Contribution ID: **225**   Type: **Talk (invited)**

A quantum future of computation

Monday, 3 December 2018 11:40 (20 minutes)

Still in early development, quantum computing is already overturning our contemporary notions of computational methods and devices. Using new concepts of computing based in quantum physics, quantum computers will be able to solve certain problems that are completely intractable on any imaginable classical computer, such as accurate simulations of molecules and materials, or breaking public key encryption. I will describe the hardware and software architecture of quantum computers and Microsoft's full stack approach, from novel topological quantum bits to real-world quantum applications. I will attempt to dispel myths and hype surrounding the field and present a realistic assessment of the potential of these devices, and the specific application areas on which they are expected to have a large impact.

Presenter Biography

Matthias Troyer is a Principal Researcher in the Quantum Group of Microsoft. After receiving his PhD in 1994 from ETH Zurich he spent time as postdoc at the University of Tokyo before returning to ETH Zurich. There he has been professor of Computational Physics until taking leave of absence to join Microsoft's quantum computing program at the beginning of last year. He is a Fellow of the American Physical Society, a Trustee of the Aspen Center for Physics, and recipient of the Rahman Prize for Computational Physics of the American Physical Society. His research interests span from high performance computing and quantum computing to the simulations of quantum devices and island ecosystems.

Primary author: Dr TROYER, Matthias (Microsoft)

Presenter: Dr TROYER, Matthias (Microsoft)

Session Classification: HPC Technologies

Track Classification: HPC Technology