The life of a scholar is a constant quest for knowledge, understanding, context, solutions and answers that continue to elude even the greatest minds.

The best universities nurture this culture where scholars can pursue their noble quests, grounded in passion, purpose and pragmatism. The gains from the search for creative solutions to complex problems are not limited only to those directly engaged in this pursuit, but also to society at large. We all can learn and benefit from the deeper understanding that is a by-product of this process, and from the very real solutions that emerge from it.

How can you prepare students for such a tumultuous world?
What is the power of storytelling?
What makes a great leader?
Why is it important to be a lifelong learner?
Can we save our dying oceans?
How do you give a voice to the disenfranchised?
What is permaculture and why does it matter?
How can we provide clean water for everyone on Earth?
Are we overreliant on educators to address societal ills?
What is global competency and why does it matter?
Are entrepreneurs born or made?
Is a truly equitable campus achievable?
Can a university help address the opioid epidemic?
Are we all inherently biased?
Can artificial intelligence lead to a more humane society?

Lehigh University’s Living Lives of Consequence, 2017 Annual Report was produced by the Office of Communications and Public Affairs.

Editor: Linda Harbrecht
Art Director: Kate Cassidy
Designer: Kate Cassidy
Illustrations by: Michał Bednarski
Photography by: Ryan Hulvat, Christina Novo, Stephanie Veto
Printing: Brilliant Graphics

TABLE OF CONTENTS

3 LETTER FROM THE PRESIDENT AND CHAIR OF THE BOARD
34 FINANCIAL REPORT
36 UNIVERSITY LEADERSHIP
40 LEHIGH AT A GLANCE

20 | How can you prepare students for such a tumultuous world?
22 | What is the power of storytelling?
24 | What makes a great leader?
26 | Why is it important to be a lifelong learner?
28 | Can we save our dying oceans?
30 | How do you give a voice to the disenfranchised?
32 | What is permaculture and why does it matter?
A LETTER FROM THE PRESIDENT
AND CHAIR OF THE BOARD

Our Path Forward

By any measure, 2017 was a year of great accomplishment by Lehigh students, faculty and staff and a year of progress and accelerating momentum for the university.

A new College of Health, slated to open in 2020, is advancing rapidly. A partnership with NASDAQ in California continues to bolster our strong position in entrepreneurship and innovation. An academic partnership with Ashoka University in India will enhance our international profile, building upon faculty and graduate student collaborations in 55 countries. Locally, Lehigh continues to be a catalyst for the remarkable transformation of South Bethlehem.

Three new engineering institutes in the Rossin College of Engineering and Applied Science are being established. The opening of an Autism Clinic in the College of Education will provide treatment for children and advance research into even more effective treatment and approaches. In the College of Arts and Sciences, students are working closely with world-class faculty on scholarship and research in the social sciences, arts, humanities and natural sciences.

A new fulltime one-year MBA program in the College of Business has quickly gained momentum.

Our aggressive plans to grow the number of undergraduate and graduate students is well underway, and we break ground this spring on a new 428-bed residence hall. A Lehigh education equips students to excel in a fast-changing world, and we will offer this transformative experience to an additional 1,000 undergraduate and 800 graduate students.

Fulfilling our ambitions requires first-rate facilities. As we will build, renovate and revitalize academic and research facilities, student living and learning spaces, and the evolving Mountaintop campus, we will enable our outstanding faculty to collaborate, work across disciplines and do their best work. Students will inhabit an environment that prepares them to tackle the challenges of our time and become the next generation of leaders.

This is an exciting time for Lehigh. This excitement and passion is driven by Lehigh people. In these pages, you will see people who are committed to making a difference in the world. Like so many Lehigh people, they are living lives of consequence.
Hope for Clean, Renewable Energy

Advances in supercomputing and new experimental techniques, says Arindam Banerjee, give reason to hope that nuclear fusion might soon provide clean, renewable energy. Banerjee, who collaborates with Los Alamos National Laboratory, has designed a unique test that sheds light on the hydrodynamic instabilities that limit the efficiency of fusion reactors.

A n  E ff i  c i e n c y G a i n f o r S t a t e P r i n t s

State corrections officials say an optimization model developed by Lehigh engineers has saved $2.9 million in the past year by automating the assignment of inmates to Pennsylvania’s 25 state prisons. The model could shorten prison stays by giving inmates more timely access to the treatment programs they need for parole.

Of all the needs we humans share, none is as unifying as our need for safe drinking water. The World Health Organization recognizes this: Its water quality standards for the world’s poorest people are as strict as those set by the U.S. Environmental Protection Agency.

Nonetheless, about 3.5 million people die each year because the water they drink is not safe to consume. Most of these people live in families earning less than $2 a day.

I’ve spent 35 years seeking solutions to this problem and have seen people on five continents benefit from the technologies my students and I have developed. But I believe that the improvement of water quality, and of living standards in the developing world, are as much philosophical and economic issues as a technological one. The lack of access to safe drinking water goes hand in hand with poverty. To provide clean water sustainably, we must also work to generate wealth.

Our technologies employ reusable, element-specific sorbents to remove arsenic, fluoride and other toxins from groundwater. But they cannot achieve a lasting solution unless the people we intend to help have a vested interest in the project. Thus, we work with community leaders in an effort to promote economic growth by providing affordable clean water as well as jobs with living wages to the people who oversee our systems.

Currently, more than one million people in six countries drink arsenic-free and fluoride-safe drinking water thanks to Hybrid Ion Exchange Nanotechnology (HIX-Nano) developed at Lehigh.

How can we provide clean water for everyone on Earth?

Arup K. SenGupta
Senior Professor of Environmental Engineering

Arup K. SenGupta is the P.C. Rossin Professor of civil and environmental engineering and also of chemical engineering. His nearly two dozen awards include the 2012 Intel Environmental Award for Technology Innovation Benefiting Humanity. SenGupta’s research has led to the creation of three social enterprises: the Tagore-SenGupta Foundation, Technology with a Human Face, and DrinkWell.
Are we overreliant on educators to address societal ills?

The answer is both yes and no. Yes, because after almost every social problem that makes the news or any human-made tragedy, the common refrain is usually: “It all goes back to education,” or “Education is the key.” While I agree, it also absolves us of our current responsibility to do anything about the issue at hand. Too casually, we seem to want to push the problem in the direction of education with the hope that educators and school leaders can somehow fix the problems that plague our society. In reality, this is betting on a better future down the road, while ignoring the perplexing problem before us.

The answer is part no, because it is the mission of education to help support and encourage our democratic society. For too many years, we have forced education in the direction of career readiness, when in actuality education and educators can prepare students for a greater function, the fortification and continuation of the American democratic experiment. Thus, K-12 schools and institutions of higher education have an additional mission to support democracy through information, preparation, appreciation for divergent thinking, critical evaluation, introspection and imagination.

My research has examined the historical use of education in African American communities as a pathway to liberation. Educators in these communities would prepare students academically and would also teach skills and give insight to navigate and thrive in society, which was still, in part, segregated. This same premise is still relevant today. Educators still need to provide academic preparation for career readiness, but they also need to prepare students for today’s fast-paced technological society undergirded by the American democracy. In the past, liberation meant physical freedom. Now, it is more of an intellectual liberation that leads to greater knowledge-awareness of our world and moral clarity.

Floyd Beachum
Bennett Associate Professor of Urban School Leadership

Beachum’s research interests include leadership in urban education, moral and ethical leadership, and social justice issues in K-12 schools. He is the co-author of the book School Leadership in a Diverse Society: Helping Schools Prepare All Students for Success, and co-author of the book Improving Educational Outcomes for Vulnerable Children.

Lehigh to Debut Autism Clinic
In the face of enormous need for effective treatment services for children with autism, Lehigh University is opening an Autism Clinic that will use state-of-the-art methods to help these youngsters gain language skills and improve how they interact with others. Faculty and graduate students in the university’s new Applied Behavior Analysis (ABA) program under the College of Education will provide evidence-based intervention techniques.

Little Talks, Big Impact
Patricia Manz, professor of school psychology, and her team created a “Little Talks” intervention program that supports the language development of infants and toddlers from socio-economically disadvantaged backgrounds. Little Talks fosters multiple approaches based on individual parent needs and preferences.
What is global competency and why does it matter?

We seek to educate graduates who are prepared to analyze complex global challenges, to collaborate respectfully and effectively with people from diverse backgrounds, and to take responsible local action after due consideration of contemporary global contexts.

This requires that our students are equipped with the knowledge, skills and attitudes that enable them to bring judgment and action to a rapidly changing and interconnected world.

Global competency begins with curiosity—curiosity about other cultures, histories, politics, geographies and faith. It implies an openness to discovering cultural differences and a willingness to risk and move outside one’s comfort zone in the process. It requires the ability to understand prevailing world conditions, problems, opportunities, and trends through an interdisciplinary lens in order to understand issues in their surprising complexity.

Global competency demands effective communication skills—both linguistic and intercultural—in order to engage in open, appropriate, and effective interactions with people from different backgrounds. It equips individuals to move from learning about the world to making a difference in it. They are ready to make decisions, take action, and contribute positively to their communities in ways that are purposeful, ethical and built on integrity.

Universities are measured by the global nature of the problems and opportunities their students are prepared to address. These issues transcend national borders, which is why we seek to educate graduates who are prepared to analyze complex global challenges, to collaborate respectfully and effectively with people from diverse backgrounds, and to take responsible local action after due consideration of contemporary global contexts.

This is a lifelong process—there is no one point at which an individual becomes globally competent—which brings us back to that foundational trait: curiosity. In fact, we hope that our students’ curiosity is never satisfied, but continues to grow as their competency grows.

Cheryl Matherly provides strategic leadership for numerous international education programs through the Office of International Affairs. These include study abroad, international student services, English language programs, international internships, partnership programs, Fulbright programs, UN programs and the Iacocca Institute.
Let’s ask this question: Are Olympic athletes born or made? Would Michael Phelps have won 23 Olympic gold medals if he had never had access to a pool? While he may have been born with genetics that supported athleticism and a competitive spirit, would he have won more medals than any other athlete without awareness, opportunity, training, coaching and conditioning?

At Lehigh’s Baker Institute for Entrepreneurship, Creativity & Innovation, we provide just that: awareness, opportunity, training, coaching and conditioning. Entrepreneurs, by my definition, are people who see problems as opportunities to innovate; to create solutions and make them available to those who value them. By introducing the concepts of entrepreneurial thinking, education in the art and science of entrepreneurial skills and mindset—and the opportunity to become immersed in it with a bias toward action—nascent entrepreneurs are created.

Of course, there are people who have started lemonade stand businesses at the age of six and will be serial entrepreneurs their entire lives. They too benefit from entrepreneurship education, just as athletically inclined kids need to learn the game, train their bodies and practice, practice, practice.

I have seen countless students who have been unaware they might create something of value until they are introduced to the concepts of entrepreneurship. And when given the opportunity to practice, they are empowered to use their entrepreneurial mindset in their school, career and personal lives.

There are many ways to become a successful entrepreneur. Whether you have the genetic predisposition, you must learn—either through trial and error or educational opportunities—the discipline, skills and mindset that it takes to turn your vision into a valuable reality.

Lisa Getzler
Executive Director,
Baker Institute for Entrepreneurship,
Creativity & Innovation

The Baker Institute for Entrepreneurship, Creativity & Innovation is designed to create a culture of entrepreneurship across the university, promote innovative thinking and foster the realization of entrepreneurial ideas. As executive director, Getzler is responsible for the strategy and vision of the Institute as well as its core programs: Lehigh Silicon Valley, LaunchBayC, the EUREKA! Venture Competition series and the Baker’s Dozen program.

11
Mountaintop Evolves

In Year five, 70 students participated in 14 Lehigh-funded projects that were selected for potential impact.

125
Number of emerging innovators produced by the Master’s in Engineering in Technical Entrepreneurship, which began in 2012. Graduates launched their own companies, joined startups and multigener-ation firms, and went into corporations as product development engineers.

Lehigh Partnership with Nasdaq

In early 2017, Lehigh celebrated the Lehigh@Nasdaq Center, which represents the next chapter in Lehigh’s long history of educating the thinkers and doers who change the world. The new, San Francisco-based partnership with the Nasdaq Entrepreneurial Center—a nonprofit designed to educate and connect the entrepreneurial community—offers a campus extension for Lehigh students in one of the most active startup scenes in the world. The environment is designed to advance the entrepreneurial spirit and skill set of students in any discipline.

Number of emerging innovators produced by the Master’s in Engineering in Technical Entrepreneurship, which began in 2012. Graduates launched their own companies, joined startups and multigener-ation firms, and went into corporations as product development engineers.

125
Lehigh Partner-

ship with Nasdaq

In early 2017, Lehigh celebrated the Lehigh@Nasdaq Center, which represents the next chapter in Lehigh’s long history of educating the thinkers and doers who change the world. The new, San Francisco-based partnership with the Nasdaq Entrepreneurial Center—a nonprofit designed to educate and connect the entrepreneurial community—offers a campus extension for Lehigh students in one of the most active startup scenes in the world. The environment is designed to advance the entrepreneurial spirit and skill set of students in any discipline.

Number of emerging innovators produced by the Master’s in Engineering in Technical Entrepreneurship, which began in 2012. Graduates launched their own companies, joined startups and multigener-ation firms, and went into corporations as product development engineers.

125
Is a truly equitable campus achievable?

A first step is understanding what we mean by “equitable campus” and how it relates to diversity and inclusion efforts. In our case, we are building on the three strategic pillars of diversity, inclusion and equity. When we talk about an equitable culture, we are really referring to a culture of equity versus a culture of equal opportunity.

Equity is very different from equality. Equality is a state in which everyone has the same amount of something (e.g., food, medicine, opportunity) no matter immediate need. While equality of opportunity may sound fair, it does not go far enough in ensuring that one gets what one actually needs. For example, equality of opportunity would ensure that both a six-foot-tall person and a four-foot-tall person got the same size ladder to see over a ten-foot-tall wall.

Equity on the other hand describes something that is deeper and more complex. Equity is more about ensuring that each of us gets what we need to succeed. This includes access to opportunity, networks, resources, and other support structures based on our needs and aspirations.

For Lehigh, an equitable culture would be an environment whereby one could not tell the difference in educational outcomes by race, ethnicity, national origin, disability, sex, sexual orientation, gender expression, gender identity, religion or socio-economic status. It would be an environment whereby we explicitly valued people with different attributes, backgrounds and experiences (diversity) to achieve the outcome we sought; an environment where everyone possesses an authentic and empowered sense of participation and a true sense of belonging (inclusion).

We must be intentional about the numerical representation of different types of people on campus. We must also support inclusion, which refers to the state of including others into the campus community. The answer is yes, but achieving a truly equitable campus is dependent on our success in creating a truly diverse and inclusive community.

Donald Outing
—
Vice President for Equity and Community

In this new role, Outing is responsible for developing and implementing a comprehensive plan to enhance university efforts around diversity, equity and inclusion. He is the former chief diversity officer and director of the Office of Diversity, Inclusion and Equal Opportunity for the U.S. Military Academy (USMA) at West Point, and was an associate professor in USMA’s Department of Mathematical Sciences.

Expanding Access
Professor George White, longtime Professor of Educational Leadership at Lehigh, was named the first managing director for the university’s Student Access and Success Program. The new university-wide position was created to champion Lehigh’s efforts to expand access to the university for first-generation and lower-income students. These efforts include Lehigh’s participation in the American Talent Initiative (ATI), an alliance between the nation’s top-performing colleges and universities that aims to increase the number of high-achieving, low-income students who graduate from top-tier institutions, and a partnership with the Posse Foundation. That group serves inner-city students in California.

40+
Social Justice Scholars, a collaborative faculty scholars group that explores the intersection of social equity and research

35+
members of the Lehigh community serve on the Council for Equity and Community, a group of faculty, staff and students focused on improving campus culture.
Lehigh Joins with City of Bethlehem to Fight Blight

This past year, Lehigh joined with the City of Bethlehem and local community groups to fight blight and in support of innovation and entrepreneurial development. Additional grants will be used to support manufacturing, credit unions, and spur further economic development.

“Women of Bethlehem Steel” Celebrates Essential Role

The first phase of a collaborative project among the Steelworkers Archive and Lehigh’s South Side Initiative and Library and Technology Services was recently completed. The project seeks to gather and share lesser-known oral histories of the women of Bethlehem Steel, who played a significant role in the success of the industrial giant.

Chris Burke — Associate Professor of Psychology

Chris Burke heads up the Community Health Research Group at Lehigh. His research spans both social psychology and quantitative psychology, with recent research focusing on links between stress experienced during pregnancy and risk for postpartum depression.

Can a university help address the opioid epidemic?

The opioid epidemic is complex and multifaceted, so the solutions are unlikely to be simple. Universities have the great advantage of the presence of faculty with diverse skill sets working in close proximity. If a university can create an environment that promotes interaction, cross-pollination of ideas, and interdisciplinary collaboration, it can become an ideal breeding ground for creative solutions to important societal issues.

In recent years, Lehigh has consistently made these kinds of investments—from building a strong core of interdisciplinary programs, to supporting cluster hiring of faculty around interdisciplinary themes, to grants promoting interdisciplinary research. Lehigh’s Community Health Research Group owes its existence to these kinds of programs, which have allowed us to build a core group of faculty with a broad set of skills and rooted in the principles of Community-Based Participatory Research (CBPR). CBPR involves being aware that an academic understanding of a complex issue like opioid addiction is always limited, and that partnering with the healthcare providers and patients who confront the issue every day can help to surpass that limit.

We are partnering with Neighborhood Health Centers of the Lehigh Valley—a federally qualified health center that provides health services to low-income residents—to assess an innovative opioid treatment program that they are implementing. We will be interviewing both patients and members of the care team at multiple time points to discover what is working well and what is not.

Much of our focus is on aspects of the program that might seem more peripheral at first—things like patient trust and satisfaction with their care, and providers’ satisfaction with implementing the program. However, we see these elements as essential, as even the best program will fail to be effective if patients don’t show up for appointments or don’t follow the treatment protocol, or if providers aren’t able or willing to implement it with fidelity.

The opioid epidemic is complex and multifaceted, so the solutions are unlikely to be simple. Universities have the great advantage of the presence of faculty with diverse skill sets working in close proximity. If a university can create an environment that promotes interaction, cross-pollination of ideas, and interdisciplinary collaboration, it can become an ideal breeding ground for creative solutions to important societal issues.

In recent years, Lehigh has consistently made these kinds of investments—from building a strong core of interdisciplinary programs, to supporting cluster hiring of faculty around interdisciplinary themes, to grants promoting interdisciplinary research. Lehigh’s Community Health Research Group owes its existence to these kinds of programs, which have allowed us to build a core group of faculty with a broad set of skills and rooted in the principles of Community-Based Participatory Research (CBPR). CBPR involves being aware that an academic understanding of a complex issue like opioid addiction is always limited, and that partnering with the healthcare providers and patients who confront the issue every day can help to surpass that limit.

We are partnering with Neighborhood Health Centers of the Lehigh Valley—a federally qualified health center that provides health services to low-income residents—to assess an innovative opioid treatment program that they are implementing. We will be interviewing both patients and members of the care team at multiple time points to discover what is working well and what is not.

Much of our focus is on aspects of the program that might seem more peripheral at first—things like patient trust and satisfaction with their care, and providers’ satisfaction with implementing the program. However, we see these elements as essential, as even the best program will fail to be effective if patients don’t show up for appointments or don’t follow the treatment protocol, or if providers aren’t able or willing to implement it with fidelity.

Can a university help address the opioid epidemic?

The opioid epidemic is complex and multifaceted, so the solutions are unlikely to be simple. Universities have the great advantage of the presence of faculty with diverse skill sets working in close proximity. If a university can create an environment that promotes interaction, cross-pollination of ideas, and interdisciplinary collaboration, it can become an ideal breeding ground for creative solutions to important societal issues.

In recent years, Lehigh has consistently made these kinds of investments—from building a strong core of interdisciplinary programs, to supporting cluster hiring of faculty around interdisciplinary themes, to grants promoting interdisciplinary research. Lehigh’s Community Health Research Group owes its existence to these kinds of programs, which have allowed us to build a core group of faculty with a broad set of skills and rooted in the principles of Community-Based Participatory Research (CBPR). CBPR involves being aware that an academic understanding of a complex issue like opioid addiction is always limited, and that partnering with the healthcare providers and patients who confront the issue every day can help to surpass that limit.

We are partnering with Neighborhood Health Centers of the Lehigh Valley—a federally qualified health center that provides health services to low-income residents—to assess an innovative opioid treatment program that they are implementing. We will be interviewing both patients and members of the care team at multiple time points to discover what is working well and what is not.

Much of our focus is on aspects of the program that might seem more peripheral at first—things like patient trust and satisfaction with their care, and providers’ satisfaction with implementing the program. However, we see these elements as essential, as even the best program will fail to be effective if patients don’t show up for appointments or don’t follow the treatment protocol, or if providers aren’t able or willing to implement it with fidelity.

Can a university help address the opioid epidemic?

The opioid epidemic is complex and multifaceted, so the solutions are unlikely to be simple. Universities have the great advantage of the presence of faculty with diverse skill sets working in close proximity. If a university can create an environment that promotes interaction, cross-pollination of ideas, and interdisciplinary collaboration, it can become an ideal breeding ground for creative solutions to important societal issues.

In recent years, Lehigh has consistently made these kinds of investments—from building a strong core of interdisciplinary programs, to supporting cluster hiring of faculty around interdisciplinary themes, to grants promoting interdisciplinary research. Lehigh’s Community Health Research Group owes its existence to these kinds of programs, which have allowed us to build a core group of faculty with a broad set of skills and rooted in the principles of Community-Based Participatory Research (CBPR). CBPR involves being aware that an academic understanding of a complex issue like opioid addiction is always limited, and that partnering with the healthcare providers and patients who confront the issue every day can help to surpass that limit.

We are partnering with Neighborhood Health Centers of the Lehigh Valley—a federally qualified health center that provides health services to low-income residents—to assess an innovative opioid treatment program that they are implementing. We will be interviewing both patients and members of the care team at multiple time points to discover what is working well and what is not.

Much of our focus is on aspects of the program that might seem more peripheral at first—things like patient trust and satisfaction with their care, and providers’ satisfaction with implementing the program. However, we see these elements as essential, as even the best program will fail to be effective if patients don’t show up for appointments or don’t follow the treatment protocol, or if providers aren’t able or willing to implement it with fidelity.

Can a university help address the opioid epidemic?

The opioid epidemic is complex and multifaceted, so the solutions are unlikely to be simple. Universities have the great advantage of the presence of faculty with diverse skill sets working in close proximity. If a university can create an environment that promotes interaction, cross-pollination of ideas, and interdisciplinary collaboration, it can become an ideal breeding ground for creative solutions to important societal issues.

In recent years, Lehigh has consistently made these kinds of investments—from building a strong core of interdisciplinary programs, to supporting cluster hiring of faculty around interdisciplinary themes, to grants promoting interdisciplinary research. Lehigh’s Community Health Research Group owes its existence to these kinds of programs, which have allowed us to build a core group of faculty with a broad set of skills and rooted in the principles of Community-Based Participatory Research (CBPR). CBPR involves being aware that an academic understanding of a complex issue like opioid addiction is always limited, and that partnering with the healthcare providers and patients who confront the issue every day can help to surpass that limit.

We are partnering with Neighborhood Health Centers of the Lehigh Valley—a federally qualified health center that provides health services to low-income residents—to assess an innovative opioid treatment program that they are implementing. We will be interviewing both patients and members of the care team at multiple time points to discover what is working well and what is not.

Much of our focus is on aspects of the program that might seem more peripheral at first—things like patient trust and satisfaction with their care, and providers’ satisfaction with implementing the program. However, we see these elements as essential, as even the best program will fail to be effective if patients don’t show up for appointments or don’t follow the treatment protocol, or if providers aren’t able or willing to implement it with fidelity.
Are we all inherently biased?

Social cognition focuses on how social forces shape how we think and act. My particular focus is on how stereotyping is a tool that people use to accomplish their goals. A wide and disparate set of goals are aided by the use of stereotypes—power, self-esteem enhancement, feelings of control, the ability to understand and predict (anticipate) the events around you, identification with a group, and more. Since stereotypes serve such a disparate set of goals, it is therefore natural to ask questions such as is stereotyping inevitable and are we inherently biased?

My research would suggest no, and yes, respectively. Despite its seeming ubiquity and the vast body of evidence for its ease of use and its passive/silent (unconscious) nature, stereotyping is not inevitable. If construed of as a tool that helps us pursue some goals, this also means stereotyping is under the control of our free will and motivational system. Just as goals can give rise to stereotyping, so too can they inhibit and control them. My work explores how even subtle and implicit processes such as stereotyping can be brought about under control, and what interventions serve to bring about such control (and which ones cause backlash and increase bias).

While I would say “no” to the question of whether stereotyping is inevitable, I would answer in the affirmative to the question of whether people are inherently biased. I see all human thought and action on the environment as always in the service of the goals of the person within that environment. These goals may be invisible to the naked eye, implicit (unconscious). But we are always pursuing a goal with every action, with every thought. Thus every action and thought is biased by these goals.

Additionally, any commerce with the environment introduces norms, standards, values, expectations and goals that exist within that social environment. Thus, any social cognition is inherently biased by these subjective forces. This is not to say people willfully are bad. They are willful, and they are biased. But they are biased simply in the sense that they are making sense of a complex world through the lens of their values and the goals they choose to pursue. It is often true that making sense of the world leads to the use of stereotypes. However, this does not need to happen, and stereotyping is not inevitable. But even if stereotyping was not involved in making sense of the immediate environment, the world would still be filtered in a biased way through the lens of the perceivers’s culture, norms, goals, values, standards, and expectations.
The Convergence of Man and Machine

Lehigh is making a $3 million institutional investment in a multidisciplinary research initiative that promises to change the way human beings harness and interact with data and with the sophisticated instruments of scientific discovery. The Nano/Human Interface Presidential Engineering Research Initiative proposes to develop a human-machine interface that will improve the ability of scientists to visualize and interpret data generated by scientific research.

Bioengineering Department Established

Lehigh established a new Department of Bioengineering in the P.C. Rossin College of Engineering and Applied Science, which will build upon extensive interdisciplinary bioengineering research. The initial departmental faculty research is supported by the National Institutes of Health, the National Science Foundation, and the U.S. Departments of Defense and Energy, among others.

Can artificial intelligence lead to a more humane society?

You will hear many different responses if you pose this question to most researchers. In my view, our society is increasingly moving toward a world in which humans and machines become integral parts of critical systems. The boundary between human work and machine work is becoming ever more blurred, as well as the boundary between decisions made by humans and decisions made by artificial intelligence. So, the question is, in such a sci-fi or futuristic world, is society more humane or inhumane?

From the point of view of human intelligence and machine intelligence working side by side, with machine intelligence assisting humans so that people can be freed from repetitive physical work and focus on creative thinking and innovations, I would say yes—artificial intelligence can lead to a more humane society. However, from the point of view of artificial intelligence competing with human intelligence for work that is enjoyable to humans and enables many people to make a good living, I would say no, at least not ever the short term.

The bottom line is, there are technological and social trends that are unstoppable, and the responsibility is with us humans, who are the creators of artificial intelligence, to design and adopt systems that lead to a more humane society.

Sharon Xiaolei Huang

Associate Professor of Computer Science and Engineering

Huang’s research interests include machine learning, artificial intelligence, computer-assisted diagnosis and intervention, content-based image/graphics indexing and retrieval, physically based modeling and simulation, HCI, visualization and bioinformatics.

Can artificial intelligence lead to a more humane society?
How can you prepare students for such a tumultuous world?

During my first fall semester at Lehigh I took a deep dive into conversations with students: officers of student organizations, freshmen, upperclassmen, residential and commuter students, grad students, international students, legacy students, first-generation students, and many of the categories and identities that compose our student population.

Key to preparing students for any challenges they will encounter is helping them become effective communicators. Overwhelmingly, our students have shared—through words and actions—that they have a willingness, or even a longing, to communicate. And not just “talk” but to have deep and meaningful dialogue on topics that are affecting college students, as well as broader themes that are embedded in our national discourse. Matters of diversity, social justice, politics, religion, constitutional rights, inclusion and even exclusion begin to scratch the surface of formal and informal conversations that take place on any given day.

At Lehigh, we strive to assist students in finding their individual or collective voice. Through mentoring, advising and challenging norms, we affirm students who dare to take even unpopular—yet sorely needed—public stances. We provide support, perspective and expertise—an approach that is student-centered, rather than administrator-driven.

Lehigh students are encouraged to envision and explore possibilities. They talk and work together, in person and in settings that may sometimes initially be outside of their personal comfort zone. But, I believe that in doing so, our students will be well-prepared to take on not just the post-graduation workplace, but a broader society that sometimes seems ill-equipped to promote co-existence with others from differing backgrounds and experiences.

The degree to which our students will ultimately succeed in the world we are sending them to will be rooted in a strong and solid foundation of 150+ years as an institution of higher learning, and shaped by current and future student generations. We are obligated to evolve along with our students so that we can continue to provide the tools and skills to not only grow and adapt to a tumultuous world, but to be the individuals who can shape it in positive, productive and remarkable ways.
A New Translation

Ben Wright, professor of religion studies, studied 23 Greek manuscripts that purport to tell the story of Aristeas, an official of Ptolemy II Philadelphus, a Greek monarch of Egypt in the third century BCE. His research is part of a forthcoming book—the first full-length commentary on Aristeas—that provides a new translation and comments on the text, setting out what the Jewish author was trying to accomplish with this story.

Expanding Arts Education

The John F. Kennedy Center for the Performing Arts has chosen Bethlehem as the 24th site—and the first in Pennsylvania—for its Ensuring the Arts for Any Given Child program. Lehigh’s Zoellner Arts Center will lead the four-year collaboration, and will include community partners in developing a strategy for in-school arts education tailored to the needs of the Bethlehem community.

What is the power of storytelling?

“Tell me a story” might be the oldest request in the world. From the time we could speak, we’ve told stories. From the time we could hear, we’ve craved them. With the glow of a campfire on our faces, we listen with rapt attention to stories about acquiring food and shelter. And later when those needs are met, we crave stories about ourselves, our deeds of daring and bravery and the myriad ways we attempt to conquer the harshness of our world.

The tales of how we navigate the vicissitudes of everyday life and loss become vital to us. From the sum of those stories, we create our lives and our identities. We are the stories we know and the stories we tell. At the heart of those narratives is the belief that we matter and belong in this world. This investigation can be frightening, but the mission of the university is to ask the questions that push us closer and closer to understanding. We ask the questions in art and science, in math and engineering that further our knowledge and prepare the way for the next generation of thinkers whose stories build on ours.

In time the stories of our lives become richer and deeper. We believe with renewed vigor that wanting knowledge does not impede our progress or deny our history, but brings us closer together as fellow seekers, believers and dreamers. So we keep asking our questions and telling and retelling our stories like our lives depend on them. Because they do.

Stephanie P. Watts

Associate Professor of English

The acclaimed author focuses on creative writing, African American literature and folklore. She is the recipient of a Whiting Award and an Ernest J. Gaines Award for Literary Excellence for her anthology of short stories titled We Are Taking Only What We Need. Her debut novel, No One Is Coming to Save Us, was published in 2017 to critical praise and was selected as a “best book” by O, the Oprah Magazine.

Stephanie P. Watts

Associate Professor of English

The acclaimed author focuses on creative writing, African American literature and folklore. She is the recipient of a Whiting Award and an Ernest J. Gaines Award for Literary Excellence for her anthology of short stories titled We Are Taking Only What We Need. Her debut novel, No One Is Coming to Save Us, was published in 2017 to critical praise and was selected as a “best book” by O, the Oprah Magazine.

The acclaimed author focuses on creative writing, African American literature and folklore. She is the recipient of a Whiting Award and an Ernest J. Gaines Award for Literary Excellence for her anthology of short stories titled We Are Taking Only What We Need. Her debut novel, No One Is Coming to Save Us, was published in 2017 to critical praise and was selected as a “best book” by O, the Oprah Magazine.
What makes a great leader?

It is certainly different from what it was in the past. Today, hierarchies are flattening, employees are looking for flexibility and meaning as much as a paycheck, and they want to be engaged, challenged, have opportunities for creativity, and have a voice. In this context, leaders who can pause, ask questions, listen and attempt to understand their employees’ perspectives (particularly those with whom they disagree), and try to empower employees, should be most effective. These are sometimes called servant leaders.

The question, then, is how do we develop such leaders?

One surprising answer may be through leaders’ emotions, but perhaps not in the way that you think. Indeed a traditional perspective on leadership and emotions supports what might be called a cult of positivity, emphasizing that positive emotions are the key to effective leadership. However, focusing on positivity is problematic insofar as the conflicting requirements of the leadership role force leaders to experience complex emotions even in situations where they wish to display a positive front.

It is my belief that leaders who are able to harness such complex emotions, and in particular, harness the experience and expression of ambivalent emotions—defined as multiple conflicting emotions at the same time—may have a real advantage.

The experience of emotions is thought to provide individuals with information about their environment. As such, feeling ambivalent emotions should provide leaders with rich and varied information about their environment, as well as signal that the environment is atypical. In response, ambivalent leaders may be more likely than purely happy or angry leaders, for instance) to pause, ask questions, listen and attempt to understand others’ perspectives. Such open-mindedness should facilitate better strategic decision making.

Interpersonally, leaders can also harness benefits from expressing emotional ambivalence, signaling that the leader is thinking in a nuanced way and is open and receptive to a full range of perspectives. Such signals empower employees to speak up and be more engaged.

In conclusion, we tend to laud leaders who act swiftly and decisively (i.e., “I will do x”) and who are full of certitude (i.e., “I am confident that”), and denigrate those who deliberate (i.e., “Hmm ... I wonder if?”) and seem more indecisive (i.e., “I am not sure, but”). The irony of my research is that the qualities we commonly disdain in leaders—like ambivalence—may be qualities that would help them be more successful.
M2 Degree Program
Sydney Glenn ’17, T’18G earned her bachelor’s degree in environmental studies and is in the master’s in management (M2) degree program. Focusing on sustainable development challenges, she participated in Lehigh’s international social entrepreneurship program and developed an award-winning design for a multitiered farming system that will be introduced in Kenya.

Why is it important to be a lifelong learner?

Sanjay Shah ’89 MBA
Founder and CEO, Vistex, Inc.

Sanjay Shah is an entrepreneur and founder and CEO of Vistex, Inc., a pioneer in helping global organizations better deploy their products and services through “Go-to-Market” programs. Vistex serves businesses of all sizes worldwide across a spectrum of industries.

Learning is the foundation for success, and I owe a lot to my education at Lehigh University. The process of continuous learning is instrumental in not just how you conduct yourself, but how you view the world. Learning implies that you need to know more. That is the impetus for me.

As a lifelong learner and a business entrepreneur, I believe that education is really the driver for innovation. For example, take the development of automation that made the world a better place, the Internet revolution, or navigating advances in digital transformation. They all stemmed from people who had an appetite for learning and a great drive for success.

Classroom education with theoretical concepts is important, but we need to embrace learning from real-world applications that provide examples of how to be more effective and efficient. The true promise of continual learning lies in the potential of how it will shape our thinking and create life and business opportunities that have not been developed.

I firmly believe that it is ongoing education that really spurs and brings out the best in professionals. This is why I feel so strongly about supporting Lehigh’s educational mission, especially the development of the university’s executive education program. Exploring practical research and live case studies will open up new insights into issues and opportunities facing today’s global organizations.

I recently committed a $5 million gift to elevate executive education at Lehigh’s College of Business and Economics. This gift endows and names the new Vistex Institute for Executive Learning and Research and allows the university to move forward with an ambitious plan to strengthen engagements with industry and business.

I firmly believe that it is ongoing education that really spurs and brings out the best in professionals. This is why I feel so strongly about supporting Lehigh’s educational mission, especially the development of the university’s executive education program. Exploring practical research and live case studies will open up new insights into issues and opportunities facing today’s global organizations.

I recently committed a $5 million gift to elevate executive education at Lehigh’s College of Business and Economics. This gift endows and names the new Vistex Institute for Executive Learning and Research and allows the university to move forward with an ambitious plan to strengthen engagements with industry and business.

I firmly believe that it is ongoing education that really spurs and brings out the best in professionals. This is why I feel so strongly about supporting Lehigh’s educational mission, especially the development of the university’s executive education program. Exploring practical research and live case studies will open up new insights into issues and opportunities facing today’s global organizations.

I recently committed a $5 million gift to elevate executive education at Lehigh’s College of Business and Economics. This gift endows and names the new Vistex Institute for Executive Learning and Research and allows the university to move forward with an ambitious plan to strengthen engagements with industry and business.
Potential New Weapon Against Superbugs

Steven L. Regen, professor of chemistry, thinks modern medicine is losing the war against “superbugs” that have built up a resistance to antibiotics.

Public health experts agree. Recently, the World Health Organization listed 12 drug-resistant bacteria which pose the greatest threat to human health and which could soon be untreatable with existing medicines.

One potential solution is to improve the drugs that kill microbes by disrupting their cell membranes. Bacteria should be less likely to develop resistance toward these drugs, Regen and his research group wrote recently in an article in the journal Bioconjugate Chemistry, than toward drugs that must be internalized to exert their toxic effects.

Regen’s current study was funded by a grant from the National Institutes of Health. It is a continuation of work he began earlier. “We did a lot of work in this area in the 1990s,” says Regen, “and then went in other directions. We’re revisiting it now in part because we want to see if it’s possible to extrapolate our results.”

It’s difficult to say, since so much depends on how aggressively we address the pressing issues that are facing us.

Oceans define our home planet, covering more than 70 percent of the Earth’s surface and driving the weather and climatic patterns that are essential to life. Maintaining the economic and life-support value of the ocean relies on preserving the well-being of its ecosystems. The 2010 Deepwater Horizon oil spill in the Gulf of Mexico was one of the worst environmental marine disasters in history, and is one of several new and emerging threats to ocean health. The spill damaged diverse marine ecosystems in the Gulf, including deepwater coral ecosystems. Because they provide habitats for abundant invertebrate and fish communities, they have been prioritized in federal restoration programs.

At Lehigh, we are working on a collaborative project designed to guide the restoration of deepwater coral ecosystems impacted by the Deepwater Horizon spill and support the sustainability of these ecosystems in the Gulf of Mexico. The project aims to understand the connectivity patterns among populations of several deepwater coral species to inform the management of marine protected areas, and is supported by $1.3 million in funding from the NOAA RESTORE Act Science Program to conduct oceanographic fieldwork using unmanned submersibles to collect coral samples and perform genomic analyses in the laboratory. Several Lehigh students are contributing to this project, both at sea and in the laboratory.

We are also focusing on the seafloor processes that have made Earth habitable over geologic time. At submarine mid-ocean ridges, circulating seawater is heated by volcanic activity and transformed into superheated hydrothermal vent fluids. When these fluids mix with seawater, they form an energy-rich mineral-laden “soup” that supports ecosystems in the absence of sunlight. Earth is not the only ocean world in our solar system, however. NASA may one day search for life on the icy moons Enceladus and Europa, and we are exploring hydrothermal systems in Earth’s northernmost ridge crest.

Leigh’s Visiting Professor Santiago Herrera (Biology) is leading the deepwater coral restoration study, aided by a $1.3 million grant from the NOAA RESTORE Act Science Program.

Santiago Herrera
—
Visiting Assistant Professor of Biological Sciences

Leigh’s Visiting Professor Santiago Herrera (Biology) is leading the deepwater coral restoration study, aided by a $1.3 million grant from the NOAA RESTORE Act Science Program.

Jill McDermott
—
Assistant Professor of Earth and Environmental Sciences

The geochemist and field scientist recently embarked on a mission to explore hydrothermal systems in the Earth’s northernmost ridge crest.

Can we save our dying oceans?

Potential New Weapon Against Superbugs

Steven L. Regen, professor of chemistry, thinks modern medicine is losing the war against “superbugs” that have built up a resistance to antibiotics.

Public health experts agree. Recently, the World Health Organization listed 12 drug-resistant bacteria which pose the greatest threat to human health and which could soon be untreatable with existing medicines.

One potential solution is to improve the drugs that kill microbes by disrupting their cell membranes. Bacteria should be less likely to develop resistance toward these drugs, Regen and his research group wrote recently in an article in the journal Bioconjugate Chemistry, than toward drugs that must be internalized to exert their toxic effects.

Regen’s current study was funded by a grant from the National Institutes of Health. It is a continuation of work he began earlier. “We did a lot of work in this area in the 1990s,” says Regen, “and then went in other directions. We’re revisiting it now in part because we want to see if it’s possible to extrapolate our results.”

It’s difficult to say, since so much depends on how aggressively we address the pressing issues that are facing us.

Oceans define our home planet, covering more than 70 percent of the Earth’s surface and driving the weather and climatic patterns that are essential to life. Maintaining the economic and life-support value of the ocean relies on preserving the well-being of its ecosystems. The 2010 Deepwater Horizon oil spill in the Gulf of Mexico was one of the worst environmental marine disasters in history, and is one of several new and emerging threats to ocean health. The spill damaged diverse marine ecosystems in the Gulf, including deepwater coral ecosystems. Because they provide habitats for abundant invertebrate and fish communities, they have been prioritized in federal restoration programs.

At Lehigh, we are working on a collaborative project designed to guide the restoration of deepwater coral ecosystems impacted by the Deepwater Horizon spill and support the sustainability of these ecosystems in the Gulf of Mexico. The project aims to understand the connectivity patterns among populations of several deepwater coral species to inform the management of marine protected areas, and is supported by $1.3 million in funding from the NOAA RESTORE Act Science Program to conduct oceanographic fieldwork using unmanned submersibles to collect coral samples and perform genomic analyses in the laboratory. Several Lehigh students are contributing to this project, both at sea and in the laboratory.

We are also focusing on the seafloor processes that have made Earth habitable over geologic time. At submarine mid-ocean ridges, circulating seawater is heated by volcanic activity and transformed into superheated hydrothermal vent fluids. When these fluids mix with seawater, they form an energy-rich mineral-laden “soup” that supports ecosystems in the absence of sunlight. Earth is not the only ocean world in our solar system, however. NASA may one day search for life on the icy moons Enceladus and Europa, and we are exploring hydrothermal systems in Earth’s northernmost ridge crest.

Leigh’s Visiting Professor Santiago Herrera (Biology) is leading the deepwater coral restoration study, aided by a $1.3 million grant from the NOAA RESTORE Act Science Program.

Santiago Herrera
—
Visiting Assistant Professor of Biological Sciences

Leigh’s Visiting Professor Santiago Herrera (Biology) is leading the deepwater coral restoration study, aided by a $1.3 million grant from the NOAA RESTORE Act Science Program.

Jill McDermott
—
Assistant Professor of Earth and Environmental Sciences

The geochemist and field scientist recently embarked on a mission to explore hydrothermal systems in the Earth’s northernmost ridge crest.
Respect =

A Dignified Debate

Religion and politics, it is said, are two subjects that people should avoid at social occasions. Anastassiya Perevezentseva ’18, however, believes discussions about touchy topics can be fruitful if people identify the traditions that inspire them. A native of Kazakhstan, she won the Libraries Student Research Prize last spring for her essay, “Is Dignity an Inescapably Religious Concept?” In it, she examines the concept of human dignity from religious and non-religious perspectives, including Judaism, Christianity, Islam, Kantianism and secular humanism.

“What I wish is to see people reach out to each other and say, ‘I value your opinion, let’s talk.’ I find this to be a beautiful thing—to have discussions with people whom I might disagree with 90 percent of the time. I want to hear what they have to say. “That’s a normal part of human decency and human dignity.”

How do you give a voice to the disenfranchised?

During the summer of 2017, I interned at Just Leadership USA, a criminal justice reform organization in Harlem that aims to halve the prison population by 2030. Part of their mission statement is that “the people closest to the problem are closest to the solution.”

Giving voice to the disenfranchised is vital to the mission of dismantling systemic inequality. Present and future generations cannot afford to be complacent in destructive public policy decisions that perpetuate institutional racism and oppression. To stay silent in face of unparalleled injustice is to be complicit in those injustices. Those with the political and socio-economic resources have a responsibility to stand up against domination and to lift others around them.

True change happens only when we empower the voices of those who experience the detriments of this broken criminal justice system firsthand. My goals as an advocate for social justice are to educate the public, mobilize underserved populations to become politically participative, and empower youths through education and community engagement.

One way in which we can achieve these goals is through theatre. Theatre as a method to educate, empower, and break barriers is very powerful and universal in its impact. I aim to engage underprivileged youths through theatre and the arts, to not only amplify their voices through a universal medium, but also demonstrate to them that their voices are equally valued, which is something that society has taught them otherwise.

The arts have the ability to foster empathy among people of all backgrounds and experiences, which is something we desperately need in order to make substantive change in the political and social realms.

Kalyani Singh ’18
— Undergraduate Student

Singh is the Theodore U. Horger ’61 Visual and Performing Arts 2017-18 Scholar and a dual major in theatre and political science. She has worked on criminal justice advocacy campaigns in Harlem and with disadvantaged urban teenagers through Jersey Cares, an organization devoted to education and youth services.

How do you give a voice to the disenfranchised?
CREATIVATE
Encourages
Students to Address Global Needs

CREATIVATE, an annual event that celebrates students’ creativity, innovation and entrepreneurial spirit, invites students to showcase their original creative projects. More than 60 Lehigh students rose to the challenge during the most recent event. The projects included:

- A product that can reinvigorate Hawaii’s egg industry by making cheap chicken feed from local resources. Happy Feed is made from three resources that are abundant in Hawaii: kelp, the larvae of black soldier flies, and the pulp and husks of sunflower seeds.
- A solo project where the cellulitic structures that form during the fermentation that produces kombucha tea are harvested and can be used to make wearable jewelry and products such as ties and vests.
- The design and development of a device called Soterra. Soterra uses mesh networking to provide access to emergency response services to women, especially those in developing countries.

What is permaculture and why does it matter?

Permaculture is an agricultural design system that focuses on sustainability through understanding patterns found in nature that can be directly related back to human systems. There are 12 principles of permaculture that are centered on three prime tenets: caring for the Earth, caring for people, and setting limits to consumption based on the population given to share harvested surplus with others.

The world needs to intertwine permaculture systems into thinking about how we design infrastructures and systems to come in order for the longevity of human beings thriving on Earth. The holistic nature of permaculture allows for human beings to observe and listen to natural systems and see how those natural systems can relate back to sustainable development for human needs.

I first went to Ghana as an undergrad through Lehigh’s Africana Studies program and learned that shea butter was actually produced there. I’ve been back several times through the Environmental Policy Design program to learn how it is produced from the nut of the shea tree fruit. I started my Superior Shea company, which sells shea butter products imported from Bobotiaroh Enterprise, a company located on a family farm in a remote village in the Upper West Region of Ghana.

With shea butter processing, incorporating permaculture means asking how we can make a sustainable production system that has access to market in a region that the government of Ghana isn’t necessarily paying attention to or investing in. How do we develop transportation methods for people living in this region so they can sell their goods? How can we move toward a sustainable way of living and a more equitable supply chain?

Ultimately, I hope to develop a sustainable system for producing and marketing shea butter, a system that takes into account issues ranging from land-use and transportation policies to agricultural practices and ecology so that we’re making a real contribution to society in addition to providing a product that people want and need.

Miles Davis ’16, ’18G
—
Graduate Student

Miles Davis is a graduate student in environmental policy design and is working on his master’s thesis titled “The Way of Shea: Developing Permaculture Systems for Shea Butter Processing in Ghana.” A 2016 Lehigh graduate, he majored in supply chain management and earned minors in Africana Studies and Japanese. He spent six weeks in Ghana in the summer of 2015 studying the history of the transatlantic slave trade through Lehigh’s Iacocca International Internship Program.

Miles Davis ’16, ’18G

Graduate Student

Miles Davis is a graduate student in environmental policy design and is working on his master’s thesis titled “The Way of Shea: Developing Permaculture Systems for Shea Butter Processing in Ghana.” A 2016 Lehigh graduate, he majored in supply chain management and earned minors in Africana Studies and Japanese. He spent six weeks in Ghana in the summer of 2015 studying the history of the transatlantic slave trade through Lehigh’s Iacocca International Internship Program.
Financial Report
Included in the following pages are highlights of the 2016-2017 fiscal year financial results, as well as key excerpts from the University’s financial statements.

Statement of Financial Position
ASSETS
The largest categories within the University’s $2.4 billion asset balance are investments and capital assets. The University’s endowment fund constitutes the majority of the University’s investment base (see “Endowment Fund”) and experiences growth based on donor support and investment return net of operating distributions. Significant capital projects in process at fiscal year-end include renovations to support experiential learning on the Muhlenberg Campus.

LIABILITIES
The Bonds, Loans, and Notes Payable balance of $396 million comprises the largest liability balance on the consolidated financial statements. The University’s debt balance includes a diversified mix of fixed and variable rate, and taxable and tax-exempt obligations. In support of the tax-exempt debt portfolio, the University has entered into interest rate exchange agreements that effectively minimize the variable rate exposure and reduce the University’s effective interest rate. In Fiscal Year 2017, the University took advantage of the favorable interest environment and issued its 2016 bonds.

Statement of Activities
OPERATING REVENUES
Net Tuition Revenue and Investment Return comprise the two largest sources of unrestricted operating revenue, representing 48% and 21% of the consolidated total in Fiscal Year 2017. Tuition and fees revenue is reported net of related scholarships. Total financial aid expenditures supporting graduate and undergraduate tuition grew 5.6% to $91.6 million. The University also provides financial aid to offset student living expenses, reported as a deduction from auxiliary enterprises revenues in the consolidated financial statements. Need-based financial aid was provided to more than 38% of undergraduate students, with an average financial aid package of just under $31,400.

Operating Investment Return includes $65.7 million of distributed earnings from the University endowment fund. The University’s policy for the distribution of endowment earnings is based on a three-year moving average market value that includes a ceiling and floor to insulate program spending from significant market fluctuations.

The University experienced a 15% increase in external research funding from federal, state, local and private sources. For the first time since 2012, Lehigh received eight new awards of more than $1 million under the leadership of principal investigators from all four Colleges.

OPERATING EXPENSE
The University continues to manage its expenses responsibly, aligning institutional resources from all sources to support its mission of education, research and public service. Fiscal Year 2017 was the University’s 47th consecutive year of positive net operating income. Almost one-half of operating expense falls within the functional expense categories of Instruction and Academic Support, directly supporting the student academic experience. Research expenditures further faculty scholarly inquiry and also provide opportunities for student independent research projects. In Fiscal Year 2017, University faculty were engaged in close to 600 actively supported research projects. Auxiliary Enterprises provide an active and balanced educational environment by integrating formal studies with the residential experience.

Classifying expenses on a natural, rather than functional, basis reveals that salaries and benefits comprise more than one-half of the University’s annual operating expense. Resource planning continues to focus on realizing operational efficiencies and collaborative efforts for the long term.

NON-OPERATING ACTIVITY
Non-operating activity includes transactions of a long-term investment nature or that indirectly relate to core activities. Examples include contributions restricted for campus improvements, contributions restricted because of donor-imposed stipulations, income and expense resulting from certain fair-value adjustments, the impact of bond defeasance and refunding activities, and investment returns net of earnings distributed for operations.

Endowment Review
The Endowment earned 15.0% for the fiscal year, net of all fees. Much of this performance was driven by healthy stock market gains (the S&P 500 was up 18% for the year), on top of which the Endowment’s Public Equity managers outperformed. Performance was generally strong across the rest of the portfolios as well, with the Private Equity and Absolute Return portfolios also seeing double-digit returns. While it is gratifying that the portfolio performed well in a year of new investments, we are focused on avoiding placing too much emphasis on a single year’s performance. The steps we are taking are significant and attractive returns over multiple years.

Fiscal 2017 was an active year for the portfolio and the Investment Office, in which we made progress toward a number of important goals. In January, the Investment Office moved into its new location in midtown Manhattan, which has been highly beneficial as a base for exploring investment opportunities and staying in contact with asset managers and peer institutions. Two new members joined the investment team in New York: Van Tran, who joined from DUMAC (Duke University’s Investment Office) as Investment Analyst, and Rika Feng, who joined as Investment Operations Manager after serving in similar roles for the endowments of Columbia University and the Smithsonian.

Within the portfolio, we advanced on a number of initiatives. We put in place a new asset allocation, one which seeks to take advantage of Lehigh’s ability to take a long-term view and tolerate short-term volatility. In addition, we set “road maps” for each asset class in the portfolios to guide our investment activity in the coming years. We also have been working diligently on concentrating the portfolio among fewer investment managers, such that each manager can perform well in a year of a number of different asset classes. Our goal is to avoid placing too much emphasis on a single year’s performance. The steps we are taking are significant and attractive returns over multiple years.

Fiscal Year 2016-2017 Operating Revenue Sources
($ in thousands)

- Tuition & Auxiliaries: $234,259 (59%)
- Grants & Contracts: $41,173 (10%)
- Contributions: $12,963 (3%)
- Investment Return: $83,515 (21%)
- Independent Operations: $15,305 (4%)
- Other Sources: $10,163 (3%)

Total: $356,576 (100%)

Fiscal Year 2016-2017 Operating Expense by Functional Category
($ in thousands)

- Instruction: $150,480 (39%)
- Research: $43,348 (11%)
- Public Service: $2,596 (1%)
- Academic Support: $35,175 (9%)
- Student Services: $36,190 (9%)
- Institutional Support: $70,348 (18%)
- Auxiliary Enterprises: $38,702 (10%)
- Independent Operations: $10,882 (3%)

Total: $387,720 (100%)
years, but we consider our work over the past year to be a strong start.

Overall, the past year has been positive on a number of fronts, and we have been fortunate to have very good performance during a year of active transition in the portfolio. Looking ahead, we are cognizant of a market environment offering more muted returns. The rising markets of the last several years have come with rising valuations, which have the effect of lowering expected future returns and reducing the margin of safety available in virtually all types of investments. In this environment, we will continue to maintain discipline and a long-term focus, diversify risk exposures, and remain on the lookout for new managers and areas of investment that can generate outperformance.

Lehigh Endowment Target Asset Allocation — Adopted 2016

- PUBLIC EQUITY 45%
- PRIVATE EQUITY 20%
- ABSOLUTE RETURN 20%
- TREASURIES/CASH 10%
- REAL ESTATE 5%

Endowment Fund Growth History

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>$1,600,000,000</td>
</tr>
<tr>
<td>2001</td>
<td>$1,200,000,000</td>
</tr>
<tr>
<td>2002</td>
<td>$1,800,000,000</td>
</tr>
<tr>
<td>2003</td>
<td>$2,400,000,000</td>
</tr>
<tr>
<td>2004</td>
<td>$3,000,000,000</td>
</tr>
<tr>
<td>2005</td>
<td>$3,600,000,000</td>
</tr>
<tr>
<td>2006</td>
<td>$4,200,000,000</td>
</tr>
<tr>
<td>2007</td>
<td>$4,800,000,000</td>
</tr>
<tr>
<td>2008</td>
<td>$5,400,000,000</td>
</tr>
<tr>
<td>2009</td>
<td>$6,000,000,000</td>
</tr>
<tr>
<td>2010</td>
<td>$6,600,000,000</td>
</tr>
<tr>
<td>2011</td>
<td>$7,200,000,000</td>
</tr>
<tr>
<td>2012</td>
<td>$7,800,000,000</td>
</tr>
<tr>
<td>2013</td>
<td>$8,400,000,000</td>
</tr>
<tr>
<td>2014</td>
<td>$9,000,000,000</td>
</tr>
<tr>
<td>2015</td>
<td>$9,600,000,000</td>
</tr>
<tr>
<td>2016</td>
<td>$10,200,000,000</td>
</tr>
<tr>
<td>2017</td>
<td>$10,800,000,000</td>
</tr>
</tbody>
</table>

ASSETS

<table>
<thead>
<tr>
<th>2017</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash and cash equivalents</td>
<td>$23,705</td>
</tr>
<tr>
<td>Accounts receivable, net</td>
<td>17,019</td>
</tr>
<tr>
<td>Inventories</td>
<td>1,503</td>
</tr>
<tr>
<td>Prepaid expenses and other assets</td>
<td>6,017</td>
</tr>
<tr>
<td>Contributions receivable, net</td>
<td>33,901</td>
</tr>
<tr>
<td>Notes receivable, net</td>
<td>11,758</td>
</tr>
<tr>
<td>Investments</td>
<td>1,871,799</td>
</tr>
<tr>
<td>Funds held in trust by others</td>
<td>4,053</td>
</tr>
<tr>
<td>Land, buildings, and equipment, net</td>
<td>413,192</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td><strong>$2,383,447</strong></td>
</tr>
</tbody>
</table>

LIABILITIES AND NET ASSETS

<table>
<thead>
<tr>
<th>2017</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable and accrued expenses</td>
<td>$42,308</td>
</tr>
<tr>
<td>Deferred revenues</td>
<td>25,354</td>
</tr>
<tr>
<td>Annuity payment liability</td>
<td>18,431</td>
</tr>
<tr>
<td>Other liabilities</td>
<td>15,257</td>
</tr>
<tr>
<td>Deposits held for others</td>
<td>1,346</td>
</tr>
<tr>
<td>Refundable federal student loan funds</td>
<td>2,018</td>
</tr>
<tr>
<td>Bonds, loans, and notes payable</td>
<td>395,972</td>
</tr>
<tr>
<td><strong>Total liabilities</strong></td>
<td><strong>537,685</strong></td>
</tr>
<tr>
<td>Unrestricted</td>
<td>932,232</td>
</tr>
<tr>
<td>Temporarily restricted</td>
<td>364,988</td>
</tr>
<tr>
<td>Permanently restricted</td>
<td>549,341</td>
</tr>
<tr>
<td><strong>Total net assets</strong></td>
<td><strong>1,845,761</strong></td>
</tr>
<tr>
<td><strong>Total liabilities and net assets</strong></td>
<td><strong>$2,383,447</strong></td>
</tr>
</tbody>
</table>
Lehigh University Board of Trustees

CONSOLIDATED STATEMENT OF ACTIVITIES
YEAR ENDED JUNE 30, 2017

[Table of data]

**2017**

<table>
<thead>
<tr>
<th>Description</th>
<th>Unrestricted</th>
<th>Temporarily Restricted</th>
<th>Permanently Restricted</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and fees</td>
<td>$191,329</td>
<td>—</td>
<td>—</td>
<td>$191,329</td>
</tr>
<tr>
<td>Federal grants and contracts</td>
<td>27,433</td>
<td>—</td>
<td>—</td>
<td>27,433</td>
</tr>
<tr>
<td>State and local grants and contracts</td>
<td>6,380</td>
<td>—</td>
<td>—</td>
<td>6,380</td>
</tr>
<tr>
<td>Private grants and contracts</td>
<td>7,360</td>
<td>—</td>
<td>—</td>
<td>7,360</td>
</tr>
<tr>
<td>Contributions</td>
<td>12,163</td>
<td>—</td>
<td>—</td>
<td>12,163</td>
</tr>
<tr>
<td>Investment return</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>10,816</td>
</tr>
<tr>
<td>Auxiliary enterprises</td>
<td>42,930</td>
<td>—</td>
<td>—</td>
<td>42,930</td>
</tr>
<tr>
<td>Independent operations</td>
<td>15,305</td>
<td>—</td>
<td>—</td>
<td>15,305</td>
</tr>
<tr>
<td>Other sources</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>10,816</td>
</tr>
<tr>
<td>TOTAL SUPPORT AND REVENUES</td>
<td>$150,804</td>
<td>$—</td>
<td>$—</td>
<td>$150,804</td>
</tr>
</tbody>
</table>

**2016**

<table>
<thead>
<tr>
<th>Description</th>
<th>Unrestricted</th>
<th>Temporarily Restricted</th>
<th>Permanently Restricted</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and fees</td>
<td>$191,329</td>
<td>—</td>
<td>—</td>
<td>$191,329</td>
</tr>
<tr>
<td>Federal grants and contracts</td>
<td>27,433</td>
<td>—</td>
<td>—</td>
<td>27,433</td>
</tr>
<tr>
<td>State and local grants and contracts</td>
<td>6,380</td>
<td>—</td>
<td>—</td>
<td>6,380</td>
</tr>
<tr>
<td>Private grants and contracts</td>
<td>7,360</td>
<td>—</td>
<td>—</td>
<td>7,360</td>
</tr>
<tr>
<td>Contributions</td>
<td>12,163</td>
<td>—</td>
<td>—</td>
<td>12,163</td>
</tr>
<tr>
<td>Investment return</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>10,816</td>
</tr>
<tr>
<td>Auxiliary enterprises</td>
<td>42,930</td>
<td>—</td>
<td>—</td>
<td>42,930</td>
</tr>
<tr>
<td>Independent operations</td>
<td>15,305</td>
<td>—</td>
<td>—</td>
<td>15,305</td>
</tr>
<tr>
<td>Other sources</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>10,816</td>
</tr>
<tr>
<td>TOTAL SUPPORT AND REVENUES</td>
<td>$150,804</td>
<td>$—</td>
<td>$—</td>
<td>$150,804</td>
</tr>
</tbody>
</table>

**NET ASSETS, BEGINNING OF YEAR**

<table>
<thead>
<tr>
<th>Description</th>
<th>Unrestricted</th>
<th>Temporarily Restricted</th>
<th>Permanently Restricted</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public service</td>
<td>9</td>
<td>—</td>
<td>—</td>
<td>9</td>
</tr>
<tr>
<td>Instruction</td>
<td>43,348</td>
<td>—</td>
<td>—</td>
<td>43,348</td>
</tr>
<tr>
<td>Operating income (loss)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Auxiliary enterprises</td>
<td>8,442</td>
<td>—</td>
<td>—</td>
<td>8,442</td>
</tr>
<tr>
<td>Independent operations</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Other sources</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>TOTAL SUPPORT AND REVENUES</td>
<td>42,930</td>
<td>$—</td>
<td>$—</td>
<td>42,930</td>
</tr>
<tr>
<td>Post-retirement plan changes other than net periodic benefit costs:</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Gifts and trusts released from restrictions</td>
<td>2,816</td>
<td>—</td>
<td>—</td>
<td>2,816</td>
</tr>
<tr>
<td>TOTAL REVENUES</td>
<td>45,746</td>
<td>$—</td>
<td>$—</td>
<td>45,746</td>
</tr>
<tr>
<td>NET ASSETS, END OF YEAR</td>
<td>$150,804</td>
<td>$—</td>
<td>$—</td>
<td>$150,804</td>
</tr>
</tbody>
</table>

**UNIVERSITY ADMINISTRATION**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position/Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>JENNIFER GONZALEZ</td>
<td>Executive director and assistant dean of the College of Arts and Sciences</td>
</tr>
<tr>
<td>ANNE R. KLINE</td>
<td>President and chief executive officer of the University</td>
</tr>
<tr>
<td>PHILIP B. SHEFFIELD</td>
<td>Retired executive vice president of Business Services</td>
</tr>
<tr>
<td>NICHOLAS P. BIGGOW, III</td>
<td>Professor of Economics and head of the department of Economics and Business</td>
</tr>
<tr>
<td>KAREN S. SCHAEFFER</td>
<td>Managing director of the Business Development Institute</td>
</tr>
<tr>
<td>BRAD E. SCHULER</td>
<td>Executive director of the Innovation, Strategy &amp; Talent at Cross, Inc.</td>
</tr>
<tr>
<td>PAUL B. BOBKO</td>
<td>Retired senior vice president and chief investment officer</td>
</tr>
<tr>
<td>ANE P. JAMIESON '75</td>
<td>Chairman of the Board of Trustees</td>
</tr>
<tr>
<td>DONALD A. OUTING</td>
<td>President, Finance and Administration</td>
</tr>
</tbody>
</table>

**CONSOLIDATED STATEMENT OF ACTIVITIES**

<table>
<thead>
<tr>
<th>Year Ended</th>
<th>Description</th>
<th>Unrestricted</th>
<th>Temporarily Restricted</th>
<th>Permanently Restricted</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>Tuition and fees</td>
<td>$191,329</td>
<td>—</td>
<td>—</td>
<td>$191,329</td>
</tr>
<tr>
<td>2016</td>
<td>Tuition and fees</td>
<td>$191,329</td>
<td>—</td>
<td>—</td>
<td>$191,329</td>
</tr>
</tbody>
</table>

**NET ASSETS, BEGINNING OF YEAR**

<table>
<thead>
<tr>
<th>Year Ended</th>
<th>Description</th>
<th>Unrestricted</th>
<th>Temporarily Restricted</th>
<th>Permanently Restricted</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>Public service</td>
<td>9</td>
<td>—</td>
<td>—</td>
<td>9</td>
</tr>
<tr>
<td>2016</td>
<td>Public service</td>
<td>9</td>
<td>—</td>
<td>—</td>
<td>9</td>
</tr>
</tbody>
</table>

**NET ASSETS, END OF YEAR**

<table>
<thead>
<tr>
<th>Year Ended</th>
<th>Description</th>
<th>Unrestricted</th>
<th>Temporarily Restricted</th>
<th>Permanently Restricted</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>Operating income (loss)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>2016</td>
<td>Operating income (loss)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

**NON-OPERATING ACTIVITY**

<table>
<thead>
<tr>
<th>Description</th>
<th>Unrestricted</th>
</tr>
</thead>
<tbody>
<tr>
<td>University</td>
<td>70,631</td>
</tr>
<tr>
<td>Independent operations</td>
<td>2,792</td>
</tr>
<tr>
<td>Gifts and trusts released from restrictions and changes in donor intent</td>
<td>(2,565)</td>
</tr>
<tr>
<td>Change in fair value of interest rate swaps</td>
<td>12,499</td>
</tr>
<tr>
<td>Post-retirement plan changes other than net periodic benefit costs</td>
<td>—</td>
</tr>
<tr>
<td>Change in net assets</td>
<td>931,161</td>
</tr>
</tbody>
</table>

**NET ASSETS, BEGINNING OF YEAR**

<table>
<thead>
<tr>
<th>Description</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and fees</td>
<td>839,051</td>
</tr>
<tr>
<td>NET ASSETS, END OF YEAR</td>
<td>$3,232,252</td>
</tr>
</tbody>
</table>

**NET ASSETS, END OF YEAR**

<table>
<thead>
<tr>
<th>Description</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and fees</td>
<td>839,051</td>
</tr>
<tr>
<td>NET ASSETS, END OF YEAR</td>
<td>$3,232,252</td>
</tr>
</tbody>
</table>
Lehigh University is in Bethlehem, PA, a vibrant and historic community located just a short drive from New York City and Philadelphia. More than 800,000 people live in the region.

LEHIGH AT A GLANCE

Lehigh University was founded in 1865 by Asa Packer, an industrial pioneer, entrepreneur and philanthropist.

5,075 Undergraduate students (55% men, 45% women)

1,942 Graduate students (55% men, 45% women)

9:1 Student to faculty ratio

$50,320 Tuition for 2017-18 academic year

4 colleges

- The College of Arts and Sciences
- College of Business and Economics
- The P.C. Rossin College of Engineering and Applied Science
- College of Education

2,000+ Undergraduate courses offered, many of which easily transfer among Lehigh’s four colleges

28 Average class size, with 69 percent of classes having 30 or fewer students

45+ Types of degrees conferred: Bachelor of Science, Bachelor of Arts, Master’s and Doctorate degrees

642 Number of faculty (542 of the faculty are full-time)

64% Percentage of faculty tenure

96% Percentage of tenure-track faculty who hold a doctorate degree or the highest degree in their field

$50,320 Tuition for 2017-18 academic year

4 colleges

- The College of Arts and Sciences
- College of Business and Economics
- The P.C. Rossin College of Engineering and Applied Science
- College of Education

2,000+ Undergraduate courses offered, many of which easily transfer among Lehigh’s four colleges

28 Average class size, with 69 percent of classes having 30 or fewer students

45+ Types of degrees conferred: Bachelor of Science, Bachelor of Arts, Master’s and Doctorate degrees

642 Number of faculty (542 of the faculty are full-time)

64% Percentage of faculty tenure

96% Percentage of tenure-track faculty who hold a doctorate degree or the highest degree in their field

96% Of the class of 2015 achieved career-related employment, entered graduate school, or landed other opportunities within their plan

28th Lehigh’s rank among the nation’s top research universities in the “best value” category

$61k Average starting salary of 2015 graduates

6th University in the world recognized as NGO by the United Nations

20+ Interdisciplinary programs spanning multiple colleges

20+ Interdisciplinary programs spanning multiple colleges

Notice of Nondiscriminatory Policy as to Students: Lehigh University admits students of any race, color, national and ethnic origin to all the rights, privileges, programs, and activities generally accorded or made available to students at the school. It does not discriminate on the basis of race, color, national and ethnic origin in administration of its educational policies, admissions policies, scholarship and loan programs, and athletic and other school-administered programs.
“Those who have been molded by their Lehigh experience are ambitious, unafraid, daring. They believe—and they act—with an entrepreneurial spirit, passion and purpose. They share a belief that all things are possible, that no dream is unachievable and no problem is unsolvable.”

John D. Simon
President