Keynote by Prof. Dr. Anastasia Ailamaki (EPFL, Switzerland):

Title: **The Next 700 Transaction Processing Engines**

Abstract:

For over four decades, throughput has been the target metric of choice for Online Transaction Processing engines. Around mid-2000s, however, Dennard scaling came to a crushing halt and now multicore processors provide explicit thread-level parallelism as an alternative to frequency scaling for increasing throughput. Thus, OLTP research focuses on developing scalable synchronization techniques for exploiting parallelism provided by multicore processors. In the late 2000s, DRAM price free-fall made it possible to fit a single server with Terabytes of memory, and to fit most operational databases, with the exception of a few rare cases, entirely in memory. This led to a flurry of research on the design of scalable main-memory OLTP engines that adopt radically different designs compared to their disk-based counterparts.

Today, state-of-the-art main-memory OLTP engines can handle millions of transactions per second and provide near-linear scalability under most workloads. However, three recent trends indicate an impending change in OLTP engine design once again: 1) changes in application workloads, 2) shifting hardware landscape, and 3) new target metrics. In this talk, we will discuss the implications of these trends on the design of next-generation transactional engines, and explore new designs with the twin goal of meeting changing application demands and optimizing for the new metrics by exploiting emerging hardware.

Biography:

Anastasia Ailamaki is a Professor of Computer and Communication Sciences at the Ecole Polytechnique Federale de Lausanne (EPFL) in Switzerland. Her research interests are in data-intensive systems and applications, and in particular (a) in strengthening the interaction between the database software and emerging hardware and I/O devices, and (b) in automating data management to support computationally-demanding, data-intensive scientific applications. She has received an ERC Consolidator Award (2013), a Finmeccanica endowed chair from the Computer Science Department at Carnegie Mellon (2007), a European Young Investigator Award from the European Science Foundation (2007), an Alfred P. Sloan Research Fellowship (2005), eight best-paper awards in database, storage, and computer architecture conferences, and an NSF CAREER award (2002). She holds a Ph.D. in Computer Science from the University of Wisconsin-Madison in 2000. She is an ACM fellow and the vice chair of the ACM SIGMOD community, a senior member of the IEEE, and an elected member of the Swiss National Research Council. She has served as a CRA-W mentor, is a member of the Expert Network of the World Economic Forum.