Supercomputer research

Here are some examples of research areas where PDC's supercomputer systems are used for simulations.

Molecular dynamics

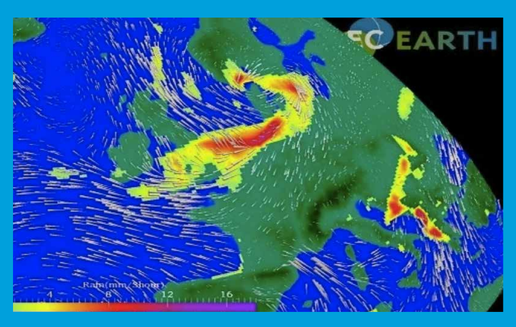
GROMACS @ SciLifeLab

The simulation of molecules and their interactions are a cornerstone in biomolecular and materials science research. Researchers from KTH and Stockholm University develop GROMACS, the leading molecular dynamics simulation code which is used worldwide.

Climate prediction

Climate modelling @ MISU & SMHI

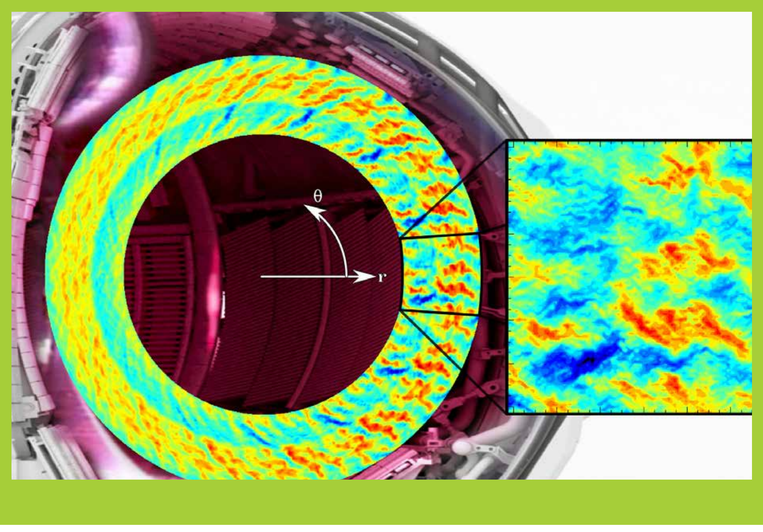
- Conducted global-scale simulations contributing to the IPCC Reports
- Contributing to the development of the EC-Earth global climate model: www.ec-earth.org



Fusion research

Virtual tokamak @ Chalmers

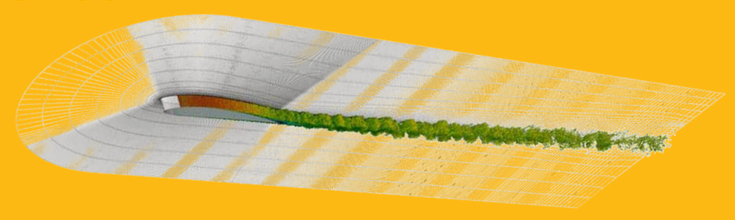
- Simulations of the plasma in a future fusion power plant
- To do real-life experiments with plasma is extremely costly, so simulations are performed to prepare for such physical experiments.



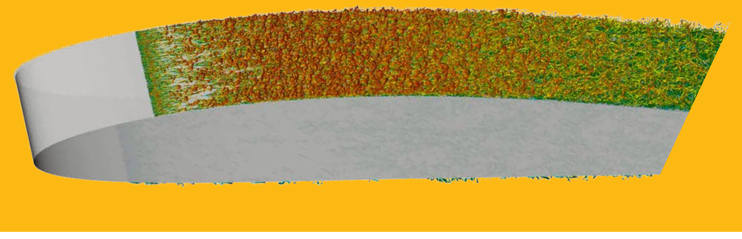
Fluid dynamics

Virtual wind tunnel @ Linné FLOW Centre & SeRC

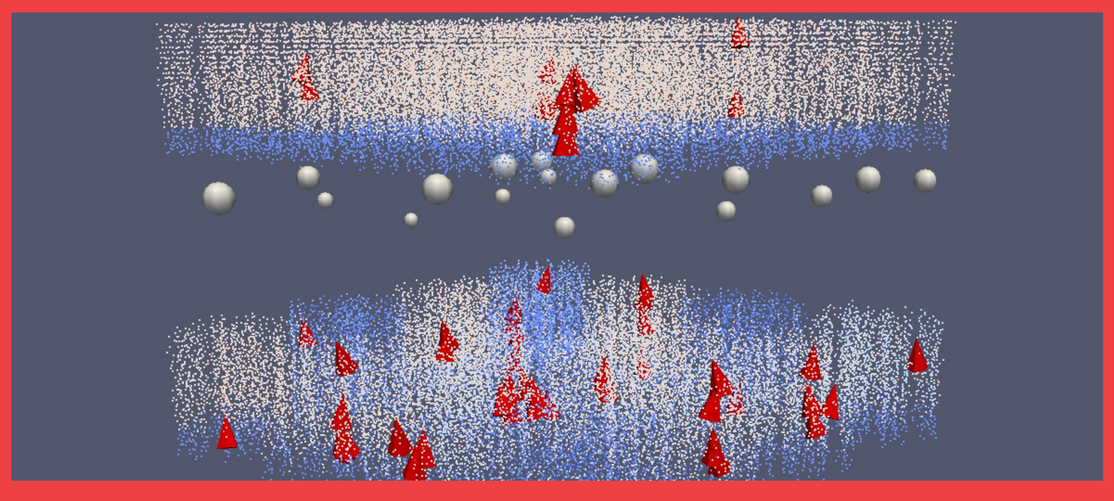
- Large-scale simulations (3.2 billion grid points) to analyse turbulent flow around the wings of aeroplanes



- Replacing physical wind tunnel tests
- Important for decreasing turbulent drag on planes



Understanding the brain



Brain Simulation @ Computational Brain Science, KTH

The human brain is extremely complex. One method to help us understand the brain is to use supercomputers to simulate parts of the brain based on biological descriptions of brain cells. In the future it may be possible to design computers that are based on principles similar to how the brain works.

PDC Center for High Performance Computing SNIC