Nearly 200 international scientists who are collaborating on the Deep Underground Neutrino Experiment (DUNE) gathered at the South Dakota School of Mines & Technology to map out the future of the mega-science project.

The DUNE Collaboration began May 19 and concluded May 22, with 175 scientists from all over the world on the Mines campus and another 100 participating via remote access.

DUNE will be the world’s flagship neutrino project, with hundreds of scientists from 27 countries, including South Dakota Mines physicists. The project planned between the Sanford Underground Research Facility in Lead and Fermi National Accelerator Laboratory near Chicago will involve the world’s highest intensity neutrino beam 800 miles long. A 160-kiloton cryogenic liquid argon detector system will be built one mile underground at the Sanford Lab to image the rare collisions of neutrinos beamed from Fermilab, with the ultimate goal to understand the origins of the universe.

It was the first time the group has met at South Dakota Mines, located less than an hour from where the detector will be built in the laboratory that was once the Homestake Gold Mine. The depth of the laboratory will shield the experiment from cosmic rays that bombard the earth’s surface.

“We are pleased to welcome scientists from all over at the world to South Dakota Mines,” said Heather Wilson, university president. “This is an exciting time for the collaboration as it moves closer to building the far detector at Sanford and advancing our understanding of the universe.”

Throughout the meeting DUNE leaders focused on pressing matters, highlighting potentially critical topics and offering steps to mitigate them. An outlook for the project was also discussed.

Juergen Reichenbacher, Ph.D., a Mines physicist who has been organizing the collaboration meeting along with Fermilab, hopes the School of Mines establishes itself as the preferred far detector conference site for DUNE, alternating as host with Fermilab, the near detector and accelerator site.

“It is a great honor for the School of Mines to host this large DUNE collaboration meeting. A lot of critical decisions will have to be made now or in the upcoming months as we will build large prototypes,” Reichenbacher said.

Reichenbacher is convener of the Purity & Radiopurity Working Group for DUNE, with fellow Mines physicist Luke Corwin, Ph.D., deputy convener. They have been working on DUNE for several years, including at previous institutions before moving to the School of Mines in 2013 and 2014.

Reichenbacher’s campus laboratory is completely housed inside a new large clean room to reduce backgrounds for sensitive measurements. He designed and constructed unique equipment for the lab, where he is making dedicated radiopurity and calibration measurements for DUNE and also the next generation dark matter experiment called LZ (LUX-ZEPLIN).

More the 800 scientists and engineers from 150 institutions and laboratories from 27 countries are already working on DUNE.

Watch this animated video to learn more about DUNE.
Mines Professor Emeritus Named 2016 J.P. Gries Geologist of the Year

Arden Davis, Ph.D., professor emeritus of geology and geological engineering at SD Mines, has been named the 2016 J.P. Gries Geologist of the Year. He was selected for his contributions to the geology and groundwater hydrology of the State of South Dakota.

After receiving his master's and doctoral degrees from SD Mines, Davis taught for more than 30 years at the university, impacting the graduate students who completed degrees under his advisement, as well as thousands of students who benefitted from his courses.

As a groundwater hydrologist and geological engineering consultant, Davis has undertaken numerous projects involving groundwater contamination, aquifer evaluation, low-level radioactive waste site evaluation, spring-flow measurements and mine site development throughout his career. He has worked with the cities of Rapid City, Hill City and Custer in characterizing and quantifying aquifer vulnerability in these developing areas, as well, ultimately designing a unique approach for quantifying aquifer vulnerability in areas such as the Black Hills uplift.

Davis also served as an expert witness regarding the proposed Keystone XL pipeline in South Dakota and assisted the U.S. Environmental Protection Agency and the South Dakota Department of Environment and Natural Resources as a member of a technical advisory team concerning the Gilt Edge Superfund Site. He has shared his expertise relating to groundwater contamination and remediation at various locations throughout the state of South Dakota, including the Williams Pipeline/Hayward School site in Sioux Falls.

The 2016 J. Paul Gries “Geologist of the Year” Award honors the memory of Paul Gries, Ph.D., a renowned geologist who made great strides in understanding the geology of South Dakota.

Mines’ Jessica Tisdale Named RMAC Summit Award Winner

South Dakota Mines’ Jessica Tisdale was named the Rocky Mountain Athletic Conference Summit Award winner for the women’s outdoor track and field.

The RMAC Summit Award is presented to the student-athlete with the highest cumulative grade point average participating at the finals sites for each of the RMAC’s championships.

All GPAs are based on a straight grading scale to ensure consistency among institutions. Any tie is broken by the number of credits completed.

Eligible student-athletes are sophomores or above who have participated in their sport for at least two years with their school. They must be an active member of the team, traveling and competing at the championship.

Tisdale is a junior from New Underwood, S.D. She has a 4.0 GPA and is majoring in civil engineering and also competed in the women’s high jump at the RMAC Track and Field Outdoor Championships in Spearfish.

“Jessica is very deserving of this recognition,” said Hardrocker track and field head coach Jerry Schafer. “She competes hard on the track and works even harder in the classroom. She is a team leader for the Hardrockers, and accolades like this exemplify that.”
The Moonrockers lunar robot placed in the top 10 at a collegiate competition held at NASA Kennedy Space Center.

The multidisciplinary South Dakota Mines student team placed 10th overall among a field of 45 qualifying teams at the 7th annual NASA Robotic Mining Competition. The team captured 2nd place in the Caterpillar Autonomy Award competition.

NASA is interested in the mineral oxides contained within regolith, or lunar soil, as a means to generate oxygen to support future habitats and create rocket fuel. Student robots were challenged to collect as much simulated lunar or Martian regolith as possible within a 10-minute period.

The two main goals this year for the team were to speed up the delivery system and implement an autonomous operation.

The Moonrockers team was led this year by Devin Kroeber, an electrical engineering major, and included the following members: Jacob Green (mechanical engineering), Charles Hartman (mechanical engineering), Samuel Hill (mechanical engineering), Daniel Hodges (mechanical engineering), Alexander Muchow (computer science), Dakota Rusley (civil and environmental engineering), Joree Sandin (mechanical engineering), Adam Holzer (mechanical engineering) and Jonathan Stelze (mechanical engineering). An additional team comprised of Erik Figuracion (mechanical engineering), Mathew Gordon (mechanical engineering), Mathew Gordon (mechanical engineering), and Jonathan Stelze (mechanical engineering) focused on developing an icy regolith system to collect larger pieces buried deep under the surface for consideration next year by the team.

The Moonrockers are advised by Jason Ash, Ph.D., mechanical engineering; Charles Tolle, Ph.D., electrical and computer engineering; and Moonrockers alumnus Zach Buechler (computer engineering). Jeff McGough, Ph.D., math and computer science, and Lowell Kolb, electrical and computer engineering, also provided assistance to team members.

Sponsors for the team were South Dakota Space Grant Consortium, Misumi, RoboteQ, alumnus Tim Lux (mechanical engineering), Burns & McDonnell, Cliffs, Dales Tires, Aquarius, Power Grid Engineering, Dakota High Voltage & Maintenance and the Student Association Finance.
Intern Spotlight

Alex Spillman
Junior
Chemical Engineering

A Mandan, N.D., native, Alex Spillman has spent the last five months working as a project engineer at Grain Processing Corporation (GPC) in Muscatine, Iowa. GPC produces 75 percent of the grain neutral spirits used in the U.S., supplying alcohol for brands such as Smirnoff, Crown Royal, Fireball, Jose Cuervo, Ciroc and Jack Daniels. Overseeing 12 projects ranging from hazard analysis to process improvement, Spillman’s industry experience has allowed him to work with pumps, heat exchangers, columns, safety valves, and tanks of all cycles. “My education has come full circle. From learning about distillation columns in Dr. Dave Dixon’s class to designing recycle stream for columns at GPC,” he said.

Mazzucco Earns $50,000 Rotary Global Grant for Study of Water, Sanitation

Mark Mazzucco, a metallurgical engineering major who graduated from the South Dakota School of Mines & Technology this spring, has been named the Rotary Foundation Global Grant Scholar, earning a $50,000 scholarship to study water and sanitation issues at the University of Leeds, England.

A Mesa, Ariz., native, Mazzucco was selected by the Rotary Club in Beaumont, Texas, which he became involved with during his internship at ExxonMobil last summer and fall. As a reliability engineer intern at ExxonMobil, Mazzucco worked closely with environmental engineers to ensure projects considered environmental standards, including land reclamation and water and safety zones, noting when ExxonMobil goes into a new area for exploration purposes, the land must be left in the same if not better conditions.

Mazzucco, who played basketball at the School of Mines and who has mentored special needs youth and tutored at an elementary school, previously earned a bachelor’s degree from Arizona State University as a psychology major. While at Mines, he received the 2015 Academic Internship Student Achievement Award by the Cooperative Education & Internship Association, a first for the university, and was named by Intel as Intern of the Week.

“I plan to pursue a graduate degree in materials science and environmental engineering. I have been extremely fortunate to learn from two completely different universities for my first two degrees and have learned that every university offers its unique experience. Had it not been for SD Mines I don’t think I ever would have found my true passion in engineering,” said Mazzucco.

Before leaving for the United Kingdom, Mazzucco will work at ExxonMobil for a summer internship. He has received a full-time offer of employment following his studies overseas.

“Mark is an exceptional student, athlete and leader. We are very pleased that he has earned this award and will have the opportunity to further his education at the University of Leeds,” said SD Mines President Heather Wilson.

Rotary global grant scholarships fund graduate-level coursework or research in one of six areas of focus: disease prevention and treatment, water and sanitation, maternal and child health, peace and conflict prevention/resolution, basic education and literacy and economic and community development. Selection by local Rotary districts is based primarily on these criteria:

- Excellent leadership skills and potential
- A proven record of success in his or her academic field or vocation
- A commitment to community service
- Well-defined and realistic goals
- Concrete ideas for advancing within his or her chosen field
A professor has published a first-of-its-kind programming textbook that will be used on university campuses and by professionals throughout the world.

Larry Pyeatt, Ph.D., associate professor in the Department of Mathematics and Computer Science, authored the textbook “Modern Assembly Language Programming with the ARM Processor,” the first to feature the ARM (Advanced RISC Machine) processor on a Linux/Android platform.

The textbook published by Elsevier in the United Kingdom has begun shipping to campuses and professional offices worldwide, and is also available on Amazon. Most universities offering degrees in computer science and computer engineering require students to take at least one course in assembly language, and as the first textbook to fill the need for an ARM-based Linux/Android course, Pyeatt’s book is well-positioned to capture a large segment of the market.

The book explains the concepts of assembly language programming, building from simple examples to more complex programming on bare-metal embedded systems, with emphasis on developing a solid structured assembly code. More advanced topics such as fixed and floating point mathematics, optimization and the ARM, VFP and NEON extensions are also covered.

Pyeatt said he was inspired to write the book after teaching an assembly language course at Mines with two existing textbooks.

“I have always wanted to write a textbook, and the time seemed right. Assembly language is a topic that I know very well. I am passionate about squeezing out the best performance that the machine can give and writing well-designed code that can safely control machines, including robots,” said Pyeatt. “This is the most important thing I’ve done with my life.”

Pyeatt earned his doctorate in computer science, focusing on artificial intelligence, from Colorado State University and was a professor at Texas Tech University for 13 years before joining the South Dakota Mines faculty in 2012.

Pyeatt has programmed in over 15 assembly languages, and teaches a variety of courses, including assembly language, operating systems, computer architecture and probabilistic artificial intelligence.
The Mines 2015-2016 outdoor track and field teams placed two Hardrocker scholar-athletes on the Rocky Mountain Athletic Conference All-Academic Team, while 13 others were named to the RMAC Honor Roll in Colorado Springs, Colo.

On the women’s team, SD Mines’ Libby Friesen, who was the 2015-2016 Summit Award recipient for the indoor season and earned RMAC All-Academic First Team honors for the indoor season, was also selected to the RMAC All-Academic First Team for the outdoor track and field season. Friesen, sophomore from Olathe, Kan., earned first-team honors with a 4.0 GPA. She is a civil and environmental engineering major.

On the men’s team, senior Nick Alberts was named to the RMAC All-Academic First Team for the outdoor season. Alberts, senior from Langford, S.D., majoring in electrical engineering, had a 3.95 GPA and also earned RMAC All-Academic First Team honors for the indoor season. "Our scholar-athletes have higher average GPAs than the student body as a whole, and there are no easy degrees at Mines. We are very proud of these students," said SD Mines President Heather Wilson.

The RMAC recognizes all-academic performers who have GPA of 3.30 or better, have been a starter or reserve, and have completed two consecutive semesters or three quarters at their current institution.

The student-athlete’s cumulative GPA is what they had earned after the fall semester. RMAC Sports Information Directors at schools which sponsor the sport of women’s and men’s outdoor track and field nominated and selected the first team honorees.

Nine lady Hardrockers were named to the RMAC Outdoor Track and Field Honor Roll. They include Katie Croell (3.56), junior civil engineering major from Broomfield, Colo.; Therese Frels (3.83), junior physics major from Guthrie Center, Iowa; Rachel Hermanson (4.00), sophomore chemical engineering major from Andover, Minn.; Karissa Kjenstad (3.37), junior chemical engineering major from Tacoma, Wash.; Shannon Morse (3.63), sophomore chemical engineering major from Sargent, Neb.; Mikenzie Nordeen (3.59), senior applied biological sciences major from Alliance, Neb.; Kari Radke (3.43), sophomore chemical engineering major from Elk River, Minn.; Tasha Timm (3.73), junior mechanical engineering major from Grover, Colo.; and Jessica Tisdale (4.0), junior civil engineering major from New Underwood.

Four Hardrocker men’s outdoor track and field team members earned a spot on the RMAC Honor Roll list. They include Cole Jolovich (3.67), senior civil engineering major from Dayton, Wyo.; Aaron Campbell (3.93), sophomore electrical engineering major from Sheridan, Wyo.; Casey Skillingstad (3.69), sophomore civil and environmental engineering major from Yankton; and Travis Buse (4.0), junior chemical engineering major from Lennox.

“Scholar-athletes at South Dakota Mines make these type of accolades look easy, but it is quite a challenge to make the grade at our institution and be competitive in the conference at the same time,” said Hardrocker outdoor track and field head coach Jerry Schafer. “Finding a balance can be difficult, but I applaud our students. They have been able to find a recipe for success.”
After serving as interim head coach of the South Dakota School of Mines volleyball team for the 2015 season, Doug Tabbert has been officially named head coach.

“Coach Tabbert has a lot of experience as a head coach and a lot of familiarity with the Hardrocker volleyball program and the type of scholar-athletes we are looking for at South Dakota School of Mines,” Hardrockers Athletics Director Joel Lueken said. “I am confident he can continue to make the Hardrockers competitive in the Rocky Mountain Athletic Conference.”

Tabbert, who served as the assistant coach of the SD Mines volleyball program in 2014, was named interim head coach before the start of the 2015 campaign after former head coach Tiffany McCampbell was promoted to associate athletic director in charge of internal operations last July.

“I’m delighted to be able to continue to lead the SD Mines volleyball program,” Tabbert said. “I greatly appreciate that Joel Lueken and President (Heather) Wilson have entrusted me with this opportunity, and I’m grateful for their support. We have a quality group of returning scholar-athletes and an intriguing incoming recruiting class. I’m eager to face the challenges of RMAC volleyball with them as we all work together to continue to grow our program. August 15 (first day of practice) can’t get here soon enough.”

Tabbert was previously head coach of the Lady ’Rockers from 2003-2006. The program improved steadily during his tenure, culminating with a 16-win season in 2006 that represented the program’s second-highest season winning percentage in the previous decade.

Overall, Lady Hardrocker players during his tenure earned one third-team All-American selection, one conference Most Valuable Senior designation, four all-conference selections, eight conference player-of-the-Week honors, three region Player-of-the-Week awards, five All-American scholar athlete awards and 25 conference scholar-athlete honors.

Tabbert returned to SD Mines from Cameron University, (Okla.) where he served as head coach for three seasons (2011-13). Although he was the program’s sixth head coach in seven seasons, Tabbert’s impact on the Cameron program was immediate.

Despite being picked to finish last in the pre-season conference poll, his first squad at Cameron more than doubled the number of conference wins from the previous season and earned the program’s first conference tournament bid in four years.

During his tenure in Oklahoma, Cameron players earned seven all-conference designations, garnered multiple conference Player-of-the-Week awards and tied or broke multiple Cameron individual volleyball records.

Previous to that, Tabbert spent four years at the University of Nebraska at Kearney (2007-10), where he was assistant coach. While at UNK, the Lopers had an overall record of 129-17 and a conference record of 71-4 including four regular-season conference championships, two conference tournament championships, four NCAA tournament appearances, and final national rankings of No. 19, No. 6, No. 12 and No. 5.

From 2001-02, Tabbert was head coach at Hastings College in Hastings, Neb., before beginning his first head coaching job at Methodist University in Fayetteville, NC, in 1998.

Coach Tabbert holds B.S. degrees in psychology and business administration from Baker University (Kansas) and a master’s degree in development kinesiology from Bowling Green State University (Ohio).

Tabbert is a native of Perry, Kan., and has coached 19 all-conference and 15 all-academic conference players, 10 all-region players and seven All-Americans.
Over 350 students received their Bachelor of Science, Master of Science or Doctor of Philosophy degrees at the South Dakota School of Mines & Technology's 173rd commencement ceremony. Alumnus Michael Black, director of the Bureau of Indian Affairs, delivered the commencement address. Geological engineering major Harrison Costello of Durango, Colo., delivered the senior class message. Robert Miesen, who earned a bachelor's degree in civil engineering from SD Mines in 1961, received the Guy E. March Medal award for his positive interaction with students, the institution and alumni. Also recognized were graduates from the class of 1966 celebrating their 50-year anniversary.
Judy Sneller has been honored with the Presidential Award for Outstanding Professor at the South Dakota School of Mines & Technology. She was among other faculty and staff members receiving special awards and dozens who were recognized for their years of service during the 2016 Employee Service Awards.

Sneller, who has been at South Dakota Mines since 1992, teaches technical communications and other courses in the Department of Humanities. Among her achievements are 13 refereed publications, 26 conference paper presentations and participation on the interdisciplinary team that brought $300,000 in funding to the university from the Bush Foundation. She has served on 33 different university committees, including the Tenure and Promotion Committee. Additionally, she has secured approximately $50,000 in funding to the university and $100,000 in funding for the Rapid City Arts Council.

Sneller has served on the SD Humanities Council board of directors for four years and as a Speakers' Bureau Scholar for 13 years. She has served on the board of the Rapid City Arts Council for four years and was president this past year. During that time, she led the council in creating its strategic plan, supported the council’s role in gathering information for and drafting the Rapid City Cultural Plan, and oversaw the preparation of core documents for accreditation by the American Alliance of Museums.

Other Mines honorees recognized for their outstanding service to students and the university were:

- **Karim Muci-Kuchler**, Mechanical Engineering, James & Connie Green CAMP Faculty Award
- **Lori Coble**, Chemistry & Applied Biological Sciences, Benard A. Ennenga Award
- **J. Foster Sawyer**, Geology & Geological Engineering, Virginia Simpson Award

- **Cathy Payne**, Veterans Resource Center, Dick Kitchen Award for Outstanding Staff Person
- **Jill Fontaine**, Surbeck Center, Outstanding Student Service Employee of the Year Award
- **Michael Dowding**, Physics, Outstanding Student Organization Advisor
- **Venkata Gadhamshetty**, Civil & Environmental Engineering, Research Award
- **Christian Widener**, Arbegast Materials Processing & Joining Laboratory, Economic Development Award

Faculty and staff members retiring this year and their years of service are Roger Dendinger, Social Sciences, 17 years; Thomas Fontaine, Civil & Environmental Engineering, 21 years; Debra Zeidler, Social Sciences, 23 years; Kathy Antonen, Humanities, 26 years; Antonette Logar, Mathematics & Computer Science, 32 years; and Charles Kliche, Mining Engineering & Management, 35 years.

Staff members recognized for receiving a Traditions of Excellence Award for outstanding civil service employees during the year were Kevin Buddle, Nancy Feiler, Shawn Fischer, Marsha Kelly, Michelle Lineweber, Tammy Merkwan, Diana O’Toole, Abena Songbird, Joel Tesch, Josh Wilkinson and Don Williams.

See the complete news release, including faculty and staff recognized for their years of service.
Prospective Students Hosted at ‘Go to Mines’ June 17 & July 23

SD Mines will host hundreds of prospective students during two summer Go to Mines events.

High school students and their families are invited to South Dakota Mines on Friday, June 17, and Saturday, July 23, to tour departments, residence halls and other facilities and to meet faculty and current students.

The in-depth campus visits are open to students of all ages, particularly juniors and seniors exploring their college options.

South Dakota Mines, a science and engineering research institution offering bachelor’s, master’s and doctoral degrees, is consistently ranked among the top returns on investment nationally for a college education. The placement rate is 98 percent, with an average early-career salary for graduates of $62,300, according to the 2015-2016 PayScale report. The university enrolls 2,843 students with a student-to-faculty ratio of 15:1.

Through the many labs, research projects and competitive teams, students participate in rich hands-on learning experiences beginning their freshman year. South Dakota Mines is also known for its specialized internship program. Last year, 78 percent of students had already worked for companies throughout the state and country during internships and co-op experiences prior to graduation.

Pre-registration is encouraged but not required for the June 17 and July 23 Go to Mines events. Prospective students and their families may pre-register at www.sdsmt.edu/visit.

Another Go to Mines event is scheduled for Saturday, Oct. 22.

Mines Team Top 3 Internationally in Mining Design

A SD Mines mining design team is among the top three in the world following a prestigious international competition. The team, called Dakota Mine Consulting, placed third in the National Stone, Sand and Gravel Association (NSSGA) Design Competition, sponsored by the Society for Mining, Metallurgy & Exploration.

The team competed against others from Canada, India, South America and the U.S. during the first phase. Six teams advanced to the finals, where they were challenged to create a solution to a real-world engineering problem based on data provided by companies in the aggregates industry.

They were evaluated on the engineering parameters presented, along with financial soundness, environmental and safety considerations and the ability to sell their conclusions.

Mines team members and recent graduates were Shelby Allen, geological engineering and atmospheric sciences major from McCook, Neb.; James Curl, mining engineering management major from Belle Fourche; Paul Jewell, mining engineering management major from Sillwater, Minn., Sam Middelstadt, mining engineering management major from Pavillion, Wyo.; Kathleen Tew, mining engineering management and geological engineering major from Pueblo, Colo.; and Austin Trout, mining engineering management major from Freeburg, Ill.

Andrea Brickey, Ph.D., from the Department of Mining Engineering & Management, is faculty advisor for the Mines team.