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Texas A&M at Qatar siblings intern with CERN Detector Technology Program

A brother and sister student duo from Texas A&M University at Qatar spent their summer holidays working as interns for eight weeks in CERN's Detector Technology Program in Switzerland.

Shaikha Al-Qahtani and Abdulaziz Al-Qahtani, both electrical engineering majors, are the third and fourth Qatari students to participate in the prestigious program, thanks to funding from the Qatar National Research Fund (QNRF).

While at CERN, Shaikha worked in Geneva on the Large Hadron Collider (LHC) ATLAS detector, one of the two large, general-purpose particle detectors that aim to discover new particles and find answers to several unanswered questions in the field of physics. During the program, she was involved on a team working on a type of detector called resistive plate chambers. She developed a software tool to monitor the chambers to detect any weak or dead chambers and locate them for repair.

Abdulaziz worked on CERN's other large particle detector, the Compact Muon Solenoid (CMS), which is located across the border in France from the Al-Qahtanis' lodgings in Geneva. Every day, Abdulaziz rode his bicycle to and from his office — 30 minutes each way — and lost 15 kg during his eight weeks in at CERN. During his internship, Abdulaziz created a code that treats raw experiment data files so scientists can get other measurements in the CMS's cathode strip chambers exposed to long-term irradiation.

For Shaikha, the internship was life-changing.

"This is one of the experiences I never thought I would be able to do," she said. "To travel out of Qatar for two months, living on my own. And after this experience, I know 100 percent that I want to get my Ph.D. Learning never stops and I love research. It's the new things that you learn, the new possibilities research provides, the opportunity to work with world-class scientists and Nobel Prize winners."

Abdulaziz said he also would like to continue his education after he graduates from Texas A&M at Qatar.

"The purpose of the LHC at CERN is to recreate the first moments of the universe after the Big Bang," he said. "Before I went to CERN, I had a completely different

idea about research. I never considered getting my master's degree but now that's what I want to do. What started as routine for me quickly became joy. I would go back again as often as I can. It was one of the top 10 experiences of my life."

The Al-Qahtanis — whose two older sisters also graduated from Texas A&M at Qatar with degrees in electrical engineering — were nominated for the program by Dr. Othmane Bouhali, research professor and director of research computing at Texas A&M at Qatar. Bouhali leads Texas A&M at Qatar's endeavors with CERN where he has contributed for the past 20 years. In fact, Abdulaziz said during one of his tours of the facilities, he saw Bouhali's name listed on a display wall along with other longtime CERN contributors and pointed it out to the rest of the group.

"None of the other interns I was with had one of their professors' names on the wall. That was really special," Abdulaziz said.

The CERN summer program is offered to students studying physics, computing or engineering, and allows them the unique opportunity to join the day-to-day work of research teams in Geneva, Switzerland. CERN, founded in 1954, is the largest research center in the world for nuclear and high energy physics research.

Texas A&M at Qatar dean Dr. César O. Malavé said, "Transformative educational opportunities such as international internships provide students with real-world, hands-on experiences that enhance the value of their degrees. We encourage our students to seek out these opportunities, which help to better prepare students for the workplace after they graduate and give them valuable skills they will need to lead Qatar's engineering future. Shaikha and Abdulaziz were given this wonderful opportunity that has previously only been afforded to two of our students, and we are proud of them for taking on this challenge."

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About Texas A&M University at Qatar

Since 2003, Texas A&M University has offered undergraduate degrees in chemical engineering, electrical engineering, mechanical engineering and petroleum engineering in Qatar Foundation's Education City, and graduate degrees in chemical engineering since fall 2011. Texas A&M at Qatar has awarded nearly 850 degrees. All four undergraduate engineering degree programs are accredited by the Engineering Accreditation Commission of ABET. Faculty from around the world are attracted to Texas A&M at Qatar to educate the next generation of engineering leaders in Qatar and to conduct research valued at more than \$236.4 million that address issues important to the State of Qatar. Visit www.qatar.tamu.edu.