

Charles University
Faculty of Mathematics and Physics

Cordially invites you to

23rd Jarník's Lecture
**Balancing Inexactness
in Matrix Computations**

Given by

Erin Claire Carson

(Charles University)

**On Wednesday, October 9, 2024
at 2:30 p.m.**

In Jarník's auditorium (M1),
MFF UK
Ke Karlovu 3, Prague 2

The lecture will be also streamed at:
<https://cesnet.zoom.us/j/98068960141?pwd=p66nRLxAObc1WbgxwB0HyG5gjhBws.1>

Abstract: On supercomputers that exist today, achieving even close to the peak performance is incredibly difficult if not impossible for many applications. Techniques designed to improve the performance of matrix computations - making computations less expensive by reorganizing an algorithm, making intentional approximations, and using lower precision - all introduce what we can generally call "inexactness". The questions to ask are then:

1. With all these various sources of inexactness involved, does a given algorithm still get close enough to the right answer?
2. Given a user constraint on required accuracy, how can we best exploit and balance different types of inexactness to improve performance?

Studying the combination of different sources of inexactness can thus reveal not only limitations, but also new opportunities for developing algorithms for matrix computations that are both fast and provably accurate. We present a few recent examples of this approach, in which mixed precision computation is combined with other sources of inexactness.

Erin Carson is an Assistant Professor at the Faculty of Mathematics and Physics. Her research involves the analysis of matrix computations and the development of parallel algorithms for large-scale settings, with a particular focus on their finite precision behavior on modern heterogeneous hardware. She currently serves as Secretary of the SIAM Activity Group on Supercomputing, as the co-chair of the GAMM Activity Group on Applied and Numerical Linear Algebra, as an Associate Editor of ACM Transactions on Parallel Computing, and as a member of the EuroHPC Joint Undertaking Access Resource Committee. She is the PI of the 2022 ERC Starting Grant inEXASCALE, and has previously been involved in the U.S. Exascale Computing Project.