McStas McXtrace

https://mcstas.org
https://mcxtrace.org
https://github.com/mccode-dev/McCode

Total presentation time is 3 minutes

Team

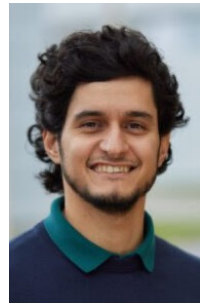
Peter Willendrup
DTU / ESS DMSC

Mads Bertelsen
ESS DMSC

Gregory S Tucker
ESS DMSC

Emmanuel Farhi
Synchrotron SOLEIL

Tobias Weber
Institut Laue-Langevin



José Robledo
FZ Jülich / IAS / JSC

Team Mentors

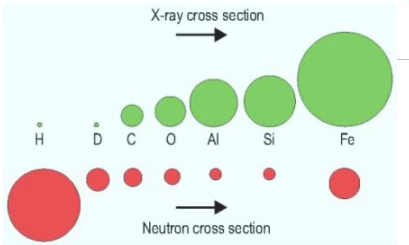
Jan-Oliver Mirus
FZ Jülich / IAS / JSC

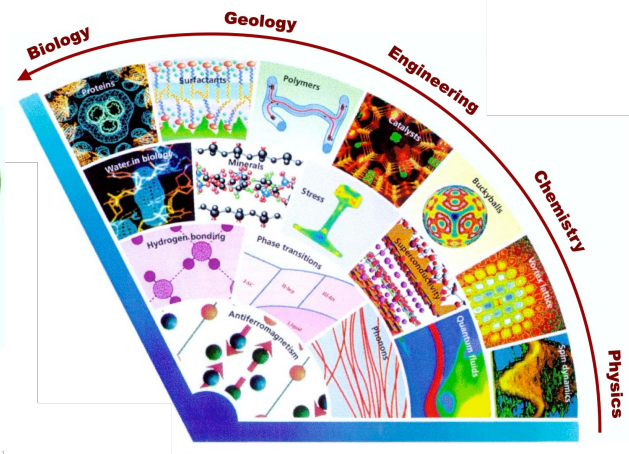
Ilya Zhukov
FZ Jülich / IAS / JSC

OpenACC More Science, Less Programming

OPEN HACKATHONS

McStas (neutrons) and McXtrace (X-rays)





'Particle beams to probe condensed matter', design 'scattering instrumentation' at user facilities.
N: research reactors, spallation sources,
X: labs, synchrotrons, FELs, space telescopes

Tell us about your application:

Algorithmic motif: Monte Carlo ray-tracing

Language is (lex/yacc) DSL → cogen → ISO C

Libraries – mostly 'internal' but some GSL, Xraylib, MCPL, NCrystal

Focus: Compute performance tuning, finding bottlenecks

GPU port via OpenACC, ~ 95% functional via:

Dresden Hackathon 2017, Espoo Hackathon 2019, own efforts.

OpenACC More Science, Less Programming

OPEN HACKATHONS

McStas McXtrace

Goals

Learn to practically use, (master?) the Nvidia profilers/performance tools

Get a better understanding of the limitations of the current implementation

Try to identify obvious bottlenecks

Get ideas!

Hack!

Optimize!

Run simulations!

Have fun! :-)