University of Pittsburgh

School of Arts and Sciences
Department of Physics and Astronomy

Pittsburgh, PA 15260
412-624-9000
Fax: 412-624-9163
www.phyast.pitt.edu

Re: KWANT software package

I am enthusiastically in favor of further development and support of KWANT. Our research is experimental low temperature mesoscopic physics on quantum devices such as semiconductor nanowires coupled to superconductors for Majorana fermions and quantum bits. We are currently using KWANT to understand the magnetic field behavior of supercurrent in our devices, a phenomenon which is crucial to understand in order to realize topological quantum bits. KWANT is built just for such complex problems and it offers a simple and intuitive way of re-creating a full nanowire device in the simulation with just a few lines of code.

Furthermore, I am excited about the opportunities KWANT offers in education. I have recently received support from the Cottrell foundation to create a new inquiry-based laboratory course at the University of Pittsburgh. Undergraduate students will perform experiments in modern laboratory settings, working with such recent breakthrough systems as graphene and superconducting qubits, as well as nanowires. As part of the course KWANT will be used to model their devices and understand the data they are getting. This highlights the other aspect of KWANT, as it brings frontier research and complex problems to the level of clarity that it becomes accessible to bachelor program students.

Sincerely,

Sergey M. Frolov
Assistant Professor
Department of Physics and Astronomy,
University of Pittsburgh
Email: frolovsm@pitt.edu
Webpage: http://sergeyfrolov.wordpress.com/