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PGAS concepts for classical HPC programming languages

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PGAS languages are presently being brought forward as an alternative to traditional parallelization approaches, being easier to program with than message passing libraries (due to one sided communication semantics, and integration of the type system), and having potentially much better scalability properties than shared memory directives like OpenMP (due to improved locality control).

This talk discusses the PGAS concepts as they appear in the Fortran 2008 standard (Coarrays), as well as an extension to the C standards (UPC, or Unified Parallel C). After introduction of the basic PGAS features, syntax for data distribution, intrinsic functions and synchronization primitives are discussed. An overview of available implementations as well as their present limitations is given. A discussion of possible future developments for both languages as well as a mention of other PGAS languages completes the talk.

After a PhD in theoretical solid state physics, Dr. Reinhold Bader joined *Leibniz Supercomputing Centre*'s scientific staff in the area of high performance computing in 1999, where since then he has worked in user support and is involved in procurements of new systems, benchmarking, courses for parallel programming and configuration management for the HPC systems.
As a member of the German delegation to WG5, the international *Fortran Standards Committee*, he also takes part in the discussions on further development of the Fortran language.

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