



THE UNIVERSITY  
OF QUEENSLAND  
AUSTRALIA

# Comparison of GPU programming models for computational fluid dynamics

**Robert Watt** , Peter Jacobs , Rowan Gollan , and Shahzeb Imran  
The University of Queensland

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# The rise of GPUs

Hello

# GPU programming models

## CUDA

- Nvidia's language, for programming Nvidia GPUs
- Based on C/C++ or Fortran

## HIP

- AMD's language for programming AMD GPUs
- Based on C/C++
- Can also target Nvidia GPUs

## SYCL

- Abstraction for heterogeneous programming in C++
- Implemented by the compiler
- Standard owned by Kronos group, a few implementations exist

## Kokkos

- C++ library providing abstractions for parallel programming
- Originally developed by Sandia National Lab, now a Linux Foundation project

## Others

- RAJA, OCCA, ...

## Chapel

- Programming language from Cray/HP for high-performance computing

# Programming models

**CUDA**

**Kokkos**

# Codes

**Chicken**

**Ibis**