

TRR Guest Scientist Lecture / Seminar

Date/Time: 13.07.2021 / 15 o'clock
Location: Online - Zoom

Dr. Sonia Buckley

*National Institute for Standards and Technology,
(NIST), USA*



Beyond Moore with superconducting and opto-electronic circuits

Abstract:

For the past several decades, silicon electronics in the von Neumann architecture has been the dominant computing paradigm. However, this paradigm can no longer keep pace with our need for compute power and energy efficiency, and different hardware, information carriers and architectures are all being explored. In this talk, I will discuss our work on superconducting and opto-electronic hardware, and how this type of hardware could provide new capabilities for the computers of the future. I will show our progress on developing components in-house at NIST, including semiconductor LED light sources coupled to integrated waveguides for communication, and superconducting single-photon detectors and superconducting electronics for low-power, energy efficient computation. I will further discuss how these components can contribute to neuromorphic and quantum processors, with specific focus on the neuromorphic application. Finally, I will discuss ideas for future exploration in this area, and where I believe some of the most important questions and opportunities remain.

Bio: Dr. Sonia Buckley is a physicist at the National Institute of Standards and Technology (NIST) in Boulder, Colorado in the group of Dr. Richard Mirin and Dr. Sae Woo Nam. The theme of her research is using the physics of emerging devices for new types of computation. Dr. Buckley received her PhD in Applied Physics and MS in Electrical Engineering from Stanford University in 2014, and her undergraduate degree in Physics from Trinity College Dublin in 2009. Her doctoral work was done under the supervision of Prof. Jelena Vuckovic on nonlinear frequency conversion in III-V photonic crystal cavities.

Contact: Jun.-Prof. Tim Bartley
Tim.bartley@uni-paderborn.de