

Penn State College of Engineering

educating world-class engineers



Dean's Report on Philanthropy ■ JULY 1, 2007, TO JUNE 30, 2008

DEAN'S MESSAGE



Dear Alumni and Friends of the College of Engineering,

As you know, Penn State is committed to giving its students the highest quality education possible. As part of this commitment, the University embarked on a new multi-year fund-raising campaign focused primarily on students.

We've made some wonderful strides in our fund-raising goals, including securing a \$3 million gift from Peter and Angela Dal Pezzo of Fresno, CA. Their gift endowed the Peter and Angela Dal Pezzo Department Head Chair of Industrial and Manufacturing Engineering. Richard Koubek, the first to hold this chair, will use income from the gift to expand the department's global reach, including international activities and partnerships.

Peter and Angela's gift is but one example of how the College's alumni and friends are helping us provide the very best engineering education possible, including giving our students learning experiences in globalization, innovation, and leadership as they become World-Class Engineers.

None of this would be possible without help from donors like you. In this report, we thank and honor those who have invested in our students, faculty, and programs. On behalf of everyone at Penn State, I thank you for your generosity. The impact of your gift will be felt and appreciated for years to come.

David Wormley

David Wormley
Harold and Inge Marcus Dean of Engineering

Current Giving

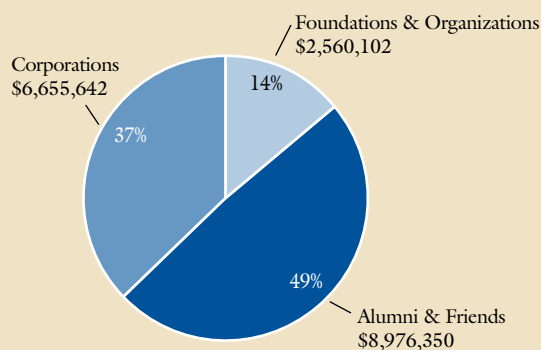
During the past fiscal year, from July 1, 2007, to June 30, 2008, the College experienced an increase in the gifts received from alumni, friends, corporations, foundations, and other organizations. Corporate giving rose from approximately \$4.4 million to \$6.6 million. Gifts from foundations and organizations rose from about \$1.2 million to \$2.6 million. Donations from alumni and friends went from \$7.3 million to nearly \$9 million.

Some areas of the College received major donations in the past year. The \$3 million gift from Peter and Angela Dal Pezzo of Fresno, CA, helped to boost faculty support donations from approximately \$1.6 million in

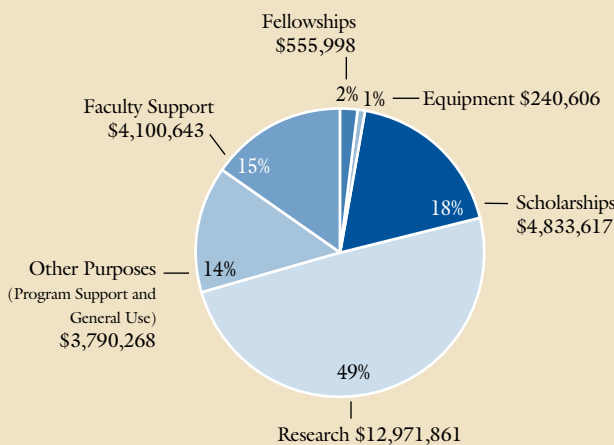
the previous year to \$4.1 million this year. A \$10 million Global Research Partnership Investigator Award from the King Abdullah University of Science and Technology pushed research donations from \$2.5 million in the previous year to nearly \$13 million.

Donors who supported the College of Engineering with \$250 or more during the past fiscal year are celebrated in the Honor Roll starting on page 15. We truly appreciate their continued support and dedication, which help to maintain Penn State's global reputation in providing a world-class engineering program for our students and faculty.

Who Supported the College, 2007-2008



Where Donations Were Designated, 2007-2008



Ensuring Student Opportunity

Scholarships play a vital role in rewarding outstanding undergraduate students whose achievements reinforce Penn State's reputation as a premier educator of world-class engineers. Academically gifted students are highly recruited by the best colleges and universities. To compete with these institutions, Penn State must be able to offer competitive scholarship support, particularly in engineering where the demanding curriculum makes it difficult for students to maintain part-time jobs.

With a minimum gift or pledge of \$50,000, a donor can establish a scholarship that will help the College attract the

best and brightest engineering students. These scholarships may be named in honor of an individual and designated for a particular campus or recipient group. They may also be limited to students in a specific major or from a particular geographic area, consistent with University policy.

A named, endowed scholarship in the College of Engineering offers support and recognition, not only for a job well done, but of faith in promising students—and perpetuates our reputation as one of the country's leading engineering institutions.

THINKING



OUTSIDE THE BOX

Ensuring Student Opportunity

Andrew Pytel, professor emeritus of engineering mechanics, didn't realize the impact he had on a particular student's life until he was told a scholarship was being created in his honor. "He was the first teacher since high school that I saw as a role model," says **John Bender** (ESM Ph.D. '76) of Pytel. "He inspired me to study engineering as a science and a discipline, not a job." To thank Pytel, Bender donated \$50,000 to create the **Andrew Pytel Scholarship**.

SARA PACE

FRED AND KIT BIGONY SCHOLARSHIP IN ENGINEERING



As a high school student, **Sara Pace** was certain she wanted to build roller coasters for a living.

But after attending the architectural engineering program at Penn State for two years, Sara's interests moved in a new direction. She explains, "Recently I have wanted to do more with green building designs. So, just last week I added biological engineering as a second major. It will allow me to see how the environment affects the buildings and vice versa. After I graduate in 2011, I want to create a really green building and maybe design zoos."

This fall, the Winchester, KY, native received help getting closer to that dream by way of the **Fred and Kit Bigony Scholarship in Engineering**. Extremely thankful for the financial assistance, Sara says, "Out-of-state tuition is so expensive. My parents help me pay for school, and this scholarship makes it a lot easier on us."

Sara was also excited to write a thank-you letter to the Bigonys. She reflects, "I think it's nice for them to get a connection to who received their donation."

And as if her studies don't fill enough of her schedule, Sara is serving her second year as the president of the Women in Science and Engineering (WISE) House. She is also a three-time volunteer for the Women in Engineering Program's Girl Scout Saturdays initiative, an active member of the Society of Women Engineers and the tennis club, and a work study in the College of Engineering's human resource office.

Despite her myriad of extracurricular activities and demanding course load, Sara manages to find some time to relax. She laughs, "I'm really a big couch potato. I like to watch television and hang out with friends a lot. I tell myself not to get too wound up about stuff. I take it one day at a time."

Enriching the Student Experience

Molding students into world-class engineers goes beyond learning in the classroom. The College continues to seek new opportunities to prepare students to be strong leaders and global citizens. These include programs in entrepreneurship and leadership, study abroad and course-related travel, and service learning and outreach. Penn State engineering students learn the importance of responsibility, community, and integrity—values that connect them with generations of alumni.

Gifts to the College enable students to take part in these valuable opportunities. They may help defray the costs of travel, provide seed money for new activities, or award grants for service learning and public scholarship.

Penn State engineers will be immersed in a stimulating environment that fosters global involvement, community service, creative expressions, and personal growth.

THINKING



OUTSIDE THE BOX

Enriching the Student Experience

Robert Alger (CE '79), president and CEO of Lane Construction, wanted to create an endowment that would give the civil and environmental engineering department a large degree of flexibility. With an initial gift of \$50,000 from Lane Construction, the **Department of Civil and Environmental Engineering Fund for Excellence** was created. Not only has Alger played a pivotal role in creating the endowment, he's been spearheading the effort to have others contribute to it. Alger envisions the new endowment as a tool **Peggy Johnson**, head of civil and environmental engineering, can use to enhance the student experience at Penn State.

WILLIAM KORB



William Korb got to do something during the first two years of his Penn State education that not many students get to do: live at home. The Erie, PA, native attended Behrend Center (now Penn State Erie, The Behrend College) before transferring to University Park. He recalls, "I was funding my own way through college, so it was important to save money any way I could."

After receiving his bachelor's degree in industrial engineering in 1962, Bill went to work for Reliance Electric, where he spent 25 years in various roles, including sales engineer, sales manager, operations manager, and group vice president.

Bill left Reliance in 1987 to lead a management buyout and become president and CEO of Gilbarco, the leading global supplier of fuel-dispensing equipment and fully integrated point-of-sale systems for the global petroleum marketplace.

After 13 years with Gilbarco, Bill retired in 2000.

Reflecting on how his Penn State education contributed to his success in industry, Bill

says, "With my engineering degree from Penn State, I was extremely well prepared to go to steel mills, paper mills, or other industrial facilities and talk about electrical, mechanical, or even hydraulics issues."

Through the years, Bill has remained active with the industrial engineering department and currently serves on the College of Engineering's Advancement Committee. This summer he established the **William B. Korb Family Endowment for Emerging Opportunities in Industrial Engineering** to foster growth, discovery, and progress in areas that are essential to the service sector, such as healthcare, retail, entertainment, and transportation.

Bill says he's happy to be able to give back to his alma mater. "I feel a lot of loyalty to anything that has helped me in life, and Penn State has done that."

A lot has changed in the department since Bill graduated, and giving back also means helping make that change happen. He smiles, "It's interesting to see the department I was in broaden their horizons, and it feels good to be part of that."

Building Faculty Strength & Capacity

The reputation of Penn State and the College of Engineering rests on the strengths of the faculty. Outstanding faculty members attract talented students and drive the development of strategic research partnerships with corporations and government agencies. An institution cannot achieve distinction if it cannot assemble and maintain a talented and dedicated faculty. In engineering, competition for outstanding faculty is fierce, particularly at the senior level. Endowed professorships and chairs serve as powerful tools for recruiting and retaining senior faculty.

Endowed positions also help to attract some of the best and brightest graduate students. They provide valuable support as these students pursue their advanced degrees. Endowing a professorship or chair in the College of Engineering helps ensure that the quality of our faculty remains high and our ability to pursue important research programs is maintained—continuing Penn State’s legacy as one of the nation’s elite engineering institutions.

THINKING



OUTSIDE THE BOX

Building Faculty Strength and Capacity

Although **William Joyce** already established a named chair in the College, he sought to supplement it with another gift. Rather than putting it all in the existing chair, he gave \$2 million to establish the **William H. Joyce Fund in the College of Engineering**. The new fund adds more money to the chair and establishes a number of graduate fellowships that allow the Department of Chemical Engineering to recruit and train the next generation of engineers.

MIKE LAPSLEY

HARRY G. MILLER FELLOWSHIP IN ENGINEERING



Fort Wayne, IN, native **Mike Lapsley** never planned to attend graduate school. However, after receiving his biomedical engineering degree from Rose-Hulman Institute of Technology in Terre Haute, he learned a lot from his job-hunting experience. He states, “When I started looking for jobs that interested me, they all required a master’s degree in a specific field. With my biomedical engineering degree I had a little experience in a few fields, but not enough specific knowledge about any one field.”

While working in the physics department at Rose-Hulman, Mike decided to pursue a master’s degree from Penn State. He recalls, “Our head of physics knew the kind of work that was being done in the engineering science department at Penn State.”

Mike says people in the department have been very helpful since he moved to State College from Indiana. He explains, “My dad is from Scotland and my mom is from England, so neither of them went to college here. As an undergraduate student I didn’t really know how to apply for scholarships.

The engineering science department helped me out a lot with finding financial resources.”

As a result, Mike applied for, and received, the **Harry G. Miller Fellowship in Engineering**. He reveals, “Getting the fellowship makes being a student less stressful. I can focus more on my research without worrying about money.”

The fellowship also handed Mike some personal gratification. He smiles, “It felt good to know someone thought I was worth the scholarship. I’m very grateful.”

After he graduates next spring with his master’s degree, Mike plans to stay at Penn State to earn his Ph.D. Eventually he hopes to seek employment in industry. He explains, “Texas Instruments would be a great place to work. They have a plasmonic sensor on the market that’s really interesting.”

Recently married, Mike spends a lot of time hiking with his wife, Megan, and playing with their dog.

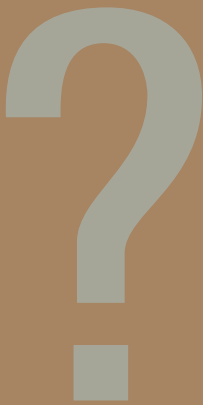
Fostering Discovery and Creativity

A major facet of the University's engineering education is a focus on hands-on experience. Our students become investigators, working alongside some of the world's leading scholars and researchers to push past old limits and create new understanding in every field and discipline. Penn State engineering students have the opportunity to participate in some of the most important academic and scientific breakthroughs of our time while

learning problem-solving methods that will serve them in their future careers.

As innovation in every field accelerates and the needs of our society change, partnerships between visionary donors and academic leaders will allow for advancing research and discovery while fulfilling our primary educational mission. Students will continue to come to Penn State, not just to learn about the world but to make it better.

THINKING



OUTSIDE THE BOX

Fostering Discovery and Creativity

Training engineers to be responsible citizens of the world was the idea behind a gift from **Charles "Chick"** (Aeronautical Eng '60) and **Joan Rolling** of Helena, MT. The couple's \$250,000 gift, the **Charles E. "Chick" and Joan F. Rolling Program Fund in Engineering and Ethics**, supports programs such as seminars and interactive workshops designed to focus on the ethical issues related to engineering. **Engineering Dean David Wormley** says, "Engineers not only face technical challenges but also ethical considerations throughout their careers."

TEAM RAINWATER JAMAICA

As part of their engineering leadership training, Philip Barr (left), Steven Baumann, and Andrzej Kulik designed a rainwater collection system.



When most people think of Jamaica, they envision beautiful beaches and reggae music. But for a team of three Penn State engineering students, Jamaica is home to a project very near and dear to their hearts.

Initiated through a cooperative agreement between Mustard Seed Communities, a non-profit community development organization, and **Richard Schuhmann**, director of the College's Engineering Leadership Development Program, the project challenged students with developing a means to harvest rainwater for use at a residential development for mentally and physically handicapped residents in Haddon, Jamaica.

The engineers were paired in a virtual team with a group of entrepreneurship students from Hungary and provided with topographic maps, rainfall data, and projected population demand to design their solution.

Andrzej Kulik, senior in civil engineering, said the project turned out to be more challenging than expected. He reflects, "As soon as we started working on it, it got complicated. Every day there were more issues."

But by the end of the semester, the three engineers and their Hungarian counterparts had a plan, so the team flew to Budapest to present it. While there, the team was exposed to some cultural experiences they would not have received in a classroom. Andrzej recalls, "We had a typical

day with lectures and classes. Afterwards we went on big city scavenger hunts to find things. Basically, we had to learn how to get around the city, then we had to make a presentation about it."

Philip Barr, a senior in civil engineering, is a teaching assistant this fall in ENG 493, a class that is responsible for continuing the effort. He explains, "This semester we are starting testing to determine the best material for rainwater collection. Next semester there will be a concrete design."

Steve Baumann, a senior in chemical engineering, observes, "This could be a big initiative, not just for the one community but for the whole country."

Schuhmann admits that outside financial support is crucial to these kinds of learning initiatives. "The Engineering Leadership Development Program received support from corporate donors such as GE and Dow for this particular project in Jamaica. Both corporations recognize that providing the world with clean water is one of the great challenges of the 21st century. The program is grateful for their vision and support."

And all three team members agreed this was an educational opportunity they probably would not have been afforded elsewhere. Philip says, "I feel lucky that I go to a university that allows you to take what you learn in the classroom and apply it to real-world experiences and, even more, help other people."

Sustaining a Tradition of Quality

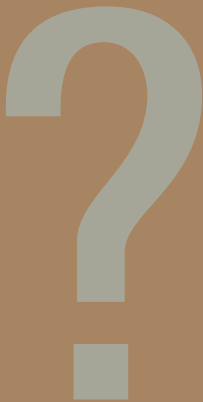
Without the generous support of individual and corporate donors, the College of Engineering would not be able to maintain its ability to prepare students for personal and professional success.

It is this tradition of quality that continually brings employers to the College of Engineering seeking to hire graduates. Companies from around the world have come to rely upon Penn State as a source for both new employees and new ideas, and they have nurtured those programs that reflect their own aspirations and values.

Unrestricted gifts to the College help enrich the student experience through curricular innovations, special lectures, and other opportunities. They may support experiential education such as co-op and international programs or student services such as the Multicultural Engineering Program or the Women in Engineering Program.

Unrestricted gifts help the College of Engineering maintain a high level of excellence, create a flexible approach to engineering education and research, establish new programs to meet emerging needs, and provide a world-class education for our students.

THINKING



OUTSIDE THE BOX

Sustaining a Tradition of Quality

The EPICS Program combines two of the University's major missions: education and service. Since 2001, EPICS, which stands for Engineering Projects in Community Service, has given students valuable hands-on experience with real projects that benefit the local community. Over the years, EPICS has been sponsored by a number of local, state, and national businesses. Students have created innovative solutions, including a voice recognition trainer for a five-year-old autistic boy, a hand-gripping device for a four-year-old with Apert Syndrome, and a retrofit plan to make a building more green.

WOMEN IN ENGINEERING PROGRAM ORIENTATION

THE WOMEN IN ENGINEERING PROGRAM



With dips, loops, and tunnels, the Mt. Nittany Monster, Buzz Blaster, and Rainbow Cyclone are guaranteed to be thrilling roller coasters. But coaster enthusiasts won't be riding them anytime soon—they're actually creative models constructed by first-year women engineering students during this year's Women in Engineering Program Orientation (WEPO).

WEPO is an empowering three-day immersive orientation for first-year women engineering students. Held the week before classes begin, WEPO provides first-year women engineers with vital resources, mentoring, and experiences to fuel their successes. Notably, students develop confidence in their chosen profession while engaging in their first engineering design, learning to navigate computer resources, and making a network of new friends.

Through hands-on projects, active mentoring, and career development activities, participants engage in problem solving, teamwork, and networking that are critical to successful engineering academics and subsequent career achievement.

WEPO uniquely provides first-year students with valuable upper-class student mentors who engage the women in engineering activities and offer well-seasoned advice on how to succeed in the first year. Mentor **Erin Golden**, a junior in chemical engineering, explains how long-term friendships often begin with WEPO. My mentor **Claire Venturino** (IE '07) and I still keep in touch by e-mail, and we even meet for lunch sometimes."

Like many programs, WEPO would not be possible without generous financial support. This year's corporate sponsors included Air Products & Chemicals, ALCOA, Boeing, Chrysler, Dow Chemical, ExxonMobil, General Motors, Lockheed Martin, Procter & Gamble, and Shell Oil Company. **Cheryl Knobloch**, the Women in Engineering Program associate director and WEPO coordinator, explains, "Funding from these companies provides support for participant accommodations, food, expendable materials, and related expenses vital to program success."

The substantial growth of WEPO is made possible by continued support of corporate sponsors and alumni. Cheryl recalls, "The first WEPO was held in 1996 and had 30 women participants, all from the University Park campus. WEPO 2008 featured 47 upper-level women on the leadership team and 162 women participants, 20 of whom were from other Penn State campuses."

One of those 20 students, Forest City, PA, native **Kristi Farinelli**, a first-year bioengineering student, is attending the Worthington Scranton campus. She says, "I was glad I attended WEPO because I met another student from my campus!"

In the end, WEPO's hope is to make participants feel comfortable as Penn State engineering students. Mentor **Colleen Zwilcher**, a junior in mechanical engineering, confirmed that WEPO objectives are being fulfilled. She says, "I participated in WEPO when I was a first-year engineering student. I was shy, but after WEPO I felt like part of a family."

New Endowments *in the College of Engineering*

FY 2007-2008

Trustee Scholarships

Homcha Trustee Scholarship in the College of Engineering

Walter and Mary Miller Trustee Scholarship in the College of Engineering

Naren K. and Judith T. Gursahaney Trustee Scholarship in the College of Engineering

Gregory T. Lucier Trustee Scholarship in the College of Engineering

Gerald and Ann Mayefskie Trustee Scholarship in the College of Engineering

Betty W. and Albert L. Moore Trustee Scholarship in the College of Engineering

Charles A. and Linda E. Sorber Trustee Scholarship in the College of Engineering

Richard H. and Helen C. Kustin Trustee Scholarship in the College of Engineering

Bruce Robert Bender, MD Trustee Scholarship in the College of Engineering

Penn State Alumni Association Trustee Scholarship in the College of Engineering

Gary and Ralphine Gentzler Trustee Scholarship in the College of Engineering

Scholarships

John R. and Jeanette Dachille McWhirter Undergraduate and Graduate Scholarships in Chemical Engineering

Richard F. Erdley Scholarship in the College of Engineering

Jeanette and Ralph Weiss Scholarship in Memory of Dr. Merrell Fenske

Boris M. and Margaret L. Osojnak Scholarship in Engineering

Program Support

Matthew P. Blickley Memorial Fund in the College of Engineering

Charles E. (Chick) and Joan F. Rolling Program Fund in Engineering and Ethics: A Global Perspective

2007–2008 Honor Roll of Donors: *Individual Partners*

Individuals who supported our College with \$250 or more during the past fiscal year

The Challenge Society — \$10,000+

Gary D. and Sheila Suther Bello
John D. Bender
Frederick and Katherine Meinig Bigony
B. Paul and Margaret Blasingame
*Roscoe E. Blyler
Fred A. and Susan Breidenbach
Glenn R. Brown and Jennette Graselli-Brown
E. Louise Buckwalter
*Ralph R. Cranmer
Peter R. and Angela Doris Dal Pezzo
John E. and Patricia A. Dewolf
Herbert L. and Susan Duffield
George L. and Patricia J. Fish
Frank Gabron
David V. and Judith Grabowski Gaggin
Gary L. and Ralphine R. Gentzler
Arthur L. and Betty Wilton Glenn
Bernard M. Gordon
John D. Groenveld
Daniel R. and Grace S. Hawbaker
Russel H. and Sandra Ross Herman
John H. and Doreen Gorski Hollenbach
Stephen F. and Ruth Ann Holmes
Stephen F. and Margaret A. Homcha
Barry E. and Shirley A. M. Isett
Robert E. and Patricia R. Jepsen
Darin P. and Laura T. Johnson
William H. and Kathleen Joyce
Harry A. and Susan Bogh Kauffman
Timothy B. and Joan Schwartz King
Richard H. and Kay W. Klingler
William B. and Wendy Trout Korb
David P. and JoAnne C. Kulig
Richard H. and Helen Clay Kustin
Gregory T. and Marilena Lucier
Harold J. and Inge Marcus
James E. and Melinda Marley
Jack V. Matson and Elizabeth Goreham
Charles A. and Elinor Strohm Matts
Gerald F. and Ann Mayefskie
George A. and Barbara J. Miller
Michael D. and Deborah Sarver Minor
Raj and Jeannette S. Mittra
Peter T. Mkhabela

Stephen M. Muck
John R. and Brenda T. Myers
Robert P. Oelschlager
Robert E. and Leslie K. Olson
C. R. and Annette C. Pennoni
A. Duer and Edna Bennett Pierce
Walter L. and Anne G. Robb
Charles E. and Joan F. Rolling
Max P. and Joan Miller Schlienger
Clyde W. and Nancy Shuman
Susan Rauscher Sinclair
James B. and Anna Lee Smith
Raymond E. and Patricia Walsh Stevens
Glenn E. Thomson
K. Dean Vought
William L. and Josephine Berry Weiss
William C. and Linda Campbell Westley
Carl H. and Lois M. Wolgemuth

Dean's Council — \$1,000 – \$9,999

John M. and Marianne L. Albanese
Ardell J. and Frances M. Anderson
Frederick T. and Nancy W. Andrews
Francis B. and Marcia A. Arieta
Richard W. and Sandra Banks Austin
Charles E. and Katherine Reid Bailey
Maurice R. and Anne Baker
Henry R. and Dorothy S. Barracano
Thomas A. and Natalie Smith Bathgate
Robert J. and Melinda M. Bathgate
William John and Mary J. Beckert
Gregory A. Beecher
Luther J. and Emily Z. Benedick
Karl H. and Patricia A. Bergey
Laurens S. and Patricia Beyland
Charles A. and Jane Y. Bibleheimer
Carl E. and Betty J. Birchard
James J. and Nancy Bolon
Nicholas and Sylvia S. Bonevac
Joseph R. and Marlene B. Borda
Ellwood E. Brem
Jack S. and Diana R. Brenizer
Charles H. and Barbara D. Brickell
Edward B. and Cheryl L. Bryant
Larry C. and Barbara Eaves Burton

James H. and Nancy Ann Buterbaugh
Timothy W. and Julieann Klipa Butler
Philip D. and Shirley M. Cady
James E. and Nancy Z. Carnes
Donald H. and Donna L. Carretta
Roger E. and Norma Michener Carrier
Charles L. and Suzanne Charriere
Ajay K. Chatterjee and Carmel McShera
Louis E. and Judith P. Chaump
Dean C. and Mary L. Cherrington
Lunkit F. Cho and Kwai F. Mui
Richard W. and Marcia L. Churns
Payson J. Clyde
J. Stanley and Elizabeth D. Cobb
Howard R. and Glenna Bauman Cohen
*Carolyn K. Coldren
William H. and Karen B. Colwill
Donna Lantz Conway
James C. and Mary Maroney Corman
Joseph F. Costa
Charles H. and Jane M. Culnane
Constantine T. and Anna Dalson
Terry A. Daniel
Kenneth W. and Elizabeth O. Davidson
Donald A. and Jane G. Dean
Dennis L. and Mary Ann Derr
David H. DeVore
Walter D. Dietz
Thomas L. and Gail L. Doorley
Joseph O. Erb
Donald R. and Irene R. Erdley
James E. Etzel
Richard F. Evans
Ronald W. and Nancy J. Ewing
Jerry W. and Barbara Covolus Faust
James A. and Aliceclair I. Faust
Royal P. and Virginia Breneman Fisher
Donald E. and Gene S. Fogelsanger
Daniel J. Folmar and Victoria A. Mekler-Folmar
Thomas T. and Leesa M. Folmar
Robert C. and Eleanor S. Forney
Wyman B. and Cheryl Glover Fowler
Norbert P. and Audrey Laffer Gaelen
John F. Gardner
Richard H. Garnes

* Deceased

2007–2008 Honor Roll of Donors: *Individual Partners*

Individuals who supported our College with \$250 or more during the past fiscal year

Mark A. and Camille G. Gelfo
Louis F. and Judy S. Geschwindner
James R. and Mary E. Veeck Gilson
Jerry E. Goldress
Phillip J. and Mary Evans Graziano
James E. and Connie H. Grube
David W. and M. Diane Grzelak
Naren K. and Judith T. Gursahaney
Robert M. Hallstrom
Thomas N. and Agnes Mason Hand
Herbert A. and Anne S. Hanson
George M. Hardisty
James F. and Nancy Haroldson Hargrave
Sabih I. and Guler Hayek
Roland H. and Donna Blank Heck
Robert J. Hemler
Douglas B. and Olivia Lauer Henderson
David E. and Janet B. Hidinger
Kristen M. Hlopick
Dale T. Hoffman
Robert M. and Judith C. Hontz
John R. and Cynthia Mark Hummel
Hance H. and Elspeth A. Huston
William K. and Suzann Jenkins
Roy W. and Diana Davis Johnson
Malcolm C. and Carol E. Justice
Andrew and Katherine Kartalis
Edward M. and Betty L. Kasody
Michael R. and Shearon Kauffman
Michael D. and Andree Ward Keebaugh
William L. Keefauver
Jesse W. and Esther A. Kehres
William T. and Sharon T. Kennedy
Edward H. and Deborah R. Klevans
Richard T. and Linda Koffenberger
Thomas L. and Tammy J. Koontz
Timothy F. and Roseann T. Kowalski
John F. and Anita J. Kray
William R. and Bonnie Baldwin Kress
Anil K. and Shama A. Kulkarni
Akhlesh and Mercedes Lakhtakia
Jeffrey H. Lange
Charles D. and A. Turid Larson
Esther M. Larson
Dean E. and Carol W. Leib
Edward G. and Jane Munafò Liszka
Michael J. and Patricia Beecher Loftus
John R. and Bonnie L. Longenecker
Thomas A. Lucas
Timothy R. and Lisa Decker Lupold
Dennis E. Lyons
Paul E. and Linda M. MacDonald
Robert E. and Marjorie Rex Manning
William E. and Kathleen A. Marciniak
Sean P. and Jennifer Marks
James G. and Lynda Saubel Matakovich
Kelly J. Mather
Vincent P. Mc Ginn and Mary Sue McGinn
Timothy J. McCarthy
Paul H. and Mona Bergman McConnaughey
Scott A. McKeever
Robert G. and Judith E. Meeker
Divo A. and Joann Messori
Sally S. Metzger
Robert J. Metzner
George M. and Anne H. Miller
Charles L. and Claire Lawrence Miller
Gary E. Miller and Sharon Feucht
James H. and Marianne Tinker Miller
James R. and Nancy L. Miltenberger
Edward and Billie J. Mitchell
Kenneth S. and Barbara K. Moffitt
Nancy C. Mohn and Robert E. Keen
Albert L. and Betty Wheaton Moore
Robert and Robin H. Morris
Walter K. and Jane Miller Morris
Dale M. and Jeanne M. Mosier
Ramatsemela Mphahlele
Frank B. Modruson and Lynne C. Shigley
Brady M. and Susan Baker Murphy
Carl N. and Cathleen F. Myers
Robert J. Nagy
Carl L. Nale
Scott A. Neff
John W. and Marilyn Fisher Newlin
Mitchell L. Thompson and
Barbara A. Nicholson
Joseph A. and Sandra Zerby Niebel
Russell L. and Judith M. Noll
Paul and Leisa North
Thomas E. O'Brien
Bradley W. and Laurie Knash O'Halla
Robert N. and Ann L. Seltzer Pangborn
Louis N. and Dolores M. Parent
Jeffrey A. and Margaret Albanese Peck
Dale C. and Rosesharon Perdue
Joseph M. and Elizabeth G. Perez
Jeffrey N. Perrone and Cynthia N. Ade
Irene M. Petrick
Brian R. Pomeroy
Robert W. Powell
Jeffrey C. and Priscilla Purse
D. Lyle and Jeanne M. Pyke
Victor M. Ramos
Shishpal S. Rawat
Joseph R. Reed
Richard E. and Loretta W. Reeder
Bradley A. Repp
David W. Roberts and Lisa A. Storms
Chet S. and Paula E. Ross
John J. and Rosanne Rozmus
Stephen J. Roznowski
Michael D. and Karen Fleischmann Rudy
Gregory F. Ruppert
Leo P. Russell
Gregory G. and Angela Forte Ryan
John R. Sacha
Mark J. Sawicki
Mervin G. and Patricia Carelli Schaefer
Stanley G. Schaffer
Susan O. Schall and Gary L. Morison
Harry C. and Arlene F. Schell
Gregory A. Schirm
Henry F. Schoenfeld
Ronald A. and Suzette M. Schultz
C. Frederick and Judith Loope Sears
Jennifer L. Sedor
Dennis J. and Jean Seeley
Stephen C. and Leslie D. Shuman
Richard G. and Francine Willick Sider
Mark S. and Holly Fenningdorf Simes
David R. and Barbara Gingrich Singer
Thomas A. and Sharron A. Sligh
Jeffrey C. Slocum and Helene D. Zuber Slocum
Marcus and Eileen Shirk Smedley
Edward I. and Carole H. Smith

Harold L. Smith
 Stephen C. and Jean Thomas Snyder
 Loren P. and Bernardine Stolp
 Donald E. and Mary S. Stout
 Gregory L. Strickler
 Brian J. O'Connell and Eileen M. Supko
 Irving Susson
 Robert M. and Susan J. Swope
 Jesse S. and Lavonne O. Tarleton
 Julie E. Tarr
 Douglas B. and Debra Leisawitz Taylor
 James J. and Patricia E. Taylor
 Richard C. and Nancy H. Temple
 Fred C. and M. Joanne Bender Thompson
 Richard L. and Ginny Thornburgh
 Judith A. Todd and Stephen M. Copley
 Maryilyn Stevens Tracy
 Rudolph J. and Monica A. Treichel
 Lawrence L. and Amanda Trick
 Bryan C. and Vivian Moyer Troutman
 Mark Trump
 *Anthony J. Turchetti
 James S. and Matilda F. Vastine
 Vijayakumar C. Venugopal
 Harry M. Vivian
 Chao-Yang Wang and Meirui Lin
 Fei Wang
 John R. and Ann Fraker Washburn
 John R. and Alice W. Watkins
 Richard A. and Mary T. Weimert
 Eric P. and Louise Grauer Whorral
 R. F. and Linda H. Wilson
 Carol R. Winder
 Elmer R. and Reba R. Witter
 Robert L. and Ileana L. Wyerman
 Suk J. Yim
 Sam Y. and Myrna Zamrik
 Nicholas and Janet S. Zettlemoyer

**Engineering Associates —
 \$500 – \$999**

Howard R. Alter
 Chimay J. Anumba
 Angela Anuszewski
 Richard L. Ashmore

Charles W. and Judith C. Askins
 Kenneth A. Bannister
 James R. and Sheri Barth
 Albert J. and Gloria E. Bartosic
 Martin D. Bates
 Aaron and Lori Olsen Bator
 William L. and Paula Short Beatty
 Eric T. Beaumont and Nancy J. Buck
 Kevin W. and Sharon Achenbach Beaver
 Peter M. and Stacey M. Begg
 John M. and Joan E. Bergey
 Elmer W. and Eunice Bergman
 Rajive and Lorie Kattnor Beri
 William J. Best
 Richard E. and Bettie A. Biancardi
 Terry L. and Barbara Tomko Bittner
 Richard S. and Pamela B. Bloss
 Donald D. Bock
 Don J. and Dorothy Allison Bostock
 Chester L. Bottenfield
 Rick and Lori A. Bouchelle
 Harold L. and Cecille P. Brooks
 Charles E. and Susan Chalker Brown
 Thomas B. and June Roush Brown
 Eric P. Butterfield
 Richard A. and Nancy Predhome Caccese
 Jerome S. Cap
 John D. Carnall
 Carol Carroll
 Jason W. Cave
 Jack C. and Kay Gilbert Cernuska
 Oscar R. and Kristen Churaman
 James R. and Andra B. Clapsaddle
 Robert A. and Lorraine Stankiewicz Clare
 William P. and Lois J. Clark
 Ira H. and Jerolyn A. Coen
 Jeremy Collier
 Ryan P. Collins
 Luke G. Contos
 Daniel E. and Peg Cook
 Steven J. Corney
 Frank K. Costigan
 Gregory A. and Nancy I. Cresswell
 Susan E. Criss
 Milo D. and Carol Dahl

James D. D'Angelo
 Peter M. and Diane Hansen Denholm
 J. Michael and Melissa Stevenson Dile
 Bernard F. and Krishna Dittman
 J. Merle Ditz
 Jonathan V. Dougherty
 A. Kay Driscoll
 Thomas L. and Ruth Monroe Dubreuil
 Robert D. Duncan
 Michael D. and Janette Durham
 Charles E. and Ruth Nissen Fegley
 Frederick J. and Patricia A. Fernsler
 James L. and Judy Savage-Ferris
 Brian E. Finkele
 John T. and Carolyn O. Frasier
 Amy L. Freeman and John Cripe
 John C. and Barbara Gecy Frey
 Alex P. and Ruth M. Fried
 Marvin L. Fry
 Richard A. and Carol A. Fry
 Mark D. Fuehrer
 Robert C. and Shelly Niznik Garman
 Robert C. Gebhardt
 Mark A. and Laura Hile Geckle
 Lyn Smith Gemperle
 Edward O. and Elaine J. Gerstbrein
 Jennifer L. Gerwig and Gregory W. Dively
 Stephen A. and Michele Rahm Giacomucci
 William W. Glassmyer
 Edward F. and Alice Kilmartin Gowen
 Amy S. Graver
 Beth Holly Green
 Douglas P. and Karyn A. Greenfield
 Kenneth E. and Louise A. Gregory
 Dane C. Grenoble
 Thomas D. and Toni Guckert
 James G. and Winifred M. Guerdon
 Donald K. and Betty Lou Hackenberry
 Barbara T. Harder
 Edwin A. and Alice N. Hardy
 Alan G. Hawbaker
 John C. and Delene McVann Hayward
 Russell L. and Diane Heiken
 Richard L. and Elisa Evans Hetrick
 Eric W. Hiatt

* Deceased

2007–2008 Honor Roll of Donors: *Individual Partners*

Individuals who supported our College with \$250 or more during the past fiscal year

Richard C. and Sandra Pelton Hickok
William R. and Nancy Hodgkiss
Philip D. and Jean Hirt Houck
Norman E. and Nancy A. Houtz
Thomas J. Hughes
William O. Iams
John M. and Gloria E. Johnson
Joseph B. and Linda M. Jones
Robert J. and Dorothy Kendra
Allan and Laurie Stroka Kennedy
Donald E. and Joyce A. Sheesley Kerr
Edward R. and Jean M. Kimmel
Larry King
Bernard A. Kraus
Joseph M. and Lynne Marie Krkoska
Robert J. Krupnik
Paul E. and Joan Krystow
J. Marc Kurowski
Charles E. and Felicia Lehman
Robert H. and Sandra K. Lengel
H. M. and Dolores R. Liptak
Albert H. and Eileen T. Long
Arthur M. Longacre
John A. and Rosemary Love
Ralph M. and Lucile J. Love
Yung S. Lu
Ray J. and Gloria Lunnen
Aaron S. and Tracy L. Marines
Charles E. and Joan M. Marstiller
Joseph F. and Sandra E. Martignetti
Richard D. Martin and Susan Yee-Martin
John M. and Michelle Shinsky Mason
Patricia Mathisen
Gregg J. and Mary K. Matz
David W. and Nancy Patalon Maynard
Kenton R. and Ann E. Mc Ginnis
Larry and Felicia E. McAllister
C. Thomas and Emily M. McCall
Earl D. McClain
Barnes W. and Emily Hess McCormick
Patrick J. McDonnell
Robert C. Meadows
David M. Menendez
Bernard P. and Ruth L. Miller
Bradley W. and Kim Marie Miller

James W. Miller
Walter M. and Mary K. Miller
Earl J. and Jane Mills
David L. and Angela D. Mordan
Paul and Mindi E. Morris
Richard B. and Judith Schoenfeld Morrison
Steve R. and Linda Pawlusiow Mosch
James H. Moser
Bill and Stasia Moustakakis
*Henry F. Moyer
William W. Mullins and Patricia A. Petrick
D. Craig and Debra Kay Myers
Fredric T. and Janet L. Myers
Kenneth A. and Leonor Littlefield Myers
James L. and Alison Kaye O'Keefe
George A. and Virginia R. Palmer
Paul D. Palmer
Brian H. Pandya
Sharon L. Parson
James S. Parsons
James E. and Marian H. Patrick
Mark Steven Allison and Ann Cristina Perry
Richard W. and Geraldine H. Pickering
Kenneth S. and Lois Morgan Plummer
Michael F. and Joanne Pohlen
James D. and Marianne C. Porter
John B. and Edith Mattke Renton
Terry L. and Mary Beth Thompson Rhodes
Thomas D. and Barbara E. Russell
Thomas and Sandra Russiello
Jerzy and Ewa K. Ruzyllo
Michael M. and Bonnie M. Ryan
Brett L. and Brenda Nissley Sands
Robert J. and Phyllis A. Santoro
Barbara Schmidt
Curtis E. Schneck
Barry J. Schoch
Ronald C. and Martha J. Schoener
Craig M. Schofer
Robert P. and Joan Schuman
Tod D. Serfass
Michael and Lisa Curran Sexter
Thomas M. Sharpe
William P. and Linda M. Sheehan
David C. Shiring

Ronald K. and Helen B. Sibley
Edward M. Singel
Gregory A. and Pamela Lesh Slusher
Paul Martori and Beth A. Somplatsky-Martori
Richard J. and Audrey Kimmel Spitko
Steven C. and Cheryl T. Sprinkle
John C. and Mary Ann Spychalski
Vincent F. and Marjorie Warden Stanec
James F. and Mary Sweeney Stangl
Wayne E. and Deanna Statler
William S. and Lois M. Stauffer
Gary H. and Catherine B. Strawbridge
Rob Striewig
Robert J. and Doris R. Stupp
Daniel P. and Karen I. Suchecki
Andrew Sucheski
Russell N. Swerdon
John A. Tague
Eric P. and Paula Rossen Taylor
Wayne E. and Kristin Goodreau Thayer
A. Frederick and Susan Weston Thompson
John E. and Donna L. Thompson
John P. and Hiroko Uchida Tomalavage
Raymond Trunzo
Carmen J. and Joanne Forster Valerio
Keith L. Vogel
Kristina N. Vogel
Mark J. and Karen S. Wagner
Douglas H. and Irene Warfel
Stephen and Kimberly Kazlo Warne
Frank W. and Ada Woodward Warner
John T. Wasdi
Jon W. Waynick
Violet L. Weeden
Paul E. Weeks
Barry B. and Eileen Weinstein
Ralph J. and Jeannette W. Weiss
Michael J. and Dena Jordan Wendle
Thomas G. and Anne Brown West
Mark J. and Mary Kay Wharton
Bradley D. and Kristine Geisler Willard
Daniel S. and Ellen A. Williams
Lee R. and Melinda Wilmot
Rodney M. and Candace C. Wilson
David A. and Hollie B. Woodle

Joseph A. and Jacqui R. Woomer
David N. and Shirley Wormley
William T. and Paulette Jacques Yost
Raymond A. Young
Zhiwen Yu
Stanley Zajkowski
Karl K. Zimmerman

Second Century — \$250 – \$499

Michael R. Abbett and Maureen Aldrich
Martin M. Abromavage
Daniel B. Allison
James D. Allison
Nicholas F. and Patricia Zerambo Amicucci
William E. and Frances E. Amos
James R. and Evelyn V. Andrews
Ricardo A. Argomaniz
William K. and Linda M. Arnold
Kraig H. Baier
Ralph R. and Ann L. Bannister
Thomas R. and Sandra M. Bardarik
Douglas W. Barker
William D. Barlow
Maureen A. Barry
Roger and Darla Bartakovits
Francine Battaglia
Andrew W. Beggs and Michelle Wierson
William L. and Susan Holman Bengtson
Matthew E. Best
Paul A. and Virginia P. Bickel
Allen D. and Diane Biehler
Sven G. and Carmen Bilén
Eugene L. Bishop
Andrew W. and Patricia Blenko
Warren A. Blittersdorf
Christopher A. Body
Arthur W. and Donna R. Boesler
John W. and Karen A. Bollinger
Fraser and Kathryn A. Bonnett
Craig E. and Janet E. Boyd
Bruce A. Brace
Richard E. and Krista L. Bradley
Charles A. Braunwarth
Ellen M. Brennan
Gary A. and Claudia McKibbin Brennen

Timothy J. Britton
Kyle P. Broadbent
A. Scott and Kristina Marado Brookes
Charles M. and Jean K. Brooks
Andrew Y. and Sharon L. Brough
Carl D. and Edith Finkey Brown
Ronald E. and Mary Ellen Brown
Paul D. and Olga Groth Browne
Jeffrey A. Budney
Frank S. and Barbara L. Burkett
William J. and Karen Brunt Burkhard
Sidney V. and Caryl P. Burns
John M. and Charlene St Clair Burrell
David J. and Kathleen Burton
Daniel A. and Mary Bush
Robert J. and Maureen Dexter Calder
Thomas P. Cap
Kenneth H. and Ethel M. Care
Jeffrey M. Casaletto
Scott D. Cathell
Edward H. and Louise Catlin
Robert W. Peters and Jennifer L. Cawthra
Andrew Cecere
James P. and Lucy Charpie
Jeffrey A. and Christen Caughey Cieslak
Joseph Cingle
George N. and Barbara Rundquist Clark
James F. and Susan Clark
Philip R. and Debra Tita Clark
David R. Clarke
David H. Coats
Bruce A. and Debra Leshay Cohen
Robert L. Cohen
John W. and Nancy Mills Coho
Darren and Jennifer H. Cole
Robert A. and Renee S. Warfield Coleman
Peter A. Colvin
Robert J. and Janice Afflebach Cook
Donald L. and Linda Yaw Corwin
Brian D. and Janet Michael Cotter
Daniel B. and Courtney A. Coulter
Gary and Penny J. Cowell
Steven J. and Patrice Brock Crawford
Greg D. and Jule Cahill Crider
Ernest J. and Ira F. Cross

Jason M. and Renee Crossland
Richard L. and Lyn Kibler Culver
Charles H. Dailey
Frederick J. and Patricia M. Damelia
Jose A. Dasilva
Lisa Witzig Davidson
David D. and Linda Searfoss Davis
Timothy J. Davis
Scott M. and Kelly Dayton
Warren L. Dedich
Susan J. Dess
Charles G. and Linda Diefenderfer
Robert Fletcher M. and Helen Kerwin Diemer
Daniel E. and Sharon P. Dietz
John L. and Eileen P. Dietz
Dion R. Dixon
Chad I. and Kristin G. Dodd
Sheldon and Cynthia K. Dolinger
Stephen T. and Catherine Bray Donohue
Andrew J. and Debra Lowry Doucette
Gary A. and Patricia Drutch
Jeffrey A. and Molly S. Ebling
Edward P. and Renate Eckman
Robert J. and Sherian Campbell Edgreen
John Einfalt
Jolie A. Elder and W. D. Barron
Daniel S. Elias
Nicholas A. Elton
Robert H. and Molly Marie Emerson
Mark E. Engelbert
Kevin L. and Lorie Brinson English
George H. and Ruth Erb
Richard L. and Darlene J. Eshleman
Ronald A. Etzel
Stephen D. and Deborah Kasaczun Eustis
Mary A. Faeth
Brian T. Fagersten
Richard A. Fahnlne
Robert V. and Gail Ann Falsetti
William H. Farrell
Charles E. and Amy B. Fetterman
Daniel R. and Lynne Clarke Filburn
Kevin C. and Linda Fiscus
Curtis L. and Kathryn E. Fisher
William D. Fitzsimmons

* Deceased

2007–2008 Honor Roll of Donors: *Individual Partners*

Individuals who supported our College with \$250 or more during the past fiscal year

Thomas S. and Valerie Foley	Ronald P. and Virginia Rizzo Harvey	George S. Ju
Cleveland C. Foster	John M. and Mary Ann Haupt	Gregory R. and Sugirtha Alexander Judd
John A. Fox	Robert E. Hauser	John W. Kakareka
L. William and Elizabeth Scott Fox	Thomas W. Hawksworth	Krishna Kandarpa
Mark I. and Janice M. Franko	Daniel C. and Amy L. Haworth	Michael A. and Sabrina D. Karam
George C. Freas and Nancy J. Cliff	Eric S. and Carrie Lidwell Hendrixson	Michael J. Kardauskas
William T. and Melinda Freeman	Kerry L. Henry	Paul J. and Joyce Grunewald Kauffmann
James D. and Joana Santamaria Freihaut	William A. Kline and Elaine T. Herfurth-Kline	William A. Kearney
Jeffrey H. Fry	Steven M. and Peggy S. Herr	James E. and Elaine Kehler
Roger M. and Joan Baranak Fry	Carol McGuire Herrmann	David J. and Helen Lehman Keister
Steven P. and Pamela Garbini	Vincent P. Herron	Steven L. Haller and Bridget M. Kerr
Jeffrey H. and Kimberlee A. Gardner	David and Melanie E. Herzfeld	Jon C. Kettles
Joseph F. and Shannon N. Gasbarre	Charles W. Hess	Daniel T. and Josephine Kimmel
Roland P. and Peggy Gehman	Julie L. Hewett	Dan L. King
Adam M. and Kimberly S. Gelwarg	Frank L. Hildabrand	Gary M. King
Richard J. Gerdts and Euphemia L. Johnson	Winthrop E. and Dolores T. Hilding	Richard W. Kirby
David E. Gerhart	Douglas P. Hoffman	Timothy M. Kirby
Edward W. and Karina Faynshtein Gibbs	Richard H. and Rosalie Hogg	Scott J. and Patricia Klevenhagen
Daniel C. and Juliet Yearns Gillespie	Richard W. and Betty Louise Hogg	Ronald E. Kmetovicz
James P. Gleba and Karen C. Miller	William G. and Agnes Jean Holbert	Brian M. and Angela R. Knight
Marci L. Goldfinger	Paul S. and Janice M. Holbrook	Lloyd G. Knowles
Ronald E. and Carolyn M. Gormont	James W. and Bobbie Holland	Bruce R. Komaromy
William H. and Jean G. Gotolski	Michael P. Holleran	Andy Koo
Stephen M. Graboski and Nancy Jane Morrison	Kent V. and Barbara A. Hollinger	Alan M. Kosydar
Kenneth R. and Cynthia A. Graziani	Michael L. Holter	John M. Kovacik
Thomas A. Gregorchik	Kevin J. Horvath	Francis J. and Marilyn Roche Krahe
Steven J. and Patti L. Gridley	Ronald K. and Shirlie M. Huber	Jonathan K. and Joann J. Kramer
Gregory J. Grieff	William H. and Wendy J. Hudson	Jeffrey K. Kroon
Walter J. and Ann Znaniecki Grzymyski	John S. and Bridget A. Huemmrlich	Jay S. and Jody Kozic Kruse
Edwin S. Guldner	John M. and Rosalyn O. Hufford	Scott and Jennifer Fissel Kruse
William J. Gumbert	William P. and Lucille Hughes	Kacy Kugel
Joseph A. and Janet K. Gundling	Ronald J. Hunsicker and Jana R. Barnett	Edward J. Kulak
Nishi Gupta	Kenneth W. and Carolyn A. Hunt	James R. and Linda H. Kunkle
Samir K. Gupta	Kenneth A. and Marcia K. Huntsman	Kenneth K. and Olivia Kuo
Willard H. and Shelby S. Hackman	Thomas B. Igoe	Stanley N. and Frances M. Kutufaris
Benjamin M. and Emily C. Hagan	Brian A. Jackson	Scott A. Kutz
Jon E. and Susan Everetts Hallander	David A. and Gail Kaneshige Janisch	Gary P. La Belle
Howard G. Halverson	Eric W. Jarvis	Harry G. and Elizabeth L. Lambroussis
Victor Hambarsoumian	Daniel M. Joffe	Jamie M. Landers
Howard C. and Corinne S. Hanna	Allan H. and Elaine G. Johnston	Gerald C. and Esther E. Lauchle
Walter S. and Joann Harner	Gerald L. and Marlena Jolley	Guadalupe G. and Kimberly Stone Leal
Christopher M. Harrington	Alan L. and Barbara Grest Jones	Charles K. and Bonita Potts Leisher
Dwight H. and Holly U. Harrison	Bradley A. Jones	Wayne J. Lescavage
James L. and Leah J. Hartsock	Cynthia J. and Alfred Jones, Jr.	John W. and Elinor C. Lewis
F. Joseph and Dawn Whisler Harvatine	Jeffrey P. and Amy Jo Norek Jones	Robert J. and Diane G. Lilley

Richard R. Lindeke
David A. Linnemans
Judy Liu
Martin C. and Janine Y. Livingston
Michael J. Lizbinski
Mark W. and April E. Lloyd
Joseph R. Lock
James J. and Lois S. Long
Maurice J. and Mary S. Longo
Bruce A. Luff and Janie Slamon
Todd L. Mackert
Thomas M. and Barbara J. Madden
Gary G. Mahle
Dennis S. and Phyllis Krison Malinge
Michael F. Malone
Susan T. Manning
Thomas G. and Gwenn R. Marchesano
Natale A. and Susan Goodhart Marini
Lawrence S. and Deborah Ann Martin
Robert M. and M. Caroline Masters
John D. Matyasic
Robert J. Mayer
Frederick T. and Diana Neam Mazzitelli
William E. and Robyn Flagg Mc Kinstry
Robert D. and Virginia Marie McCavitt
Michael and Candice McCouch
Robert V. and Barbara B. McFadden
James M. and Joyce Myers McKay
William J. McLaughlin
William H. and Veronica F. Megonnell
Daniel P. and Christine M. Mesaros
Kerry J. and Beth A. Mickle
Chauncey S. and Edith Elinor Miller
*Donald W. and Dorothy M. Miller
Douglas W. Miller
Justin R. Miller
Michael J. Miller
William M. and Kathleen M. Miller
Le Roy W. Mink
Harry R. and Lynn Minnich
Richard G. and Tamara Akins Mistrick
David L. and Kristine J. Mitchell
Richard N. and Ginny Moffett
Christopher G. and Lynette Anne Mollo
Richard and Carolyn Petrick Morin
John W. Morris
Philip J. and Brenda M. Morris
Jeffrey L. and Judy Peters Motter
Donald A. and Julie Exler Moul
Mark C. Moyer
William R. and Rosemary K. Moyer
Sanjib K. Mukherjee
Kevin R. Mullen
Robert L. Mumper
Victor L. Mykulowycz
John Robert and Mary Jo Goodheart Nagel
Frank Naret
Robert C. Nelson
Amy L. Neumeier
William David and Patricia Karian Newman
Gilbert O. Nielsen
Richard M. Ninesteel
Deborah A. Norton
Eugene P. and Linda Tippings Oddi
William J. O'Donnell
Emanuel V. and Maria C. Orfanon
David E. and Susie Paik
Joseph R. and Kimberly Palmieri
David J. Palmowski
James E. Panichella
Robert A. and Maureen Williams Papp
Alexander L. and Betty K. Parry
Larry B. Parsons
Dale R. and Abigail Francis Patches
Andrew J. and Eileen Thomas Patrylak
Emerson O. and Tammy Stuart Peery
Bryan K. and Susanna C. Perriello
David A. and Julia S. Pezza
Dodd A. Pfeffer
James J. and Nancy E. Pinto
Balys P. and Robin Renee Platukis
Steven F. Poklar
David M. Potetz
David C. and Diane K. Punola
Andrew and Jean Landa Pytel
Edward J. Radziszewski
Christopher H. and Mary A. Raebel
Michael J. Ramundo
Richard D. and Lynda A. Randall
Daniel T. and Kelli Thum Regan
Charles H. and Alta C. Rehkopf
Eugene F. Retter
Jon A. and Karen Lynn Rhan
Ralph L. and Patricia Fuehrer Rhodes
Philip L. and Laurie Ricciardi
Donald L. Richards
Lucinda F. Risser
Karen M. Ritchey
Kenneth E. and Patricia Smith Ritchey
Carlos R. Rivera
Patrick B. and Cynthia North Roche
Joseph Romanchak
Bruce M. Rosenbaum
Harvey W. and Gloria Rothfeld
Elliott J. and Julie B. Ruby
Thomas G. and Kristine B. Rudowsky
Neil F. and Mary M. Ruggieri
Robert D. and Donna M. Ruth
Mark C. Ryan
Herbert F. and Margaret Bitner Sailer
Timothy S. and Jodi A. Sammarco
Erwin M. and Karen Geary Saniga
Thomas J. Sarosky and Elizabeth M. Imboden
Steven B. and Eleanor M. Satrom
Phillip E. and Elaine Schiever Savage
Lawrence P. Scherer
Herbert T. and Ria J. Scheuren
Carl E. Schlier
Glenn L. and Connie Schmehl
Edward F. Schmitt
Thomas W. Schnautz
Charles R. and Enid Hennessy Schneider
William J. Schneider and
Linda Comis-Schneider
Paul W. Scholz
Gary Schooley and Jana Mellott Schooley
David W. Schuler
Matthew E. Schultz
William J. Schumacher
Jeffrey K. Schweitzer
Olof H. and Eva Jakowenko Scott
Raymond J. Sedwick
Dennis C. Seibel
Larry R. and Carol Seiders
Stanley E. and Deborah Kates Senft
Bradley W. and Pamela Dunn Shaffer

* Deceased

2007–2008 Honor Roll of Donors: *Individual Partners*

Individuals who supported our College with \$250 or more during the past fiscal year

William F. Shaffer	Bradley A. and Beth Bishop Stump	Todd M. and Mary Hammond Warner
Roger B. Shakely	Mahesh Swaminathan and Gomati Mahesh	Cheryl Ault Way
Scott G. and Edith Sheffer	Ted T. and Renee Edelson Szabo	Michael J. and Laurie Weigner
Bruce J. and Laura De Rocher Shook	James M. Tarlecki	Dennis A. Weller
John J. and Charlotte Sideravage	Bryce A. Taylor	Nancy W. Wentworth
Douglas F. and Katherine L. Sitrler	Clifford M. Theony	Christopher M. Wentz
Curtis L. and Lisa D. Sittler	Robert A. and Nancy McClintock Thomas	William M. and Regina Bilotto Werts
Robert E. Skinner	John A. and Evelyn A. Thomchick	Harry H. and Laurel Brutout West
John W. Skooglund	Scott C. and Rachel Ann Thompson	Richard E. and Joanne Brace Weyers
James W. and Marilyn M. Smiley	Melissa D. Topper	Richard A. Whelan
Edward C. and Pamela Schott Smith	David W. and Naomi H. Traub	Ronald L. and Linda Woods Wiggins
Gary C. and Janet E. Smith	Robert M. and Kay Badollet Troxell	Julian J. and Stephanie A. Wilkins
Keith A. and Darla Smith	Robert B. Tucker	Jack H. and Marsha F. Willenbrock
Larry P. and Barbara March Smith	James A. and Barbara Clark Tudas	Douglas L. Williams
Neal R. and Sharon Clifford Smith	Greg and Diane C. Turk	Frederick F. Willis and Ann E. Frost
Robert Smith	David J. Van Dyke	Curt M. and Amy D. Wilson
William J. Smith	Joseph L. and Mary S. Veracco	Charles R. and Charlotte H. Wilson
Richard E. Snell	Ted V. Veterano	William C. and Diane D. Wimer
Timothy A. Sochor	Raymond A. and Tracy A. Volpatt	Michael W. Wimsatt
Charles A. and Linda Babcock Sorber	Peter Vrona	Francis S. Wlodarczyk
Witt and Jennifer M. Sparks	Martin and Helen Wachs	William H. and Marianne P. Wood
Donald H. and Helene Krebs Stalcup	Michael D. and Tina Wagner	Christopher S. Woolley
William S. and Mary Anne Stanley	Kevin M. and Allyson Arcesi Waldman	Wei-Te Wu and Li-Mey Lee
Giles W. Stanton	David G. and Amy Walker	James Yatsko
Joseph M. Stash	Jeffrey A. and Mary Foley Walsh	James E. and Dolores M. Yochim
Calvin C. and Calvin C. Staudt	John A. and Ann J. Jennings Walsh	Thomas C. and Jean Stover Young
John W. and Lori Anderson Steele	Norman Daniel and Trudy K. Waltersdorff	Ki Hwan Yum
George R. and Louise Terpak Sterner	Joseph D. Wanderling	Joseph F. and Barbara L. Yurso
Gary L. and Holly B. Stevenson	John B. and Linda R. Wardell	Pam M. Zaslav
Mark W. and Martha Avery Stewart	Matthew J. Warfield	Willis L. and Joanne S. Zimmerman
Joseph A. and Carla R. Stoner	James D. and Lou Ellen M. Warner	John R. Zlogar

2007–2008 Honor Roll of Donors: *Corporate Partners*

Individuals who supported our College with \$10,000 or more during the past fiscal year

Corporate Partners — \$10,000+

Academy Motion Picture Arts and Sciences Academy Foundation	Fidelity Investments Charitable Gift Fund	PPG Industries Foundation
Advanced Machine Technologies, LLC	Flowserve Corporation	Pratt & Whitney
Aerospace Corporation	Ford Motor Company	Precision Medical, Inc.
Air Products and Chemicals, Inc.	Forrester Construction Company	Procter & Gamble Fund
Air Products Foundation	GE Fund	Qualcomm
Alcoa Foundation	GE Inspection Technologies, Inc.	R.G. Vanderweil Engineers, LLP
Alcoa, Inc.	General Motors Corporation	RM Associates
Alliance Structural Engineers, LLC	General Motors Foundation	Shell Oil Company
American Chemical Society	Glenn O. Hawbaker, Inc.	Siemens Medical Solutions Health Services Corporation
American Society for Nondestructive Testing	Gordon Foundation	Sikorsky Aircraft Corporation
Analytical Graphics, Inc.	GRG Consulting Engineers, Inc.	Silicon Valley Community Foundation
AT&T Mobility	Grunley Construction Co., Inc.	Silvestri Family Foundation
Atlantic Microwave Corporation	Hansung University	Simpson Gumpertz & Heger, Inc.
Automated Logic Corporation	Harvey Industries, Inc.	Singapore Institute of Manufacturing Technology
BAE SYSTEMS	Henry Luce Foundation, Inc.	Southland Industries
Balfour Beatty Construction	Herb Duffield, LLC	Sprint Nextel
Barton Malow Company Foundation	Hewlett-Packard Company	Structural Insulated Panel Association
Barton Malow Design/Construction Services	Intel Corporation	Technology Collaborative
Bechtel Foundation	James G. Davis Construction Corporation	Toyota Info Technology Center U.S.A., Inc.
Bello Family Foundation, Inc.	Kern Family Foundation	Toyota Motor Manufacturing North American
Boeing Company	King Abdullah University of Science and Technology	TRF Sustainable Development Fund
Boeing Company/Boeing Defense & Space Group	Lane Construction Corporation	Tsinghua University
BP Foundation, Inc.	Liebert Corporation	Turner Construction Company
Chevron Corporation	Lindy Paving, Inc.	UniStar Nuclear, LLC
Chrysler Foundation	Lockheed Martin Corporation	United Technologies Corporation
Cisco University Research Program	Lord Corporation	Volvo Construction Equipment
Clark Construction Group, LLC	Lutron Electronics Company, Inc.	W. L. Gore & Associates, Inc.
CMS Foundation Inc.	McGraw-Hill Companies	Weiss Family Foundation
Cobham Defense Electronic Systems Corporation, Inc.	Michael Baker Corporation	Whirlpool Foundation
Combustion Propulsion & Ballistic Technology Corporation	MTS Systems Corporation	Wiss, Janney, Elstner Associates, Inc.
Commonwealth Financial Network	Muck Family Foundation	Xerox Corporation
ConocoPhillips, Inc.	Narus, Inc.	Yuan Ze University
Corning Incorporated Foundation	National Academy for Nuclear Training	
Dow Chemical Company Foundation	National Collegiate Inventors and Innovators Alliance	
Eaton Charitable Fund	National GEM Consortium	
Electrical Alliance	National Roofing Foundation	
Emerson Charitable Trust	National Electrical Contractors Association	
Erie Community Foundation	Nextgen Aeronautics	
Exelon Nuclear	Nissan Motor Company, Ltd.	
ExxonMobil Corporation	Northrop Grumman Corporation	
ExxonMobil Foundation	Nucor Corporation	
	Oldcastle	
	P J Dick/Trumbull	
	Pentadyne Power Corporation	

2007–2008 Advisory Boards

Engineering Advancement Committee

Eugene M. Bard
BR+A Consulting
Engineers, Inc.

Gary D. Bello
Atera Partners

William Happel
General Motors (retired)

William B. Korb, Jr.
Marconi Commerce Systems
Incorporated (retired)

Bennett Levin
City of Philadelphia (retired)

Roberta Levy Liss
CB Richard Ellis
Brokerage Services

James E. Marley
AMP Incorporated (retired)

John R. McWhirter
Copper Beech Townhomes, LLC

Kenneth Moffitt
Ingersoll-Rand Company (retired)

Joseph R. Monkowski
Chair of Advancement Committee
Pivotal Systems Corporation

Victor M. Ramos
J. Blanco Associates, Inc.

Walter Robb
Vantage Management

Charles Schneider
U.S. Security Associates, Inc.

Joseph M. Silvestri
Court Square Capital Partners

Susan R. Sinclair
Hershey Chocolate USA

Engineering Diversity, Committee for Multicultural Engineering Program

Shani Allison
Ford Motor Company

Caroline Blackwell
Department of Defense

Sheree Denny
Boeing

Bruce Fletcher
ATS-Chester Engineers

Joe Furino
BAE Systems

Paula Garcia Todd
Dow Chemical Company

Bob Gochnour
BP America

Christina Guice
PPG Industries

Jay Henderson
Nucor Steel Arkansas

Karen Marasco
Westinghouse Electric Company

Larry McAllister
Air Products and Chemicals

Dale Perdue
Alcoa

Robert Raybits
Northrup Grumman

Johanna Ramos
Scitor Corporation

Victor Ramos
J. Blanco Associates

Calvin Roberts
Michigan State Department
of Transportation

Wayne Robertson
Wyndham Mills International

Vernon Ross Jr.
Lockheed Martin

Richard Temple
Chevron Energy Technology

Dan Williams
Bechtel National

Lisa Chenevert-Williams
Dow Chemical Company

M. Caroline Wright
Siemens Medical Solutions

Herbert Young
Turner Construction Company

Engineering Diversity, Committee for Women in Engineering Program

Kathy Baltins
BP America

Mike Bober
ExxonMobil Research
& Engineering

Laura Chan
Harris RF Communications

Janet Cunningham
JBC Associates

Anne Eisert
GE Transportation

Julie Arbuckle Finnegan
Accenture

Annemarie Gessner
3M

Lynne Goodstein
University of Connecticut

Robert Hemler
Independent consultant

Eric Jackson
3M Center

Kimberly Jasek
Chevron

Liz Kisenwether
KidTech Corporation

Anna-Maria Rivas-McGowan
NASA Langley Research Center

Diane Murray
Northrup Grumman Corporation

Adrienne Robinson
Merck & Co.

Meghan Scanlon
Ortho-Clinical Diagnostics

Elayne Schmidt
Wyeth Research

Anita Todd
University of Cincinnati

Learning Factory
Bryan Berical
BAE Systems

Liz Boni
Appalachian Arts Studio

Vince D'Imperio
Air Products and Chemicals

Joe Fledderman
BAE Systems

Joe Furino
BAE Systems

Joe Gabrys
Boeing

Alan Gehringer
Industrial Modernization Center

Ted Graef
Intuitive Control Systems

William Grauer
Boeing

Thomas Kapelewski
Decorator Industries

Perry Morrisette
Boeing

Paul North
Harris Corporation

Greg Slusher
General Motors

Jorene Proper
Central Intermediate Unit #10

Leonhard Center

Eugene Bard
Bard, Rao & Athanas
Consulting

Michael Brunner
AT&T Federal Systems (retired)

James Carnes
Sarnoff Corporation (retired)

Arthur Glenn
GE (retired)

Jerry Goldress
Grisanti, Galef & Goldress

David Grzelak
Komatsu America

Priscilla Guthrie
Institute for Defense Analysis

William "BJ" Johnson Jr.
J and J Consulting

William Keefauver
AT&T (retired)

William Leonhard
The Parsons Corporation (retired)

William Leonhard Jr.
U.S. Air Force (retired)
The Parsons Corporation (retired)

Bennett Levin
Pennsylvania Department of
Licenses and Inspections (retired)

Andrew Milne
Tidebreak

Nancy Mohn
ALSTOM Power

John Myers
Tru-Circle

Ralph Olsen
R.A. Jones & Company

Walter Robb
General Electric (retired)

Max Schlienger
Retech

Charles Schneider
U.S. Security Associates, Inc.

Donald Stout
Antonelli, Terry, Stout & Kraus

K. Dean Vought
Textile/Clothing Technology

Carl Wolgemuth
Penn State (retired)

Penn State Engineering Society

Francis Arieta (ChE '96)
Patricia Beecher Loftus (NucE '75)
Dean Butler (AE '77)

Edward Heckman (ESci '66)
John Hollenbach (ChE '78)
Matt Kelly (ESM '03)
Gerald Kolbe (EE '86)
Ronald Lombard (EE '69)

Salvatore Luzio (CE '04)
John McKeown (Aero '65)
Susan McNulty-Atwater (ABE '99)
John Mikita (IE '67)
William Nace (CE '61)

Richard Randall (ME '71)
Jerry Robertson (ME '69)
Mike Sherwin (IE '01)
Karen Sweeney (AE '80)
Mark Wharton (EE '71)

2007–2008 Industrial and Professional Advisory Council

Aerospace Engineering

Paul C. Bavitz
Lockheed Marin
Robert Braun
Georgia Institute of Technology
John Colwell
SAIC, Inc.
Mark E. Drier
Bell Helicopter Textron, Inc
Pamela Gomez
FAA
Daniel Kunec
Joint Strike Fighter Program
Janis Mantini
Boeing
Jim Neidhoefer
Aeronomy, Inc.

Agricultural and Biological Engineering

William Batchelor
Mississippi State University
Wayne Bogovich
USDA-NRCS
Thomas D'Alfonso
Danisco Animal Nutrition
James Day
TurfTeq
Dave Elkin
Murphy Brown
Dale Lehman
URS
Feng Li
Merck & Company

Susan McNulty-Atwater
Wayne Martenas
CNH Global
Julie Masser-Ballay
Trus Joist
Michael Lorenz
King Architects, Engineers &
Interior Designers
Jordana Langiotti Swank
Hershey Foods Technical Center

Architectural Engineering

Glenn Bell
Simpson Gumpertz & Heger
Thomas Bellace
Alliance Structural Engineers
Mattias Bergman
Infrastructure Solutions Group
Herbert Duffield
Furlow Associates
Michael Harrison
Hines
Russell Heiken
X-nth
Stephen Lee
Carnegie Mellon University
Roberta Levy Liss
C.B. Richard Ellis Group
Raymond Sowers
ONCORE Construction
Karen Sweeney
Turner Construction Company

James White
LLI Technologies
Joseph Wisnewski
Wisnewski Blair and Associates
Joseph Zaharewicz
Elliptipar, Division of SRS Design

Bioengineering

Joel Bartholomew
B Braun
Scott Corbett
Abiomed, Inc.
Gretchen Reed
Teleflex

Chemical Engineering

Paul Bryan
Chevron
Pablo Debenedetti
Princeton University
Thomas Doorley III
Sage Partners
Colleen Griffith
Invitrogen
Ignacio Grossmann
Carnegie Mellon University
Michael Harold
University of Houston
Eric Jackson
3M
Ganesh Kailasam
GE Plastics

Joe Krkoska
Dow Chemical
Johnathan Spadt
RatnerPrestia
Tom West
Pioneer Hi-Bred International
John Zielinski
Air Products and Chemicals

Civil and Environmental Engineering

Robert Alger
Lane Construction Company
Michael Bronzini
George Mason University
George Cascino
Consulting engineer
Janet Cunningham
JBC Associates
Dennis Johnson
Juniata College
John Kulka
HRI
Lewis Link Jr.
University of Maryland
Nancy Mohn
ALSTOM
James Moorcroft
CH2M Hill
Jorge Pagán-Ortiz
Federal Highway Administration
Thomas Skibinski
GJAI Consulting Engineers

Computer Science and Engineering

Steven Betza
Lockheed Martin
Systems Integration

Robert Burger
Innovectra

Kenneth Huntsman
America Online

Jack Gallagher
Motorola

Lizy Kurian John
University of Texas at Austin

Christopher Kelly
Booz Allen & Hamilton

Timothy Kowalski
ICT Group

Mark Milford
BakBone Software

Patrick Roche
Telecordia Technologies

Cetin Seren

James Stangl
Management Science Associates

Bruce Wile
IBM System and
Technology Group

Rod Woodruff

Electrical Engineering

John Croteau
Analog Devices

Todd Erdley
Videon Central

David Gaggin
CHELTON Microwave

John Golombek
Northrup Grumman

Robert Hemler

Engineering Science and Mechanics

Gregory Altonen
Lutron Electronics

Lori Bouchelle
CMP Technologies

Charles Dages II
Warner Bros. Technical Operations

William Ellingson
Argonne National Laboratory

Barry Farmer
Air Force Research Laboratory

Hance Huston
IBM

Krishana Kandarpa
University of Massachusetts

Walter Miller
Winhall Capital

William Skullney
Applied Physics Laboratory

Alan Wilks
Packer Engineering

Howard Witham
ST Microelectronics

Sam Zamrik
Penn State (retired)

Industrial and Manufacturing Engineering

Peter Dal Pezzo
PELCO (retired)

Edward Kasody
American Trim (retired)

Paul McConnaughey
Alcoa (retired)

John Mikita
Armstrong World
Industries (retired)

Jeffrey Sheetz
Tyco Electronics/AMP

Leslie Shuman
Alcoa

Ed Szkudlanski
Eclipse Business Solutions

Susan Schall
SOS Consulting

Mechanical and Nuclear Engineering

James Adams

J. Jeffrey Brightman
Bechtel Power

David Carter
United Technologies
Corporation-Pratt & Whitney

Thomas Christopher
Areva

Michael Corradini
University of Wisconsin-
Madison

Matthew Fronk
General Motors

Hans Gougar
Idaho National Laboratory

Andrew Hamel
Stryker Endoscopy

John Karidis
IBM Thomas J. Watson
Research Center

William Mitchell
Nuvera Fuel Cells

Eileen Supko
Energy Resources International

William Wepfer
Georgia Institute of Technology

Dave Wisler
GE Aircraft Engines

How to Support the College

ANNUAL CONTRIBUTIONS

Your contribution to the Penn State College of Engineering sustains a tradition of excellence and makes a difference for current and future Penn State engineering students. To make your annual gift to the College, please use the return envelope provided with this report.

You may:

1. Return your check in the envelope.
2. Charge your gift to your credit card.
3. Set up an electronic funds transfer from your checking account for an easy, efficient, monthly contribution.

Penn State offers the option of Electronic Funds Transfer (EFT) to allow you to spread your contribution over the fund year. The amount you specify is deducted from your checking account at the beginning of each month. Alumni often find that a little each month adds up to more than they could afford at one time. If this is a good option for you, you may initiate an EFT from your account by providing the required information on the return envelope and returning it with a voided check from your account.

To designate your gift for a particular use, please check the appropriate box on the return envelope.

For more information, contact:

John L. Dietz Jr., Director of Development
 Penn State College of Engineering
 101 Hammond Building
 University Park, PA 16802
 Tel: 814-863-3848
 Fax: 814-863-4749
 E-mail: jld5@psu.edu

This publication is available in alternative media on request. Penn State is committed to affirmative action, equal opportunity and the diversity of its workforce. U.Ed. ENG 09-68

GIFTS THAT KEEP ON GIVING

The College of Engineering Endowment is a pooled investment of gifts. The University holds these gifts in perpetuity, investing them and spending only a portion of the total return annually for each endowment's designated purpose. Establishing a named endowment in the College of Engineering will provide income to make a difference for Penn State engineering students forever.

Endowment Category	Minimum Gift
Faculty Chair	\$2,000,000
Professorship	\$1,000,000
Career Development Professorship	\$500,000
Graduate Fellowship	\$250,000
Undergraduate Scholarship	\$50,000
Trustee Scholarship	\$50,000
Program Support	\$25,000

Endowments may be established through a one-time gift of cash or securities or through a pledged commitment to be paid over a specified number of years. Endowments can also be created through a bequest or in the form of a deferred gift designed to provide a life income for the donor or his or her dependents.

For information on making a deferred gift or establishing a named endowment with maximum benefits to both the donor and the College, please contact John Dietz at the address at left or check the box on the envelope when you return your annual gift.

General donations made to Penn State will not reach the College of Engineering unless they are designated as a gift for the College of Engineering. Donations sent directly to the College do not need to be designated for any special purpose unless the donor chooses to do so.



PENN STATE *Making Life Better*

TRADITION

Penn State's College of Engineering, established in 1896, has a long tradition as one of the country's leading educators of engineers. Through its land grant tradition, Penn State Engineering strives for national leadership in innovative engineering education, vigorous R&D partnerships with U.S. industry, and service initiatives through continuing education, technology transfer, and support for governmental agencies.

VISION

The vision of the College of Engineering is to have a partnership of faculty, students, staff, alumni, and government and corporate leaders working together to provide the highest quality education and continue building one of the nation's best engineering institutions. The aim is to create a climate that attracts and supports a diverse group of students, faculty, and staff where effective learning, research, and service are accomplished by working together.