

THE MAJOR

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MESSAGE FROM THE CHAIR

THIS ISSUE



PALANKI

Higher education in the United States is at a crucial crossroads. Higher education institutions, more so now than ever, must step forward as genuine change agents for the country in knowledge and technology transfer while at the same time maintaining core educational values and missions. Public research universities are increasingly asked to create a larger footprint of entrepreneurial and economic development activities aimed at jump-starting regional economies and ensuring the nation's future as a leading technological society. The Department of Chemical and Biomedical Engineering at West Virginia University is at the core of this transformational effort.

Yuxin Wang joined our department in Fall 2022. He completed his doctorate from the Chinese Academy of Sciences and then worked with John Hu as a post-doctoral researcher at WVU. His research expertise is in catalysis.

Regarding our undergraduate programs, the current biomedical engineering enrollment is 141 and the chemical engineering enrollment is 109. Both undergraduate programs are currently being reviewed for accreditation by ABET. The ABET team that visited the department in September 2021 indicated that neither program has any shortcomings. The final determination will be made in the ABET meeting in July 2022 and we are expecting to get our full six-year accreditation for both undergraduate programs.

We continue to attract bright, capable and motivated undergraduate students and their accomplishments are reflected well in the department. Jackie Arnold is a recipient of the 2021 Beckman Scholars Program Award. Four of our students won research presentation awards at the 2021 American Institute of Chemical Engineers (AIChE) annual meeting in November, including: Ashley McCullough (adviser: Fernando Lima), Rebecca Erwin (adviser: Oishi Sanyal), Jackie Arnold (adviser: Cerasela Dinu) and Lillian Bischof (adviser: Fernando Lima). Our students are now forming teams to compete next year in the Cheme Cube Competition and the Cheme Car Competition.

In research news, the department research expenditures have increased substantially and are now over \$5.5 million per year. This is great news given the tight funding situation across the country. This increased research funding effort has allowed for growth of our doctoral programs and our funding base. Several faculty members have recently received significant research awards, including John Hu, Debansu Bhattacharyya, Wenyuan Li, Oishi Sanyal, Fernando Lima, Yuxin Wang and many other awards that continue to support our growing research program. We now have 67 doctoral students in the department – the largest cohort of postgraduate students in the Statler College of Engineering. Furthermore, every doctoral student is funded with the highest stipend in the college and university tuition waiver.

Srinivas Palanki
Chair, Department of Chemical and Biomedical Engineering

I began my role as department chair after **Richard Turton** retired on July 1, 2021, and it is hard to believe that one year has passed. During that time, I am pleased to report that we successfully recruited seven new faculty members in the tenure-track assistant professor levels in the department in the past year.

Madelyn Ball obtained her doctorate from the University of Wisconsin with James Dumesic and completed her post-doctoral research with Chris Jones at Georgia Tech. Her research expertise is in catalysis.

Yuhe Tian obtained her doctorate from Texas A&M with Stratos Pistikopoulos, and her research expertise is in chemical process systems.

Wenyuan Li obtained his doctorate from WVU with Xingbo Liu. His research expertise is in electrochemistry.

Stephen Cain obtained his doctorate from the University of Michigan. He worked at the University of Michigan for several years as a research scientist after receiving his education and his research expertise is in biomechanics.

Soumya Srivastava joins us after working at the University of Idaho for several years. She obtained her doctorate from the Mississippi State University, and her research expertise is in point-of-care medical diagnostic platforms.

Moriah Katt joined our department in June 2022 after obtaining her doctorate from Johns Hopkins University with Peter Searson and her post-doctoral research with Eric Shusta at the University of Wisconsin. Her research expertise is on variable lymphocyte receptors for blood-brain barrier targeting and delivery.

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DEPARTMENT NEWS

WISH THEM WELL

Please join us in wishing them the very best for their futures.



Jessica Allen, assistant professor of biomedical engineering, will be leaving WVU in August 2022 to return to her home in Florida. Allen joined the department in August 2017 and played a significant role in the biomedical engineering program and in helping to initiate the graduate degree program. Allen received her doctorate in mechanical engineering from

the University of Texas at Austin in 2012. She will be returning to the University of Florida in Gainesville where she received her bachelor's degree. We thank her effort and support of the biomedical engineering program and wish her the best of luck in future endeavors. We hope she leaves the department with fond memories and will visit us in the future.



Nagasree Garapati, visiting assistant professor in chemical engineering, will leave WVU in August 2022 to advance into a tenure-track faculty position at the University of New Haven in Connecticut. Garapati received her doctorate from WVU in 2013 and returned to her alma mater in September 2016 as a research assistant professor. In 2020 she

became a visiting assistant professor in the department. Garapati was an active member of the department teaching classes, performing research and providing service. We wish her the best of luck with her future endeavors.

NEW FACULTY HIRES

Please help us welcome our newest hires:



Moriah Katt joined the department in June 2022 and will be an integral part of the program. Katt received her doctorate in materials science and engineering from Johns Hopkins University in 2018. Since 2018, Katt has been a postdoctoral fellow at the University of Wisconsin-Madison in chemical and biological engineering. Katt was hired to

provide expertise and develop an active research program in the general area of biomedical engineering with a primary focus in neurosciences.



Yuxin Wang will join the department as an assistant professor in August 2022. Wang received his doctorate in chemical engineering from the Chinese Academy of Science in 2012. Previously he was a postdoctoral fellow at Louisiana Tech University and WVU. Currently he is a research assistant professor in the department. Wang has

been hired to provide expertise and to develop an active research program in the general area of heterogeneous catalysis, natural gas conversion, and plastics upcycling.

FACULTY AWARDS & RECOGNITION

Statler College researchers have received an \$859,136 grant from the Reducing Embodied-energy and Decreasing Emissions Institute and Braskem to increase the recycling rate of single-use plastics by converting plastic waste into valuable aromatics that will be used to create petrochemical materials. **Yuxin Wang**, research assistant professor, is leading this research. Also working on the project are **John Hu** and **Changle Jiang**. **Wenyuan Li**, assistant professor, is a Co-PI on a \$7.5 million grant from U.S. Department of Energy to develop technologies aimed at upgrading critical components of power plants that frequently fail due to stress caused by continuous cycling of various energy sources. The Statler team of engineers consists of Xingbo Liu, associate dean for research as the PI, and Co-PIs **Kostas Sierros**, associate professor in the Department of Mechanical and Aerospace Engineering, and Wenyuan Li.



COLLEGE NEWS

RESEARCH AND DEVELOPMENT

The National Science Foundation Higher Education Research and Development Survey ranks Statler College research programs among the top 100 in the U.S. The survey tracks total research and development expenditures at U.S. academic institutions each fiscal year. WVU was ranked 126th with \$188,452 million in total research and development expenditures during 2020. The Statler College accounts for nearly \$42.7 million in research and development expenditures which represent 23% of the total research expenditures of the University. Seven disciplines in the College ranked in the top 100 of the survey, with chemical engineering ranked at 62.

DINU APPOINTED ASSOCIATE DEAN



Cerasela-Zoica Dinu, professor of chemical and biomedical engineering, was appointed as the first associate dean for student, faculty and staff engagement. This new role will support students, faculty and

staff, as well as promote all efforts to proactively increase diversity. Dinu will work to advance the College's vision and goals through the creation and implementation of strategic academic initiatives that ensure success, relevancy and sustainability.

HISSAM APPOINTED ASSOCIATE DEAN



Robin Hissam, teaching associate professor of chemical and biomedical engineering, was appointed associate dean of academic and student performance. Hissam became a teaching assistant professor in chemical engineering in August 2008 and was promoted to teaching associate professor in August 2019. She took on the role of director of undergraduate education for the department in November

2019. Hissam began her associate dean responsibilities on July 1, 2022. Congratulations to Hissam and we wish her the best in her new role. Hissam will continue with limited responsibilities in the biomedical engineering program.

ACADEMY NEWS

ACADEMY INDUCTEES

The annual meeting of the Academy of Chemical Engineers was held on April 7-8, 2022, at the Holiday Inn Morgantown. The dinner on Thursday, April 7, was hosted by Academy members Jim Bero and Stuart Goodman. Brian Anderson, National Energy Technology Laboratory director, was the speaker for the Thursday event. The annual meeting was held on Friday, April 8, and was attended by 17 members in-person and three virtually. The induction ceremony and awards banquet were held that evening at the Holiday Inn Morgantown. One new member and one honorary member were inducted into the Academy of Chemical Engineers in the Class of 2022.



Laurie Wiegand-Jackson
(B.S. '84)
President and Founder
Utility Advantage
Woodstown, New Jersey

Laurie Wiegand-Jackson is a successful entrepreneur with over 30 years of experience in the energy industry. As the president and founder of Utility Advantage, she supports the company's strategic initiatives with her national experience

including wholesale and retail energy markets, utility energy efficiency programs and clean energy. Laurie is a passionate activist in the areas of sustainability and gender equity in the energy sector. She regularly speaks on the importance of sound energy policy, innovative technologies, the clean energy transition and diversity in the 21st century energy workforce.

Wiegand-Jackson served as the president of the International Association of Energy Engineers (AEE) in 2007. She received AEE's Distinguished Service Award and was inducted into the Energy Manager Hall of Fame in 2016. She is a founder of the Council for Women in Energy and Environmental Leadership fulfilling her commitment to support the success of women in the industry.

Wiegand-Jackson is a lifelong resident of New Jersey, where she resides with her husband Gerald Jackson of more than 20 years. She graduated from WVU in 1984, earning a bachelor's degree in chemical engineering. Laurie is a devoted wife and mother to her son Sebastian who currently works in construction. She and her husband also serve in Christian Ministry.



Richard Turton
(Honorary Member)
Professor Emeritus, WVU
Chemical and Biomedical
Engineering
Morgantown, West Virginia

Richard Turton was born in London, England, in 1955 to his parents Donald W. and Joyce Turton. He grew up in the southeast London borough of Eltham and attend St. Olave's Grammar School in Southwark, London. He graduated

from Nottingham University in England in 1977 with a bachelor's degree in chemical engineering. While he was at Nottingham, he was a member of and captained the university golf team and was a student member of the Faculty Senate.

After graduating with his bachelor's, he attended Oregon State University and graduated with a master's in chemical engineering in 1979. He then worked as a junior process engineer for Pullman-Kellogg Co. in England and as a process engineer for Fluor E&C Corp. in Irvine, California. In 1983, he returned to OSU and became a doctoral student under the mentorship of Octave Levenspiel. After receiving his doctorate, he joined the faculty at WVU in the Department of Chemical Engineering in 1986. He spent the remainder of his professional career at WVU serving as the department chair from 2018-2021, as Faculty Senate Chair from 2015-2016, as a member of the Board of Governors from 2015-2017 and as the WVU Bolton Professor from 2012 to his retirement in June 2021. He is the lead author for two textbooks and a co-author of nearly 100 peer-reviewed research papers.

He and his wife Becky reside in Morgantown, West Virginia, and look forward to traveling, watching movies and pursuing their many hobbies.

ACADEMY SCHOLARS

The 2022-2023 Chemical Engineering Academy Scholars were announced and recognized at the annual Academy Induction Ceremony and Awards Banquet held at the Holiday Inn Morgantown on Friday, April 8, 2022. The 2022-2023 Academy Scholars are **Lillian Bischof, Leah Haines, Hayden Hamilton, Hannah Litz** and **Dean Sweeney**.

DARLENE SCHUSTER APPOINTED CEO AND EXECUTIVE DIRECTOR OF AIChE



The Board of Directors of AIChE, the global home of chemical engineers, has announced that **Darlene S. Schuster** has been appointed as the new chief executive officer and executive director of the institute. Schuster received her bachelor's degree in chemical engineering from WVU, her master's degree from

the University of Pittsburgh, and her doctorate from WVU in 1990. She started her career working in the oil fields at Gulf Oil and later, as a Bucknell University Clare Booth Luce Chair and professor of chemical engineering. Over the past twenty years, Schuster has served AIChE as a volunteer, consultant and employee – and most recently leading AIChE's publications, membership, meetings, business development, education and technical entities as chief of technical operations, membership and business development. Schuster was inducted into the Academy of Chemical Engineers in the Class of 2017.

UNIVERSITY NEWS

PURPOSE INSTITUTE



President **E. Gordon Gee** will establish a first-of-its kind Purpose Institute at WVU. Creating space and time for students to discover their life paths will allow students to grow.

"We must pursue education, healthcare and prosperity with a renewed and focused determination to transfer WVU into a purpose-driven leader in higher education," Gee said. "The center will help prospective students and employees, as well as current students, faculty, staff and alumni discover – or rediscover – their purpose and place in the world, and then help them chart the path forward."

HIGHER EDUCATION EXCELLENCE IN DIVERSITY AWARD



For the sixth consecutive year, WVU has earned the Higher Education Excellence in Diversity Award. The award recognizes U.S. colleges and universities that demonstrate an outstanding commitment to diversity and inclusion.

RECORD SHATTERING RESEARCH FUNDING

WVU received \$203 million in external funding for research and other sponsored programs during the fiscal year 2021, beating the previous year's record by \$8 million. This is an incredible accomplishment considering the ongoing COVID-19 pandemic and other uncertainties in the higher education world. WVU receives research funding from various sources, including federal, state, industry and private donors.

STUDENT NEWS

STUDENT AWARDS & RECOGNITION

Jackie Arnold (ChE '22) placed third in the Food, Pharmaceuticals and Biotechnology Category, Group 2 at the annual meeting of the AIChE in November 2021. Her poster was titled, "Enzyme Immobilization Within a Hyaluronic Acid Matrix for Biosensor Applications" and was co-authored by **Jordan Chapman** and **Cerasela Dinu**.

Jackie Arnold was also a 2021-2022 Beckman Scholar. The Beckman Scholars program provides in-depth, sustained undergraduate research experiences for exceptionally talented, full-time undergraduate students. As a WVU Beckman Scholar, Jackie published as the first author of a peer-reviewed publication. The article, "Hyaluronic Acid Allows Enzyme Immobilization for Applications in Biomedicine," was published by Arnold, **Jordan Chapman**, **Myra Arnold** and **Cerasela Dinu** in volume 12, issue 1 of the open access journal, *Biosensors*, in December 2021.

Lillian Bischof (ChE '23) placed third in the Computing and Process Control, Group II Division at the annual meeting of the AIChE in November 2021. Her poster was titled, "Modeling of Solar and Wind Power Plants in West Virginia Using the System Advisor Model." The paper was co-authored by **Ronald Alexander** and **Fernando Lima**.

Victoria Dean (BMEG '22), **Kevin Donnelly** (ChE '22), **Rebecca Erwin** (ChE '22), **Savannah Hays** (BMEG '22) and **Ali Rai** (BMEG '22) were recognized as WVU 2022 Outstanding Seniors. The outstanding seniors were recognized at a drop-in event Friday, May 13, in the Betty Boyd Lounge of Elizabeth Moore Hall.

Rebecca Erwin (ChE '22) placed third in the Separations I Division at the annual meeting of the AIChE in November 2021. Her poster was titled, "Development of Polyelectrolyte Multilayer Membranes for Ammonium Recovery from Anaerobic Digestate." Other authors on the poster were **KmProttoy Shariar Piash**, **Rifat Anwar**, **Lian-Shin Lin** and **Oishi Sanyal**.

Savannah Hays (BMEG '22) was one of eight WVU seniors honored with the 2022 Order of Augusta. WVU's Order of Augusta and Outstanding Senior awards honor the University's most talented graduating seniors.

Savannah Hays (BMEG '22) was also a recipient of a Statler College Excellence in Diversity, Equity and Inclusion Award for 2021. Savannah received the award for her dedication to increasing representation and promoting women in STEM disciplines. She was working with Honors EXCEL to promote female high school STEM outreach in West Virginia. As part of the outreach, Hays developed the Morgantown SWENext Club, and hopes to target other areas of the state during 2021-2022.

Raimah Hossain (BMEG '22) was named a 2021 Homecoming royalty. On Saturday, October 2, 2021, at the WVU football game against Texas Tech, **Raimah Hossain** and **Kylie A. Parker** were named the 2021 Homecoming Royalty, marking the start of a new tradition at the University.

Ashley McCullough (ChE '23) placed second in the Computing and Process Control, Group I Division at the annual meeting of the AIChE in November, 2021. Her poster was titled, "Renewable Energy Data Mapping and Integration for the PJM Region," and was co-authored by **Selorme K. Agbleze** and **Fernando Lima**.

Jessica Sacco (ChE '22) and **Savannah Sakhai** (ChE '22) were recognized for the best senior year major presentation for 2021-2022. They each received an Apple iPad for their accomplishment. The award is sponsored by Dow Chemical.



RECENT GRADUATES

The WVU 2022 Commencement was held on May 13-15, 2022, at the WVU Coliseum and Canady Creative Arts Center. Nearly 4,500 graduates received their diplomas during the 16 in-person commencement ceremonies. Messages of hope and resilience were the theme for this year's commencement exercises.

During 2021-2022, the department had a total of 74 graduate students: 54 from chemical engineering and 20 from biomedical engineering. Of those students, 67 graduated with a doctorate degree and seven graduated with a master's degree. In August 2021, the department graduated one doctorate student and two master's students. In December 2021, the department graduated three doctorates and one master's student. In May 2022, the department graduated one doctoral student. Their names, research topics and research advisers are as follows:



Xinwei Bai (Ph.D. – December 2021)

Research Advisor: John Hu

Title: Microwave-Assisted Natural Gas Conversion to Value-Added Chemicals

Brent Bishop (Ph.D. – May 2022)

Research Advisor: Fernando Lima

Title: Design and Control of Intensified Membrane Reactor Systems Through Module-Based Design Approach

Vinayak Dwivedy (M.S. – December 2021)

Research Advisor: Debangsu Bhattacharyya

Title: Dynamic Modeling of a Coal Mill for Simultaneous Dynamic Data Reconciliation and Parameter Estimation

Goutham Kotamreddy (Ph.D. – August 2021)

Research Advisor: Debangsu Bhattacharyya

Title: Process Modeling and Techno-Economic Analysis of Micro-Encapsulated Carbon Sorbents for CO₂ Capture in a Fixed Bed and Moving Bed Reactors

Owen McGrath (M.S. – August 2021)

Research Advisor: John Hu

Title: Biological Conversion of Carbon Dioxide to Value-added Chemicals

Anca Ostace (Ph.D. – December 2021)

Research Advisor: Debangsu Bhattacharyya

Title: Modeling, Optimization and Uncertainty Quantification of Solids-Based CO₂ Capture Technologies

Jacob Suffridge (M.S. – August 2021)

Research Advisor: Shuo Wang

Title: Investigating the Role of Attention and Memory in Visual Exploration

Sarojini Tiwari (Ph.D. – December 2021)

Research Advisor: John Hu

Title: Simultaneous Activation of Stable Molecules- Methane and Nitrogen- Using Microwave Reactor With and Without Plasma- to Produce Ethylene and Ammonia

BIOMEDICAL ENGINEERING SENIOR DESIGN

Biomedical Engineering Senior Design Presentations were held on Tuesday, April 26. The design groups presented elevator pitches by the chief engineers and poster presentations and open discussions followed.



During their senior year, biomedical engineering students work on projects to solve problems that have clinical or translational relevance. These open-ended projects are developed by clients in collaboration with **Cerasela Dinu**, and students work in small teams with faculty mentors and the clients to design and produce prototypes. This experience allows students to show their creativity in design concepts while working within the constraints set by the client or the team.

In 2021-2022, eight design teams were mentored by chemical and biomedical engineering faculty, including **Jessica Allen**, **Margaret Bennewitz**, **Stephen Cain**, **Robin Hissam** and **Soumya Srivastava**. Other faculty included **Loren Reith** from the Department of Mechanical and Aerospace Engineering and **Alexander Stolin** from radiology in the School of Medicine. These groups worked with clients in academics, including chemical and biomedical engineering faculty Stephen Cain, Robin Hissam and Soumya Srivastava; Loren Reith from mechanical and aerospace; **Raymond Raylman** from the School of Medicine; clinical **John Hollander** and **Joel Palko** from the School of Medicine and industrial **Christopher Racer**, Alcon. These positions work toward biomedical engineering designs to solve problems in healthcare. The 2021-2022 projects marked the first time a team of students developed a project idea.

Design teams presented their final prototypes and posters during an in-person symposium held on April 26 to faculty, students and external visitors including industry representatives, family and friends. Abstracts of two examples of clinical and translational projects are given below:

Investigation of Small Lesion Detectability of a Dedicated Breast PET-CT Scanner

Dense breast tissue is known to affect the accuracy of mammograms, a form of x-ray imaging, to locate small lesions. In this project, two forms of imaging were combined to assess small lesion detectability. X-ray computed tomography (CT) imaging observed differences in tissue density, while positron emission tomography (PET) imaging is used to monitor a biological process like the uptake of fluorodeoxyglucose F-18 (18F-FDG). Regions that uptake 18F-FDG are often indicative of malignant lesions. To assess the PET-CT scanner detectability, a phantom was developed to mimic breast tissue. The phantom consisted of a fillable cylindrical container filled with a solution of FDG to simulate normal glucose uptake of breast tissue. Solid acrylic beads were immersed in the solution to mimic the nonuniformity of breast uptake. Radioactive agar spheres of specific sizes were inserted to represent malignant lesions. After imaging, the CT images were used to find each lesion represented by an agar sphere. It was determined that higher target-to-background ratios allowed for the detection of all agar spheres, and lower ratios showed decreased reliability in detecting smaller agar spheres.

DEBUT Challenge: Creation of a Spinal Puncture Practice Model to Increase First-Attempt Success Rate

The Design by Biomedical Undergraduate Teams (DEBUT) Challenge is a nationwide competition recognizing undergraduate teams achieving excellence in biomedical engineering design projects. The team identified a need to improve the strategies and models used to train medical professionals for epidural and lumbar punctures. Considering the types of models on the market, the project goal was to create a high-fidelity model at a low-fidelity cost. The cost of a high-fidelity tissue insert is around \$1,200. The team worked to develop a lower-cost design while also improving interaction with the device. To make a more realistic model, the group considered creating a realistic ligamentum flavum popping sensation and decreasing the appearance of needle marks in the model. The team developed several design iterations and completed testing multiple iterations to gauge efficacy. Medical school students and the team conducted testing. A cost analysis was also performed to compare the model created by the team to those on the market. The third iteration, which incorporated dye to tint the gel and latex tubing to mimic the ligamentum flavum, proved to be most effective based on realism during puncture tests and manufacturing cost of approximately 3% of the high-fidelity tissue insert cost.

CHEMICAL ENGINEERING SENIOR DESIGN

The ChE Senior Design project for 2021-2022 was titled “Hydrogen Production and Storage Process Design in the Appalachian Region and was led by Chief Engineer Jackie Arnold. The group was tasked by H2Tek, Inc. to perform a series of techno-economic studies to evaluate the design of potential technologies that can produce and store blue and green hydrogen.

The final presentation was held on Thursday, April 21.

Due to the rise of societal interest in protecting and reviving the environment, the energy sector represents an area of vital concern and relevance within an evolving world economy. On August 19, 2021, H2Tek, Inc. contacted Mountaineer Hydrogen Tech (MHT) to investigate feasible methods to produce, store, and transport blue and green H₂ as an energy source in the Appalachian region. MHT proceeded to perform a series of techno-economic studies to analyze the profitability and viability of various plant design options. This evaluation was conducted over three phases.

Phase one involved the comprehensive literature review of H₂ production and storage techniques, diverse and available process feedstocks, carbon capture and utilization, and the economic, political, environmental, and health related implications of the endeavor to be invested in. Following the scoring and ranking of explored pathways in categories such as applicable scale, practicality, novelty and complexity of modeling, a MHT

proposal was accepted by H2Tek, Inc. at the conclusion of this first phase. The configuration included proton exchange membrane electrolysis, air separation, autothermal reforming and the water-gas shift reaction, pressure swing adsorption, tail gas combustion, adsorption, cryogenic separation, hydrogen storage and transportation. As phase two progressed, base simulations and models were generated for each of the outlined units that could be validated with mass and energy balances and against available literature data. In phase three, topological and parametric optimizations were performed following the completion of the base case to improve the economic validity of each unit independently as well as in cohesion with the rest of the design. Finally, all units completed equipment sizing including the rigorous design of a pressure vessel, and selected units generated a hazard and operability study, a piping and instrumentation diagram, and a sustainability analysis, respectively.



GROWING GRADUATE FELLOWSHIPS

When we take a look at other R1 classified research institutions, we think of Harvard, Stanford, MIT and Georgia Tech as examples of excellence in higher education because of their high profile research programs. The high-caliber research that happens within the chemical and biomedical engineering department at WVU seems to be a well-kept secret.

The future of growing our research base, reputation and reach is by funding highly qualified incoming graduate students during their first year of study at WVU. Such funds would allow us to make offers without having to worry about who the student would work for as a graduate or teaching assistant and whether or not that professor had funding at the time to offer to the student. This sort of funding model is common at many, if not all, established research universities.

Following this model, a fund has been created but needs to grow to have a meaningful impact. The department has a goal of about \$2,000,000 — that would allow three incoming graduate students to be funded for their first year at WVU.

We need your help to boost our national reputation and stature, and remain viable. It is crucial that the research mission and productivity of our department flourishes.

Can we count on you to make a commitment to help us take chemical and biomedical engineering to new heights?

Contact Tammy Cavarretta at
tammy.cavarretta@mail.wvu.edu

IN MEMORIAM



Betty Louise Miller (B.S. '47) passed away peacefully in her sleep on February 16, 2022. Betty was the only woman to graduate with an undergraduate degree in chemical engineering in 1947. After graduating she accepted a position in the laboratories of Celanese Corporation in Cumberland, Maryland. In 1956 Betty returned to WVU to earn a master's degree in mathematics and subsequently became an instructor, assistant professor and associate professor in mathematics. In 1992 she retired as associate professor

emeritus. After her retirement she remained in Morgantown and served WVU in many capacities including in the office of the president. Betty received numerous awards and recognition for her service to WVU. She was inducted into the Academy of Chemical Engineers in the Class of 1994.

Charles "Chuck" Cather (B.S. '65) peacefully passed away on Friday, September 17, 2021. Chuck grew up on the family farm on Berry Run Road in Flemington, West Virginia. He earned a bachelor's degree in chemical engineering from WVU. He started his career at PPG in New Martinsville. He later worked for Consolidated Natural Gas/Dominion in Hastings and Clarksburg. After retirement he and his wife returned to the family farm where he remodeled his grandparents' house and enjoyed living at the farm. Playing golf was one of his favorite hobbies.

This newsletter is published yearly to keep our alumni and friends informed of departmental news and ongoing activities. For additional information, visit our web site

<http://www.cbe.statler.wvu.edu/>

We continue to make it more informative and useful to our visitors. Let us know your thoughts and comments, and drop us a line.

CLASS NOTES

David Velegol (B.S. '86) is working with Hatch Engineering (formerly Chester Engineers) focusing on primary metals and O&G industries in water and wastewater. He recently won his sixth term as Mayor of Follansbee, West Virginia. He and his wife have two daughters who recently graduated from WVU in 2019 and 2022.

REMINDER

For those who have sent contributions to the Department this past year, **our many thanks!** These funds are used to support many undergraduate and graduate activities, and to help enhance the overall academic and learning environments in the Department. Your support is greatly appreciated.

Please remember to designate your tax-deductible gifts for use by the Department. The best way for contributing to support of WVU chemical and biomedical engineering is to write your check out to the WVU Foundation and designate it for use by chemical and biomedical engineering on the memo line. Also, please check with your company – many will provide matching gifts.

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Alumni Update Year in Review 2021-2022

PLEASE WRITE TO US! We want to know where life has taken you since you left West Virginia University. Complete and return this form with your news and comments. Pass this newsletter on, or let us know any alumni who are not receiving *The Major*.

Send to: Department of Chemical and Biomedical Engineering
West Virginia University | 413 ESB | PO Box 6102 | Morgantown, WV 26506-6102

Or, email updates to linda.rogers@mail.wvu.edu.

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Business Phone: _____

E-mail: _____

Employer: _____

Position Title: _____

Employer Address: _____

City: _____ State: _____ Zip: _____

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Brief News of Professional and Family Activities for Future Newsletters:

Suggestions/Comments: _____

This newsletter is published yearly to keep our alumni and friends informed of departmental news and ongoing activities. For additional information, visit our website: cbe.statler.wvu.edu

We continue to make it more informative and useful to our visitors. Let us know your thoughts and comments, and drop us a line.