

CSU PHYSICS COLLOQUIUM

“Perspectives of quantum computing with magnons”

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120 Engineering (Hammond Auditorium)

Abstract

Finding new ways for fast and efficient processing and transfer of data is one of the most challenging tasks nowadays. One of the most challenging directions in this area is quantum computing. Thus, it is very important to look for physical systems, which might become companions or even replacements for the current superconducting computing elements.

One of the possible solutions might come from the investigation of magnetic systems and quasiparticles associated with the elementary disturbance of magnetic order – magnons. Large tunability, relatively long lifetimes of excitations, intrinsic nonlinearities, excellent ability to connect to other physical systems and easy creation of macroscopic quantum states like magnon Bose-Einstein Condensate (BEC) – these are some of the main features, which might be used for the advancement of quantum computing.

In this talk, I will summarize some of the main achievements in the field of quantum magnonics and present a recently developed heralded single magnon source concept.

Biography

Dr. Bozhko received his B.Sc. and M.Sc. in physics from the Taras Shevchenko National University of Kyiv in 2013, and his doctorate in physics from the Technische Universität Kaiserslautern in 2017. After postdoctoral work first at TU Kaiserslautern and after that at the University of Glasgow, he joined the faculty of the Department of Physics and Energy Science at the University of Colorado Colorado Springs in 2019, where he now holds the rank of Assistant Professor. Dr. Bozhko is the author of over 34 refereed publications. His experimental studies of magnonics are funded by the National Science Foundation.