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Image created at my desk at home, and then edited
in GIMP (graphical image manipulation program).

Images of Research Competition

University of Alberta

Back to back

Semi-finalist (2020)

How do we know the stuff we know?

In physics and engineering, a lot of our knowledge comes from calculations. And when these calculations become difficult, we need tools to perform them.

Fifty years ago, mechanical calculators (pictured left) were the tool of choice, and they allowed us to quickly add, subtract, multiply, and divide numbers. They are reliable, make a heck of a noise, weigh 20 pounds, and they just work. They solved many problems before the advent of the computer, contributing a huge amount to what we know today. But as science progressed, new and faster tools were required.

Today, almost every day, I use my computer (pictured right) to solve the equations I encounter in my research in physics. Don't get me wrong: many of those calculations could, in principle, still be done on the mechanical calculator, but a computer is just faster, quieter, and does not weight as much.

In the background you can see a part of the equation that I solved using my computer. Below it, the mechanical calculator and the laptop stand "back to back," as if they are debating who is better at solving it.