

International research university opens in Saudi Arabia

The well-funded, strategically executed yet isolated experiment could fly or flop.

Are money and faith enough to build a world-class research institute? That is the hope driving Saudi Arabia's new King Abdullah University of Science and Technology.

On 23 September KAUST officially opened its doors in a glitzy, high-security inauguration ceremony, whose roughly 3000 guests included King Abdullah bin Abdulaziz Al Saud, many other royals and dignitaries from Saudi Arabia and beyond, academics from around the world, and a few hundred journalists.

The university is the realization of a quarter-century-old dream of the king, who launched it with a \$10 billion endowment (see *PHYSICS TODAY*, August 2007, page 33). "Throughout history, power has attached itself, after God, to science. And the Islamic nation knows too well that it will not be powerful unless it depends on, after God, science," the king said in his KAUST inauguration speech. "Humanity has been the target of vicious attacks from extremists. Undoubtedly, scientific centers that embrace all peoples are the first line of defense against extremists. And today this university will become a house of wisdom to all its peers around the world, a beacon of tolerance."

Lavish conditions

KAUST, a graduate-level research university, is made up of interdisciplinary centers in energy and environment, bioscience and engineering, materials science and engineering, and applied math and computational science. The idea is to do basic research with an eye toward issues relevant to Saudi Arabia, such as solar energy and water desalination. So far, some 817 students have been admitted from among more than 7000 qualified applicants. Nearly 400 of them joined 71 professors this fall at the new campus, a self-contained enclave on the Red Sea some 80 km north of Jeddah; the rest will start in January. KAUST's goal is to grow to around 2000 students and 250 professors within a decade. The incoming student body represents 61 countries, with the largest fraction of students from Saudi Arabia (15%), followed by China (14%),

SCOTT NELSON/KAUST



Desert rising. About 3000 people attended the inauguration (above) in Saudi Arabia of a new university that went from paper to people in less than three years. The 60-meter-tall beacon in the university's Red Sea harbor (below) is inspired by traditional Arabic art and architecture while also nodding to the present with individually unique bricks that form a geometric pattern representing carbon, a basic building block of life.

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Mexico (11%), and the US (8%). The top countries of origin among faculty are the US (20%), Germany (10%), and Canada and China (8% each). About 20% of the students and close to 10% of the faculty are female.

A key attraction for western scientists is the top-of-the-line equipment. KAUST boasts Asia's most powerful supercomputer—"Shaheen," the 14th most powerful worldwide; a three-dimensional visualization computer cave; 10 nuclear magnetic resonance instruments; and facilities for analytical chemistry, coastal marine science, and nanoscale fabrication, imaging, and characterization. "The extent of the instruments is remarkable," says facilities director Tony Eastham. "We are fortunate to equip the university at startup. That's the only way one could get so much new equipment at one time."

The generous conditions add to the lure: For now at least, students receive free tuition, housing, and textbooks, and for the first few months food is free at Burger King and other international fast-food restaurants on campus. On top of that, master's and PhD students receive stipends of roughly \$20 000 and \$40 000, respectively, and a paid visit home. Despite the competitive application process, some students came from schools that are not up to Western standards or that do not offer courses in specific disciplines. For example, says KAUST geophysicist Gerard Schuster, "in my basic seismology class I must go slower than I did at Utah because at least half the students are not from traditional geophysics-related backgrounds."

Schuster left his tenured position at the University of Utah "for the excitement of starting a new university." He was concerned about his continued computing access at Utah, and "with the collapse of the economy, my pension fund was reduced by 40%. One night, in a desperate situation, I e-mailed KAUST. A week later they asked me to come interview at UT Austin"—one of 42 partner universities that is helping KAUST to recruit. After 24 years at the University of Utah, Schuster moved to KAUST with a research associate, a postdoc, and several PhD students. The financial conditions are much better at KAUST, Schuster says, but he and others declined to elaborate. Among other perks, faculty members get generous research funding; free cell phones, laptops, medical insurance, and housing; and paid annual round-trip flights to anywhere in the world for their families.

Something Schuster did not foresee was the intensity of interactions with his new colleagues. "Over the month that the 70 or so faculty members have been here, we have all gotten to know each other. We have a certain bonding. It's both personal and professional. It's stirring the pot," he says. "We are starting to form collaborations with the visualization center and the Shaheen supercomputer group. I think we'll see some really good stuff come out of that." Scientifically, he adds, "I will have the same or better supercomputing capabilities here."

Challenging the status quo

Still, no one denies that KAUST faces hurdles. For example, says Schuster, one of the PhD students he had hoped to bring with him was a woman from China who didn't come because of perceptions of how women fare in Saudi Arabia. And Schuster says there are "stiff headwinds" to set up a consortium of oil companies like what he had in the US to sponsor long-range seismic research. "[The oil companies] have to be convinced [KAUST] is an independent university. They have to abide by rules for sending money to the Middle East. They join to have access to first-rate students, so another potential barrier is whether KAUST graduates will be able to get visas to work in the US."

The king and the KAUST community hope that the university will join the world science scene and that it will have a big impact in the region. KAUST "has a lot of potential," says John Burgess, a former US diplomat to the Middle East who now blogs about Saudi Arabia (<http://www.xrdarabia.org>). "But its success is predicated on three things." First, he says, King Abdullah has to live long enough for the university to become well established; the princes in line to succeed the 85-year-old king are more conservative and may not make education a priority. Second, because KAUST challenges many Saudi customs—for example, women and men study and work together, there is no strict dress code, and women are permitted to drive on campus—it is a potential target for terrorists, "so its success rests on Al Qaeda and other terrorist groups not regaining strength." And third, Burgess says, time will tell if the country's religious conservatives are satisfied that KAUST is "not too great a challenge to the social status quo."

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