TONY KARUMBA/AFP VIA GETTY

Violence to women in protest exposed

Violence is widespread towards people protesting against harm caused by the extraction of natural resources, particularly in marginalized communities. But the impact of such violence on women is seldom documented. Writing in *Nature Sustainability*, Tran and Hanaček analyse more than 500 instances of social conflict involving environmental defenders who are women, taken from a database called the Environmental Justice Atlas. The investigation teases out nuanced correlations between forms of violence and the circumstances in which they occur (D. Tran and K. Hanaček *Nature Sustain.* https://doi.org/gsbjz3; 2023).

In 81 of the cases studied by the authors, the women involved were killed, but Tran and Hanaček also examined cases in which women were displaced, repressed or otherwise targeted in a violent manner. Their study shows that violence towards women engaged in environmental activism is most prevalent in countries that have a low regard for the rule of law. But the data also suggest that such violence occurs irrespective of the robustness of a country's legal system or how highly the nation regards gender equality.

Abigail Klopper

Quantum information

Quantum computer scales up by mitigating errors

Göran Wendin & Jonas Bylander

A post-processing technique for handling errors has enabled a quantum computer comprising 127 quantum bits to calculate the physical properties of a complex model system – a task that cannot be performed by a classical computer. **See p.500**

The idea that quantum computers might one day solve complex problems at lightning speed on microscopic chips has long been touted. But the race to show that these processors can outperform their classical counterparts is a difficult one, in which every success is cause for celebration. On page 500, Kim *et al.*[1] report a quantum-computational feat that is well beyond the capability of classical simulation: the determination, using 127 quantum bits (qubits), of the magnetization of a model quantum material. The system's fundamental advantage pertains to scale rather than speed: no classical computer has enough memory to encode the possibilities computed by the 127 qubits.

A quantum computer that can outperform a classical computer is said to display quantum advantage, but this is an elusive concept with many facets. It was once synonymous with the idea that a quantum processor could accelerate computation exponentially, by using the fact that qubits can encode a superposition of entire memories containing the 1s and 0s that store information in conventional computers. Over time, it has come to refer to more-modest quantum speed-ups in the computing times of algorithms used in chemistry, materials and logistics research[2].

Developing the full potential of quantum computers requires devices that can correct their own errors. Such errors occur all too frequently, and correcting them is a difficult task needing a large, multidisciplinary engineering effort. The resulting systems, known as fault-tolerant quantum computers, will consist of thousands of high-quality qubits, held in check by an exquisite control system. But is it possible to achieve useful quantum advantage in the interim, before accomplishing full fault tolerance?

It has been conjectured that some meaningful problems can be solved without quantum error correction, using an approach called noisy intermediate-scale quantum computation[2]. This technique encodes the problem in qubits that need not be perfect, in a state that