

---

**THOMAS THEURER**, University of Calgary

*Resource theories of operations*

The question where quantum mechanics differs from classical physics is not only of interest, but has technological implications too. To address it in a systematic manner, so-called quantum resource theories were developed. These are mathematical frameworks that emerge from restrictions that are put on top of the laws of quantum mechanics and single out specific aspects of quantum theory as resources. It is then investigated how these restrictions influence our abilities to do certain tasks, how these restrictions can be overcome, and how the resulting resources can be quantified. Historically, resource theories were mainly focused on the resources present in quantum states. In this talk, I will speak about how these concepts can be extended to quantum operations. This allows us to describe quantum resources that cannot be captured in resource theories of states and leads to various interesting applications.