FROM THE DEPARTMENT HEAD

Dear EME Alumni,

It is January 31, 2017, as I sit down to write this note to you from my office in your Energy and Mineral Engineering Department. It is one of those beautiful winter days with some significant snowfall and relatively mild temperatures.

The view from the window of my office makes me recall some notes that I used to receive (I still do by the way!) from some of our alumni who used to say how much they miss the change of seasons, change of colors, and the wintry days of Penn State. What is more amazing is that these sentiments have also been shared by our international students who have arrived at Penn State from different corners of the world without any prior exposure to snow and cold weather. When I look out of my window, I think how right they have been -- it is so beautiful outside!

Our faculty and staff members, and our teaching and research assistants, have completed another busy year. In spite of the downturn of the energy industry, we completed another busy year. In spite of the downturn of the energy industry, we all continued to work hard to maintain our standards with the cognizance of the factors that have been shaping our department such as:

• The pronounced increase in energy resources and technologies in our neck of woods
• The increased need for innovative engineers and scientists to conduct innovative research in energy and minerals
• The potential for EME to become a campus-wide focal point for the study of energy and mineral resources on a holistic basis

The above three bullets will unquestionably require:

• Modernizing departmental facilities
• Tackling the current imbalances of resources and obligations
• The pronounced increase in energy resources and technologies in our neck of woods
• Modernizing departmental facilities
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Please note that we are working hard on all of the items summarized within the context of five bullets listed with the goal of making the EME department a signature academic unit that provides a top-rated education for students who will select us as their first choice to receive their education and go on to become leaders in our academic fields. The help and guidance that you have provided over the course of the years has added significant momentum, energy, and excitement to our efforts and we thank you for that.

And now, in a way, I must bid farewell to you all. This note is going to be my last as the EME department head. My journey at Penn State started when I arrived in State College in 1975 as a Ph.D. student with my wife Filiz. Almost 42 years later, on June 30, 2017, I will be retiring. But our journey is not coming to an end as Filiz and I have made our decision to stay in the area, in this small campus town in central Pennsylvania where we have, over time, nurtured a strong attachment, and where our hearts are. By the way, in this way, we will not miss the beautiful winter days either. Please note that this is not a goodbye, only a “see you later.” And, let us know when you are in town so that we can have a cup of Turkish coffee together and exchange notes.

Thanks for everything and as always, WE ARE....

Energy Drilling

Turgay Ertekin

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CONTACT US

CONNECTION is a publication of the John and Willie Leaone Family Department of Energy and Mineral Engineering in the College of Earth and Mineral Sciences at Penn State.

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Created by Morgann McAfee.

You’re invited to join us in celebrating 40 years...

A retirement celebration in honor of Dr. Turgay Ertekin

Friday, June 23, 2017
3:00—6:00 PM
The Ballroom, The Nittany Lion Inn
Penn State University Park campus

R.S.V.P. by Friday, June 9, 2017
Online: www.eme.psu.edu/ErtekinRetirement or to Rachel Conaway at ria7@psu.edu or 814-865-3439

You’re invited to join us in celebrating 40 years...

in the corridors of time...and also in the corridors of Hosler Building

For four decades, Dr. Ertekin has devoted his career to education and the future of petroleum and natural gas engineering. Please join us in commemorating 40 years of excellence, dedication, and integrity. All colleagues, alumni, and friends are welcome.

Connection | 3
These roofs are initially very strong, Liu said, but over time become compromised by the elements. During the summer, warm, humid air enters the cooler mine, creating condensation. In the winter, the reverse occurs. This humidity cycling degrades the shale, which is especially prone to moisture damage. How quickly and by how much is what Liu hopes to find.

“Doing the science that’s taking place in these mines, and then we will see how to best use these results,” said Liu. “We are focusing on the scientific behavior of the rock under the real conditions. This stage is really important. Once we analyze the data, we can offer the best practices to the industry.”

Nondestructive testing allows for prolonged testing and is an ideal way to account for variables over time because the composition and strength of the roof is really varied throughout the testable area, said Liu, who said the research could pave the way for technologies to control the moisture cycle or reinforce the mine. That innovation will come later. The first step, he said, is understanding the problem.

Last month, Liu began traveling to three partnering mines to gather rock samples. He will use those samples to create replica shale roofs. In the lab, he will perform a series of tests to determine how the shale responds to moisture-induced swelling. He will also test enhanced bolting methods, an industry standard where companies brace the mine’s roof for support. The existing practice is to use vertical bracing, but Liu thinks cross-bracing or other patterns could offer more stability.

“A major goal is to understand the science that’s taking place in these mines, and then we will see how to best use these results,” said Liu. “We are focusing on the scientific behavior of the rock under the real conditions. This stage is really important. Once we analyze the data, we can offer the best practices to the industry.”

Modeling software to assess roofs exists, said Liu, but it accounts for so few real-life variables. He hopes his research will fill in those gaps and add to the model, leading to safer mines and miners.

One piece of equipment obtained though this grant can test rock strength without destroying that’s key for Liu’s research but it also will benefit other engineering and energy-related research.

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Mathews began his career at Penn State in 1976. Prior to that, he worked at the Amax Extractive Research Laboratories in Golden, Colorado, as a research metallurgist and project leader, where he developed technologies for nickel and cobalt extraction and refining.

In 2004, he was elected a member of the U.S. National Academy of Engineering for pioneering contributions to the understanding of extraction processes. In addition, he served as editor-in-chief of Hydrometallurgy from 1998-2010.

Penn State awarded him the University’s Faculty Scholar Medal for Outstanding Accomplishment in Engineering in 1999. In 1995, the College of Earth and Mineral Sciences honored him with the Wilson Award for Excellence in Research.

Osséo-Asare has also served as visiting professor at universities in Australia, Brazil, Ghana, Nigeria, Japan, South Africa, and Tanzania, and as a Dr. Martin Luther King Jr. Visiting Professor at the Massachusetts Institute of Technology.

He has a special interest in development engineering and advancing science and technology education in developing countries.

Osséo-Asare attended secondary school at Achimota School, a boarding school in Ghana. He received a bachelor of science degree in 1970, a master of science degree in 1972, and a doctoral degree in 1975, all in materials science and engineering from the University of California, Berkeley.

Founded in 1916, the Brazilian Academy of Sciences is a nonprofit entity that operates as an honorific scientific society and as a consultant for the government to perform technical, scientific, and policy-related studies. The academy promotes technological advancement and encourages innovation through collaboration. It honors significant contributions by those in the international scientific community.
By Seth Blumsack, Program Chair, Associate Professor of Energy and Environmental Economics

The past year has been a busy and productive one for the Energy Business and Finance program. Enrollment remains strong, at around 375 students, and the number of EBF students taking concurrent majors in technical engineering programs continues to grow. Moreover, the number of students (mostly in engineering disciplines) taking the minor in Energy Business and Finance exceeded 200 for the first time this past year. While this has made for busy times for faculty and student advisers, we remain very proud of the program’s strength and are especially encouraged to see so many students with interests in both technical and business education as they prepare for careers in the energy world.

For the 2016-17 academic year, we have been happy to welcome Farid Tayari to the Energy Business and Finance faculty. Tayari, who holds the PhD in technology and mineral engineering at Penn State and did his interdisciplinary doctoral work on the economics of carbon sequestration in depleted shale-gas reservoirs, Tayari has jumped into the deep end by taking on some of the program’s largest and most important courses, including our introductory course on commodity markets (EBF 301) and the advanced course on energy project evaluation (EME 460). A major focus for the program this year has been to build study abroad and study away opportunities for EBF students. Our summer term abroad program at the Dalian University of Technology in China has continued this year, with six EBF students spending three weeks at Dalian University taking courses on Chinese society, energy, and the environment, followed by a three-week mini-internship with PetroChina. The program also sent its first student to study for the certificate in Business in Emerging Markets at ESAN University, the premier business school in Peru. We are looking forward to building this unique program and eventually welcoming students from Peru to study at Penn State. Finally, some EBF students will be able to apply for a new study away experience in urban sustainability with the Penn State Center in Pittsburgh, planned for Fall 2017. We hope that this experience will provide a springboard to develop new energy-focused study away programs at the Penn State centers in Pittsburgh and Philadelphia.

The program has also been increasing the opportunities for student interaction with alumni in the business world. More than a dozen alumni and companies visited EBF classes this past fall, giving professional information and advising sessions to students with business career interests in the energy space. Alumni visiting our classes have discussed the challenges of operating fossil-fired power plants in a highly regulated environment, outlined the forces driving the challenging environment for upstream oil and gas, and put our energy finance students through a shark-tank style business pitch exercise. We look forward to welcoming additional alumni and visitors in the coming year.

EBF students have continued to be involved energy professionals, most notably with the attendance of several students in the Energy Land Management option at the North American Prospect Expo (NAPE) in Houston, Texas. NAPE is one of the country’s premier events for upstream oil and gas development, and we are very happy to see our students in attendance networking with oil and gas professionals.

On behalf of the program and its faculty, I wish everyone a happy and healthy spring. We welcome inquiries from alumni interested in reconnecting with the EBF program. Interested folks can contact me directly at sab51@psu.edu.
Enrollments in the Environmental Systems Engineering (ENVS) program remain high with a total of 182 students as of fall 2016, including 142 students currently in the major and another 40 students who have indicated ENVS as their preference at the University Park and other Penn State campuses. This sustained period of growth has produced increasingly larger graduating classes during the last several years as reflected in the current enrollment for the spring 2017 capstone design course (ENVS 480), which has approximately fifty students.

At the end of the fall 2016 semester, Thaddeus Ikuyembil announced his intention to step down as program chair for the ENVS program in order to explore research interests. Energy and Mineral Engineering department head Turgay Ertekin expressed his most sincere thanks to Thaddeus for his dedicated and effective service to the program. Ertekin has appointed me chair of Environmental Systems Engineering, effective January 3, 2017. The ENVS program is pleased to be joined by Norman Folmar who will be serving as Instructor for the capstone design course, ENVS 480 Environmental Systems Engineering Process Design. Folmar worked previously as the director of undergraduate programs for Penn State’s Department of Civil and Environmental Engineering, and has taught upper level engineering courses at Penn State and Bucknell University. Folmar also has experience working as a consulting engineer on projects related to acid mine drainage treatment systems. We are happy to welcome Folmar to the ENVS program!

The student chapter of the Society of Environmental Systems Engineers (SESE) continues to hold monthly meetings and has organized several field trips including an October tour of passive and active acid mine drainage (AMD) treatment systems located in the Philipsburg Pennsylvania area, led by Penn State alumnus, Aaron Pontier of the Pennsylvania Department of Environmental Protection (PA DEP). The society also organized a trip to the Pennsylvania Brownfields Conference held in Lancaster, Pennsylvania, on October 26-28, 2016. Earlier in spring 2016, SESE was able to provide supporting funds to become a sponsoring university of a number of ENVS students to attend the Central Pennsylvania Environmental Association’s Professional Development Conference (CPSE-PDC), which is held each year in State College, Pennsylvania. The society plans to continue the tradition of inviting program graduates back as speakers for the upcoming spring semester meetings and has found the SESE Group on the professional networking site LinkedIn to be a very useful tool for maintaining ties with ENVS alumni. The LinkedIn SESE Group currently has 44 members and all current and former students are encouraged to join and network with their fellow ENVS students and graduates.

The ENVS program continues to benefit from the generous donations of industry stakeholders. Funding provided by Chevron allows the program to maintain and upgrade equipment that is critical to our teaching laboratories. In addition, Baker Hughes recently donated a field mobile X-ray fluorescence (XRF) instrument (Thermo-Scientific Niton XL) for elemental analysis of samples of various matrices including metals, powders, liquids and films. It is anticipated that this instrument will find use in the laboratories of both ENVS and the Environmental Health and Safety option. The support of Chevron and other industry partners over the years is greatly appreciated.

Two years ago we initiated an effort to revise and realign our curriculum to better meet the expectations for twenty-first century mining engineers. The content of the required courses has been reviewed and in some courses major revisions have been implemented. The graduation requirements for students entering in future years is also changing with a modest increase in the number of credits required and a few changes to the list of required courses. Our third new elective course, which is focused on aggregate operations, was offered this past fall semester. The input provided by mining companies, our Industry and Professional Advisory committee, students, and alumni has been invaluable to us as we make these changes.

Enrollment in the Mining Engineering program continues to grow from the mid twenties in 2014 to the low sixties in 2016. We are approaching the historical average for the 125 years of the program, and hope to reach a point of graduating 15 - 20 students each year. It may take another year or two to reach that goal, but that’s our current trajectory! While enrollment is an important metric within the University, it is only one of many. Placement and internship rates are key indicators, and as I have already shared with you, these are excellent. A majority of our students have won scholarships, 5 percent are Schreyer Scholars students, nearly all are active in our student societies. We sent a sizable delegation of students to Pittsburg Coal Mining Institute of America (PCMA), MinExpo, and the annual meeting of the SME. We also had a group attend the annual International Society of Explosive Engineers (ISSE) meeting, and the annual SME meeting. During our spring break, yet another group will attend GOMEXPO-CON/AGG. Our student mine rescue team is active and has become quite competitive. The students continue to participate in philanthropic events such as THON, as well as civic activities such as the Boy Scouts of America’s Mining in Society merit badge. Honestly, I couldn’t be more proud of this group. Their enthusiasm for mining and their commitment to the profession are outstanding!

There are, of course, challenges and opportunities for further improvement. We are still down two faculty members, which creates a substantial burden for the rest of us. Fortunately the search to fill these two tenure-track positions is well under way, and hopefully we’ll enter the fall 2017 semester with a full complement of faculty. As the enrollment increases, we’ll need to add additional internships, and we’ll be counting on our many loyal alumni to create these great opportunities for our students.

Finally, I’d like to underscore the value of your support and involvement in the Penn State Mining Engineering program. During the past year, alumni have helped us to create new content for some of our courses, hosted field trips for our classes, given talks in classes or at Mining Society meetings, provided information and data for case studies, and created new internship positions for our students. Many of you have helped us with your generous contributions, and that support is very much appreciated as well. Please stay in touch, and let me know if you will be making a campus visit.
Dear Petroleum and Natural Gas Engineering (PNGE) Alumnus,

I am pleased to update you on the PNGE program over this past year. We received good news from U.S. News & World Report last Spring: our graduate program was ranked fifth in the United States. Although these rankings are quite subjective, they are important, as the highest ranked programs receive applications from the best graduate students. This ranking is especially rewarding, considering our faculty number is a quarter to half the size of other top programs. We must work hard to expand our faculty and resources to match the interest and quality of our students, and to maintain a high ranking.

Joining our faculty this fall is Gregory King, an alumnus of our program, who retired from Chevron after a long and accomplished career. King is a co-author of the Society for Petroleum Engineers (SPE) textbook series Basic Applied Reservoir Simulation. We are very pleased to have him, as he brings a significant practical component to our program as well as strong research interest in reservoir simulation.

This year, we will see significant change in our leadership. Both the head of our department, Turag Ertekin, and our Dean, William Easterling, are leaving PNGE this summer. After ten years as Dean, Easterling will head the NSF Directorate for Geosciences. Ertekin is retiring after a long and wonderful career at Penn State. No words can express what he has meant during the last forty years to the petroleum engineering program and, specifically, to his students. Ertekin pursued strong research activities, while also maintaining a friendly and warm student environment. He will be greatly missed. Please send him your best wishes in his retirement.

We remain concerned about placing our students within the upstream sector of the petroleum industry. Oil prices increased by nearly 50 percent in 2016 to over $50 per barrel for West Texas Intermediate (WTI) crude oil, and we have seen increased drilling activity as a result (see chart). The number of job openings have inched forward in response, although so far not in a significant way. Thankfully, our senior class was GPA controlled (required 3.0 GPA), but we still have a large number of students who will be graduating this academic year (more than 160 students).

If you have jobs related to either the upstream or downstream, operations or engineering, please hire our students! Visit https://sites.psu.edu/petrojobs/ to see updated resumes of our amazing students.

Now is the time to hire PNGE students as they are some of the best students in the world! Our GPA controls will be more stringent next year (3.3 GPA) so the number of graduating seniors will be significantly smaller than this year. Unless our faculty numbers and resources increase significantly, our long-term goal is to have a total undergraduate number between 200 and 300 students, and we are on our way to achieving that goal.

The Energy and Sustainability Policy programs are designed for persons interested in energy production and management, sustainability management, foreign and domestic energy and sustainability policy analysis, and other related fields. Both are 120-credit degrees, with the same general education and core coursework requirements. In the B.S. program, students select additional coursework in areas closely related to the major: energy and science; analysis and technology, business and management; and ethics, leadership, and communications. The B.A. program has a more expanded focus. Students attain foreign language proficiency and take supporting coursework in global culture and humanities. We are very pleased with the educational opportunities these programs give our students, suitable for a range of professional interests and aspirations, careers, and graduate school options.

Both ESP degrees have engaged scholarship requirements, including policy research with personal interactions with stakeholders, public presentations, and completion of 3 credits of internship or foreign studies. This attention to engaged scholarship has become a distinguishing characteristic of our ESP degrees, often giving students a leg up in experience, connections, and preparedness for professional advancement.

Summer 2016 graduate Tip Stama, who happened to live near University Park, used his internship at Penn State’s Office of Physical Plant (OPP) to develop a new process for inventorying the University’s greenhouse gas emissions. Before he graduated, he landed a position as an environmental compliance specialist at ClimeCo, in the environmental commodity products business, closely related to his internship. He works on environmental projects to reduce emissions of greenhouse gases and other toxic pollutants, including methane mitigation at dairy farms, redirecting organics from landfills to compost operations, capturing and destroying ozone-depleting gases, and reducing nitrous oxide emissions from nitric acid plants. Furthermore, with a perfect 4.0 GPA, Tip was named student marshal for the College of Earth and Mineral Sciences for the summer 2016 commencement!

Many ESP students joined others from universities near and far at the Sustainable Energy Fund’s annual Energypath Conference held summer at Penn State’s University Park campus. Three days of hands-on energy camps were held proceeding the conference, focusing on solar, wind, biomass, microhydro, and fuel cells. I co-instructed the solar camp where fifty students and faculty worked to build the temporary installation of a fully operational grid-tied 5.6 kW photovoltaic array at the Sustainability Experience Center Site. Students from the ESP programs and Penn State’s graduate program in Renewable Energy and Sustainability Systems (RESS) participated in this rare on-campus opportunity to work hands-on with solar modules and system components.

And, in perhaps the most special “engagement” opportunity of all, many ESP students traveled from around the country to join graduation activities, often their first in-person trip to a Penn State campus. We wish all of our 2016 ESP graduates the very best!

ESP Lead Vera Cole helps campers use photovoltaic field measurements to understand current-voltage characterization of solar modules.

Tip Stama, ESP B.A. graduate (and pilot) with high flying perfect 4.0 GPA and summer 2016 student marshal for College of Earth and Mineral Sciences.

ESP and RESS students participated in Energypath Conference hands-on energy camps. Left-to-right, Tom Fritz (RESS), Mark Staub (ESP graduate), Brand Robinson (ESP faculty), Kristy Provost (ESP), Mike Reichart (ESS), Vera Cole (ESP lead faculty; solar camp instructor), Brian Hillard (ESP).
Connecting with other Penn State alumni in the industry

While working at IHRDC, Thomas had the opportunity to network with other Penn State alumni.

“It was surprising to see so many Penn State alumni at the company,” said Thomas. “It just shows the extensive network that our University has.”

One alumnus that Thomas interacted with was David Donohue, president and founder of IHRDC and a graduate of Penn State’s petroleum and natural gas engineering program. He also worked with Donohue’s son, Timothy, a fellow Penn State student. Donohue, his son and their family endowed a professorship in EME.

In addition, Thomas worked alongside Erhan Aslan, who received his doctorate in energy and mineral engineering with a focus in petroleum and natural gas engineering in 2013, and Y. Serdar Dogulu, who received his master’s degree and doctorate in petroleum and natural gas engineering in 1994 and 1998, respectively.

Thomas pointed to the courses he has taken while working at IHRDC that he would have liked to have received in the petroleum and natural gas engineering program at Penn State that prepared him well for his internship. He also emphasized the usefulness of what he learned at IHRDC and how it would be applied in his senior-level courses.

“Working at a training company gave me a whole new perspective on different information in the oil and gas industry,” said Thomas. “For example, in Reservoir Modeling (PNGE 430), we have been discussing the mass transfer of oil in reservoirs, which I learned quite a bit about during my internship.”

get your mind churning on a more creative way of what we see at home and mirror that with some of the problems you see,” said Phoebe.

His job is creating and continuing programs that offer services to the community while addressing the United Nations’ seventeen goals for sustainable development. Each GREEN program looks at how a nation confronted and then solved sustainability problems.

“Our biggest mission is to shake up higher education and to bring educational programs that are focused on topics relevant to life. We try to be as hands on as possible,” said Phoebe. “These programs are built by students for students. We know what the college students are looking for, what you need to get ahead.”

Phoebe said Penn State taught him ways to think in a larger global context to find solution to problems, and GREEN gave him a road to continue that message.

Flash forward a few years and now he’s the one curating the experience. The 2012 graduate is director of global operations for GREEN, a position he obtained after first becoming a student ambassador for the program.

At GREEN, he connects students with trips to Iceland, Peru, and Philadelphia, each offering its own learning opportunity based on the culture and surroundings. For example, Iceland, which creates more than 90 percent of its energy needs sustainably, gives students a front-row seat to geothermal and hydroelectric heat and power plants, while Peru offers a look at water resource management practices.

Phoebe said one of the main perks of the job, aside from frequently traveling to picturesque places such as Costa Rica and Iceland, is being able to craft hands-on programs that show — not tell — some of the world’s most eco-friendly advancements.

“When you see it abroad it’s a great way to process and give you different avenues and opportunities. We try to be as hands on as possible,” said Phoebe. “These programs are built by students for students. We know what the college students are looking for, what you need to get ahead.”

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“When you see it abroad it’s a great way to
Positive Energy spruces up park, tours natural gas company

By David Kubarek

More than a dozen members of Penn State’s Positive Energy student group cleaned up areas of Cross Creek Park in Washington County, Pennsylvania, in a partnership with the natural gas company Range Resources.

Positive Energy, an organization formed under the University’s student chapter of the Society of Petroleum Engineers (SPE), organizes community service events aimed at giving back to the environment.

On October 20, students traveled to the energy company’s Southpointe office to meet industry representatives before working on the creekside project. The group spent the day cleaning up litter along the creek. Later they toured a nearby natural gas production pad.

Adam Larson, Positive Energy co-founder and a junior majoring in petroleum and natural gas engineering, said the trip hit on chief tenets of the group.

“What we wanted to do was provide supplemental support to cleaning up the park and support our efforts as engineers in the energy industry to give back to the environment,” said Larson, who is also SPE student chapter president. “It conformed the technical arm of SPE together with the volunteering arm.”

Range Resources contributed the lion’s share of the $1.73 million to construct the 2,800-acre recreational area and shared their goals for maintaining the park with the students.

“Range Resources loved the event,” said Jacob Morrison, vice-chair of Positive Energy and a senior majoring in energy engineering. “They loved having students volunteer with them because having partnerships with students who could potentially be new hires is always nice. They got to see people interact with those who will shape the future of the field.”

Positive Energy, which formed on Earth Day 2015, has more than 100 members and has completed several environmental projects. The group adopted and maintains a road near Black Moshannon State Park, has planted more than 400 trees across the state, and partners with ClearWater Conservancy, a central Pennsylvania conservation organization, to mitigate erosion on a five-acre plot of land where a stream feeds into the Chesapeake Bay watershed. The group visits the area monthly to plant trees and monitor conditions.

By David Kubarek

The venture capital business, said Penn State alum and State College native Peter Rigby, is a “terrible learning environment.” That’s why he was on the University Park campus recently, aiming to give students an advantage in the high-risk field.

Rigby, a 1979 graduate who dual majored in petroleum and natural gas engineering and art and sciences, said the business offers little immediate feedback.

“You only get to make a few investment decisions a year and it takes years to figure out whether they work or not,” said Rigby.

“And then, what’s the right lesson? Were you successful, were you lucky or were you good? Most of the time you were probably just lucky.”

Rigby was speaking to students in an Energy Corporate Finance course taught by associate professor Seth Blumsack, Blumsack said Rigby is the perfect candidate to speak to the future work environment his students will encounter.

“When he has seen all sides of the energy finance world, from small companies getting off the ground to major billion dollar deals from some of the world’s largest energy firms,” said Blumsack. “He brought the kind of real-world experience that helps our Energy Business and Finance students understand where their classroom skills can take them.”

In Blumsack’s classroom, Rigby listened as students gave “Shark Tank” style elevator pitches to entrepreneurial business ventures they crafted during previous class sessions. As groups of students presented ideas such as solar-powered water filtration systems and solar-powered car roof panels, Rigby peppered them with logistical, marketing and financing questions. He urged students to spot and remedy trouble areas early on in their business ventures.

Rigby knows a thing or two about innovation and making money. Early in his career, the engineer discovered he had a knack for complex investments related to energy and for applying computer technology to the oil industry.

At Standard & Poor’s, where he worked for two decades, he helped increase the company’s rated investment portfolio from $5 billion to $200 billion.

Now retired from Wall Street, Rigby dedicates his time to several nonprofits and charities, including Asta Angels, a private equity and venture capital group focused on angel investing in women-owned startups. There, since its 2013 founding, the group has invested more than $12 million in more than forty companies.

Expanding and diversifying your portfolio is another bit of advice he gives students. That’s why Asta Angels takes on so many deals.

Asta focuses on investments related to clean technology, health care and sustainability. They back entrepreneurs making strides in cancer diagnostics, stem cell research, sustainable clothing manufacturing, and artificial intelligence applications.

Rigby told students entrepreneurship is a challenging career path but those who understand the paths to success can minimize their risks.

Entrepreneurs create new and unique things, so there’s no way to gauge the market for something new, he said.

“If you have a product that’s never been used, what’s the market look like? It takes a while for those markets to develop,” said Rigby, adding that market research is expensive and oftentimes out of reach for struggling startups.

Rigby said great startups can face insurmountable roadblocks if a minor setback comes at a hard time, financially. He said entrepreneurs need to be realistic when assessing their strengths.

“Entrepreneurs tend to have gaps. It could be a financial gap. It could be a legal gap. It could be a manufacturing or operations gap,” he said.

Rigby said setbacks can foster success. At Standard & Poor’s, when the global financial market was rocked by the Enron scandal, he built early stage big data and predictive analytics platforms to help identify when history was at risk of repeating itself.

“I kind of had a big mandate to figure out what we could do from a market intelligence basis to look for emerging trends that perhaps the analysts might not see as quickly as possible,” said Rigby. “Once we had all these tools, which were good at capturing massive quantities of market data — both text and quantitative data — and analyzing using some interesting mathematical techniques, they helped our analysts begin looking at the market with a new perspective. We actually got our analysts to engage better with investors.”

His first platform, Sherlock, was a system to “read and analyze” U.S. Securities and Exchange financial filings, such as 10-Ks, 8-Ks and proxies, in real time. It led to a U.S. patent. Sherlock uses natural language processing, artificial intelligence, and text categorization to identify emerging areas of financial risk.

Rigby said his successes all build from his engineering background and the systematic analysis and problem-solving that comes with being an engineer.

“It was a great experience and laid the foundation for a lot of other things I’ve done,” he said. “The engineering discipline has turned out to be a really good discipline for business, especially for energy finance.”

EMSS alum, entrepreneur gives ‘Shark-Tank’ style advice to students

By David Kubarek

The venture capital business, said Pennsylvania State University and State College native Peter Rigby, is a “terrible learning environment.” That’s why he was on the University Park campus recently, aiming to give students an advantage in the high-risk field.

Rigby, a 1979 graduate who dual majored in petroleum and natural gas engineering and art and sciences, said the business offers little immediate feedback.

“You only get to make a few investment decisions a year and it takes years to figure out whether they work or not,” said Rigby.

“And then, what’s the right lesson? Were you successful, were you lucky or were you good? Most of the time you were probably just lucky.”

Rigby was speaking to students in an Energy Corporate Finance course taught by associate professor Seth Blumsack. Blumsack said Rigby is the perfect candidate to speak to the future work environment his students will encounter.

“When he has seen all sides of the energy finance world, from small companies getting off the ground to major billion dollar deals from some of the world’s largest energy firms,” said Blumsack. “He brought the kind of real-world experience that helps our Energy Business and Finance students understand where their classroom skills can take them.”

In Blumsack’s classroom, Rigby listened as students gave “Shark Tank” style elevator pitches to entrepreneurial business ventures they crafted during previous class sessions. As groups of students presented ideas such as solar-powered water filtration systems and solar-powered car roof panels, Rigby peppered them with logistical, marketing and financing questions. He urged students to spot and remedy trouble areas early on in their business ventures.

Rigby knows a thing or two about innovation and making money. Early in his career, the engineer discovered he had a knack for complex investments related to energy and for applying computer technology to the oil industry.

At Standard & Poor’s, where he worked for two decades, he helped increase the company’s rated investment portfolio from $5 billion to $200 billion.

Now retired from Wall Street, Rigby dedicates his time to several nonprofits and charities, including Asta Angels, a private equity and venture capital group focused on angel investing in women-owned startups. There, since its 2013 founding, the group has invested more than $12 million in more than forty companies.

Expanding and diversifying your portfolio is another bit of advice he gives students. That’s why Asta Angels takes on so many deals.

Asta focuses on investments related to clean technology, health care and sustainability. They back entrepreneurs making strides in cancer diagnostics, stem cell research, sustainable clothing manufacturing, and artificial intelligence applications.

Rigby told students entrepreneurship is a challenging career path but those who understand the paths to success can minimize their risks.

Entrepreneurs create new and unique things, so there’s no way to gauge the market for something new, he said.

“If you have a product that’s never been used, what’s the market look like? It takes a while for these markets to develop,” said Rigby, adding that market research is expensive and oftentimes out of reach for struggling startups.

Rigby said great startups can face insurmountable roadblocks if a minor setback comes at a hard time, financially. He said entrepreneurs need to be realistic when assessing their strengths.

“Entrepreneurs tend to have gaps. It could be a financial gap. It could be a legal gap. It could be a manufacturing or operations gap,” he said.

Rigby said setbacks can foster success. At Standard & Poor’s, when the global financial market was rocked by the Enron scandal, he built early stage big data and predictive analytics platforms to help identify when history was at risk of repeating itself.

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