The ALF Project

General code for auxiliary-field **quantum Monte Carlo simulations**

***A**lgorithms*
***L**attice*
***F**ermions*

generic **open-source** **efficient**

highly cited **actively developed**

General Hamiltonian

- single-body operators,
- squares of single-body op.
- single-body operators coupled to a scalar field

Flexibility

- model
- Bravais lattice
- observables

High Performance

- parallelization (MPI, OpenMP)
- near-optimal single-core performance
- restart facilities

Ease of Use

- Python interface: pyALF
- extensive documentation
- engaged support

Advanced Features

- parallel tempering
- ground state projective QMC
- global Monte Carlo updates
- continuous fields
- Langevin dynamics updates
- stochastic Maximum Entropy method
- symmetric Trotter decomposition