2020 YEAR IN REVIEW

VIRGIN

BENJAMIN M. STATLER COLLEGE OF ENGINEERING AND MINERAL RESOURCES

WEST VIRGINIA UNIVERSITY®

MESSAGE FROM THE CHAIR

DEPARTMENT OF MINING ENGINEERING



Dear Alumni and Friends,

EST

Greetings from Morgantown! I do hope you are all staying safe and healthy. What an unprecedented year it was for all of us. The last nine months brought significant and unexpected new challenges and disruptions in our lives. The students' lives have been turned upside down almost overnight. We switched to online class delivery for spring 2020 in mid-March, some cancellation notes were received for students' summer internships, mine visits and travels to professional events were placed on hold, and our traditional student celebration of accomplishments was cancelled. The William N. Poundstone lecture was postponed for the better times.

However, we did not retreat, we adjusted and adapted, and responded to, for all of us, new circumstances. Our mining engineering faculty were able to successfully transform and lead to a successful end of the spring 2020 semester. The WVU and Statler College leadership managed to keep the university and the college on stable financial ground despite many challenges.

Many alumni and friends stepped up and helped land summer internships for our students in the coal, metal and non-metal sectors of our industry. In my survey of the students, they worked for a number of companies including Compass Minerals, Martin Marietta, Arch Resources, Luck Stone, GMS, Nevada Gold Mines, BNN Coal, United Coal, Vulcan Materials, Blackhawk Mining, and Laurel Aggregates. I have included several stories on their summer internship experiences and I hope you enjoy reading them.

I am particularly grateful to The Gimme Foundation, Martin Marietta, WAIMME, ISEE, SME Pittsburgh Section, PCMIA, and SME who financially supported our students in these times. I am also thankful to many of our alumni, friends and donors who established a strong scholarships support and endowments for our students over the years. This has certainly helped our students to overcome many financial difficulties during these times.

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MISSION STATEMENT

The Statler College mission is to prepare students for success in their professional careers; to contribute to the advancement of society through learning, discovery, extension and service; and to stimulate economic wellbeing in West Virginia and the world through technical innovation, knowledge creation and educational excellence.

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MESSAGE FROM THE CHAIR

We had almost all mining engineering classes in person in fall 2020, and all these classes were conducted following strict COVID-19 rules and guidelines issued by the university. This has certainly made a significant positive response by the students and contributed to their educational experience. Although we did not have in-person industry information sessions on campus, we welcomed Martin Marietta, RESPEC, Blackhawk Mining, CEMAX and United Coal through the online virtual environment. We appreciate them giving these sessions and interviewing our students for summer internships and full-time jobs.

We welcomed two new faculty members this fall: Hassan Amini and John Craynon. I would like to call your attention to the articles written by these two new faculty members, and we look forward to their future contributions to the Department.

I am very thankful to Interim Dean Earl Scime who was very supportive of our Department in fall of 2019 and spring 2020. His support and help to our Department are appreciated very much. We have been fortunate to get a new dean of the Statler College in summer 2020, Dr. Pedro Mago. He brings a novel and exciting vision to the College, and he has been very supportive of our Department. He fully understands the importance of mining and minerals not only for the state of West Virginia, but also for the nation, and we are excited to have him as a new dean. Please welcome Dean Mago to the Statler College and WVU.

This fall we lost an icon, the titan, the biggest advocate of coal mining, and the greatest supporter of the WVU Department of Mining Engineering, Mr. Robert E. Murray. I will always appreciate and cherish the long conversations I had with him, and his support and commitment to our Department and me personally. His advice and vision made a difference in my personal life and my professional career. He will be greatly missed. Mr. Murray's family is in my heart and mind. May his soul rest in peace.

As the chair, and on the behalf of the faculty, staff and students, I thank you very much for your support and commitment to the Department of Mining Engineering.

We see the light at the end of tunnel in the fight against COVID-19, and I am confident that we will prevail. Please be safe, healthy and stay mining strong!

VLADISLAV KECOJEVIC Robert E. Murray Chair and Professor Department of Mining Engineering

Research

New technology to improve underground mine safety in development by WVU engineers

New technology created by engineers at West Virginia University will improve safety in underground mines by reducing the likelihood of "fall of ground" related accidents, one of the leading causes of injuries in underground mines, which occurs when part of the roof or a pillar collapses.

Ihsan Berk Tulu, assistant professor of mining engineering in the Statler College of Engineering and Mineral Resources, will develop mine-specific, geology-dependent pillar and standing support design tools that will be immediately available to the mining industry thanks to a \$450,000 award from the Alpha Foundation.

According to Tulu, despite progress in reducing ground control related fatalities and injuries in mines, coal miners are still at risk from roof collapses and falling debris while working underground.

A recent report by the Mine Health and Safety Administration revealed that fall of ground incidents still account for almost 30 percent of the occupational fatalities in underground coal mines, out of these ground control related fatal accidents, 25 percent of them were in longwall mines. For fatalities related to ground control, 80 percent of them have occurred in areas with roof support. This project aims to improve the safety by enhancing current ground control design tools, Tulu explained.

"The ultimate goal of this research is to improve the safety of mine workers in regional mining operations in Appalachia, the U.S. and around the world," Tulu said. "Therefore, this research will serve WVU's mission as a land-grand institution by improving the safety of West Virginia and the U.S. residents who are working in the underground coal mining industry."

The grant from the Alpha Foundation will also be used to fund graduate students and purchase advanced geo-mechanical software.

Tulu will work alongside graduate research assistants Deniz Tuncay and Haochen Zhao on this project. Tuncay will develop the geology-dependent global loading model by using a mine scale modeling methodology. Zhao will use a small-scale modeling methodology and analyze a database of case histories to develop a local entry scale ground response model. Both of these simplified models would be later incorporated into the National Institute for Occupational Safety and Health design software.

The Alpha Foundation for the Improvement of Mine Safety and Health is a private foundation with the mission to improve mine safety and health through funding research and development projects at qualified academic institutions and other not-for-profit organizations.

Ihsan Berk Tulu, assistant professor of mining engineering, is improving safety in underground mines by developing minespecific, geology-dependent pillar and standing support design tools. (WVU Photo/Paige Nesbit, 2018)

funtries.com

Kecojevic receives SME distinguished service award



Vladislav Kecojevic, the Robert E. Murray chair and professor of mining engineering, was selected as the recipient of the 2019 Society for Mining, Metallurgy and Exploration's Coal and Energy Division Distinguished Service Award.

The award, presented at the SME 2020 Annual Conference and Expo in February 2020, recognized Kecojevic for his dedicated and exemplary service to the coal mining industry, international education and his research collaboration with the global mining engineering community.

"I am grateful to have been selected for this distinguished award from my peers in SME and it is an honor and privilege to join those past distinguished honorees," Kecojevic said. "I have enjoyed serving the mining community in the past and I hope to continue to serve for many years to come."

After earning a doctorate in mining engineering from the University of Belgrade, Kecojevic worked as a mining engineer at Krupp Canada before beginning his career in academia at Penn State University. He joined the Statler College of Engineering and Mineral Resources at WVU in 2010.

Throughout his career, Kecojevic has served as SME program chair, chair of the SME Coal and Energy Division and as a member of several SME and Coal and Energy Division committees. He is currently president of the West Virginia Coal Mining Institute and the secretary general of the Society of Mining Professors and served as its president in 2016.

SME is a professional society whose more than 15,000 memberships represents all professionals serving the minerals industry in more than 100 countries. SME advances the worldwide mining and underground construction community through information exchange and personal development.

Peng publishes textbook on surface subsidence

Syd Peng, Charles E. Lawall chair emeritus of mining engineering in the Statler College, was the editor of a new textbook on surface subsidence, the sudden sinking of the ground's surface with little or no horizontal motion.



"Imagine if a coal seam seven feet thick was mined out from 600-700 feet below the Engineering Sciences Building on campus," Peng explained. "The overlying strata, layers of sedimentary rocks or soils, from the coal seam to the surface will break and the surface will subside four and a half feet, which would cause the building to tilt, crack up and might break apart.

"Because of this underground coal mining not only disturbs the rock layers beneath the surface, but also the rock layer above the coal seam," he continued.

Written by 14 top experts in three leading coal producing and consuming countries in the world, "Surface Subsidence Engineering Theory and Practice," discusses how surface subsidence is caused by underground mining.

The book also covers subsidence prediction, subsidence measurement techniques, subsidence impact on water bodies, subsidence damages, mitigation and control and subsidence on abandoned coal mines.

"Most importantly it covers the experience obtained so far in the world's top three leading coal producing and consuming countries, the United States, China and Australia," Peng said.

Peng has written several textbooks on the topics of longwall mining, ground control, and surface subsidence. He has received numerous awards including the American Institute of Mining, Metallurgical and Petroleum Engineers Erskine Ramsey Medal and the Medal for Excellence from London's Institute of Materials, Minerals and Mining. He is also a member of the West Virginia Coal Hall of Fame and of the National Academy of Engineering.

He joined WVU in 1974 and was appointed as chair of mining engineering in 1979, a position he held until 2006. Peng served again as interim chair in 2015.

The textbook was published by CSIRO Publishing in Australia and was publicly available after September 1, 2020.

Mechanical engineer named new dean of the Statler College

A distinguished higher education leader and expert in energy systems and sustainability – key areas in West Virginia University's research – was selected as the next leader of the Benjamin M. Statler College of Engineering and Mineral Resources.



Pedro J. Mago's appointment as the Glen H. Hiner Dean of the Statler College was announced Jan. 31, 2020 by Provost and Vice President of Academic Affairs Maryanne Reed. Mago most recently served as department head and PACCAR Chair Professor at Mississippi State University. His WVU appointment began July 1, 2020.

"Pedro Mago is exactly the right leader for the Statler College at this time in the life of both the College and University," said WVU President Gordon Gee. "The college, with its world-changing discoveries, research and innovation efforts, is a key contributor to the economic future of our state and nation. I am confident that under his leadership and expertise he will guide the College to new opportunities and even greater success."

Reed echoed Gee's sentiments.

"We are delighted to welcome Dr. Mago as the newest Mountaineer to our Morgantown campus," said Reed. "His extensive experience as a leader in higher education and in building strong partnerships with industry collaborators will continue the momentum of the Statler College's ongoing success.

"Moreover, Dr. Mago is committed to building on the culture of collaboration, diversity and inclusivity at WVU, as well as the University's mission to help drive economic development and prosperity in the state," Reed said.

Mago was a tenured professor and head of the Mechanical Engineering Department at MSU, the largest department in the Bagley College of Engineering and the third-largest department at the university. He served in that role as well as the PACCAR Chair Professor since 2014. Mago also served as assistant and associate professor; director of the Micro Cooling, Heating and Power (Micro-CHP) and Bio-Fuel Center; co-director of the Department of Energy Southeast Clean Energy Regional Application Center; and co-director of the Southeastern Center for Industrial Energy Intensity Reduction, all at MSU.

His research area has been on energy systems and is currently focused on combined heat and power systems, building energy simulation and waste heat recovery technologies. Mago has received numerous awards, including the 2010, 2011, and 2012 Hearin Faculty Excellence Award at MSU; the 2013 Bagley College of Engineering Academy of Distinguished Teachers Award; and the 2013 Bagley College of Engineering Outstanding Faculty Researcher Award. He also held the Tennessee Valley Authority Professorship in Energy Systems and the Environment from 2010 to 2014. Mago was named fellow of the American Society of Mechanical Engineers in 2013.

Among his teaching and research awards at MSU, Mago secured more than \$15 million worth of sponsored research resulting in more than 160 publications. As department head, he led his department to a 37 percent increase in research expenditures, a 25 percent and 28 percent increase in the undergraduate and graduate enrollments, respectively, as well as the implementation of several new initiatives to increase the diversity of the faculty and student population.

"I am honored and humbled to serve as the next dean of the Benjamin M. Statler College of Engineering and Mineral Resources," said Mago. "I am very impressed with the quality of the faculty, staff and students of the College. I am excited and optimistic about the future of the Statler College, and I look forward to working closely with faculty, staff, students, administrators, alumni and community leaders to elevate the College to new levels of excellence, distinction and contributions."

WVU Vice Provost Paul Kreider led the search committee that selected four candidates from a pool of applicants to visit campus in October and November 2019. The University retained the national firm Greenwood/Asher Associates, Inc. to assist in this search.

Earl Scime, professor in and former chair of the Department of Physics and Astronomy, was interim dean of the Statler College from June 30, 2018 until July 2019.

"Dr. Scime has more than ably led the Statler College during this transitional year, making important hires, elevating the college's research profile and inspiring faculty with his own outstanding research record," said Reed. "We are deeply grateful to him for his commitment to the students and faculty at the University."

The Statler College is a leader in engineering research in West Virginia. As part of an R1 research institution, the College is committed to engaging in groundbreaking research endeavors and strives to serve the people of the state by stimulating economic well-being through technical innovation, knowledge creation and educational excellence. For its 130 year history, the College has served as an example for what an institution of higher education can do for its state, people and country by contributing to the advancement of society through learning, discovery, extension and service.

Mago will be the second Glen H. Hiner Dean at the Statler College since the establishment of the endowment in 2005.

DEPARTMENT AWARDS AND SCHOLARSHIPS

The Charles E. Lawall Award: Mackenzie Stone

The Charles T. Holland Award: Jacob Godfrey

The MRAC Award: Shannon Seitz

The Old Timers Award: Daniel Ausherman

The Student Chapter of the Society for Mining, Metallurgy, and Exploration Award: Jeremy Diehlmann

The Calvin Kidd Fellowship Award: Rachel "Boz" Boothby

The West Virginia Coal Mining Institute Award: Richard Shipe

The Careers in Coal Award: William Burow

The Mining Engineering Faculty Awards (undergraduate students): Lauren Masterson, Takoda Kelly

The Mining Engineering Faculty Awards (graduate students): Lazar Zujovic, Sena Cicek, Jian Yang

The Student Chapter of the Society for Mining, Metallurgy, and Exploration Award: Qingqing Huang

The Student Chapter of the Society for Mining, Metallurgy, and Exploration Officers Award: Brijes Mishra

McKamish Endowed Scholarship: Dmitri Agnew

Sammy Elias Scholarship: Dmitri Agnew

Julius W. Singleton, Jr. Scholarship: Dawson Apple

Department of Mining Engineering Scholarship: Daniel Ausherman, Emily Carroll, Samantha Fowkes, Jacob Godfrey, Takoda Kelly, Lauren Masterson, Andrew Moore, Benjamin Safer, Shannon Seitz, Mackenzie Stone, Victor Valencia Syd S. & Felicia F. Peng Family Endowed Scholarship: Eric Blinkhorn

Wells Fargo Energy Group Scholarship: Colin Bourn, Alec Elliott, Samantha Fowkes, Rince Longo, Emily Horowitz, Erica McCauley, Benjamin Safer, Maxwell Schaefer, Richard Shipe, Brian Welsh

Royce J. & Caroline Baker Watts Family Endowed Scholarship: Jared Broyles

Watson Scholarship: Dawson Apple, Jared Broyles, Zoey Carper, Kayla Gibson, Takoda Kelly, Mackenzie Stone

A. Hardy Tait COMER Endowed Scholarship: Nyeer Burley

James Sterling Farinash Scholarship: Nyeer Burley

Ralph & Geraldine F. Dado Mining Engineering Endowed Scholarship: William Burow

A. Wahab & Judith B. Khair Endowed Scholarship: Richard Campbell

Doris H. & J. Banner Bise Memorial Scholarship in Mining Engineering: Richard Campbell

Westmoreland Coal Company Endowed Scholarship: Zoey Carper

Richard C. Lemons & Merrilyn M. Lemons Endowed Scholarship: **Emily Carroll**

Mineral Resources Alumni Chapter Mining Engineering Scholarship: William Chmelik, Erica McCauley

Robert L. Raines Mining Scholarship: Jeremy Diehlmann

A. Hardy Tait COMER Endowed Scholarship: Samantha Fowkes, Djime Keita, Noah Reed Raymond H. Blowers, Jr. Scholarship: Maureen Ghee

Charles Edward Witt Memorial Scholarship: Kayla Gibson

Warren D. & Grace W. Sharpenberg Scholarship: Kayla Gibson

Raymond E. Salvati Memorial Scholarship: Takoda Kelly

Jack White Memorial Scholarship: Donavon Key

Julius W. Singleton, Jr. Scholarship: Donavon Key

Frank H. and Barbara K. Wheeler Family Scholarship: Gabriela Kosakowski

Peter's Creek Coal Association Scholarship: Molly McFarland

Research Trust Fund Wells Fargo Endowment Scholarship: Andrew Moore, Megan Sibley

Westmoreland-Sprague Scholarship: Lucas Poe

R. Larry Grayson Endowed Scholarship: James Pollock

Larry Family Scholarship: Megan Sibley

Joseph W. Leonard IV Memorial Scholarship: Mackenzie Stone, Dawson Apple, Jared Broyles, Takoda Kelly

Mark Sansone Memorial Scholarship: Jared Broyles

McElroy Scholarship: Kyla Gibson

Charles R. Nailler Memorial Scholarship: Zoey Carper

Northern WV Coal Preparation Society Scholarship: Takoda Kelly, Mackenzie Stone, Dawson Apple

NEW FACULTY HIRES



JOHN CRAYNON

I joined the Department of Mining Engineering as a teaching assistant professor in August 2020, after being retired just over a year and a half. I have my bachelor's (1982), master's (1985), and PhD (2011) in mining and minerals engineering

from Virginia Tech. My master's work related to the collectorless flotation of sphalerite, and my PhD dissertation focused on incorporating sustainable development into Appalachian coal mine design and operation. I am a Professional Engineer in the Commonwealth of Virginia, and hope to be licensed in West Virginia soon as well.

I spent 28 years at the United States Department of the Interior, including jobs at the late, lamented U.S. Bureau of Mines, the Bureau of Land Management, the Department's Office of Environmental Policy and Compliance, and the Office of Surface Mining Reclamation and Enforcement. I was chief of the regulatory and technical staff in OSM headquarters for almost 15 years.

Following my DOI career, I spent five years on faculty at Virginia Tech, managing the Appalachian Research Initiative for Environmental Science (ARIES) which included researchers from more that 14 universities, including WVU. While I was in that position, I had the opportunity to teach several classes, which inspired me greatly.

Following that, I returned to government as the senior mining engineer at the Export-Import Bank of the U.S., from where I retired at the end of 2018. After failing at being retired, I was fortunate to land the position at WVU, where this year I am teaching the MinE 483/484 capstone mine design class (along with Dan Alexander) and MinE 471 Mine and Safety Management. I am serving on a couple of College committees related to undergraduate academics and am leading the effort to put together the Department's self-study report for the upcoming ABET accreditation review. I hope to be teaching electives based on my experience and knowledge starting next academic year.

Although I have been a Hokie for most of my life, I have already become a Mountaineer as well and am excited to be a part of the strong tradition of excellence in the mining engineering program here.



HASSAN AMINI

I joined the WVU Department of Mining Engineering as an assistant professor in August 2020. Prior to joining the WVU faculty, I served as a research scientist (2019-20) and postdoctoral associate (2018-19) in the Department of Mining and Minerals Engineering at Virginia Tech. I earned my bachelor's (2011),

master's (2014), and PhD (2017) in mining engineering from Amirkabir University of Technology, the University of Kentucky, and WVU, respectively.

During my career, I have been working on numerous educational and research activities related to mining and mineral processing, with an emphasis on the process optimization, modeling, and simulation, ultraclean coal production, physical separation, industrial waste recycling, and water treatment processes. Additionally, as an instructor, co-instructor, and teaching assistant at four different institutes, I have been involved in developing lectures and teaching several courses in the general areas of mineral processing and mining engineering.

My teaching and research focus on the general areas of mineral processing, techno-economic process analysis and environmental pollution control. My specific interests include industrial waste recycling, sustainable recovery of critical materials, and health and safety improvement in mining operations. In the past, I have received funding from federal agencies, foundations, and private sources to support these endeavors.

I currently serve as an external reviewer for several professional journals, including Powder Technology, Fuel, Minerals, International Journal of Coal Preparation and Utilization, and International Journal of Coal Science & Technology. I am an active member of the Society for Mining, Metallurgy, and Exploration and also the Society of Mining Professors, serving in different committees and divisions. I am the recipient of the 2018-2019 SME Rong Yu Wan PhD Dissertation Award in Metallurgical Engineering and the 2017 WVU Outstanding Graduate Student Award.

I believe the mining program at WVU is among the best in the nation, and I consider it an honor to be a part of this group. Besides my research and teaching, I look forward to supporting other non-academic student activities related to professional development and industry networking while maintaining the department's prestige and notoriety for the next generation of mining engineers.

FACULTY UPDATES



BRIJES MISHRA

This is one of the most extraordinary years anyone has experienced. My research group continued to be extremely active. I received the last contract from the NIOSH five-year project which will end in 2021. The total funding amount was 1.25 million dollars with nearly \$250,000 per year. From the project, I have graduated three PhD students and two master's students and continue to advise two more PhD students. In the year 2020, we published more than 10 papers.

My research group has focused on understanding roof failure in underground through experimental rock mechanics. In particular, we are focused on the laminated coal measures rock that still produce unpredictable roof failures which has caused injuries in fatalities. Using advanced numerical models such as PFC3D and supported with laboratory testing we are gaining new insights into this unique behavior of the laminated roof rock. We have also developed stochastic models that can predict erratic nature of roof as well as predict the rock mass properties from the laboratory tests. In teaching, I have taught two classes which are underground mining systems and rock mechanics and ground control. This was the first time when we conducted our rock mechanics laboratory through Zoom. I continue to be the board member of the International Conference on Ground Control in Mining as well as editorial board member of the International Journal of Mining Science and Technology. I continue to be active in the SME and currently serve as the executive member in the Coal and Energy Division. Finally, interacting with industry folks keep me updated on the latest in mining.



QINGQING HUANG

My research team and I have been working on multiple research projects aiming to extract rare earth elements (REEs) from various coal wastes, including coarse coal refuse and acid mine drainage. The biggest challenges of the ongoing research lie in producing enriched REEs from coal wastes in a both economically and environmentally benign way. The challenges are particularly noteworthy when the initial concentration of REEs in coal wastes is typically low, i.e., parts per million, compared to traditional REE-bearing minerals. Moreover, radioactive elements, such as thorium and uranium, are generally associated with REEs, which raises environmental concerns.

To overcome these challenges, we are developing advanced separation technologies to recover REEs in a technically feasible, economically and environmentally viable way. To date, promising results have been generated, and pure REE solids with a concentration greater than 90 percent have been generated. Moreover, hazardous and radioactive elements are selectively removed prior to the recovery of REEs. We are now advancing the research from the laboratory/bench scale to the pilot-scale testing with the ultimate goal of realizing the commercial production of REEs from coal wastes in the long run.

Therefore, a mining liability can be turned into a critical revenue chain. Due to the significant research findings being generated by the team, two new projects have been recently awarded by Shonk Investments LLC and the U.S. Department of Interior to expand the interest from REEs to other critical minerals, such as cobalt and lithium, etc. Research efforts have also focused on extracting REEs and phosphorous for Florida phosphate processing clays within the team. All these ongoing studies aim to diversify the domestic supply chains of critical minerals and facilitate their commercial production within the country.

I was pleased to be recognized as one of the 2019-2020 Outstanding Researchers of the Year/Junior by the Statler College of Engineering and Mineral Resources. This award is intended to recognize and reward exceptional research, innovation in research, technology development, externally funded research grants and contracts, graduate student mentorship, entrepreneurship and a strong record of peer-reviewed, archival publications.

MINING ENGINEERING STUDENT SELECTED FOR OUTSTANDING MERIT FELLOWSHIP

A mining engineering doctoral student in the Statler College is investigating separation techniques for the removal of radioactive and hazardous materials from rare earth elements, chemical elements in Earth's crust that are essential ingredients in modern technologies such as cell phones, rechargeable batteries, GPS equipment and many defense applications.

Deniz Talan, a native of Ankara, Turkey, was awarded the West Virginia University Outstanding Merit for Continuing Doctoral Students Fellowship, to continue her studies. The fellowship recognizes doctoral students who are succeeding at high levels, including current grades, research, service to the WVU community and professional publications.

Talan has been working alongside her faculty adviser **Qingqing Huang**, assistant professor of mining engineering, on a project with the United States Department of Energy's National Energy Technology Laboratory.

"The project focuses on rare earth extraction from coal and coal byproducts both in an environmentally and economically benign manner," Talan said. "My specific research topic aims to investigate the potential of various separation techniques for the removal of radioactive and hazardous elements from rare earths."

Talan explained that the U.S. is vulnerable to interruptions in the rare earth elements market due to its lack of domestic supply. High-tech companies like Apple, Tesla and Philips Healthcare, rely on these elements for production, making her research critical to a stable economy.

"The outcome of this project is using different coal and coal-based materials as a feedstock to extract rare earth elements," Talan said. "Considering the vast amount of coal reserves, and the volumes of byproducts generated after coal mining and processing, the utilization of which will not only overcome the challenges that the rare earth industry is facing but also contribute to the U.S. economy."

Talan hopes her research will help bridge the knowledge gap in the mining industry regarding the environmental aspects of rare earths extraction from coal and coal-based materials.



Recipients of this fellowship are selected by each College and submitted by the dean, associate dean or a designee.

"I am truly honored for being acknowledged among my peers both with my research and academic achievements," Talan said. "I would like to thank my adviser who has nominated me for this fellowship. I am grateful for her support and guidance. I also greatly appreciate Office of Graduate Education and Life for recognizing me as a recipient of this distinguished fellowship."

In the future, Talan has her sights set on becoming a tenure-track professor in the field of extractive metallurgy and hydrometallurgy, as well as working on extraction of critical elements.

"Being recognized by WVU for such a competitive fellowship will definitely help me stand out professionally," Talan said. "It will be a motivation to tackle my upcoming challenges."

Vladislav Kecojevic, Robert E. Murray chair and professor of mining engineering, said this fellowship will help Talan further her research in rare earth elements.

"Deniz is an outstanding student working on pilot-scale testing of an integrated circuit for the extraction of rare earth elements," Kecojevic said. "This fellowship is a recognition of all her accomplishments and exemplary work as she continues to pursue exciting research that will make a significant contribution to the field of rare earth elements for the benefits of our communities, environment, economy and national security."

EXTERNAL SCHOLARSHIPS, AWARDS AND RECOGNITIONS

A number of mining engineering students received external scholarships through professional societies, organizations and foundations. These include:

SME Coal and Energy Division Scholarship: Daniel Ausherman (1)

John Sidney Marshall Memorial Scholarship: Samantha Fowkes, Molly McFarland, Ricky Shipe and Eric Blinkhorn (2)

SME Mining and Exploration Division Scholarship: Molly McFarland (3)

Eugene P. Pfleider Scholarship: Mackenzie Stone (3)

J. H. Fletcher & Co. Scholarship: Mackenzie Stone (4)

George V. Weisdack Scholarship: Mackenzie Stone (5)

Mining and Exploration Division Stewart R. Wallace Memorial Scholarship: Sena Cicek (3) and (6)

Syd S. and Felicia F. Peng Ground Control in Mining Scholarship: Sena Cicek (7)

Syd S. and Felicia F. Peng Ground Control in Mining Scholarship: Jian Yang (8)

Claude A. Goode Memorial Scholarship: Emily Carroll (9)

The Society of Explosives Engineers Education Foundation Scholarship: Jared Morse (10) and Djime Keita (11)

The Pennsylvania Western Section of WAAIME: Amir Eskanlou (12)

WAAIME Scholarship: Alec Elliot (13), Dowson Apple (14), Djime Keita (15), Dmitri Agnew (16), Erica McCauley (17), Gabriela Kosakowski (18), Jared Broyles (19), Mackenzie Stone (20), Samantha Fowkes (21), Shannon Seitz (22), Takoda Kelly (23); and Chase Mowery (24)

WAAIME Graduate Student Scholarship: Amir Eskanlou (25), Deniz Talan (26), Deniz Tuncay (27), Francisco Patino (28), Haochen Zhao (29), Jian Yang (30), Mustafa Suner (31), Qingwen Shi (32), Samuel Escobar Gil (33), Sena Cicek (34), Yun Zhao (35), and Zhongqing Xiao (36)

The Gimme Foundation Scholarship: El Hacen Saleh; Maxwell Schaefer; Dmitri Agnew; Alec Elliot; Molly McFarland; Emily Carroll; Djime Keita; Jared Broyles; Shannon Seitz; Takoda Kelly; Gabriela Kosakowski; Emily Horowitz

Martin Marietta Scholarship: Megan Sibley; Alec Elliott; Gabriela Kosakowski; Samantha Fowkes; Brian Welsh

We would like to extend our sincere gratitude and appreciation to Remember The Miners organization, WVU Head Men's Basketball Coach **Bob Huggins**, and **Erik Ryan Muendel** for raising the scholarship funds for mining engineering students at West Virginia University. These funds make a significant positive impact on our students and we thank them for continuous support over the years. (37)

Students continue to garner awards for their design work from national contests. In 2020, Lauren Masterson, Thomas Wetzel and William **Chmelik** finished first in the 28th SME/PCMIA Senior Design Award competition. The competition is open to all U.S. ABET accredited mining engineering programs. WVU has taken first or second place in this contest 13 times in the last 19 years.

Graduate student **Amir Eskanlou** placed second at the 2020 Mineral and Metallurgical Processing Division Student Poster Contest, and the third at the 2020 Graduate Student Research Poster Contest during the SME Annual Conference and Expo in Phoenix, Arizona. (38) Sena Cicek, Mario Bendezu and Mustafa Suner finished second at the Move Mining competition at the SME Annual Meeting and Expo in Phoenix, Arizona. According to the SME, "Move Mining is a competition aimed at elevating the perception of mining. From grassroots to global, teams pitch their best ideas on how to share the everyday importance of mining with the public." (39)

Qingqing Huang, assistant professor of mining engineering, was named Statler College Outstanding Researcher of the Year/Junior.





















































Let's go...

































KOMATSU

BLACK DIAMONDS | Student



A total of 28 students, six faculty and one staff member attended the 2020 SME Annual Meeting in Phoenix, AZ.



MINING ENGINEERING GRADUATE SEMINAR

The Department was pleased to continue the Graduate Seminar Presentation Series for the spring and fall 2020 semesters under Dan Alexander's guidance, in which WVU hosted eighteen speakers. Mining professionals and alumni that spoke at the graduate seminar included Heather Dougherty (NIOSH); Daniel Curry (Contura Energy); Mohsen Yahyaei (University of Queensland); Lihong Zhou, James Rowland and Liming Yuan (NIOSH); Sebastian Guerrero (American Geotechnical); Gary Buchan (Oyu Tolgoi); Serkan Saydam (University of New South Wales); Robert Kudlawiec (Tetra Tech); Aleksandar Bugarski (NIOSH); Joanna Krzyzanowska (Australia); Biao Qiu (Agapito Associates); Emily Haas (NIOSH); Carolyn Walker (Barrick Gold); Chelsea Gilbert (Caterpillar); Cassandra Hall (Freeport McMoRan Copper & Gold); and Donna Schmidt (Mining Magazine).



INDUSTRIAL INFORMATION SESSIONS AND JOB INTERVIEWS

The Department was pleased to virtually host several mining companies in 2020 including Martin Marietta, RESPEC, Blackhawk Mining, CEMAX and United Coal. We appreciate them giving info sessions and interview our students for both full-time positions and summer internships.

THE SME STUDENT CHAPTER REPORT

Although this year has been drastically different for the WVU Student Chapter of the Society for Mining, Metallurgy, and Exploration than ever before, it has continued to stay active in the university setting and involved with the mining industry.

During the spring semester, the first meeting was with Mr. Bob Seitz, the father of the current SME chapter president. He spoke to the chapter about the political side of the mining industry relating to opening a mine and gaining the public's trust. Also, last February the Department of Mining Engineering took 16 undergraduate and 12 graduate students to Phoenix, Arizona, for the national SME conference. This event, with almost 6,000 attendees, served as a great networking event as well to hear from future colleagues about research, industry news, and technological advancements relating to mining (1) The February meeting and the SME conference were the only events in the spring due to COVID-19 and the switch to online classes.

At the SME meeting in Phoenix, Arizona three graduate students (Sena Cicek, Mustafa Can Suner, and Mario Alejandro Bendezu de la Cruz) took part in the annual SME Move Mining Competition. This competition tasks applicants with changing negative perceptions about the industry and increasing awareness of the importance of mining. The team, Let's MINE Mountaineers, were awarded second place in the event along with a prize of \$3,000.

The SME meetings for the fall semester were held online via "Zoom." (2) After a "kickoff" meeting in the beginning of September, the chapter began to invite speakers to talk to our students about a variety of mining related topics. The first meeting was held on September 30. We invited Brian Joseph, the CEO of Touchstone Research Laboratory, to talk to our students about alternative uses for coal as well as the future of the mining industry. For the October meeting, we invited Patrick Brindle, vice president of project management for Piedmont Lithium, to talk about the exploration efforts being done on a greenfield hard rock lithium project in North Carolina. The final fall meeting was held in November, during which Mike Mosser, self employed at Mosser Resource Consulting, spoke to our students about his career in the mining industry as well as looking toward American mineral independence for the future.

Outreach has been different this year due to COVID-19. Our SME Chapter officers met with freshman engineering students for "EngineerFEST" which is an annual event for students to explore other disciplines within Statler College. Many students became interested in joining SME and the Department of Mining Engineering after the group educated them on the importance of mining. Additionally, a few students from SME attended another virtual meeting for an introductory freshman engineering class to present about the department and their involvement with SME.

It is no secret that we are all ready to go back to our normal lives and we are hoping that COVID-19 begins to lessen in severity so that next year we will be able to attend our usual conferences, mine visits, and monthly SME meetings. No matter what next year looks like, our chapter will continue to be involved, educate our peers, and stay positive about the future.





WOMEN IN MINING (WIM)

WVU Women in Mining (WIM) Student Chapter is a newly established student chapter. We aim to continue promoting women involvement in mining industries as well as facilitating networking between students and professionals through the exchange of ideas and information at the WIM events.

According to the Minerals Council South Africa, women made up about 12 percent of the global mining industry in 2018. The U.S. Bureau of Labor Statistics stated that women accounted for 15.8 percent of the workforce in mining, quarrying, and oil and gas extraction industries in the U.S. in 2019. Although it is a significant achievement compared to the historical involvement of women in the mining industry, we believe that there is a lot to do to raise the profile and involvement of women in the mining sector; and we want to help in these efforts. In parallel, we also believe that the participation of men is as important as the women in this process. For that reason, one of our goals for the 2020-2021 academic year is to convey the message that WIM is not only for female students but also for male students. We are happy to report that we reached approximately 50 percent of male student involvement in WIM events and we are truly proud of that our message is conveyed across students at WVU.

In the October WIM webinar, we hosted Joanna Krzyzanowska who is a former mine manager in one of the mines in Australia and the current principal engineer at MEC Mining Consultancy company in Australia. Krzyzanowska shared her career paths with us from Poland to South Africa; from New Zealand to Australia. By showing her travel blog along with her professional experience, she has shown us the importance of work-life balance while still being exceptionally successful in work life.

In the November WIM webinar, we invited Carolyn Walker who is the head of value realization of Barrick North America. Walker spoke about her life-long lessons with us that she gained over 20 years in the mining industry all over the world. Walker set an amazing example for all of us how to navigate through different branches in the mining industry until finding our passion and living a fulfilling life. Also, she gave invaluable advice on how to become an excellent professional and a future leader.

During the fall semester, we heavily concentrated on establishing good relationships between WIM and mining professionals along with recruiting new students into WIM. We are grateful to guest speakers for their contribution to the chapter and their willingness to keep the lines of communication open with the mining students at WVU. We also started to work on organizing webinars for the next semester with the various topics based on the student members' interest. At the same time, we are in touch with other student organizations such as Society of Women Engineers (SWE) to collaboratively organize events and webinars. Also, we focus on preparing appealing advertising tools to professionally represent the WIM for upcoming in-person events.

We are looking forward to attending the WIM Annual Conference which is tentatively in May 2021 and trying to receive donations to send as many WIM students members as possible. We are very excited to strengthen our presence in the University and mining industry in the upcoming semester.



WIM at Mining Symposium in Charleston, WV

INTERNATIONAL SOCIETY OF EXPLOSIVES ENGINEERS (ISEE)

In the fall 2020 semester the newly appointed ISEE officers have made major progress in reclaiming the previously dormant chapter. Despite COVID-19 bringing major restrictions on the flexibility of student involvement, the chapter had established meaningful relationships with multiple corporations and professionals driving the explosives industry today. The chapter's first professional to present in November featured Nathan Rouse, who is an active ISEE member and professional engineer for Dyno Nobel. In the presentation Nathan discussed the history of Dyno Nobel, as well as the current technology that the company uses to address issues in mining and civil environments. Later into November, Mike Allen of Martin Marietta highlighted the importance of data analytics and accurate blasting in underground settings. For the remainder of the semester the WVU ISEE Chapter is scheduled to have two more presentations by Josh Hoffman and Evan Thibaud. Josh is a professional engineer for IME (Institute of Makers of Explosives) and an active member of ISEE. Evan is the chief executive officer at Pneuwave Consulting and also remains an active member of ISEE.

Additionally, prioritizing the expansion of our member base, the chapter has transitioned towards becoming all-inclusive of those studying a track in engineering at the Benjamin M. Statler College of Engineering and Mineral Resources. Our officers believe that the dynamic role of explosives is influenced by all facets of engineering instructed at WVU, and therefore should be represented by those across all engineering tracks. In order to achieve this goal, we are focused on recruiting and outreach throughout the academic year. These events allow the ability to network with students and faculty regarding the principles of explosives engineering and their relevance to a degree path in mining and/or civil engineering.

As a chapter, we look forward to 2021 and all of the opportunities it will bring. Several activities including professional presentations, field visits, and a national seminar are being orchestrated to maintain our presence in the University and the mining industry. For as long as the pandemic remains, our chapter upholds its commitment to growth and positive impact within the University's educational community.

Internships provide an invaluable experience for our students on their path to a career in mining engineering.

Our students share those experiences... >>

SUMMER INTERNSHIPS

Have you ever packed up and moved almost 1,200 miles away? Have you done it with three weeks notice or in the middle of a pandemic? I have. After having my first internship canceled due to COVID-19, I was given the great opportunity to travel to Southern Louisiana and intern at an underground salt mine for Compass Minerals.

Being that my past internship experience has only consisted of underground coal mining, I had no idea what to expect from a salt mine. All I knew was that I was eager to learn about a new type of mining and experience the culture in a state I had never been to before.

The first time I went underground at the mine is something I will always remember. Switching from an eight-foot-tall coal mine to a 35- to 75-foot-tall salt mine was a big adjustment. The heat and humidity were also something that took some getting used to, but my time underground was always filled with learning and excitement. I spent time collecting belt samples, working with the ground control crew, performing a natural ventilation survey, and shadowing different miners from equipment operators to foremen. Every time I was underground, I learned so many new things about mining that I will be able to take with me and use now and in my career once I graduate in May 2021.

Lalso spent a lot of time on the surface working with mining engineers and other departments. I worked on projects using AutoCAD that dealt with ground control and ventilation for the main mine engineer. I also was able to spend some time in the quality control lab with the lab technician running samples to test the quality of the salt. My main project over the summer for the production manager allowed me to talk to the heads of all the departments at the mine. This was a great opportunity for me as I got to learn how all of the different departments worked individually and together to keep the mine running.

When I joined the Mining Engineering Department at WVU, I never thought I would have some of the amazing opportunities I have. After my summer experience, I have never been more grateful to be a part of a department that has done so much to turn me into the student and person I am today.

Salt mining in Louisiana

BY SAMANTHA FOWKES

Gold metal mining in Nevada

BY DJIME KEITA AND SENA CICEK

DJIME KEITA

I am a senior mining engineering student at WVU, graduating in May 2021. During the summer of 2020, I had the opportunity to work for Nevada Gold Mine (NGM). My project was based in Winnemucca, Nevada, where one of NGM's open pit sites was located. The journey has been very rewarding, because I have acquired new skills and learned how to use new software such as Vulcan, Pointstudio, and their system to track every material called Minestar.

During my internship, I performed cycle edits every day, meaning that I made sure that every load from the previous day was recorded and went to the right destination. I made daily production PowerPoint slides and presented them during the foreman meeting. Some of the main projects I worked on were truck scale study, stockpiles by year process schedule through 2047, cycle time from different benches to different destinations for every materials, bench compliance (helping the Geotech crew on Pointstudio), monthly mining schedule for the next five years on Vulcan, number of benches per month per year for the two pits (Mega and Vista), risk analysis of the six plus six schedule, and other smaller projects. I also designed a haulage road for the new cut starting in 2021.

This summer was very productive and full of experiences. I had the chance to work with a great team that define the expression of "teamwork is dreamwork." They had a great communication system all over the mine and always supportive when I needed help.

This internship experience was valuable and helpful to me as a student and gave me an idea about a full-time mining engineer position. It made me realize that I made the right choice going into the mining industry. I hope this short summary of my experience inspires other students to seek work experience during their college life, so that they know what the work load is like, therefore make a decision on what they plan to focus on in their professional life.



SENA CICEK

I am an international graduate student from Turkey and my research interest is in ground control of primarily coal and limestone mines. This summer, I had a great chance to work at one of the largest gold-producing complexes in the world with Nevada Gold Mines, a recent joint venture between Barrick Gold Corporation and Newmont Corporation. In addition to academic and professional development opportunities at WVU, I was thrilled to gain unique experience in the industry through working for Nevada Gold Mines.

I was an engineer intern in the Growth and Life of Mine Planning Department under the supervision of head of value realization of Barrick North America. I conducted a benchmarking project at the Carlin, Turquoise Ridge and Cortez mine complexes. The benchmarking project that I worked during summer aimed at (1) comparing equipment efficiency, operator performance with each other and with the business goals, (2) increasing data transparency between sites, and ultimately (3) identifying potential performance and value improvement opportunities. In order to achieve these goals, I prepared a list of holistic, consistent and normalized Key Performance Indicators (KPIs). During the collection of data, I realized that the different data source systems and distinct report structures have been utilized by the sites resulting in collecting information that cannot be practically compared on a fair basis. For that reason, I established a single template for data population which enables comparing apples to apples.

Shortly after, I learned how to use Power BI software and created visuals of these large quantities of information using Power BI in order to clearly communicate and interpret complex data and identified patterns, trends and outliers in the data set. Afterwards, I visited the sites and got feedback from different departments on the visuals and accordingly did my changes to finalize the visuals and dashboards. Additionally, data transfer from template to Power BI is automated to make the visual creation sustainable. At the end of the internship, I provided Power BI reports for data-driven decision making and easily scalable and automated benchmarking prototype for future applications. I also won second place in Nevada Gold Mines internship presentation competition.

During my internship, I had a chance to work with more than 60 professionals such as mine managers, engineers, accountants and human resources specialists, data analysts and many others. Working with people with different backgrounds helped me quickly learn different aspects of mining. All the people I worked with were very approachable and willing to help and teach me. This internship would not be so educational and memorable without their support. I am also glad that I was able to build a great network of people during the summer.

Besides the internship experience itself, exploring the West Coast of the United States where I have never been before was super exciting and fun. I made lifelong friends and visited national and states parks in Nevada, Utah and Idaho in my spare time with my new friends.

Although I am passionate about working projects related to ground control, working on a project that I have not had any experience before made me very excited and provided me an opportunity for improving myself in business aspects of mining. I gained great exposure to challenges resulting from merging two big companies and associated strategies implemented to function and grow the company as a single entity. Overall, I am grateful to work for a word class mining company. My supervisor was more of a mentor to me than a supervisor. She taught me a lot that I will apply my entire life. For this fabulous summer internship, I cannot thank Nevada Gold Mines enough and all the people who made my journey meaningful.

BLACK DIAMONDS | Summer Internships

Aggregates mining in Pennsylvania

BY GABRIELA KOSAKOWSKI

The spring and summer of 2020 brought unprecedented change to everyone's expectations and plans for the year. I worked hard to secure a summer internship with Laurel Aggregates in Lake Lynn, Pennsylvania and I was grateful that the opportunity was not delayed or cancelled as many others had been. I was eager to learn anything that I could, understanding that everyone was doing their part to keep the country moving throughout the uncertainty. With that being said, I can clearly say that my expectations were exceeded at Laurel Aggregates.

As my first intern experience, I was able to rotate through different positions in the company and the mine to help gain an understanding of what the industry entails. I experienced everything from management to shadowing contractors, machine operation and more. Through this, I was able to see the challenges that I may face in this field as well as observe common strategies for success. I had the opportunity to lead and assist in a variety of projects. My main focus was to work on a cost effective way to reduce Selenium. I also worked to prevent dust from coming off of our haul road as well as find a more efficient way for our blasters to navigate the mine and finish loading faces in a guicker manner. During my time I was tasked with daily responsibilities which would help to keep track of inventory, update mine maps and monitor safety training. When I found free time the foremen weren't afraid to throw me into new activities. It allowed me to be trained in different equipment both in the mine and at the plant. I was able to drive a haul truck, operate a manlift and load faces with ANFO. This, along with flying the surveying drone and walking the plants to look for potential citations was a great way to get the hands-on experience that I desire in an internship.

This summer was a great reminder that my chosen field is essential to the continuous growth and success of America. I was glad to have a supportive team to work with that believed in my abilities and who were willing to teach me about their expertise in mining. I am already looking forward to building upon these lessons, as a fundamental and evolving part of our economy.



Aggregates mining in Nebraska

BY MAXWELL SCHAEFER

Throughout my time in college, I have had the goal to gain as much experience in the diverse fields the mining industry has to offer. I did not come into school as a mining engineer, however, after listening to the presentation in my freshman engineering class from the mining department, I switched. I was drawn to the opportunities, but I did not have any family members nor did I know anyone at all who has ever worked in the mining industry. This was a completely new world for me. In the summer of 2019, I was presented with the opportunity to gain experience and confirm to myself that I chose the right degree with an internship in underground coal with Murray Energy. My experience was great and I now validated that I had, in fact, made the right decision to join the mining industry. Sophomore year came around and it was time for me to make my decision on what industry I wanted to pursue the following summer. Did I want to stay in coal, an industry I enjoyed, or gain new experiences elsewhere? I went back and forth on the decision and ultimately took a different route than I had my previous summer. I chose to accept an internship in Fort Calhoun, Nebraska, with Martin Marietta at a surface and underground limestone mine.

Moving halfway across the country, entering the aggregate industry with no prior experience, and many other things presented their own challenges, but I was ecstatic to tackle them. The mine was originally a surface mine, and still operates on the surface, however, it is now becoming an underground mine. The underground portion was still in its early stages. When I arrived, there was only one pillar developed. Not every day are you given the chance to see how the early mine is developed and partake in solving the complications associated with it. The adolescence of the mine is what I believe gave me the skills and experience that I can carry forward with me throughout my entire career.

Personally, I believe the experience I gained operating the heavy equipment was the most beneficial. In just a short few months and only as an incoming junior in college I got to operate the scalar, articulated haul trucks, roof bolter, double boom drill, excavator, skid steer and loader. Being able to run multiple pieces of equipment is a skill that will benefit me in my future.

Safety should be the number one concern for any industry, and my experience with Martin Marietta truly brought this to light. They operate under a guardian angel creed which in simple terms means everyone is always looking out for the safety of all the people at the mine. The level of priority that was put on safety allowed me to know that I would never be put into a position that could be potentially harmful. From the recommendations I received from my coworkers and the overall mentality I now have gained towards safety is one I will never forget.

> My summer internship was one I will never forget. I got to travel and learn about the culture all while developing myself as a student and personally. I hope all my future endeavors are as positive as my summer with Martin Marietta. In general, my internships have allowed me to not only gain hands-on experience but they have also taught me how to communicate, lead projects, and other skills that cannot be taught in a classroom. Thank you, Martin Marietta, for the irreplaceable experience as well as once again proving to me why I love the mining industry.

> > SCHAEFER

Coal mining in West Virginia

BY BRIAN WELSH



This past summer many people may have said it was the worst and most uneventful summer they have ever experienced, but I would completely disagree with that statement. That is because I was still given the opportunity of a lifetime to spend the summer with Blackhawk Mining in an underground coal mine just outside of West Virginia's state capital. This was a shock to me as the entire U.S. and world economy was shutting down due to COVID-19. This dramatically affected the coal market forcing mines to be furloughed across the country. So, with this opportunity still being given through all of this, I wanted to make sure I gave it all I had and learned all that I could.

Over the summer I was able to experience a lifestyle that I, and many others from where I was raised, have never experienced before. I grew up in the smack dab middle of Maryland in Montgomery County. This is a county full of suburbanites, so, being raised with blue collar working roots is rare for the area. Some of my summers were spent striping roofs, laying patio brick, and landscaping. So, the hard demanding labor work that was a part of the coal mines wasn't scary for me, but it sure was work I wasn't used to. I started the summer in the gorgeous southern mountains of West Virginia in Boone County. This was to train for the required 80 hour safety certification prior to kicking off my underground work. It was amazing how much the safety training can teach you and how important it is to know what to watch for so you are able to protect yourself and your crew members.

When I acquired my 80 hour safety certification, no time was wasted sending me to work. When I started I had very little experience underground, but I was beyond excited to get my hands dirty. What better way to get my hands dirty than on the midnight move crew. This was an extremely valuable time spent being able to learn anything from navigating the mine to knowing how to extend the belt, structure and power. I was able to learn the most effective method of advancing the belt so the production crew can come in that morning and start mining with no down time. My supervisor, Mark Morris, repeatedly explained to me the importance and impact this shift has on the mine and on my future career. This is because I not only will know how to do these tasks, but I will also be able to grasp a deeper understanding of coal mining and all of the moving parts behind the scenes.

After spending four weeks learning the ropes of moving belt and doing maintenance, I had another extremely interesting opportunity. Blackhawk had acquired a new mine that they were in the mix of getting started in the upcoming year. This mine came with what we called the "Vault," a single room with thousands of maps of surrounding mines that dated as far back as the mid 1800's. Not only was this an in-class learning experience as Mark Morris explained how these different styles of mining worked and how the mapping was constructed. It was also a team building effort as I worked and coordinated with another intern to physically organize the Vault and outline the organization into an excel spreadsheet.

When this project came to a close, I was then sent to the preparation plant to learn what we do with the raw coal when we get it out from underneath the Earth's surface. During this assignment I spent a lot of time conducting maintenance on equipment and learning the basic functions and flow of the entire prep-plant. What I found most interesting about the prep-plant was the control room that operates the entirety of the plant. Not only does this room have to watch and monitor pressure levels throughout the equipment, they also have to be alert for the dozers around the feeders and loadouts. This ensures the safety of the crew and flow of the plant remains constant. What's also interesting about the above ground side of coal production is the environmental engineering role. I was able to see how the lay of the land played a role in the design and location of culverts and runoff ponds. I also discovered how to monitor the reserve ponds and how rain and plant runoff water is recycled and used for the prep-plant, underground and for surface dust control. This can only be done if the selenium is caught in these run off ponds and settled to the bottom to be later cleaned and disposed properly. This is so the surrounding environment and wildlife remain safe. All in all, I was able to learn and get plenty of hands on experience throughout this time spent.

The remaining weeks of my internship, I was sent back underground to shadow the section boss. The main purpose of this experience was to get exposed to the management side of the production shift. Andy Walters has years of experience bossing and working underground. He was able to teach me the ins and outs of a walking section and a super section. Including which entries the continuous miners are going to next as well as how to mark centerlines for these miners. What I realized was the most important was the ventilation on a working face. Every little thing from the correct way to hang a fly pad helping force air in the needed direction to determining where these pads are needed. This was an experience that was able to help me decide on what I'd like to do upon graduation in December 2022, stay above ground and work the engineering side or use my education and experiences to shorten my time needed to get my bossing papers.

After all was said and done and I gave the internship 100 percent of what I had, this internship absolutely made my summer! From the priceless lessons to the connections that I was able to make. I discovered that as long as you hustle and work as hard as you possibly can, people will respect you. They will even be more willing to teach you since you are showing a sense of interest and positive attitude toward the shared practice. I'd like to thank the mining department as a whole for helping the students out in any way possible, from organizing companies to come speak with us to individual help. I'd also like to thank my supervisor Mark Morris and everyone at Blackhawk Mining. They really gave me a great experience that I will be able to carry with me for the rest of my career. I can't wait to see what summer 2021 has in store.

BY ALEXIS HARTMAN

Going into my summer internship I was not confident that I would enjoy my experience in underground coal. I had always thought that my interests would be more focused in surface operations. After just a few weeks at Arch Resources Leer South operation formally known as the Sentinel Mine in Philippi, West Virginia my mind set had changed. I loved the underground experienced and the days I enjoyed most were spent underground. I had taken every opportunity I could to go underground with the engineers, safety department, or some of the various assistant shift foremen.

I grew up in Lebanon, Pennsylvania, very close to Hershey, mining is nearly extinct in my area other than a few rock quarries. My family is all located in that general area and I always expected to be drawn back to there after college. After a few short weeks at the coal mine I had realized how much I enjoyed the entire atmosphere. I had to overcome a few boundaries while working in the coal mine, since most of my time was spent underground, I was not with the engineers as much. Gaining respect as a woman with men who in most cases have never worked with a female took some time. After a few weeks of helping them underground on the section I gained the respect of nearly all of them. One thing I took from the summer is that as a female in the field it may take more to prove ourselves, but I found that the gained respect meant so much to me and was a huge impact on my summer. If I could give my advice to anyone going into their summer internships, male or female it would be to step up and lend a hand and ask plenty of questions.

Most of the summer I was on a project that focused on improving the high quartz samples on the headgate and tailgate sections that are in the developmental phase for the long wall. We started gathering baselines on the miner and then began to change and come up with ideas to prevent dust accumulation. I realized throughout my experience with that project I could see myself on the production management side of the operation rather then the engineering side of things. I was so thrilled by the experience I was given with Leer South, and all the time and work they put in to help influence my career choice after college.

In Memoriam

A TRIBUTE TO ROBERT E. MURRAY

WRITTEN BY **VLAD KECOJEVIC**

Robert E. (Bob) Murray passed away on October 25, 2020 at the age of 80.

He was born on Jan. 13, 1940, in Bethesda, Ohio. Bob graduated in mining engineering from Ohio State University, and Harvard Graduate School AMP program.

He was the founder, chairman, president and chief executive officer of Murray Energy Corporation,



and his company created tens-of-thousands of jobs both nationally and internationally. Before forming Murray Energy, he was with the North American Coal Corporation for thirty-one years, serving in all levels of management and ultimately as president and chief executive officer.

During his over sixty-year mining career, Murray has received numerous safety, educational, engineering, leadership, professional and philanthropic awards. He was past president of American Institute of Mining, Metallurgical, and Petroleum Engineers and the Society for Mining, Metallurgy, and Exploration and has served as a leader and board member for national and state coal trade associations.

Murray was well known for his philanthropic contributions to his local communities, the Boy Scouts of America, The Salvation Army, his church, WVU Department of Mining Engineering and to SME.

Murray is survived by his wife of 58 years, Brenda L. (Moore) Murray, and sons, Robert Edward Murray, wife Kelly Strauss Murray, Jonathan Robert Murray, and Ryan Michael Murray, wife Melanie Homan Murray, and eight grandchildren.

On a personal note, I will always appreciate and cherish the long conversations I had with him, and his support and commitment to our WVU Department of Mining Engineering and me personally. His advice and vision made a difference in my personal life and my professional career. He will be greatly missed. May his soul rest in peace.

BLACK DIAMONDS | In Memoriam / Support

In Memoriam



A TRIBUTE TO ROYCE WATTS

WRITTEN BY DANIELLE PETRAK

Royce Jackson Watts, faculty member and founder of the Watts Museum in the Statler College, passed away on May 29, 2020, at the age of 91. He was preceded in death by his wife of 68 years, Caroline Baker Watts.

The first child of a coal miner, Watts was born in a company house in the mining community of Cassity in Randolph County, West Virginia, in 1929. Royce spent the majority of his childhood on his family farm in Tyler County.

After graduating from high school in 1946, Watts enlisted in the U.S. Army. He served in Italy immediately after WWII and then in the Korean War where received the Silver Star for gallantry in combat in 1951. He served in the Army Reserve for many years, retiring as a full colonel in 1989.

Watts earned both his bachelor's and master's degrees from WVU and joined the faculty of WVU as an instructor of accounting and economics in 1955. He worked at WVU for six decades, retiring as associate dean of the Statler College in 2017.

In the mid-1980s, Watts spearheaded the establishment of a museum, now known as the Watts Museum, dedicated to the history of West Virginia's mineral resources and related industries. Along with his wife Caroline, he made major contributions towards the museum's growth and development and worked to ensure its longevity through the establishment of an endowment.

"Meeting and knowing Mr. Watts is truly one the greatest blessings of my life," said Danielle Petrak, curator of the Watts Museum. "I am honored to have worked for him and become his friend, and I am so thankful for his mentorship and guidance. The Mountain State is so lucky to have had you here for so many years, Mr. Watts — West Virginia and I will miss you so much."

His impact will always be felt and appreciated in the halls of the Statler College, and he will always be fondly remembered and honored by the WVU community.



Russell B. Mechling, 90, of Hopwood, Pennsylvania, passed away on October 16. A native of Pittsburgh, Mechling graduated from West Virginia University in 1956 with a mining engineering degree. He began his career at U.S. Steel as a mining engineer and worked during the historic Robena No. 3 disaster, spending three days aiding in rescue and recovery. He later joined his father at the Fayette Engineering Company in Uniontown, Pennsylvania in 1963, the business that was started by his grandfather in 1902. As an engineer, he worked with many municipalities, agencies, and private developers to advance Fayette County through local development. Mechling was awarded the Eberly Economic Development Award and was recognized by the Pennsylvania State Senate and House of Representatives for businesses contributing to the wellbeing of the community. He is survived by his six children, his stepchild, thirteen grandchildren and eight great-grandchildren.

WILLIAM N. AND DORIS MAE POUNDSTONE

Supporting opportunities into the future

Poundstone is a name synonymous with mining and education. The Mining Engineering Program and the College have benefitted from William N. and Doris Mae Poundstone continuous support for many years. Poundstone included WVU in his estate plan and established graduate scholarships in mining engineering to help future generations of students.

"West Virginia University was an enduring part of my parents' lives. They took great satisfaction in supporting the mining school and the Poundstone lecture series. With this estate gift these two proud West Virginians will continue to assist new generations of Statler College students." — William N. Poundstone, Jr.

> To learn more about how bequest, life-income and other gifts can help you achieve your goals, contact the development office at 304-293-4432 or Statler-DevOffice@mail.wvu.edu.



West Virginia University's fourth annual Day of Giving is set for March 3, 2021.

2021

This 24-hour online event open to WVU alumni and friends to support the University's greatest priorities and opportunities – including scholarships and unrestricted funds at the University and unit-specific levels.

Mark you calendars!



Department of Mining Engineering West Virginia University P.O. Box 6070 Morgantown, WV 26506-6070

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Alumni Update 2020 YEAR IN REVIEW

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 Black Diamonds.

Send to: Department of Mining Engineering West Virginia University | 365A MRB | PO Box 6070 | Morgantown, WV 26506-6070

Or, email updates to karen.centofanti@mail.wvu.edu.

Namo

Degree(s):	Year:	
Home Address:		
City:	State:Zip:	
Home Phone:		
Business Phone:		
E-mail:		
Employer:		
Position Title:		
Employer Address:		
City:	State: Zip:	
Preferred Mailing Address: □ Home	••••••••••••••••••••••••••••••••••••••	

Suggestions/Comments:

Brief News of Professional and Family Activities for Future Newsletters:

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