has raised about USD$435 million and is valued at USD$4.5 billion, according to White. "We're exporting great people," he said. "What we need to do is develop an ecosystem where we can retain them so they can flourish here."

Morle agreed, saying that companies in Australia need to be appropriately funded in order to attract talent.

Quantum industry insights

In order to compete globally, Australia's quantum industry needs to work fast—including international collaborations that enable this speed—and pull together resources from academia, government, and industry, according to the panelists. They advocated for government funding, an encumbered IP so that university work and industry or entrepreneurial work is separate, and international collaboration that utilizes expertise globally in addition to national expertise in order to compete globally.

Michelle Simmons, Scientia Professor and Australian Research Council (ARC) Laureate Fellow at the University of New South Wales, Sydney, director of the Centre of Excellence for Quantum Computation and Communication Technology at ARC, and the founding director of startup company Silicon Quantum Computing Pty. Ltd. (SQC), described the global competition as "the case of the tortoise and the hare. We very much see ourselves as a tortoise in this game."

Launched in 2017, the stated goals of SQC are a 10-qubit prototype quantum integrated processor by 2023, a 100-qubit quantum processor with error correction before 2030, and a universal quantum computer by the mid-2030s. SQC specializes in precisely positioning phosphorus atom qubits hosted in silicon. Qubits in this type of semiconductor platform are sensitive to charge noise. In August, Simmons's research group reported a significant reduction in charge noise. According to their news release, the researchers revealed that the presence of defects either within the silicon chip or at the interface to the surface were significant contributors to the charge noise. They published this latest work in *Advanced Materials* (doi:10.1002/adma.202003361).

During the webinar, Simmons said that Google and IBM quantum systems use the superconductor platform, which will run into problems during scale-up. She believes the strength in her company is in developing atomically engineered qubits where they "can engineer each aspect of the actual device itself. This allows us to focus on generating the best quality qubits, the lowest noise qubits, and the fastest qubits."

"The potential of quantum is going to be pervasive," said Foley. "We're already seeing it, and it's accelerating."

Judy Meiksin

South Africa's Platinum Valley project to pull hydrogen initiatives into one ecosystem

South Africa plans to establish a Platinum Valley that will serve as an industrial cluster bringing various hydrogen applications in the country together to form an integrated hydrogen ecosystem. The initiative is part of the government's economic recovery plans.

South Africa's version of a "hydrogen valley" will identify concrete project opportunities for kick-starting hydrogen activities in promising hubs, with the aim of boosting economic growth and job creation, spurring the development of new industries, increasing the valorization of the country's platinum reserves, and reducing its carbon footprint.

The industrial corridor project will start in a platinum group metals (PGMs) mining area in Limpopo, including the Limpopo Province Science and Technology Park, and continue through the Johannesburg-to-Durban corridor.

The Platinum Valley will also allow South Africa to showcase its recent achievements in supporting the sustainable extraction, processing, and recycling of PGMs, which are essential for low-carbon technologies throughout the value chain. South Africa has 75% of the global reserves of PGMs, which form a key input into proton-exchange membrane fuel-cell technologies.

In another development, the Department of Science and Innovation has given the thumbs-up for the development of the National Hydrogen Society Roadmap for South Africa in line with the Hydrogen South Africa (HySA) Strategy.

The vision of the HySA Strategy is to use local resources to create knowledge and human resource capacity, enabling the development of high-value commercial activities in hydrogen fuel-cell technologies.

The roadmap will set out the plan for creating an inclusive hydrogen society in South Africa, so that an enabling compact between industry, labor, communities, and the government can be developed. This will enable the government and industry to draw up a policy framework for exploiting the potential benefits of hydrogen by integrating it into various sectors of the economy.

An Atlas of Green Hydrogen Generation Potentials in Africa is also being developed in order to establish Africa's potential as an exporter of green hydrogen. The atlas will not only identify clean hydrogen potentials in the continent, but will also consider related social, political, climate, infrastructure, policy, and environmental issues. □

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