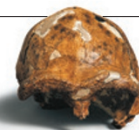


NEWS IN FOCUS

TECHNOLOGY Mobile-phone expansion threatens weather satellites **p.208**

NEUROSCIENCE Data gold mine could reveal how neurons compute **p.209**

PUBLISHING Tide turns against controversial impact factor **p.210**



EVOLUTION Chinese fossils challenge ideas about human origins **p.218**

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Student protests at universities have thrust South Africa's research into an unwelcome spotlight.

RESEARCH AND SOCIETY

South African universities awash in political turmoil

Campus violence around the country has taken a toll on research activities.

BY ERIKA CHECK HAYDEN

South Africa's universities have long been viewed as among the strongest in sub-Saharan Africa. But ongoing financial and political turmoil are endangering research at the nation's centres of higher learning.

It is an extension of the overall crisis that currently faces South Africa. The country's economy is in tatters, with its currency falling in value, and a corruption scandal has weakened President Jacob Zuma and his ruling political party. The upheaval is an unwelcome backdrop to the upcoming 21st International

AIDS conference in Durban on 18–22 July (see page 214).

Funding cuts have threatened agencies such as the South African Medical Research Council (MRC), and have harmed researchers' abilities to run their labs and recruit young scientists. They have also delayed planned projects at South African universities. The MRC is fighting a 7% budget cut for 2017–18, says council president Glenda Gray, and probably more cuts the year after. "This would be devastating," she says. "By cutting off science funding, you cut off your ability to be globally competitive."

But the true effects have not yet been felt,

says vaccine researcher Shabir Madhi, executive director of South Africa's National Institute for Communicable Diseases in Johannesburg. He worries that young scientists' careers will sputter as a result of funding shortfalls, because junior researchers depend on government and university money to launch their programmes. Long-established scientists draw much of their research funding from outside South Africa and are less affected by the cuts.

Attempts by universities to compensate for slashes to funding have been challenged, sometimes violently. A proposed 10.5% fee hike at the University of the Witwatersrand ►

► in Johannesburg last October sparked a student protest movement, known on social media as the “#FeesMustFall” campaign. The protests spread to other universities, which had also proposed fee increases of 10–12%. The movement successfully squashed the hikes, and protestors are now pressing for free tuition at all South African universities.

Without fee increases, however, universities are facing immediate budget shortfalls, which have forced them to make widespread cuts. Astronomer David Block at the University of the Witwatersrand says that he and his colleagues were told at a faculty meeting last month to save money by cutting their use of water, heat and electricity. Earlier this year, he attempted to recruit a promising postdoctoral researcher, but failed because his department lacked money for new hires. “It really has reached a crisis — we’re under tremendous strain.”

UP IN SMOKE

Projects such as a programme to train vaccinology researchers at various institutions, including the University of the Witwatersrand, have had to find outside funding — a temporary stopgap.

Researchers are also worried about access to infrastructure, ever since protests ahead of municipal elections on 3 August led to campus vandalism. Unrest in January shut down University of Pretoria campuses for weeks, and in February, the Potchefstroom campus of North-West University was closed after students torched administration buildings, including a science centre. In May, arsonists burned down a historic auditorium at the University of Johannesburg.

Researchers and university administrators worry that political violence is becoming a new normal. During some of the worst mayhem, in May, Alta Schutte, director of the hypertension unit of North-West University said, “When I go home every day, I am a bit concerned that when I come back, my office, my lab, my hypertension clinic or my biobank will not be there.”

The protest movement is a response to the nation’s persistent inequality. “An upper-middle-income country like South Africa should widen access to education,” says cardiologist Bongani Mayosi at the University of Cape Town. But the violence and intimidation have gone too far, he says.

Danie Visser, deputy vice-chancellor for research and internationalization at the University of Cape Town, agrees. “We are probably at a critical juncture: if the country is able meaningfully to address the issues that brought about the student protests in the first place, our universities — and therefore also our research — will survive and flourish.” ■



Severe-weather forecasts deteriorate when wireless broadband interferes with satellite transmissions.

METEOROLOGY

Interference puts satellite data at risk

US plan to expand mobile-phone bandwidth raises alarm.

BY ALEXANDRA WITZE

As Hurricane Patricia barrelled down on Mexico last October, forecasters at the US National Oceanic and Atmospheric Administration (NOAA) grabbed as many satellite images as they could to track its progress. But at least one crucial shot failed to download. A 22 October image from the Geostationary Operational Environmental Satellite (GOES) system showed a black swathe — no data — across most of the Pacific Ocean.

“You couldn’t even see the hurricane,” says Al Wissman, chief of data management and continuity operations for NOAA’s satellite and information service in Silver Spring, Maryland. “That’s how devastated the imagery was.”

The culprit was radio interference from mobile-phone companies. And the problem may soon get worse. The US Federal Communications Commission (FCC) is considering whether to allow a satellite-communications company to share a crucial, additional set of frequencies that NOAA uses for time-critical weather transmissions.

If the application is granted, Ligado Networks of Reston, Virginia, will begin transmitting at frequencies between 1,675 and 1,680 megahertz. That overlaps with the communications range of NOAA’s next

generation of GOES satellites, starting with the game-changing GOES-R probe that is set to launch in November. The satellite will transmit in three times the number of channels as do current satellites, providing images with four times the current resolution, and it will scan for weather events five times faster.

Last month, emergency managers, pilots, private weather forecasters and other groups flooded the FCC with letters arguing against the change. Researchers will discuss the proposal at a meeting of the American Meteorological Society (AMS) in Tuscaloosa, Alabama, on 21 July.

Wireless broadband has been a boon for meteorologists, who can now send crucial tornado, hurricane and other alerts directly to people’s smartphones. “But it can’t come at the risk of interrupting important weather communications that are used in order to be able to deliver the most accurate and reliable forecast,” says Jonathan Porter, vice-president of innovation and development at the private forecasting company AccuWeather in State College, Pennsylvania. Porter also chairs an AMS committee on spectrum allocation.

In general, the US government sets aside swathes of radio frequencies for purposes that protect safety and national security, such as weather forecasting. But in 2010, President Barack Obama told the various agencies

RICKY CARIOTI/WASHINGTON POST

CORRECTION

The article 'Interference puts satellite data at risk' (*Nature* **535**, 208–209; 2016) wrongly stated that William Mahoney would lead a panel on spectrum-sharing at an American Meteorological Society meeting later this month. Jonathan Porter is the panel chairman. In addition, it did not make it clear that Ligado Networks is a satellite-communications company.