The start of the 2016-2017 academic year is less than 30 days away and I’m proud to share a few of the successes we experienced this past year in the Statler College.

Topping the list of accolades is the international notoriety achieved by the research team at the Center for Alternative Fuels, Engines and Emissions, which helped land its director, Dan Carder, on the 2016 Time 100, the magazine’s annual list of the 100 most influential people in the world. CAFEE did the initial research that led to the Environmental Protection Agency and the California Air Resources Board conducting their own study that found Volkswagen had intentionally violated the Clean Air Act by installing a “defeat device” software code that altered the performance of the emissions system on their vehicles.

The College has grown to almost 4,600 students and we graduated nearly 900 students in May. In that class were two National Science Foundation graduate fellowship winners, Andrew Maloney and Nicholas Ohi. Maloney, our first-ever Goldwater Scholar, is headed to MIT, where he will continue his studies in chemical engineering. Ohi, a mechanical and aerospace engineering graduate, remains at WVU, where he will continue his research in autonomous robotics.

Our latest Goldwater Scholar is also our first-ever in our newest undergraduate major, biomedical engineering. Ryan Mezan, a junior from Weirton, is conducting research on new ways to diagnose the toxicity of nanomaterials. He plans to pursue a combined M.D./Ph.D. after he graduates.

Leading our students are faculty that conduct groundbreaking research in areas ranging from energy to materials to rare earth elements.

None of this would be possible without your generous support. On behalf of the faculty and staff of the Statler College, thank you for the trust you place in us to educate the next generation of engineering leaders.

Eugene V. Cilento
Glen H. Hiner Dean and Professor
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22 Mining Engineering
24 Petroleum and Natural Gas Engineering
26 Research
28 Outreach
32 Honor Roll of Donors
ENROLLMENT

UNDERGRADUATE PROGRAM

<table>
<thead>
<tr>
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GRADUATE PROGRAM

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<td>COLLEGE TOTAL</td>
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OUTREACH

Intel International Science and Engineering Fair:

10,000

West Virginia State Fair:

10,000

Volunteer Hours Performed:

6,122.45

AVERAGE SCORES

FOR CALCULUS READY STUDENTS:

ACT
MATH 30.3
TOTAL 29.5

SAT
MATH 673
TOTAL 1276

For these students 79% were in the top 25% of their graduating high school class.
RESEARCH EXPENDITURES
$18,698,502 MILLION IN EXTERNALLY FUNDED RESEARCH

BY SOURCE

- FEDERAL GOVERNMENT: $10,519,889.34
- STATE OF WEST VIRGINIA: $2,115,448.75
- NON-GOVERNMENTAL ORGANIZATIONS AND PRIVATE DONORS: $5,216,727.75
- OTHER: $846,436.21

BY DEPARTMENT

CAPITAL CAMPAIGN

CUMULATIVE GIFTS

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ANNUAL STATLER GIFT TOTAL = $2,407,015 (FISCAL YEAR, JULY 1, 2015-JUNE 30, 2016)
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<tr>
<td>BRIAN ANDERSON</td>
<td>Department of Chemical and Biomedical Engineering</td>
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<td>GE Plastics Material Engineering Professor</td>
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<tr>
<td>Research Interests: natural gas hydrates, nanomaterials, molecular-level design</td>
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<td>KARL BARTH</td>
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<td>Research Interests: finite element modeling, structural stability, bridges, steel members and frames</td>
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<td>Teaching Interests: bridge engineering, structural stability, plastic design of steel structures, behavior of steel members, steel design, structural analysis</td>
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<tr>
<td>NIGEL CLARK</td>
<td>Department of Mechanical and Aerospace Engineering</td>
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<td>George B. Berry Chair of Engineering</td>
<td>Funded by George B. and Carolyn A. Berry</td>
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<tr>
<td>Research Interests: alternative fuels; atmospheric emissions inventory; internal combustion engines; vehicle propulsion, powder, and particle technology; multiphase flows; thermal sciences; energy and efficiency research</td>
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<td>ALI FELIACHI</td>
<td>Lane Department of Computer Science and Electrical Engineering</td>
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<td>Electric Power Systems Chair</td>
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<td>HOTA GANGARAO</td>
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<td>Research Interests: design, development, production, and implementation of fiber reinforced polymer composites including recycled polymers for constructed facilities with emphasis on high structures, utility poles, and underground structures</td>
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<td>JOHN ZANIEWSKI</td>
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<tr>
<td>Asphalt Technology Professor</td>
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<td>JOHN A. HERBST</td>
<td>Department of Mining Engineering</td>
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<td>Research Interests: flowsheet and equipment design, mathematical modeling and computer simulation</td>
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<tr>
<td>JOHN HU</td>
<td>Department of Mining Engineering</td>
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<tr>
<td>Statler Chair in Engineering for Natural Gas Utilization</td>
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<td>Teaching Interests: catalysis, reaction engineering, refining processes</td>
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<tr>
<td>VLADISLAV KECOJEVIC</td>
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CHEMICAL AND BIOMEDICAL ENGINEERING

At a glance

» Enrollment: In fall 2015, 215 undergraduates and 43 graduates students were enrolled in chemical engineering; 45 students were enrolled in biomedical engineering.

» The Department officially changed its named to the Department of Chemical and Biomedical Engineering in spring 2016.

» The chemical engineering graduate program moved from 94 to 88 in U.S. News & World Report’s top 100 rankings of graduate programs in 2016. The undergraduate program was ranked 39th out of 135 by College Factual for best value in 2016.

» Five out of 20 Bucklew scholarship winners in 2016 expressed interest in studying either chemical engineering or biomedical engineering. The Neil S. Bucklew Scholarship is valued at $32,000 and provides students with more than $8,000 per year toward educational costs during four years at WVU and is able to be used in addition to the state’s PROMISE Scholarship. One of the five was chosen to be a Foundation scholar.

Faculty and staff

» Debangsu Bhattacharyya was designated Researcher of Year in the Statler College for 2015-2016.

» Cerasela Dinu is leading the biomedical engineering program as associate chair; she was appointed to the position effective July 1, 2015.

» Rakesh Gupta received the Distinguished Speaker award from the Indian Institute of Chemical Engineers.

» Jeevan Maddala joined the Department as an assistant professor in spring 2016. He does research in the area of microfluidics.

» Richard Turton completed his term as chair of the WVU Faculty Senate in 2015-2016.

Research highlights

» Debangsu Bhattacharyya and Richard Turton, along with NETL researchers and Schneider Electric, won an R&D 100 award for virtual-reality based software.

» David Klinke received a $1.7 million five-year award from the National Cancer Institute for research on fighting cancer using immunotherapy.
Student accomplishments

» Jesse Beilhart received the Professional Promise Award from the Pittsburgh Section of the American Institute of Chemical Engineers.

» Graduate student Reem Eldawud won an award for her research posters at the 2015 Annual meeting of the American Institute of Chemical Engineers.

» Michael Fouts won a scholarship from the West Virginia Society of Professional Engineers.

» Anna Gilpin, a biomedical engineering major, was awarded a National Science Foundation funded summer research fellowship with the National Institute for Standards and Technology.

» Andrew Maloney, a chemical engineering major, was awarded a graduate fellowship by the NSF. He was also named an Outstanding Senior by WVU and won an award for undergraduate research at the poster competition held at the 2015 Annual meeting of the AIChE.

» Andrew Maloney and Jordan Chapman won awards for their posters at the 2015 Summer Undergraduate Research Experience contest.

Curiosity and tenacity are just two of the many descriptions one can give to Ryan Mezan, one of two Goldwater Scholarship recipients from West Virginia University.

The Goldwater is one of the most prestigious awards of its kind, awarding up to 260 scholarships annually to students who have the potential to make significant contributions in the fields of mathematics, the natural sciences and engineering. The scholarship is open to sophomores and juniors and provides as much as $7,500 for tuition, fees, books, room and board for students who demonstrate their aptitude through course work and their own original research.

The program was established in 1986, and since that time WVU has had 42 winners.

Mezan, from Weirton, was assisted in pursuing his scholarship by WVU’s ASPIRE office, which helps students who seek nationally competitive scholarships. Kenneth Blemings, dean of the Honors College, served as the faculty adviser for the scholarship application process.

“This year’s pool of candidates was the strongest, most diverse group of students that I have seen since beginning as the Goldwater faculty adviser,” Blemings said. “Because of this, WVU submitted four very high-quality applications. We are so pleased that Ryan and Zach Short (Eberly College) were selected. Both of these young men are already making significant contributions to their respective fields and their selection as Goldwater Scholars positions them to continue their cutting-edge research.”

Mezan is an Honors student and junior biomedical engineering major at the Benjamin M. Statler College of Engineering and Mineral Resources. He started his academic career at WVU in the first class of biomedical engineering majors. He thought that the small class sizes would lead to more opportunities to get involved. That assumption served him well.

During his second month of school, he went to a lecture about the importance of undergraduate research. The idea interested him so much that he began calling all the professors in his department. Yong Yang, assistant professor of chemical engineering, gladly took him under his wing and had him start participating in his research. This was before Mezan even started taking major-specific classes.

“Dr. Yang has always wanted me to be as successful as I want myself to be,” says Mezan about the important role his faculty mentor has played in his growth as a student researcher.

Mezan’s own research focuses on new ways to diagnose the toxicity of nanomaterials. He has presented posters of his research, and had the distinguished opportunity of addressing leaders and scientists in his field in an oral platform at the Biomedical Engineering Society’s annual conference, something usually reserved for full-fledged Ph.Ds or physicians.

“Having the chance to pursue this research as an undergraduate is a fantastic opportunity,” says Mezan. “That’s why I applied for the Goldwater.”

Mezan plans to pursue a combined M.D./Ph.D. after he graduates. He wants a career where he can create the greatest social impact: “One breakthrough device could positively affect millions of people,” he says.
At a glance
» Enrollment: In fall 2015, 280 undergraduates were enrolled in the Department.
» One faculty member, Omar Abdul-Aziz, joined the Department in August 2015.

Faculty and staff
» Karl Barth, Roger Chen, Leslie Hopkinson, David Martinelli, Hema Siriwardane, PV Vijay and Jennifer Weidhaas received Departmental excellence in teaching awards.
» Jennifer Weidhaas won a CAREER award from the National Science Foundation for her research in detecting biological contaminants in environmental samples.
» Udaya Halabe was recognized as an Outstanding Advisor in the Statler College.
A team from West Virginia University captured first place in the steel bridge competition at the American Society of Civil Engineers’ Virginias Conference, held at George Washington University, in Washington, D.C.

Seventeen WVU engineering students were at the competition with the 280-pound steel bridge they designed and fabricated over the past eight months. They are the first group from WVU in more than 20 years to capture top honors in the regional competition.

“This year, we did extensive research into previous years’ designs to come up with a bridge that was not only structurally sound but could be put together quickly,” said Marcus Spina, a senior civil engineering major and the steel bridge team captain. “What we ended up with was a bridge that was a bit heavier than our previous bridges and consisted only of a lower truss system.”

The bridge design followed a strict set of standards and guidelines set by the national organization that could withstand 2,500 pounds of weight. The pieces of the bridge were all three feet or smaller in length and were constructed with a simple bolt system for speed.

“At the competition, we knew we would be judged on the time it took to construct our bridge,” said Spina, a Cross Lanes native. “When we started practicing building the bridge, it took us almost two hours. By the competition, we could do it in under 15 minutes.”

According to Spina, the success the team found this weekend is even sweeter because they fabricated the bridge entirely by themselves.

“We made the whole bridge without the help of professionals,” said Spina. “Everyone was in the machine shop several days a week to cut, grind and weld the steel to make the bridge. We checked and double checked everything ourselves.”

Joining Spina on the team are civil engineering majors Sean Cottrill (Mineral Wells), Alex Gennuso (Canonsburg, Pennsylvania), Tyler Rockhill (South Hampton, New Jersey), Robby Tennant (Fairview), Lee Shields (Rossiter, Pennsylvania), William Barker (Mineral Wells), John Malone (Gambrills, Maryland), James Peterman (California, Pennsylvania), Mike DeYoung (Downington, Pennsylvania), Andrew Pacifico (Stewartsville, New Jersey), Katelyn Kosar (Monrovia, Maryland), Derrick Merwin (Frederick, Maryland) Daniel Boyles (Morgantown), Chris Mierzejewski (Morgantown), petroleum and natural gas engineering major Zack Nagy (Saylorsburg, Pennsylvania) and fundamentals of engineering students Tess Marunich (Fairmont) and Michael Macioce (Elizabeth, Pennsylvania).

“This is a fantastic achievement for the steel bridge team as it represents hundreds of labor hours and years of team building efforts,” said Jennifer Weidhaas, assistant professor of civil and environmental engineering and co-advisor of the team. “The students have learned valuable design, teamwork, budgeting and time management skills during the process. This is truly a student led team and they are to be highly commended for their independent accomplishment and professional conduct.” The team was co-advised by Assistant Professor Antar Jutla.

By virtue of the win, the team moved on to the national competition at Brigham Young University, in Provo, Utah, in May, where they finished 41st. They were one of the teams pictured in the August 2016 issue of Modern STEEL Construction magazine.
Morgantown is 2,449 miles from Valencia, California, but that hasn’t stopped Trinity Classical Academy alumni from attending West Virginia University.

The Statler College of Engineering and Mineral Resources has the largest number of alumni from the small private school to attend an out-of-state college with six students currently enrolled, one committed to attend in the fall and countless others visiting throughout the year for visitation days and campus tours.

“The Statler College has built a great relationship with this group of students, which is important because their high school classmates hear about all the opportunities at WVU, and it makes them consider attending,” said Cate Schlobohm, outreach coordinator. “We are always trying to recruit more non-resident students to help enrich the culture of our college by having students from diverse backgrounds.”

“We have been encouraged by the successes our students have been able to achieve at WVU,” said Liz Caddow, Head of School. “The fact that our first alum to attend was invited to participate in the U.S. Department of Energy’s Solar Decathlon and offered the opportunity to study abroad among other opportunities has created an interest for other Trinity students. These opportunities have encouraged and excited our students to apply to WVU. Trinity students are taught to work diligently and WVU is an environment where they can thrive.”

The academy’s legacy at WVU started with senior industrial engineering student Frank Ceglia, who visited WVU under the recommendation of his uncle and aunt, Jed and Nancy DiPaolo. Jed is a 1976 engineering alumnus, a member of the Statler College’s advisory committee and a 2013 honorary degree recipient. Nancy is a 1976 College of Business and Economics alumna and the past chair of WVU’s Alumni Association. In 2009, the DiPaolo’s were honored as the “Most Loyal Alumni Mountaineers” during Mountaineer Week.

“I originally planned on attending college back home, but when I heard about WVU’s engineering program, I had to visit,” said Ceglia. “That visit sold me on the school because of how hands-on the program is. Statler was the only school I visited where undergraduates can participate in research and design projects from day one.”

Ceglia is a resident assistant, participated on WVU’s 2015 Solar Decathlon team, is vice president of the club golf team and has founded two student organizations at WVU, the Society of Hispanic Professional Engineers and Young Americans for Freedom. He has held co-op and internship positions with Altec and FOX TV. Before moving to Philadelphia to intern in technical sales at NALCO after graduation in May, he’ll finish an undergraduate research position at WVU’s Center for Alternative Fuels, Engines and Emissions.

“WVU is such a great engineering school that gives students autonomy in their time here,” said Ceglia. “It’s a difficult program, but it’s built for anyone with passion and motivation to be successful.”

The next two to make the trek to Morgantown were Grant Doohen and Nicholas Spinello. A sophomore computer science major, Doohen was impressed with the Statler College’s Lane Department of Computer Science and Electrical Engineering and knowing someone at WVU made him more confident in moving so far from home.

“Knowing others that have taken the plunge to attend WVU and really like it made me more comfortable making the decision to come,” said Doohen. “It also didn’t hurt that the fundamentals of engineering staff were all really welcoming.”

Doohen, who intern for Leidos year-round, enjoys keeping in contact with students from his high school to encourage them to attend WVU.

“When I hear about students that are thinking about attending WVU, I pressure them to visit,” said Doohen. “Once they’re here, I really try to show them just how much better WVU is than all their other options.”

Spinello swears he isn’t crazy for leaving sunny California for cold winters in the Mountain State.

“People always tell me I’m crazy for leaving California, but they don’t understand just how much opportunity WVU gives its students compared to other engineering programs,” said Spinello, a sophomore mechanical engineering major.

As a freshman, Spinello was involved with the Solar Decathlon team, an opportunity he says wasn’t available until junior year at other schools he visited. He joins Ceglia as a resident assistant and is the project manager for WVU’s 2017 Solar House. An avid snowboarder, Spinello has welcomed the change in geography.
“You really can’t understand what it’s like moving across the country until you do it,” said Spinello. “It’s a whole new world, but it’s great. Everyone is welcoming and the professors care and want to see you succeed.”

Three freshmen round out the California contingent

Frank’s younger brother, Joseph Ceglia plans to major in industrial engineering and was eager to become a Mountaineer for the hands-on opportunities it provides.

“My favorite thing about WVU is the fact that everyone—professors and staff—truly care about your success, not just in college but for your future,” said Joseph. “Everyone that I have personally talked to has been very informative and helpful.”

Joseph helped his brother in co-founding Young Americans for Freedom and is also a member of the club golf team. Over the next three years, he hopes to be involved with the Solar Decathlon team and other groups around campus.

Thomas Nichols, who plans to major in computer science, was drawn to WVU after a recommendation from the Ceglia family. After doing his own research on the engineering program, he was sold.

“When deciding on a school, I made sure to research the academic accomplishments of the faculty,” said Nichols. “I found that WVU’s engineering faculty had degrees in a variety of engineering disciplines rather than hard science majors. That was really important to me.”

Nichols is a part of WVU’s Experimental Rocketry Club and Amateur Radio Club. He thinks the best aspect of attending WVU is the atmosphere.

“Living on the Evansdale campus where the engineering buildings are located puts you in close proximity with many other engineering students,” said Nichols. “There’s a community that is built around being an engineering major.”

Magdalena Langdon hopes to major in electrical engineering and says having former classmates at WVU is an added bonus to WVU’s comprehensive engineering program.

“Coming to WVU not only gives us an opportunity to receive a great engineering education, but is an opportunity to experience new places and new people,” said Langdon.

She often gets phone calls from high school classmates or their parents asking questions about WVU. Langdon gives her best advice on what classes to take, what dormitory to live in and which dining halls serve the best food.

Langdon is a member of WVU’s Experimental Rocketry Club and the Bennett Hall Council and works for dining services. On life at WVU, Langdon says the best part is the people she has met.

“From the girl from Maryland I sit next to in French, to my chemistry laboratory partner from Minnesota or the student from Guam that I sit next to on the bus, I’ve met so many new people and have learned from their different backgrounds and life experiences,” said Langdon. “Through these types of encounters, I’ve developed so much as a person while at WVU.”

“Jed and I are thrilled that our ‘California cousins’ trusted family recommendations that their son, Frankie, attend WVU,” said Nancy DiPaolo. “As crazy as it seemed for Frankie to travel across the country to achieve his dream of becoming an engineer, WVU seemed to be a perfect fit. While Mountaineer Spirit is highly contagious, we could have never anticipated that, based on Frankie’s experience, Frankie, his brother Joey and their parents would become actively involved in convincing Trinity students and their families that WVU is a special ‘old gold and blue’ treasure.

“How humbling and unexpected to see so many students join the Mountaineer family as a result of true teamwork: West Virginia family roots, WVU alumni recommendations, WVU’s great academic programming and support for students and the Ceglia family’s strong ties to Trinity,” DiPaolo continued. “We are proud of these new Mountaineers and very thankful for the Ceglia family!”

At a glance

- Formally known as Freshman Engineering, the program was renamed Fundamentals of Engineering in spring 2016 and formally recognized as an academic program, thereby providing an integrated academic home for entry-level engineering students, faculty, and STEM education practitioners.
- Fundamentals of Engineering enrolled a total of 900 first-time, full-time freshmen in 2015-2016.

Research highlights

- Lizzie Santiago, Melissa Morris and Robin Hensel were awarded an National Science Foundation grant of $249,964.00 for their proposal, “Engineering Essentials: A Course to Introduce Non-calculus Ready First-Year Engineering Students to Engineering Concepts and Critical Thinking Skills.”

Outreach and recruitment

- In addition to regular outreach and recruitment activities, faculty and staff also help to train K-12 teachers to teach engineering principles in their classrooms through the Project Lead the Way program. Core training is offered to teachers during summer and PLTW students are invited to visit our campus throughout the year. The Statler College also hosts an annual state PLTW conference for teachers, guidance counselors, and school administrators, bringing close to 100 people to campus each year.

Faculty and staff

- Gerald Angle, Mike Brewster, Ordel Brown, Robin Hensel and Melissa Morris successfully proposed the implementation of a three-part engineering live/learn community for Statler College freshmen living in Braxton Tower plus two specialty communities within the engineering live/learn community: an engineering honors floor and the Academy for Engineering Success community. Each of these groups will have specialized engineering-related programming led by members of the FEP faculty throughout academic year 2016-2017.
- Ordel Brown was recognized as the Outstanding Advisor in the Statler College in 2016. She also won the WVU Foundation’s Teaching Award for 2016, the National Academic Advising Association’s 2016 West Virginia Faculty Advisor Award and the WVU Amizade 2015 Study Abroad Professor and Program of the Year Awards. She was promoted to the rank of teaching associate professor and led five students on a two-week study abroad service learning trip to Jamaica in 2015.
- Robin Hensel was selected as a WVU Provost Academic Leadership Fellow for the academic year 2016-2017 and will have a part-time administrative appointment to allow her to work closely with University administration on major academic initiatives, including academic alignment with regional campuses and the student success collaborative. Hensel also received the Project Lead the Way 10-Year Service Award for services as the state’s affiliate director.
Alcoa, Constellium, Kaiser and Noranda are four major corporations within the international aluminum industry. While they have different specializations and produce unique commodities, they all have one common denominator—a West Virginia University industrial engineering graduate on their executive team.

Jon Rateau is vice president for global power generation operations of Alcoa Energy and president of Alcoa Fuels in Knoxville, Tennessee. Rateau’s resume includes many notable accomplishments, including a recently completed four-year assignment in Saudi Arabia to join Alcoa and the Saudi Arabia Mining Company to construct the largest vertically integrated aluminum complex in the world. The total investment in aluminum, water and power plant facilities exceeded $16 billion.

A Weirton native, Rateau graduated from the Statler College of Engineering and Mineral Resources in 1981.

“Being a West Virginia native and growing up a Mountaineer sports fan, attending WVU was a natural choice,” said Rateau. “I chose industrial engineering because industrial engineers can work in a variety of contexts, environments and industries—opportunities and career choices are unlimited, and that was appealing to me.”

During his time at WVU, Rateau was involved with the American Institute of Industrial Engineers, Student Government Association committees, Club Rugby, Ski Club and worked as an undergraduate student research assistant. He credits his extracurricular involvement and course load for helping him start his career on the right foot.

“On top of the knowledge I absorbed in my course work, many of the engineering courses at WVU involved team projects or experiential learning opportunities, which directly correlated to my career that has included a lot of team projects,” said Rateau. “Taking advantage of student life programs was a way to grow and build social and leadership skills.”

Just two hours from Morgantown in Ravenswood, sits Constellium Rolled Products, one of the world’s largest rolled products facilities with more than 1,100 employees. Buddy Stemple is the company’s chief executive officer.

Stemple began working for Constellium—then Kaiser Aluminum—during summer breaks from WVU. After graduating in 1982, Stemple worked for Alcan Aluminum/Novelis, where he held various positions in operations, human relations, sales and marketing. Stemple received his master’s in business administration from WVU in 1987 and continued to move up the ranks, eventually becoming vice president and general manager of Novelis Specialty Products, a position he held through 2009.

In 2010, Stemple joined the Oman Aluminum Rolling Company, a 140,000-ton-per-year light gauge rolling facility in Sohar, Oman, as chief executive officer overseeing the establishment of the facility, organization and marketing plans for the company. In 2014, he returned to his hometown of Ravenswood.

“I never visited another college, I always just assumed I would go to WVU,” said Stemple. “As for working in the aluminum industry—that just made sense, too. Constellium played such a big role in my community and I enjoy the unique capabilities of aluminum and its value proposition.”

Stemple describes his years at WVU as a “rounding experience” and urges current students to grow as much as possible during their time here.

“I was an average student, but I worked very hard,” said Stemple. “A lot of people I went to WVU with were smarter than me, however I have never met anyone that I cannot out work.”

Keith Harvey is president and chief operating officer of Kaiser Aluminum. Born and raised in Beckley, WVU was the only option he ever considered.

“I loved the Mountaineers all my life—I never even considered applying to another school,” said Harvey. “I enjoyed math growing up and felt that industrial engineering was the perfect springboard for the technical career I wanted.”
Harvey has worked for Kaiser since graduating from WVU in 1981 in a multitude of positions including industrial engineer, senior vice president of sales and marketing and executive vice president of fabricated products. He now resides in Coto De Caza, California, near the company’s headquarters.

Harvey considers attending WVU the best decision he ever made.

“Attending WVU and majoring in industrial engineering was the best decision I have ever made,” said Harvey. “The education was appropriately diversified to allow me to go into any industry or discipline with confidence of being successful. We were extremely well prepared for the ‘real world’ and the memories and friends I made there have been with me my entire life.”

Another Weirton native, Don Suray is vice president of treasury and risk management at Noranda in Franklin, Tennessee.

Suray began his career in the steel industry after graduating from the Statler College in 1988 and attended Carnegie Mellon University at night to earn his master’s in business administration with a concentration in finance in the mid-1990s before switching industries due to a spiraling steel industry. Over the past 20 years, Suray has worked in the pharmaceutical, semiconductor and durable goods industries before finding himself back in the metals industry.

“Coming back to the metals industry reminded me how impressive the engineering and design is required to convert these various chemical reactions you see in a lab to large-scale manufacturing operations,” said Suray. “It felt nostalgic to walk through the factories with a hard hat and safety gear on, and it reminded me of how much I enjoyed this environment.”

Suray believes the personalized education at WVU helped him become the successful professional he is today.

“Though WVU is a large, state university, the engineering program always had a more personal, small-school feel,” said Suray. “We were all very competitive but also willing to help each other. We learned to be problem solvers and team players.”

Morgantown will always hold a special place in Suray’s heart, and he urges current engineering students to make the most of their time at WVU.

“You will leave WVU as an expert at analyzing and programming, but advancing your career will take leadership skills,” said Suray. “Learn to listen well, communicate and convey ideas succinctly and effectively.”

At a glance

- **Enrollment**: In fall 2015, 302 undergraduates and 90 graduate students were enrolled in the Department.
- The industrial engineering program was ranked **sixth for best value** by College Factual, an online guide the college selection process.

Faculty and staff

- **Kenneth Currie**, chair of the Department, has been awarded Fellow Status by the Institute of Industrial and Systems Engineering. The award recognizes outstanding leaders in the profession who have made significant, nationally recognized contributions to industrial engineering. A fellow is the highest classification of ISE membership.
- **Bhaskaran Gopalakrishnan** accepted a Governor’s Award of Excellence for Enabling Industrial Energy Efficiency at the 2016 Innovation & Entrepreneurship Day at the West Virginia Capitol in Charleston. The award was given on the occasion of the 25th anniversary of the Industrial Assessment Center and in appreciation of its more than 400 energy assessments in West Virginia, resulting in reduced energy costs of approximately $2 million for West Virginia manufacturers. The awards were co-sponsored by the Governor’s Office and the TransTech Energy/Industries of the Future-WV programs at West Virginia University.
- **Professor Gary Winn** wrote a book for early career professionals interested in becoming leaders in occupational health and safety or engineering. “Practical Leadership Skills for Safety Professionals and Project Engineers” parallels the steps that millennial students or recent graduates need to take to move quickly from the classroom on through to their early managerial years.
- **Assistant Professor Thorsten Wuest** was selected as one of eight WVU faculty members chosen for the inaugural class of Innovation, Design and Entrepreneurship Academy Faculty Fellows program, part of a comprehensive cross-campus initiative in entrepreneurship and innovation. The IDEA Fellows receive a stipend and extensive training and professional development in entrepreneurship and will work as a cohort for two years to champion entrepreneurship and innovation across the university.

Research highlights

- Assistant Professor Xinjian “Kevin” He received a grant from the National Institute for Occupational Safety and Health to characterize breathing flow in healthcare workers using respiratory protection. No national standards currently exist regarding the minimum required operational flow when powered air-purify respirators are used by healthcare workers. He will collect data on the inhalation flow rates and type of work being done by 15 healthcare workers at Mon General Hospital in Morgantown over the next year. From that data, He will characterize breathing flows produced by healthcare workers who perform routine tasks such as moving, lifting and turning patients.

Student accomplishments

- **Clay Chipps** received the Harold and Inge Marcus Scholarship awarded competitively through ISE. The award is available to undergraduate students enrolled in any school in the United States provided the school’s engineering program is accredited by an agency recognized by ISE and the student is pursuing a course of study in industrial engineering. The award is intended to recognize academic excellence and noteworthy contribution to the development of the industrial engineering profession.
- A four-member team from WVU captured **first place** in the Race to the Case Supply Chain Management competition at the University of Pittsburgh in October. Modeled after the TV show, “The Amazing Race,” teams were comprised of two supply chain and two engineering students. The WVU team, which included industrial engineers Clay Chipps and Perry Shumate, brought home a cash prize of $3,000.
- **Graduate students Alireeza Ebrahimvandi** and **Mahsa Kiani** won second place in the FlexSim Simulation Competition at the Society for Health Systems Conference in Houston, Texas. They competed against more than 80 teams worldwide to develop recommendations for improving staffing and room utilization at the Kirklin Hospital Clinics at University of Alabama-Birmingham.
- **Emily Phipps** was one of three Statler College students selected to attend the second Global Grand Challenges Summit in Beijing, China, based on her outstanding academic and extracurricular achievements. As an industrial engineering major with an eye on a career in the health industry, Phipps was most struck by the session on health in the age of informatics.
WVU repeats second place performance in Robo-Ops Competition

BY MARY C. DILLON
For the third consecutive year, the team from West Virginia University found itself on the podium at the NASA’s Revolutionary Aerospace Systems Concepts-Academic Linkages or Robo-Ops Competition, held May 24-26, at the Rock Yard at Johnson Space Center in Houston, Texas. The Mountaineers finished second behind University of Oklahoma, with University of Utah finishing third.

According to faculty advisor Powsiri Klinkhachorn, professor of computer science and electrical engineering, WVU is the only team that has stayed at or near the top each year, having finished first in 2014 and second in 2015 and 2016, respectively.

“Last year’s first and third place teams didn’t even finish the competition this year,” Klinkhachorn said. “The fact that WVU has stayed at or near the top each year is a testament to the hard work and dedication of our students to this competition. I’m incredibly proud of their success, especially this year.”

This year proved especially difficult due to problems the Mountaineers have experienced before: cellular connectivity to the rover. Because the rover is tele-operated remotely by team members in Morgantown, a reliable connection is critical to success on the competition field.

To correct the problem, the team employed a modern capable of utilizing two SIM cards concurrently to establish a connection from the rover’s remote location to its home base in Morgantown for feedback and control. According to team lead Eric Loy, an electrical engineering graduate student from Keyser, the bandwidths from two cellular providers were bonded together to form a more robust network, which the team hoped would give them a huge advantage over previous years.

“Initial testing showed promise and improvement when compared to the previous year’s system, so the communication issues were somewhat unexpected,” Loy said. “On the test day, we were able to run the rover in a competition scenario with ease. We experienced latencies at or below approximately one second, so rover control was fairly responsive. Our operators were able to quickly search and acquire samples while swiftly navigating through obstacles in the rock yard. At first glance, our solution for the communications system looked as if it would solve our issues from prior years.”

On competition day, however, the connectivity was sporadic, causing communication between mission control in Morgantown and the rover in Texas to drop every 10-15 seconds.

“The software is written so it will automatically reconnect when the issue is resolved, so we were still able to operate, but at a much slower and imprecise level than we had hoped,” said electrical engineering graduate student Matt Grubb from Winchester, Virginia. “It makes the fine movements needed for sample collection very difficult.

“Given the circumstances, I am extremely impressed with the team’s ability to collect as many rock samples as they did in the hour,” Grubb continued. “They even attempted the contingency mission and were very close to completing it before running out of time and having to return to the start point.”

WVU swept the mini-competitions held in Texas, finishing first in best locally controlled manipulator dexterity, best locally controlled climbing agility and best locally controlled class slalom challenge.

At a glance

- **Enrollment:** In fall 2015, 470 undergraduate students and 237 graduate students were enrolled in the Department.
- **The Department’s online graduate program in software engineering was ranked 30th nationally by *U.S. News & World Report*.**
- **Computer engineering was ranked 10th for best value by College Factual, an online guide the college selection process.**

Research highlights

- **Kevin Bandura, Natalia Schmid and Katerina Goseva-Postojanova** were part of a team that were awarded a five-year, $9.65 million EPSCoR grant to work on radio astronomy.
- **Yanfang “Fanny” Ye and Katerina Goseva-Postojanova** were awarded a three-year, $500,000 grant from the National Science Foundation for trusted and assured computing.
- **Thirimachos Bourlai** led the WVU team that was part of a Department of Homeland Security Center that was awarded in the area of border security.
- **Xin Li** and a team of students began work on a new NSF grant to further his work in area of collective Sensing, which allows the efficient identification and use of specific types of information that is needed by users. Li’s work takes into account human perception in determining how to extract information from a sensor network.

Faculty and staff

- **Muhammad Choudhry** was recognized with an Outstanding Teacher Award in the Statler College.
- **Yaser Fallah** was recognized with Outstanding Researcher Award in the Statler College.

Student accomplishments

- A team of students led by faculty members Dimitris Korakakis and Cindy Tanner placed 12 out of 20 teams at the Department of Energy’s 2015 Solar Decathlon competition, which was held in Irvine, California, in 2015.
- A group of students from CyberWVU, advised by Professor Roy Nutter and CSEE graduate student David Krovich placed tied for fifth out of 32 teams in the Collegiate Cyber Defense competition’s mid-Atlantic regional competition, held at Johns Hopkins Applied Physics Labs in April.
- Doctoral student **Michael Morehead** won the 2016 WVU Student Innovator Award. He is the co-founder of IstoVisR, a company focused on building scientific software for immersive virtual reality systems. These technologies could accelerate the discovery of novel trends in brain circuitry and advance clinical techniques in diseases like schizophrenia, autism and Alzheimer’s.
At a glance

» Enrollment: In fall 2015, 612 undergraduates and 126 graduate students were enrolled in the Department.

» Aeronautical engineering was ranked 53rd in U.S. News & World Report's top 100 ranking of graduate programs, while mechanical engineering was ranked 100.

Faculty and staff

» Patrick Browning was chosen as the Statler College’s Outstanding Teacher of the Year. Teaching awards were also given to Marvin Cheng, John Kuhlman and Andrew Nix.

» Xueyan Song was chosen as the Statler College’s Researcher of the Year. Slava Akkerman was also recognized as an Outstanding Researcher in the College.

» Cosmin Dumitrescu received the Ralph E. Powe Junior Faculty Enhancement Award from the Oak Ridge Associated Universities.

» Xingbo Liu was selected to receive the Minerals, Metals and Materials Society 2016 Brimacombe Medalist Award and was named a Fellow of ASM International.

» James Smith was inducted into the Legends Hall of Fame of the National Association of Entrepreneurship.
For the sixth straight year, a member of the Statler College faculty has been selected to receive the prestigious CAREER award from the National Science Foundation.

V’yacheslav Akkerman, assistant professor of mechanical and aerospace engineering, has earned the award to further his work on promotion and prevention of flame acceleration and transition to detonation. The award comes with at least $500,000 in funding over a five-year period.

People who witness a fire oftentimes report hearing an explosion that resulted from a chemical reaction. Investigators then begin to look for clues in an effort to understand if that reaction happened at a speed below that of the speed of sound—known as deflagration or flame—or above—known as detonation. If the fire involved both, investigators then look for clues as to how fast the event moved from deflagration to detonation.

"From a practical consideration, the deflagration to detonation transition—or DDT—events influence countless disasters, such as explosions in power plants and mining accidents, that claim hundreds of lives every year,” said Akkerman. "On the positive side of things, however, DDT can be employed in advanced technologies such as micro-combustors and pulse-detonation engines of next-generation hypersonic aircraft. This makes DDT an intriguing phenomenon with applications ranging from combustion and inertial confined fusion to thermonuclear supernovae."

Akkerman’s research will bridge the gap between fundamental studies and practical applications by characterizing the mechanisms promoting, controlling or preventing the DDT process. He will investigate the possibility of replacing a hazardous detonation in energy-efficient manufacturing with a safer alternative combustion regime. Additionally, a novel predictive tool for fire safety and DDT risk assessment will be developed, which is important for West Virginia, whose economy relies heavily on coal mining and shale gas drilling industries.

As part of the award, Akkerman will integrate his research into an extensive education module that promotes awareness of advanced combustion research in schools and colleges.

“The educational module will include an on-campus annual training program organized in partnership with the NASA West Virginia Space Grant Consortium, as well as the delivery of lectures at various schools state wide,” Akkerman said. “It will also include the development of a new, advanced course on computational combustion that we hope to offer both onsite and online, which is in line with WVU’s initiatives in the area of shale gas utilization.”

The educational module, Akkerman added, will be translated into Concept Warehouse, an NSF-sponsored web-based instructional tool that can be used to fit an individual faculty member’s teaching philosophy and her/his learning environment.

Akkerman earned his doctorate from Umeå University, Sweden, after completing his bachelor’s and master’s degrees at the Moscow Institute of Physics and Technology in Russia. He also holds a philosophy licentiate from Umeå University and a candidate of sciences (PhD equivalent) degree from the Nuclear Safety Institute of the Russian Academy of Sciences. He was a postdoctoral fellow at the Center for Turbulence Research, co-led by Stanford University and NASA Ames Research Center, and a professional research staff member in the Department of Mechanical and Aerospace Engineering at Princeton University.

The NSF’s Faculty Early Career Development, or CAREER, program supports junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations.
Big 12 environmental health and safety directors visit WVU experimental mine

BY BERNADETTE DOMBROWSKI

In a smoke-filled section of the experimental mine at West Virginia University’s Academy for Mine Training and Energy Technologies, environmental health and safety specialists from the Big 12 conference began to understand the challenges of mine rescue.

The cohort visited Morgantown for the Big 12 Environmental Health and Safety Directors Meeting on May 2. An annual event that rotates through campuses in the conference, this year was WVU’s first chance to show the group what the University had to offer.

“We wanted to showcase something unique to West Virginia,” said Teresa Hefferin, assistant director of environmental health and safety for WVU. “We could’ve shown them research we’re conducting around campus, but that happens everywhere. Schools from states like Texas and Oklahoma have never seen anything like our Academy for Mine Training and Energy Technologies.”

The half-day session began with Josh Brady, associate director for mining extension, explaining the history of coal mining in the region and the introduction of the mine training academy—one of only two training facilities in the state that offers live fire training in an underground atmosphere.

Brady discussed basic mining knowledge, rescue skills, life support systems and emergency procedures.

“Having this group of safety specialists at our facility was a great opportunity to showcase the safety procedures we’ve worked so hard to perfect,” said Brady. “We wanted to show this group that we truly care about the health and safety of not only the workers in the mining industry, but workers in all hazardous fields. If they can take what they saw and apply it to an industry in their state, that’s great.”

Armed with cap lights, the group took their new knowledge of mining and mine rescue and headed into the experimental mine. A maze the size of a football field, WVU extension agents led the group through the experimental mine and gave lessons in air pressure readings, ventilation systems, confined space operation and industrial firefighting.

“I had no idea of the potential hazards in mining; it’s just not something we’re exposed to in our environment,” said Christina Robertson, director of environmental health and safety at Texas A&M University. “I’m walking away with a new understanding of how brave the men and women are who work in mines, and what an important role facilities like this play in the safety of miners and making sure they get to go home at the end of each day.”

For Jim Dean, director of mining and industrial extension, the opportunity to network with other universities with similar missions was a highlight of the day.

“At the end of the day, every person here today wants to make the work place safer for their constituents,” said Dean. “Making these relationships with other major universities is a way for us to expand our knowledge and our reach as an extension office, which is always our goal.”
A busy year filled with new partnerships, services and employees has led West Virginia University’s industrial extension to a year of significant expansion within the state.

Industrial extension’s signature West Virginia Manufacturing Partnership, a program that helps businesses improve competitiveness in local and global markets, was again selected as the state’s affiliate for the National Institute of Standards and Technology’s Manufacturing Extension Partnership.

The open, federal call for proposals brought stiff competition for the designation, but WVU’s extensive experience helped them differentiate themselves.

“In the final stages of the process, our willingness to work on-site with manufacturers, our extensive state network and support from state government and other agencies helped us prove our worth,” said Gerald Biser, director of industrial extension and the WVMEP. “As NIST’s focus has shifted to help grow small, rural manufacturers, we fit perfectly because our organization has been doing that for more than 18 years.”

Two new services were added to industrial extension’s tool box to expand the existing program in wake of the designation. The Business Evaluation Service is a top-to-bottom assessment package that evaluates companies and identifies opportunities for improvement and growth in all areas of business operations.

“Our first project with this service was at Huntington Plating and it resulted in many opportunities for improvement from marketing and sales through process and safety,” said Biser. “This service is a transformational gateway and will enable us to develop long-term relationships with clients.”

The second service is an innovation and marketing workshop that helps West Virginia companies diversify their product lines and markets. The workshop enhances industrial extension’s Innovation Program.

Another milestone, industrial extension developed two new business partnerships that have provided funding for two important industries within the Mountain State.

The first is an agreement with Southern West Virginia Community and Technical College and the West Virginia Division of Energy to work with coal supply chain companies in Boone, Lincoln, Logan, Mingo, Wyoming and McDowell counties.

The agreement gave industrial extension the opportunity to hire two additional full-time employees. One employee, based out of SWVCTC, conducts outreach and marketing within the six counties focusing on innovation, market diversification and marketing. The second employee, based out of Beckley, conducts marketing and outreach activities in addition to working on southern coal supply chain efforts.

The second agreement comes to industrial extension as the sub-recipient of a United States Economic Development Administration grant awarded to TechConnectWV to provide services to start-ups, entrepreneurs and small companies. Industrial extension will provide transformational manufacturing services to the businesses serviced under the two-year grant and must participate in a minimum of 20 projects.

“It’s been a transformative year for industrial extension, which has resulted in significant impact for the manufacturers we work with,” said Biser. “We are continuing these projects into the new year with the goal of advancing the state and even more of its manufacturers.”
At a glance

» Enrollment: In fall 2016, 80 undergraduate and 24 graduate students were enrolled in the Department.

» John Herbst was named Robert E. Murray Chair and Professor of Mining Engineering.

Research highlights

» Assistant Professor of Mining Engineering Aaron Noble is working on a grant with Paul Ziemkiewicz from the West Virginia Water Research Institute and Xingbo Liu, professor of mechanical and aerospace engineering, to investigate the extraction of rare earth elements from acid mine drainage. The project is sponsored by the Department of Energy’s National Energy Technology Laboratory.

Student accomplishments

» Laura Nugent won first place in SME’s Mineral Processing Division Student Poster Contest at the annual meeting in Phoenix, Arizona, in February. Her poster presented her research on high-speed image analysis of froth flotation.

» Chris Vass was selected as the recipient of the James and Betty Hall Doctoral Fellowship, offered by Statler College. Vass’ current research focuses on the feasibility of implementing machine-learning algorithms to control chemical treatment of mine water discharge outlets. He hopes to use the outcomes of this research as he moves into his doctoral research on mine-to-mill optimization with big data analytics.

» The WVU Student Chapter of SME was awarded the best student chapter by the national society.
Researchers at West Virginia University have partnered on a nearly $1 million grant from the United States Department of Energy’s National Energy Technology Laboratory on the development of a mobile plant facility for the recovery of rare elements that could breathe life back into West Virginia’s coal industry.

Aaron Noble, assistant professor of mining engineering, and John Herbst, Robert E. Murray Chair and Professor of Mining Engineering, will collaborate with researchers from the University of Kentucky and Virginia Tech to develop a facility that can efficiently recover rare earth elements present in coal.

According to Noble, there are 17 rare earth elements that are in increasingly high demand for their use in everything from batteries to magnets, cell phones and defense applications. Their concentration scarcity in other ores has impeded economical extraction.

“All of the rare earth elements are essential to modern life, but they are very poorly concentrated in nature,” said Noble. “One place where we do find significant concentrations of these rare earth elements is in coal.”

The U.S. has 10.9 million tons of rare earth resources in coal deposits located in just five western and four eastern states, including Kentucky, West Virginia and Virginia, according to the U.S. Geological Survey Coal Quality Database.

“Some of the ‘heavy’ rare earth elements are particularly valuable and scarce, and while coal contains all rare earth elements to some degree, it often has a substantial amount of these heavy elements that command a higher value,” said Noble.

The researchers will be designing the entire processing facility from the ground up using advanced separation technologies that have been proven in the laboratory.

“Because rare earth recovery from coal has never been done outside the laboratory, we have to start at the very bottom,” said Noble. “We will use the methods proven to work in the lab and scale them up. If successful, this pilot facility will provide a clear path to future commercial deployments.”

Commercial deployment could mean the creation of hundreds of jobs for the suffering mining industry in the Mountain State.

“A new rare earth industry could certainly invigorate the West Virginia coal mining industry, bringing additional revenue to coal producers and also eliminating some of the current waste streams by turning them into valuable products,” said Herbst. “The end result will be a process that is economic and environmentally benign, but most importantly something that will benefit the people in West Virginia and other coal producing states.”

Along with DOE funding, more than $300,000 will come from other project partners. The team will work with industrial participants including Arch Coal, Blackhawk Mining, Alliance Coal, Eriez Manufacturing and Minerals Refining Company. If Phase I is successful, Phase II will involve construction and testing of the mobile facility.
At a glance

» Enrollment: In fall 2015, 371 undergraduate and 32 graduate students were enrolled in the Department.

» The Department is one of only three accredited petroleum and natural gas engineering department in the country. It is one of only 18 accredited petroleum engineering departments in the U.S. and is the only such department in the state of West Virginia.

Faculty and staff

» Sam Ameri was named the 2015-16 Outstanding Professor of the PNGE Department by WVU Student Chapter of Society of Petroleum Engineers.

» Kashy Aminian had a chapter published in the American Society for Testing and Materials Handbook of Petroleum and Natural Gas Processing.

» Shahab Mohaghegh had a book, titled Data-Driven Reservoir Modeling, published by the Society of Petroleum Engineers.

Student accomplishments

» Mohammad Kazemi won first place in the 2016 North America Society of Petroleum Engineers Ph.D.-level student paper contest, held at Louisiana State University. He qualified for entrance into the International Student Paper Contest, which will be held in September 2016 in Dubai.

Alumni involvement

» WVU faculty regularly schedule alumni functions at Society of Petroleum Engineer conferences and in around the Morgantown area. This year’s event, however, took on an international flavor when a team of University dignitaries, led by WVU President E. Gordon Gee traveled to Manama and Kuwait City for functions attended by alumni in key leadership roles throughout the Middle East and around the world. While there, Department Chair Sam Ameri discussed the establishment of joint projects and research collaborations.

» Barry Lay was named this year’s Outstanding Mineral Resources Alumni. Lay serves as the vice president and general manager of the Appalachia North Division of EnerVest Operating, LLC, a Houston, Texas-based oil and gas operator with more than 1,100 employees and more than 13,000 wells across five states. Lay has a long and extensive resume spanning more than 40 years since completing his degree at WVU in 1983.
In its first-ever attempt, a team of five students from West Virginia University captured top honors in Drillbotics, an international drilling competition designed to test teams’ ability to create a miniature robotic drilling rig inside a laboratory environment.

The team from WVU used every skill they had—plus a few they had to learn—to create the rig, which stood approximately seven-feet tall, weighed 300 pounds and took nearly six months to build, to successfully drill the 10.5-inch rock sample in a record time of 27 minutes.

Ten teams submitted proposals for the 2016 competition, with only five selected to advance to the final round. WVU bested teams from Colorado School of Mines, Texas A&M University, University of Texas and defending champion University of Oklahoma.

The team included petroleum and natural gas engineering doctoral candidate Tawfik Elshehabi (Suez, Egypt); master’s students Zachary Cox (Hewett) and Cody Smith (Pataskala, Ohio); Gbolahan “Bugzy” Idowu (Ogun State, Nigeria), a master’s candidate in mechanical engineering; and Rachel Richards (Wellsburg), an undergraduate majoring in PNGE and geology. Advising the team was PNGE Associate Professor Ilkın Bilgeşu, with Cox serving as student lead.

“The team of students worked hard and were fully dedicated to this project,” said Bilgeşu. “With their perseverance and the excellent leadership provided by Zach, they won against other well-established petroleum engineering schools who were also competing.”

“The first several times we sat down as a group for this competition we began critiquing and questioning what the teams had done last year,” said Cox. “One theme was using what was considered a best solution; however we wanted to ensure that our system could adapt and change as it drilled. There was also a strong focus within the team to build as complete a rig as was possible. This is why we had not only a circulations system but also a filtering system and emergency reserve.”

The team also didn’t want to rely on a computer to run the rig; they wanted it to run independently without any additional hardware or software.

“When a PC was used to receive the data from the rig, this was a one-way communication and all control was handled by the onboard systems,” Cox said.

From there, the team went to work, manufacturing the pieces needed to create the rig. And this is where the learning curve set in. First, they headed to the industrial engineering lab, where they learned to fabricate the bit subs, which connect the bit to the drill pipe. Then, they used 3D printers to design and print everything from stabilizers to motor mounts. They also had to teach themselves how to program the rig using an Intel Edison module and four Arduino Uno boards to delegate rig functions and run the algorithm. According to Cox, this method was chosen because several team members had used them before in mechanical engineering courses.

“For most of the construction, there was a strong emphasis for us to do everything we could ourselves,” Cox said. “This was primarily due to the experience we had and to save on cost. It also allowed us to go through many design iterations to find what worked best. This became a familiar event for us: try something that seemed like a good idea and then improve it as we went along. While there was always a plan on how to do things, this was nearly always adapted to suit our position better.”

The judges, Fred Florence, president of Rig Operations, LLC, of Austin, Texas, and Aaron Logan, vice president of engineering with Evolution Engineering, of Calgary, Alberta, were impressed by how the team made decisions based on a term the team called proportional cost.

“What seems to have drawn the most interest is our commitment to adaptability and proportional cost,” Cox said. “Proportional cost is simply our method of buying cheaper components for noncritical systems. This could be a cheaper, less accurate sensor or smaller hardware for the structure. This, in part, allowed us to use our budget for worst-case scenarios and changes to fix issues we had not foreseen.” The total cost of constructing the rig was $8,700.

When the competition was over Cox and his teammates agreed that the experience of creating something from the ground up was overwhelming but extremely satisfying.

“There are many crowning moments in a six-year college career, from finishing a capstone to your first publication and many others. However, this is one of the only events where we as students go from concept to design to performance to be evaluated by independent judges all while receiving the attention and support of the department, college and all the affiliated parties,” Cox said.

“With that being said, I believe the team came together because this seemed like a unique and challenging competition we took particular interest in. There was also a desire to create something for the department to generate more interest among fellow students.”

“The opportunity to be a part of such a ground-breaking design project, was one I couldn’t pass up,” said Idowu. “Although my undergraduate studies were in petroleum engineering, I have never truly worked in this capacity. I was amazed with how easily I was able to grasp the theoretical concepts I struggled with during my undergraduate career.”

“On behalf of the entire Department, I couldn’t be more proud of this group of students,” said Samuel Ameri, department chair. “Winning this competition shows the world that WVU deserves its spot among the very best. We work hard each day to earn and keep this reputation, and these students are proof of what the scope and breadth of knowledge gained here provides. My heartfelt congratulations goes out to each one of them on this fantastic achievement.”

Financial support was provided by the Department of Petroleum and Natural Gas Engineering, the Statler College of Engineering and Mineral Resources and the NASA West Virginia Space Grant Consortium.

By virtue of winning, the team will be provided funding to travel to Dubai to the Society of Petroleum Engineers Annual Technical Conference and Exhibition to present a technical paper about their solution and their work.
RESEARCH
Developing new dimensions and worldwide recognition

The world of academic research continues to grow highly interdisciplinary and involves three interconnected themes: atoms, bytes and genes. Statler College faculty have been engaged in research themes that encompass these fundamental units of research.

The College has always been strong in advanced plastics, composites, ceramics, and metallic materials for generation, conversion and storage of energy. Sensors/devices, aerospace, construction and other applications continue to be at the center of many research programs in the College.

One of the major research stories of the year for the Statler College and WVU has been the accomplishment of Dan Carder, Arvind Thiruvengadam, Greg Thompson and their team at the Center for Alternative Fuels, Engines and Emissions. CAFEE, which is engaged in translational as well as basic research, was credited in uncovering the use of so-called “defeat devices” in certain vehicles. Their work has been recognized around the world. Carder, the director of CAFEE, was named to the Time 100, the magazine’s annual list of the 100 most influential people in the world.

The Statler College and WVU continue to make investments to further strengthen the capabilities of CAFEE, which has significant industry interactions.

The College has made considerable progress in the research world connected to the “gene” dimension. David Klinke, an associate professor in the recently renamed Department of Chemical and Biomedical Engineering, received a $1.7 million grant from the National Institutes of Health for his research programs challenges related to cancer immunotherapy. Klinke and his colleagues in the College have developed close collaborations with researchers in WVU’s Health Science Center. Last year, the first group of internally funded awards to support biomedical engineering research were made to faculty in the College and the HSC using funds through the Byars-Tarnay Endowment in the WVU Foundation. The endowment was established to build biomedical engineering programs for the College with the School of Medicine.
As budget challenges continue and the funding climate remains difficult, new faculty joining the College are working hard to develop their own research programs. For the sixth straight year, a faculty member in the College has earned the prestigious CAREER award from the National Science Foundation. V'yacheslav (Slava) Akkerman, assistant professor of mechanical and aerospace engineering, earned his award that would allow him to advance his research in combustion science. The award comes with at least $500,000 in funding over a five-year period. These and other grants and scholarly activities not only bring in the resources needed to conduct research but also the prestige that help support and maintain WVU’s newly acquired status as the Highest Research Activity research university.

Through a series of networking opportunities, faculty in the Statler College continue to form partnerships with colleagues at WVU, many other academic institutions, national laboratories and industry partners. The College is currently working on major proposals in the area of advanced manufacturing and process intensification. These efforts are led by Ken Currie, chair of the Department of Industrial and Management Systems Engineering; Jianli (John) Hu, Statler Chair and Professor; Rakesh Gupta, George & Carolyn Berry Chair Professor and Chair of the Department of Chemical and Biomedical Engineering; and Brian Anderson, GE Plastics Professor and Director of the WVU Energy Institute. The goal is to become a part of the National Network of Manufacturing Institutes.

Programs centered on computer science and electrical engineering, i.e., data analytics, image processing and biometrics, are also addressed by many research programs. This research effort is led by Nasser Nasrabadi, Matt Valenti, Donald Adjeroh, Xin Li and many others. The Lane Department of Computer Science and Electrical Engineering, led by Brian Woerner, has added a number of new faculty in the area of data analytics.

Research related to energy remains strong. Teams of researchers that include Xingbo Liu, Aaron Noble and Paul Ziemkiewicz, Hanjing Tian and others received competitive funding that is directed at different strategies aimed at recovering rare earth elements from the waste and by-products involved in coal processing.

The College continues to develop strategically selected international research partnerships. The Constructed Facilities Center at WVU conducts research and development vital to the rehabilitation of our nation’s constructed facilities. Directed by Hota GangaRao, Maurice A. and Jo Ann Wadsworth Distinguished Professor of Civil and Environmental Engineering, the Center, being funded by the National Science Foundation’s Industry University Cooperative Research Center program, has developed partnerships with China and more recently with Mexico. The support for this Center also comes from the private sector, the U.S. Army Corps of Engineers and the West Virginia Department of Transportation.
OUTREACH AND RECRUITMENT

NEW PARTNERSHIPS:
THE SHACK | WVU Learning Center | Morgantown Public Library | WVUTeach

NEWS OF NOTE
44 STATLER COLLEGE-SPECIFIC STUDENT ORGANIZATIONS

STUDENT ORGANIZATIONS PERFORMED 6,122.45 volunteer hours, an increase of 63.55 percent from academic year 2014-2015

Two, College-wide student organizations were nominated for WVU Student Organization of the Year: Engineers Without Borders and Society of Women Engineers.

AUGUST 2015
August 13-23: West Virginia State Fair

SEPTEMBER 2015
September 14: EOT Scholarship Judging
September 15: Tours for Mountaineer Success Academy Students
September 14-15: Berkley, Jefferson and Morgan County College Fair
September 17: West Virginia Guidance Counselor Tours
September 18: Randolph, Pendleton, Pocahontas and Tucker Counties College Fair
September 19: SWE’s Murder Mystery Lunch, Museums at the Mall
September 23: Meet WVU Event (Kanawha Valley)
September 25-27: National Engineering Ambassador Network Workshop at Ohio University
September 28: Wheeling Area College Fair, Adamston Elementary Visit (Harrison County)

OCTOBER 2015
October 2: Statler College to West Chapmanville School (Logan County)
October 3: Fall Family Weekend Cookout
October 4-5: Big 10 Grad School Expo, Purdue University
October 6: Kanawha County College Fair, Meet WVU Event (North Central West Virginia)
October 7: Johnson Elementary Visit to Statler College
October 8-11: Statler College to Trinity Classical Academy and Valencia High School, Valencia, California
October 9: Brookhaven Elementary Early Dismissal Outreach Program
October 12: Barbour, Lewis, Upshur County College Fair
October 13: Meet WVU Event (Ohio Valley)
October 15: Monongalia and Preston County College Fair, Statler College visit to Eagle Elementary School (Martinsburg)
October 16: Statler College visit to Potomac Elementary School (Martinsburg)
October 17: Discover WVU Open House, Science Day at Children’s Discovery Museum of West Virginia
October 18: Fairfax County Public Schools College Fair, Fairfax, Virginia
October 20: Meet WVU Event (Eastern Panhandle)
October 21: Cheat Lake Elementary Science Fair
October 22-24: Society of Women Engineers Annual Conference, Nashville, Tennessee
October 22: WVU Graduate Fair
October 23: WVU Pumpkin Drop
October 24: Discover WVU Open House
October 27: Meet WVU Event (Southern WV)
October 28: North Elementary Visit
October 29: Tau Beta Pi Graduate Fair, Rhode Island
October 30: Tour for WVU Legacy Event
October 31: High School Visitation Day, Trunk or Treat

More than 61,000 people reached
### November 2015
- November 2: Admitted Student Day
- November 3: SciTECH Day at Carnegie Science Center, Pittsburgh, Pennsylvania (middle school), Discover-E Night at North Elementary
- November 4: SciTECH Day at Carnegie Science Center (middle school)
- November 5: SciTECH Day at Carnegie Science Center (high school), SciTECH Day at Carnegie Science Center (high school), Maker Faire Children’s Museum Event at Barnes and Noble
- November 8: Maker Faire Children’s Museum Event
- November 11-15: Society of Hispanic Professional Engineers National Conference, Baltimore, Maryland
- November 14: 4H Lego Robotics Competition at Jackson’s Mill
- November 16: Admitted Student Day
- November 17: Tomahawk Elementary School Visit (Berkeley County; third–fifth graders)
- November 19: Greene County College and Career Fair

### December 2015
- December 2: Glade Elementary Visit
- December 3: Suncrest Primary TAG program visit
- December 7: Bruceton Mills Science Fair, Academic Excellence Event
- December 10: WVU visit to Mountaineer Middle for Coding Project (Harrison County)
- December 17: Lincoln County High School Robotics Team Visit
- December 19: EQT Scholars Banquet, Charleston

### January 2016
- January 8: Presentation at John Marshall High School
- January 11: EWB Presentation to Parkersburg Rotary
- January 14: Trinity Christian School Science Fair, Statler College visit to Harrison County Gifted Program fourth graders
- January 15: Statler College visit to Harrison County Gifted Program fifth graders

### February 2016
- February 1: Admitted Student Day
- February 3: Statler College to “The Shack” Afterschool Program
- February 4-5: Pittsburgh NACAC
- February 5-7: SWE Region G Conference, Cincinnati, Ohio
- February 6: West Virginia Science Bowl
- February 8: Admitted Student Day
- February 13: 8th Grade Day
- February 15: Distinguished Scholar Event
- February 19: WVU Day at the Legislature
- February 20: Discovery Family Fun Day at the Clay Center (Charleston), TSA TEAMs Competition
- February 19-21: Region E Society of Women Engineers Conference, Blacksburg, Virginia
- February 22: Statler College visit to Harrison County Gifted Program (first–second graders)
- February 25: Undergraduate Research Day at the Capitol
- February 27: Merit Badge University
- February 26-28: Institute of Industrial Engineers Annual Conference, Greensboro, North Carolina
- February 29: Academic Excellence Event

### March 2016
- March 1: SciTECH Day at Carnegie Science Center (middle school), Statler College visit to Harrison County Gifted Program third graders
- March 2: SciTECH Days at Carnegie Science Center (middle school), Statler College visit to Westwood Elementary Afterschool Program
- March 3-4: SciTECH Day at Carnegie Science Center (high school)
- March 5: Spring High School Visitation Day
- March 6-8: EnGender Workshop (recruiting females and minorities to engineering)
- March 9: Watt’s Museum Open House
- March 12: Decide WVU Day, Statler College visit to Hooverstown Heights Primary School (Brooke County; K-5)
- March 14: Admitted Student Day
- March 16: Statler College to Harrison County Gifted Program (4th graders)
- March 17: Statler College to Brookhaven Elementary After School Program, Statler College to Notre Dame High School
- March 18: Statler College to Harrison County Gifted Program (fifth graders)
- March 22: Big Elm Elementary Career Day (Harrison County)
- March 23: WVU to Watson Elementary kindergarten students (Marion County)
- March 23-27: National Society of Black Engineers Annual Conference, Boston, Massachusetts
- March 28-31: Junior Preview Day
- March 31: Discover-E Night, North Elementary (second grade)

### April 2016
- April 1: Statler College visit to West Milford Elementary (Harrison County; fifth graders), Junior Preview Day, STEM Night at Brookhaven Elementary, Welcome and recruitment presentation to Eastern Collegiate Mine Rescue Team Competition
- April 2: Mineral County 2016 STEM Expo, Decide WVU Day Open House, West Virginia State Science and Engineering Fair
- April 6: Recruitment Roundtable with West Virginia Extension Agents
- April 7: Statler College to University High School for career presentation
- April 8: New Jersey Technology Institute Visit
- April 9: Girl Scout Day, Science Fair at “The Shack”
- April 11: Glenwood Middle School visit (eighth grade students), Science Night at Bruceton Mills
- April 13: Eighth Grade Career Day at Mylan Park Expo Center
- April 15-17: USA Science and Engineering Festival, Washington, D.C.
- April 15: Statler College to Clay Battelle (eighth grade), Ohio, Pennsylvania, Virginia, West Virginia guidance counselors visit
- April 21: Statler College to Hodgesville Elementary (Upshur County), Long Drain Elementary students visit (Mercer County)
- April 22: Statler College to Turkeyfoot Valley School District (seventh grade), STEM Night at Mylan Park Elementary
- April 25: Tours for Project Lead the Way students
- April 27: Statler College Visit to North Elementary (first grade)
- April 29: Statler College visit to Marion County Home School Network, Sixth graders from Keyser visit

### May 2016
- May 9: Cleveland Technical Societies Council 2016 College Fair
- May 10-12: Intel International Science and Engineering Festival, Phoenix, Arizona
- May 7-12: Engineers Without Borders trip to Huttonsville (Randolph County)
- May 13: Engineers Without Borders School Visit to Elkins Middle School (Randolph County)
- May 16: Bruceton School Fifth Grade STEM Field Day
- May 19: Eastwood Elementary Science Fair
- May 20: Third grade Students from Coalton Elementary visit Statler College (Randolph County)
- May 26: Eastdale Elementary Visit (Marion County; fourth graders), Bridgeport High School Juniors visit (Harrison County)
- May 27: North Elementary Science Fair (fifth grade)
- May 31: North Elementary Science Fair (fourth grade)

### June 2016
- June 3: Cheat Lake Elementary Fifth Grade STEM Picnic
- June 13 and 15: WVU Learning Center Camp Visit
- June 14: West Virginia Boys State College Fair
- June 16: West Virginia Girls State College Fair
- June 20-24: Middle School Engineering Challenge Camp Week 1
- June 26-July 1: Growing Roots in STEM All-female Engineering Challenge Camp (high school)
- June 27-July 1: Middle School Engineering Challenge Camp Week 2
- June 28: INDY Youth Achievers visit to Statler College (13–18 years old)
- June 28-July 2: Technology Student Association National Conference and Competition, Nashville, Tennessee

### July 2016
- July 6: Salem University’s Upward Bound to South Carolina visit
- July 10-15: Engineering in Action Engineering Challenge Camp (high school), Engineering in Entertainment Engineering Challenge Camp (high school)
- July 13: African American Arts and Heritage Association visit to Statler College
- July 15: Suncrest United Methodist Science Camp Activity
- July 17-22: Engineering in Sustainability Engineering Challenge Camp (high school)
- July 18-22: First-Third Grade Engineering Challenge Camp Week One, Fourth-Fifth Grade Engineering Challenge Camp Week One
- July 25: International Ambassador Program visit to Statler College
- July 25-29: First-Third Grade Engineering Challenge Camp Week Two, Fourth-Fifth Grade Engineering Challenge Camp Week Two, Middle School Engineering Challenge Camp Week Three
- July 27: HSTA Roundtable

### August 2016
- August 1-5: First-Third Grade Engineering Challenge Camp Week Three, Fourth-Fifth Grade Engineering Challenge Camp Week Three
- August 5-6: 24 Hours of Robotics Competition
- August 9: Teen Extreme Middle School Summer Camp visit to Statler College
- August 12-21: State Fair of West Virginia
- August 19: Meadow Bridge High School STEM Day
Honor Roll of Donors

We would like to thank our benefactors who have generously contributed to the College. We are grateful for your support; we could not accomplish what we do without your help. Listed below are individuals and organizations who contributed to a program or department in our College from July 1, 2015, through June 30, 2016.

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