

The future draws nearer



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Yiwen Chu researches new ways of connecting quantum technologies, with the aim of creating a quantum telecommunications network for the exchange and storage of quantum information.

Planting tomatoes on her balcony, playing the piano, climbing – Yiwen Chu’s leisure activities are no different to those of many other 30-somethings. But the similarities stop there. With her research group for Hybrid Quantum Systems, the young assistant professor aims to build new quantum information systems and help to better understand how our world works at its core.

Charting new territory

Chu has been at ETH Zurich since the beginning of 2019, having previously been a researcher at Yale. The move to ETH was an easy one: “I already knew a lot of people from earlier research collaborations, so I had no problem fitting in,” she explains. She enjoys the freedom and support she receives here for her research: “The current state of development of quantum information processing systems is comparable with the beginnings of the computer age. We are investigating which technologies and parts are necessary in order to facilitate information exchange and store data.” Chu’s research group aims to develop new methods and devices to connect various types of quantum objects and transmit quantum information. The group is also conducting basic research into where the boundaries between the quantum world and the classical world lie.

In September, the young researcher received additional support for her research project in the form of a Starting

Grant from the European Research Council (ERC). Chu's aim is to build a kind of quantum telecommunications network. "This grant is a great confirmation that our work is moving in a promising direction, and motivates us even more," she says.

Applications in just a few years' time

Questions abound - but she has the enthusiasm to match. Chu knew at an early age that she wanted to be a physicist, but not in which field.

"When I first learned about quantum physics, it was mind-blowing," she says. The researcher is convinced that major developments will be possible in the coming years, because not only will we understand the processes of quantum mechanics, we will also be able to really use them, for example in cryptography or to simulate chemical reactions: "I'm fascinated by how we are constantly pushing the boundaries of what is possible. I also love every aspect of my work, from experiments in the lab, through computer calculations to the interactions with colleagues and students."

For Chu, the opportunities for exchange are essential. She is part of the National Centre of Competence in Research QSIT (Quantum Science and Technology), in which 31 research groups from different Swiss institutions regularly exchange ideas about projects and developments. Chu is looking forward to the new physics building HPQ, which she helped to plan: "It will be much easier to work together with other research groups on developing exciting approaches." She also receives input at home from her partner, whom she met during her postdoc work at Yale and who also works in the field of quantum information, at the Paul Scherrer Institute (PSI).

Breakthroughs thanks to perseverance

Chu's most important tip for young scientists is to believe in yourself. "The more successful your research is, the more brilliant the people who surround you. Resilience and perseverance will get you so much further than self-doubt," she says. This attitude has proved effective for this young researcher - her research group is growing and she is confident that the next generation of hybrid devices for processing quantum information will become reality in a few years. And she will definitely be able to benefit from her perseverance during the coming winter, when she plans on learning to ski

Accelerating progress in quantum science

"Just as in the early days of the conventional computer, we are currently finding out which technologies work."

Yiwen Chu

https://ethz-foundation.ch/en/spotlight/uplift_6_portrait/