

## OPEN SESAME

The SESAME synchrotron near Amman, Jordan, will start circulating beams in December. But it will initially use only a fraction of its potential capacity.

## MICROTRON

Electrons accelerated to 22 megaelectronvolts.

## BOOSTER RING

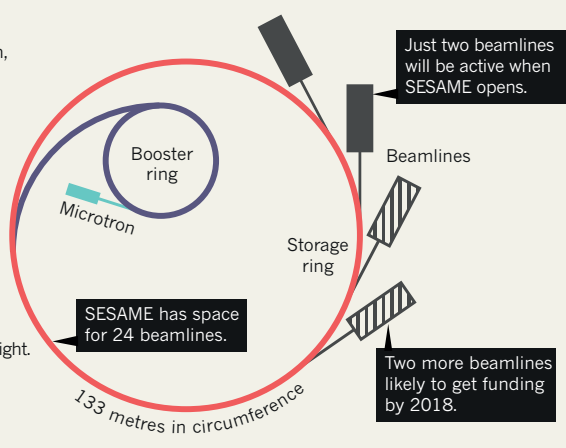
Electrons further accelerated to 800 megaelectronvolts.

## STORAGE RING

Electrons circulate at 2.5 giga-electronvolts, and start to emit light.

## BEAMLINES

Optical instruments tailor the light and use it to investigate samples.



► structure of materials, biological samples and artefacts down to the atomic scale. SESAME has space for 24 beamlines. The plan was initially to open with four of the slots filled, but a lack of funding means that it will open with just two — one infrared and one X-ray.

“SESAME is in a part of the world where you have very difficult times politically, and a lot of instability, and the money just didn’t come,” says Toukan. Iran couldn’t pay its contribution until January, owing to sanctions that prevented it from transferring money internationally. Cyprus has not paid its share of the running costs since it was hit by a financial crisis in 2011, says Toukan, and Pakistan has paid only half of its dues this year. Jordan and Turkey are the only countries to have paid their annual and capital contributions in full, he says. Politics has touched SESAME, too: two Iranian physicists killed in car-bomb attacks in 2009 and 2010 were members of its council.

Still, engineers are expected to have finished testing the synchrotron by May, and a group of 260 researchers, largely from universities in the Middle East and in fields from pharmacology

to physics, will then be able to apply for time on the two beamlines.

Toukan hopes that the facility will ease brain drain from the region, boost collaboration between the scientific community and industry and create opportunities for researchers who lack the funds to leave the Middle East.

Because of its proximity to many of the world’s archaeological treasures, the facility presents a fresh opportunity for studying the region’s cultural heritage. Jan Gunneweg, an archaeometrist at the Hebrew University of Jerusalem, hopes that scientists will use SESAME to collaborate on understanding their shared history. Many artefacts — such as Egyptian mummies and delicate papyrus — are fragile and must be insured at high cost if they are to travel long distances. “If that material has to go in the air, you destroy it,” says Gunneweg.

He wants to use the synchrotron to further his studies of the composition, and therefore origins, of parchments including the Dead Sea Scrolls, the oldest known biblical texts.

SESAME cost around US\$110 million to build, just one-sixth of the price of the European

Synchrotron Radiation Facility in Grenoble, France, one of the world’s most advanced synchrotrons. Pared-back ambition helped, but SESAME also relied on parts donated from dismantled European facilities, and was built on land that was given for free.

Two more beamlines are due to be installed by the end of 2018. SESAME has secured \$2 million from the Jordanian Scientific Research Fund for its third beam, which will perform protein crystallography. And Toukan is confident that the collaboration will find funds for a fourth beam dedicated to materials science.

Beyond these four beams, there is no set schedule for filling the remaining 20 slots. “A few tens of million of dollars could make this dream come true,” says Roy Beck, a biophysicist at Tel Aviv University in Israel and a committee member of the SESAME users’ group. He laments that more nations have not been willing to swallow national differences for the sake of science. Some Gulf countries will not take part because of Israel’s participation, he says, and the United States has made only a small contribution, which both Beck and Toukan attribute to political considerations (see page 468).

Advocates hope that SESAME will foster peace in the same way that CERN, Europe’s particle-physics laboratory, near Geneva, Switzerland, helped to heal the wounds of the Second World War and brought Soviet and Western scientists together at the height of the cold war.

But crucial factors in that success were CERN’s communal spaces, where scientists could share a coffee and get to know each other, says Beck. SESAME is scheduled to open without a cafeteria or dedicated accommodation, although a committee is trying to raise US\$32,000 in donations to create the former.

“I hope people from all round will understand that this is a true chance for people within the Middle East to join hands and talk about things that unite them,” says Beck. ■

## SOCIETY

# Immigrant and minority scientists shaken by Trump win

*Worries include job prospects, discrimination — and safety.*

BY HEIDI LEDFORD, SARA REARDON & RAMIN SKIBBA

As the US presidential election results rolled in, Naglaa Shoukry watched a door slam shut. An immunologist at the University of Montreal in Canada, she had been contemplating a move to the United

States in search of better research funding. But when Donald Trump clinched the presidency, she knew that she would probably not go.

Shoukry, a Muslim from Egypt, did post-doctoral research in Ohio and was there when the United States tightened security after the terrorist attacks of 11 September 2001. When Trump pledged to use “extreme

vetting” to determine which immigrants could enter the country, Shoukry recalled the humiliations her family experienced when travelling to see her in Ohio. “You have an interesting name,” a US border official once told her brother, Mohamed, before detaining him for extra security checks. Under Trump, Shoukry decided, it would surely be worse.

Shoukry is not the only scientist shaken by the result of the 8 November election, nor is she alone in reconsidering whether to work or study in the United States. Trump's campaign rhetoric was at times insulting to women, immigrants and under-represented minorities, and there are signs that his victory has further inflamed racial tensions. The Southern Poverty Law Center, a civil-rights advocacy group in Montgomery, Alabama, collected 437 reports of intimidation and harassment in the five days after the election — many of which explicitly referenced president-elect Trump. Fifteen per cent of the incidents reported to the centre took place at universities.

Such events have led several universities and scientific societies to reaffirm their commitment to diversity. "Take concrete steps to protect and advocate for colleagues and students who are particularly vulnerable right now," urges a letter signed by ten astronomers on the Astronomy in Color blog, which advocates for diversity in the field. "We must reiterate how absolutely essential it is to the core values of our community, and also to the well-being of our society and world, that all persons be treated with the dignity and respect they deserve," wrote Amy Gutmann, president of the University of Pennsylvania in Philadelphia, when black undergraduates there received racist e-mails after the election. "We all stand together in solidarity with our Black students."

Still, scientists around the country have reported harassment. Mónica Feliú-Mójer, a science communicator originally from Puerto Rico, is nervous about speaking Spanish in some public places after hearing a passer-by shout "Build that wall!" — referencing Trump's plan to build a wall along the US–Mexico border. The 12 November incident took place in San Diego, California, where Feliú-Mójer was attending the Society for Neuroscience annual meeting.

Patrick Freeman, an ecologist at the Carnegie Institution for Science in Stanford, California, was out driving on the day after the election when a person in a truck with a Trump bumper sticker started honking at him — perhaps because Freeman's car sports a sticker in support of Trump's Democratic opponent, Hillary Clinton, and of lesbian, gay, bisexual, transgender and queer people. The truck driver pulled up alongside Freeman and repeatedly pantomimed shooting him before speeding away.

For some scientists, the post-election atmosphere has been stifling. Nicole Cabrera Salazar, an astronomy graduate student at Georgia State University in Atlanta who was born in Chile, says she is mindful that her field is dominated by white males — and that 63% of white males who voted supported Trump. Cabrera Salazar was once outspoken in support of marginalized students, but she has begun to hold back for fear of a backlash. "It's a toxic environment for women of colour," she says.



Donald Trump has taken a hard-line stance on US immigration.

Some foreign researchers even question whether to travel to the United States for conferences. Shaaban Mousa, an anaesthesiologist at Charité University Hospital in Berlin, comes to the Society for Neuroscience meeting every year, but considered skipping it this year because of the election result. "I was not relaxed," he said last week at the meeting. "I came because I have my ticket." And Razi Nalim, an engineer at Indiana University–Purdue University in Indianapolis, worries that he'll have difficulty recruiting Muslim students and postdocs to work in his department.

**"'Why are you still here?' a man shrieked. I think he meant: 'Why are you still here after Trump's election?'"**

About 2% of scientists in the United States are Muslim immigrants, according to a survey of biologists and physicists led by Elaine Howard Ecklund, a sociologist at Rice University in Houston, Texas. And 64% of them say they have experienced religious discrimination — a higher proportion than for any other racial or religious group in Ecklund's study. The US Federal Bureau of Investigation's annual hate-crimes report suggests that number may grow: hate crimes against Muslims in the United States climbed by 67% last year.

But several Muslim scientists contacted by *Nature* still feel comfortable in the United States. Some, such as a husband and wife studying neuroscience at the Medical University of South Carolina in Charleston, were pleased

to see Trump win. "It's a good change for the US," says the husband, who asked not to be named over concerns with his career. He and his wife say that they have never experienced racism or Islamophobia during their time in South Carolina — a state where Trump won 55% of the vote — and they have been shocked by mass e-mails from their professors calling Trump supporters racist and hateful.

Shoukry says that some of her Muslim colleagues in the United States are troubled by the thought of raising children in an increasingly hostile environment. Islam Hussein, an Egyptian virologist who is a research scientist at the Massachusetts Institute of Technology in Cambridge, says his children were nervous about going to school the day after the election. But after a decade in the United States, Hussein wants to stay. His family has always felt welcome, he says, and his wife, who wears a hijab, has a flourishing career as a pre-school teacher. After the election, friends rushed to offer the family support. "This is the spirit of America that we should all keep embracing," Hussein told *Nature* on 14 November.

The next day, Hussein contacted *Nature* again: his wife had just been accosted at their local pharmacy. "Why are you still here?" a man shrieked at her, then hopped into his car and fled. "I think he meant: 'Why are you still here after Trump's election?'" says Hussein. "This is the first explicit act of discrimination we have encountered in ten years." ■

*Additional reporting by Erika Check Hayden.*