advancing the application of quality methodologies and principles. It's an implementation guide for creating a Lean Culture from the ground up while gaining buy-in from key stakeholders, and it includes a full set of case studies to demonstrate real-life applications.

"I've taught people from Abbott to Boeing to Toyota to Target, as well as students in all industries at Villanova," Professor Agustiady says. "The sky's the limit with Lean Six Sigma-it has always had a strong foothold in manufacturing and engineering, but the methodology has just evolved so much that people from all sorts of industries want this training."



Pritpal Singh, PhD

Professor of Electrical and Computer Engineering

Pritpal Singh, PhD, has impacted the lives of hundreds of thousands of people in developing countries worldwide through his work as a humanitarian engineer over the past 40 years. Recognizing his innovative and meritorious contributions to advancing engineering education, the International Federation of Engineering Education Societies selected Dr. Singh to receive the prestigious 2022 Duncan Fraser Global Award for Excellence in Engineering Education.

An expert in renewable energy systems and sustainable engineering, Dr. Singh is a dynamic scholar, educator and inventor who has facilitated educational workshops on several continents, produced more than 100 conference and journal publications, and secured seven US patents.

"I've always had an interest in working with underserved communities," says Dr. Singh, professor of Electrical and Computer Engineering. An impassioned believer in using his expertise to address societal challenges, he's worked with students to develop high-impact technologies that have improved quality of life in some of the farthest reaches of the globe.

In support of this work, he's received millions of dollars in funding from federal agencies, international humanitarian aid organizations like UNICEF, nonprofits and professional organizations alike. The outcomes have been transformative—whether it's a telehealth system that improves health care for rural Nicaraguans or solar disinfection methods that expand access to clean drinking water in Ecuador.

"My goal is to build capacity by empowering local communities to address local problems," he explains. "One of the most successful ways I've found to do that is working with local educators—because they understand the needs and the culture, and they have the technical capabilities to develop and implement solutions with the local community."

To that end, he's shared his expertise through countless workshops on renewable energy and entrepreneurship to audiences ranging from professors at major US universities to local high school teachers and college educators in remote African villages. And, in spring 2023, he will expand on those efforts teaching and researching as a Fulbright Scholar in Ecuador.

Building on an established partnership he has with the university Escuela Superior Politécnica del Litoral (ESPOL), he will teach a course on the implementation and commercialization of sustainability-focused technologies as well as researching the potential of renewable energy on the neighboring Galapagos Islands.

REAL-WORLD IMPACT

The Power of Connections

Although the Galapagos Islands are one of the world's top ecological tourist destinations, the local community has faced significant challenges with limited internet connectivity, which has prevented students and educators across the four inhabited islands from accessing much-needed resources.

In 2018, Dr. Singh embarked on an ambitious project with a team of Villanova Electrical and Computer Engineering students: to develop a local intranet system that would connect all five schools on the island of San Cristobal, allowing them to access shared educational materials.

Not only did their project succeed—it evolved into the Community Education
Network, a local intranet system that connects
7,300 students from 21 schools scattered across all four inhabited islands to a wealth of free, shared resources. A collaboration with Ecuador's Ministry of Education, Ecuadorian university ESPOL and several local partners, the network launched this fall, marking a major milestone in transforming educational access for the Galapagos Islands.



Brett Frischmann, JD

Charles Widger Endowed University Professor in Law, Business and Economics

With his work appearing in prestigious scholarly publications as well as respected consumer outlets like Scientific American, Brett Frischmann, JD, is a prolific author and researcher who is leading the charge in vital and thought-provoking conversations about how communities share, develop and govern information in today's digital age.

Professor Frischmann, a respected thought leader on intellectual property and internet law, examines the consequences that come with society's increasing reliance on technology. Joining the University in 2017 as the Charles Widger Endowed University Professor in Law, Business and Economics, Professor Frischmann has focused the bulk of his research on three overlapping areas: infrastructure, knowledge commons, and the relationships between the techno-social world and humanity.

His most recent book, Re-Engineering Humanity, focuses on society's embrace of big data, predictive analytics and smart environments—and individuals' willingness to hand over personal information, privacy and control to the small group of people and companies providing and regulating that technology.

"We're on a slippery slope toward a world in which more and more of our lives, of who we are and who we can be—as individuals and collectively—is managed and governed by supposedly smart techno-social systems," Professor Frischmann says.

"Have you entered into a contract that you didn't bother reading? Of course you have; we all have," he says. "The contracts and, more importantly, the humancomputer interface through which they're presented, are designed so that there's no point in reading the fine print, much less stopping and thinking about the legal relationships you're forming or whether the third parties lurking in the background are trustworthy."

Using their interdisciplinary expertise, Professor Frischmann and co-author Evan Selinger provide a practical framework for assessing and negotiating the often intricate and hidden tradeoffs of "smart" technology.

REAL-WORLD IMPACT

A Plan for Good Governance

Each day, millions of internet users turn to Wikipedia, open source software and news reporting wire services for information. Just a few examples of knowledge commons, these types of forums provide a community where users share information, data and content-and also, increasingly require a governing framework and privacy protections.

To help address this crucial need, the National Science Foundation awarded Professor Frischmann a three-year grant in 2020 to develop the Governing Knowledge Commons research coordination network.

Utilizing the grant, Professor Frischmann and colleagues from the University of Pittsburgh and New York University are bringing together expertise from law, the social and behavioral sciences, computer science and engineering to communicate, coordinate and integrate their research and educational activities across disciplinary and organizational boundaries.

Christina R. Whitehouse, PhD

Assistant Professor of Nursing

Christina R. Whitehouse '04, '16 PhD, AGPCNP-BC, CDCES, FADCES, is esteemed nationally and internationally as a nurse scientist, adult-gerontology primary care nurse practitioner and a certified diabetes care and education specialist. Her work has improved access to care and supported patient engagement for individuals living with diabetes, especially in the geriatric population.

Publishing extensively in peer-reviewed journals and presenting at international conferences, Dr. Whitehouse, an assistant professor at the M. Louise Fitzpatrick College of Nursing, has earned numerous accolades as a practitioner, educator and scholar. She was named a 2022 Fellow of the Association of Diabetes Care and Education Specialists for her outstanding contributions to diabetes care and education through clinical practice and research. And in 2021, the National Hartford Center of Gerontological Nursing Excellence—which represents the gold standard in gerontology—recognized her leadership in the field as a Distinguished Educator in Gerontological Nursing.

With an estimated 29.2 percent of adults over the age of 65 living with diabetes, the necessity for Dr. Whitehouse's research is significant and immediate. Her work focuses on addressing the needs of older adults during transitions in care, specifically in diabetes. "Transitional care bridges the gap in helping patients get the resources—the medicine, the education, the food, the support—that they need to prevent another hospital stay," explains Dr. Whitehouse.

To better prepare those in the position to provide earlier detection, the American Diabetes Association enlisted Dr. Whitehouse to teach primary care providers about transitions in care for patients living with diabetes. More than 6,800 health care providers worldwide have registered for this online learning module since its launch in August 2022 as part of Diabetes Is Primary, a continuing education program.

"We really need to instruct providers on how to manage patients at home—that's where you get to the root of the health inequities that you can't always see inside the hospital," she says.



Partners in Promoting Local Health

In July, the Association of Diabetes Care and Education Specialists awarded Dr. Whitehouse and colleagues in the MacDonald Center for Obesity Prevention and Education at the College of Nursing a grant to provide diabetes self-management education and support to clients of Martha's Choice Marketplace in Norristown, Pa.

"My prior research showed that some patients were struggling more because of their lack of access to nutritious food, so now I'm partnering with individuals and groups from other specialties who can really help address that," says Dr. Whitehouse. "It's an interprofessional effort."

Over the course of the 12-week project, Villanova Nursing students, registered dietitian nutritionists and diabetes care and education specialists from the University will facilitate education in both English and Spanish that includes videos about diabetes as well as monthly group sessions and peer mentorship. Study participants will receive nutritious food that is consistent with dietary guidelines for diabetes from Martha's Choice, a community-based emergency food market that serves more than 6,000 food-insecure families.



Villanova Scholars on the Ascent

The Faculty Early Career Development (CAREER) Awards are the National Science Foundation's most prestigious grants for junior faculty. Selected recipients embody the role of teacher-scholars as outstanding researchers and excellent educators who integrate education and research within the context of their institutions' missions.

Nine Villanova professors have received NSF CAREER awards since 2017. The grants provide significant funding for five-year scholarly projects that are designed to build a firm foundation for a lifetime of leadership in education and research. Villanova's CAREER grant recipients are undertaking projects that have great potential to break new ground in their disciplines, and are doing so while also serving as role models for the STEM professionals of tomorrow—our students.

Villanova celebrates these remarkable teacher-scholars, and we are proud that they are carrying out this vital work as members of our community. Not only are they earning widespread acclaim for their dedication to scholarship and innovation in their field, but they are also furthering the University and our commitment to the Augustinian Catholic intellectual tradition.

Scott Dietrich, PhD Assistant Professor of Physics

Area of expertise: Nanoelectronics

NSF CAREER Project title: "Microwave Transmission Spectroscopy of Van Der Walls Materials"

"We often consider electricity as flowing like water in a pipe, but this analogy breaks down when electrons interact strongly. This so-called 'collective behavior' of electrons in a material often leads to exciting new electronic properties. This project uses microwave radiation to characterize these electronic phases. By understanding the collective behavior, new technology can be developed around it."

Jacob Elmer, PhD Associate Professor and Dicciani Endowed Professor of Chemical Engineering

Area of expertise: Gene Therapy

NSF CAREER project title: "Manipulating the Innate Immune Response to Improve Gene Therapy"

"The goal of this project is to improve gene therapy by identifying and modifying the genes involved in the immune response to foreign DNA in several cancer cell lines. Such an approach is expected to enhance gene delivery by inhibiting the target genes with both small molecule inhibitors and inhibitor proteins."

Janette Herbers, PhD Associate Professor of Psychological and Brain Sciences

Area of expertise: Homelessness and Poverty

NSF CAREER project title: "Supporting Healthy Development of Infants in Contexts of Poverty and Homelessness"

"This project will investigate developmental processes of risk and resilience among infants whose families are homeless and have very low income. The project will contribute to the limited knowledge of the well-being of homeless infants. Infants are overrepresented among children experiencing homelessness but underrepresented in the research literature."

Chengyu Li, PhD Assistant Professor of Mechanical Engineering

Area of expertise: Fluid Dynamics

NSF CAREER project title: "Odor-Guided Flapping Flight: Novel Fluid Dynamic Mechanisms of Insect Navigation"

"Insects rely on odor-guided flapping flight to mate and hunt for prey. ... Understanding how insects achieve the balance between aerodynamic performance and olfactory sensitivity is the stepping stone towards transforming this feat in engineering solutions for the navigation of miniature aerial vehicles in GPS-denied environments, with important applications for search in natural disasters, chemical leaking monitoring and drug-trafficking detection."

Megan Povelones, PhD Assistant Professor of Biology

Area of expertise: Mitochondrial Structure and Function

NSF CAREER project title: "Defining Novel Pathways for Mitochondrial Dynamics in an Early-Diverging Eukaryote"

"The shape of sub-cellular structures such as mitochondria is precisely tuned to their function, and can be readily adapted to suit different environmental conditions. Using single-celled parasites as a model system, these studies will provide insights into organelle structure-function relationships and the evolution of cellular organization."

Kristin Sample-Lord, PhD Associate Professor of Civil and Environmental Engineering

Area of expertise: Geotechnical and Geoenvironmental Engineering

NSF CAREER project title: "Coupled Phenomena Resilience and Dynamics in Bentonite Barriers"

"The research focuses on transforming how we measure, predict and educate others about the long-term performance of clay barriers used for environmental protection. ... The results will improve prediction and modeling of how contaminants escape through clay barriers over time, supporting design of resilient barrier systems and improved protection of public health and the environment."

Troy Shirangi, PhD Associate Professor of Biology

Area of expertise: Role of Genes in Instinctive Behaviors

NSF CAREER project title: "How the Dissatisfaction Nuclear Receptor Regulates Drosophila Courtship Behavior"

"The formation of a nervous system capable of integrating outside inputs, making decisions and coordinating motor outputs is critical for a healthy life. To uncover basic principles that guide this process, this project investigates how a developmental gene in fruit flies controls their reproductive behaviors and nervous system development."

Joseph Toscano, PhD Associate Professor of Psychological and Brain Sciences

Area of expertise: Speech Recognition

NSF CAREER project title: "Integrating Information Across Levels of Processing During Real-Time Spoken Language Comprehension"

"Language comprehension is central to successful communication. ...
This project will investigate how people understand spoken language in different contexts by studying brain responses to speech and developing computer models that recognize spoken words in context. The aim is to understand the ways that human listeners successfully communicate in a noisy world."

Wenging Xu, PhD Associate Professor of Civil and Environmental Engineering

Area of expertise: Environmental Interfacial Chemistry

NSF CAREER project title: "Transforming the Synergistic Interactions Between Pyrogenic Carbonaceous Matter and Sulfur Species Into Solutions for Contaminant Detoxification"

"Many halogenated pollutants are toxic and enter the environment as pesticides, surfactants and industrial chemicals. These toxic pollutants are often found in sediment where pyrogenic carbonaceous matter (PCM) and sulfide naturally coexist. My group aims to employ polymer chemistry and advanced surface characterization techniques to understand how the interaction between PCM and sulfide degrades these halogenated pollutants. The ultimate goal is to apply these naturally occurring reactions to produce engineering solutions that will effectively detoxify pollutants."

SCHOLARSHIP & INNOVATION

PRESIDENT'S REPORT 2021-22

Financial Summary 2021–2022

Over the past year, campus gradually returned to a more "normal" (i.e., pre-pandemic) level of activity, and, while the pandemic is not entirely behind us, most of the costs associated with the University's response to it have moderated significantly. Unfortunately, ongoing inflationary pressures resulting from the pandemic and from other geopolitical factors continue to impact the budget, and the "Great Resignation" has impacted our workforce.

Despite these pressures, our operating results continue to be healthy and stable, driven by a strong brand and robust undergraduate enrollment, continued growth in the endowment, and discipline in managing expenses. Our continued healthy operations, combined with the generous support of our donors, facilitate significant continued investment in campus infrastructure and in the endowment. These institutional strengths were cited by Moody's Investors Service in February 2022, when the University's credit rating was raised to Aa3, with a stable outlook. In April, Standard and Poor's affirmed our AA- credit rating and stable outlook.

For the year ended May 31, 2022, total net assets increased by \$125 million, to over \$1.9 billion, primarily as the result of fundraising, as well as income from operations. Despite volatility in the financial markets, the endowment recorded a net return of 4.0 percent for the fiscal year, which exceeded its performance benchmarks. The market value of the investment pool increased to \$1.17 billion as of May 31, 2022, after providing support to operations of over \$38 million, which represents over 7.5 percent of total operating expenses.

Ground was recently broken for the renovation and expansion of the Center for Engineering Education and Research (CEER), which represents the first major facilities project associated with the University's Strategic Plan, *Rooted. Restless.* An updated master plan for campus facilities is currently being developed to identify future major projects.

Our positioning in the higher education marketplace, stable financial position and operations, and loyal and generous donors enable us to look forward with confidence as we prepare to move the campus into the future.

Sincerely,

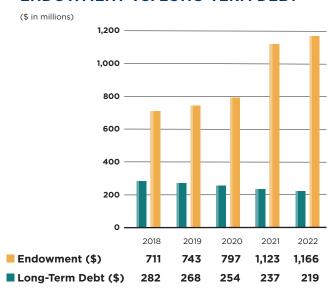
Neil J. Horgan

Vice President for Finance and Chief Financial Officer

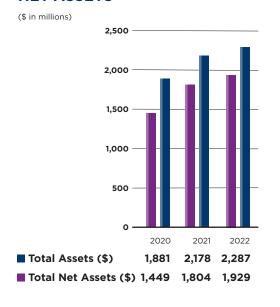
BALANCE SHEETS

(\$ in thousands)		as of May 31	
	2022	2021	2020
ASSETS			
Cash and Cash Equivalents	\$ 83,020	\$ 98,461	\$ 133,194
Investments	1,359,040	1,262,769	909,782
Accounts and Pledges Receivable, net	88,604	67,661	80,317
Other Assets	30,394	31,779	15,583
Land, Buildings and Equipment, net	726,397	717,114	741,930
Total Assets	\$2,287,455	\$2,177,784	\$1,880,806
LIABILITIES			
Accounts Payable and Accrued Expenses	\$ 77,767	\$ 69,654	\$ 53,531
Deposits and Deferred Revenue	31,060	34,706	40,695
Short-Term Lines of Credit	_	_	60,000
Long-Term Obligations	219,262	236,822	254,044
Other Liabilities	30,555	32,711	23,834
Total Liabilities	358,644	373,893	432,104
Net Assets	1,928,811	1,803,891	1,448,702
Total Liabilities and Net Assets	\$2,287,455	\$2,177,784	\$1,880,806

ENDOWMENT VS. LONG-TERM DEBT



NET ASSETS



SCHOLARSHIP & INNOVATION

UNRESTRICTED REVENUES AND EXPENSES

45,315

\$539,590

23,712

\$491,236

35,312

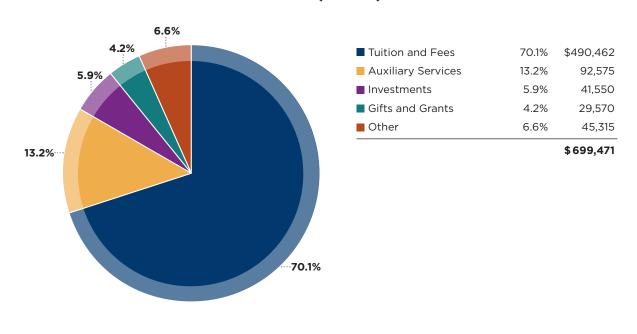
\$487,140

(\$ in thousands)	as of May 31				as of May 31			
	2022	2021	2020		2022	2021	2020	
OPERATING REVENUES				OPERATING EXPENSES				
Student-Related Revenue:				Salaries, Wages and Employee Benefits	\$ 326,258	\$ 307,660	\$ 297,543	
Student Tuition and Fees	\$490,462	\$ 480,736	\$ 461,867	Supplies, Services and Other	126,292	101,911	112,058	
Sales and Services of Auxiliary Enterprises	92,575	75,392	71,079	Depreciation	38,299	37,361	33,070	
Less: Financial Assistance	(159,882)	(153,961)	(142,523)	Interest on Indebtedness	7,598	8,319	8,849	
	\$ 423,155	\$402,167	\$390,423	Utilities	8,623	6,300	6,659	
				Total Operating Expenses	\$507,070	\$461,551	\$458,179	
Gifts and Grants	29,570	27,596	25,230	Amounts Bosses of Control Francisches				
Endowment Resources	38,150	35,527	32,171	Amounts Reserved for Capital Expenditures, Debt Principal Payments and Strategic Initiatives	\$32,520	\$29,685	\$28,961	
Investment Income	3,400	2,234	4,004		, , , , , , ,	. 3,555	,	

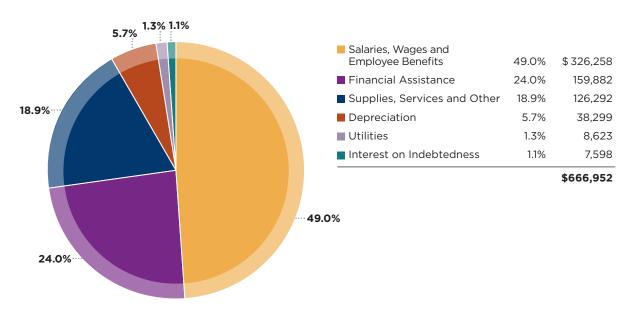
SOURCES OF OPERATING REVENUE (GROSS) 2022

Other

Total Operating Revenues



DISTRIBUTION OF EXPENSES AND CONTRA-REVENUE 2022



SCHOLARSHIP & INNOVATION
PRESIDENT'S REPORT 2021-22

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