

Project 18/2014: "**Multi-grid parallelization of Numerical Information Field Theory (NIFTY)**"

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Abstract:

Information field theory (IFT) is information theory for fields, describing mathematically how information on spatially distributed quantities can be optimally extracted from data. IFT has been applied to cosmology, particle physics, radio astronomy, X-ray and gamma-ray astronomy, and biophysics. For more specific information see www.mpa-garching.mpg.de/ift. NIFTY is an object-oriented Python library to implement field/signal reconstruction algorithms derived in IFT. A code developed in NIFTY can be applied to N-dimensional Euclidean spaces as well as the 2-sphere in arbitrary resolution. So far, NIFTY is not fully parallelized and therefore NIFTY applications have to run on shared memory computers. The long-term goal is to develop NIFTY into a multi-grid parallelized code, which can exploit supercomputer power. As a pilot study for this, an ongoing 3D Galactic tomography project by us should be parallelized in this project.