Advancing the Capabilities of the Exascale Computing Project (ECP) Software Stack

Many large-scale applications that are of interest to the DOE and the broader community rely heavily upon preconditioned iterative solvers for large linear systems. In order for these solvers to exploit current and future leadership-class supercomputers, both the solver algorithms and implementations must be redesigned to address emerging challenges. These challenges include extreme concurrency, complex memory hierarchies, costly data movement, and heterogeneous node architectures.

The PEEKS project is a focused effort to advance the capabilities of the ECP software stack by developing new scalable algorithms within the Ginkgo and Trilinos libraries and making them available via the xSDK collaborative ecosystem.

PEEK is part of ICL’s involvement in the ECP, which was established with the goals of maximizing the benefits of high-performance computing (HPC) for the United States and accelerating the development of a capable exascale computing ecosystem. Exascale refers to computing systems at least 10 times faster than the nation’s most powerful supercomputers in use today.