

WHY ARE SUPERCOMPUTERS IMPORTANT?



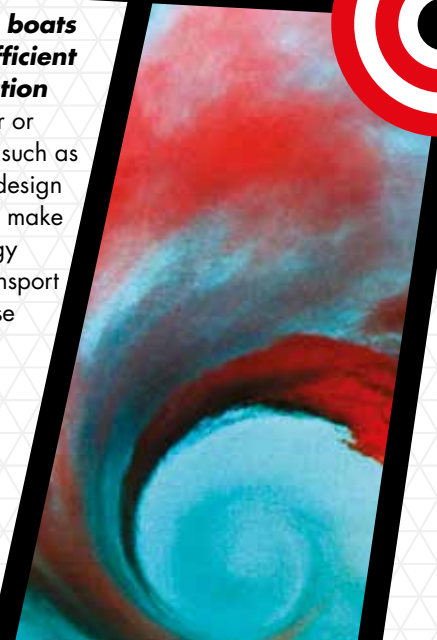
SUPERCOMPUTERS ALLOW US TO UNDERSTAND THINGS THAT ARE TOO DIFFICULT TO SEE OR MEASURE IN REAL LIFE – because they may be too big, too small, too dangerous, too fast, too slow, etc. **If we can understand these things, we can learn more about how our world works and how to make new things.**



Making planes, boats and cars more efficient and reducing pollution

By understanding how air or water flows past an object, such as a boat or a plane, we can re-design these objects to use less fuel and make fewer greenhouse gases. The energy used and the pollution created by transport is a major concern for us today, but these can be reduced by an efficient design.

Wave tanks and wind tunnels have been used for many years to understand how fluids flow around objects, but this can be time consuming and expensive. Modelling the flow of a fluid around a shape on a supercomputer helps scientists to identify, create and test only the most promising designs.

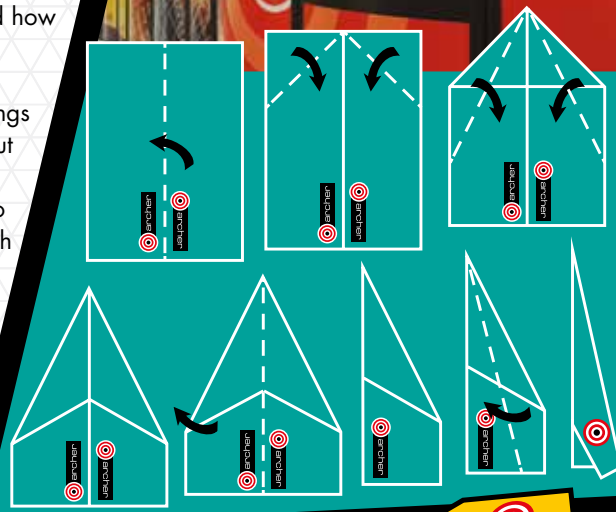


The aircraft wing demonstrator

Our aircraft wing demonstrator allows you to model the flow of air around an aircraft wing. The shape and angle of the wing can be adjusted, which will change the way the air moves around the wing. This can be used to predict how the aircraft will take-off and how far it will fly.

This model allows us to test multiple wings to help identify the best designs, without needing to build every possible wing design. While this is a simple model to demonstrate the concept, this approach is used in many real-world situations.

For example, the UK's National Supercomputer ARCHER has been used to design aircraft landing gear that is more environmentally friendly, both in terms of noise and greenhouse gas emissions.



Further information

This demonstrator has been created by EPCC at the University of Edinburgh. More information on Supercomputing and the science carried out on Supercomputers can be found at:

www.epcc.ed.ac.uk/discover-and-learn

www.archer.ac.uk/casestudies/

ARCHER is the UK National Supercomputing Service. The service is provided to the UK research community by EPSRC, UoE HPCx Ltd and its subcontractors: EPCC and STFC's Daresbury Laboratory, and by Cray Inc. Laboratory. The Computational Science and Engineering (CSE) partners provide expertise to support the UK research community in the use of ARCHER, and researchers can also apply for longer-term software development support through the Embedded CSE (eCSE) programme. The ARCHER CSE partners are EPSRC and EPCC at the University of Edinburgh. This work was supported by EPSRC research grant EP/N006321/1.



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