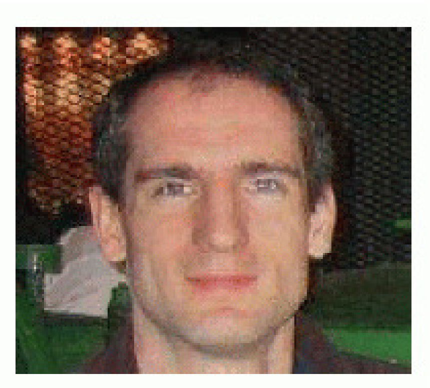
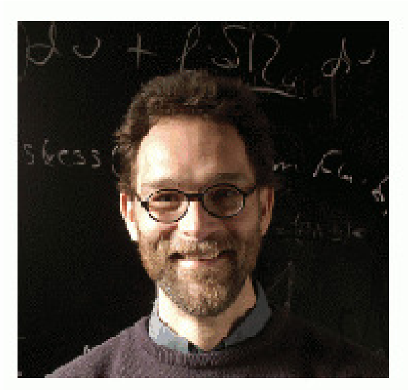
Chapter 1

People

The oomph-lib "architects" are (in no particular order)



Andrew Hazel



Matthias Heil

...assisted by former/current project/MSc/PhD students and collaborators who made (or are still making) significant contributions to the development of the library (listed in reverse chronological order):

- **Patrick Keuchel** worked on forced oscillations and resonances in axisymmetric fluid-conveying tubes.
- **Ben Gavan** worked on mesh adaptation procedures using gmsh.
- **Rupinder Matharu** worked on the simulation of creep processes during the annealing of HDPE materials.
- **Aidan Retallick** works on the simulation of graphene-based pressure transducers.
- **Christian Vaquero-Stainer** did his Masters project on modelling fingering in Hele-Shaw cells with time-dependent gap-widths, and then moved on to this PhD on the subtraction of singularities in the flow past arbitrarily-shaped disk-like objects in Stokes flow.
- **David Robinson** developed and implemented C1 continuous triangular elements for the solution of fourth-order PDES. He used them for the implementation of the Foeppl-von-Karman and Koiter-Steigman plate theories.
- **Thomas Brion, Simon Finney and Hannah Chamberlain** all worked on Foeppl-von-Karman based models of graphene-based microphones.
- **Louis Calot-Plaetevoet** improved the methodology used to transfer solutions between different meshes.

- **Thierry Gonon** implemented the methodology to subtract singular (or non-singular) functions off solutions to the Poisson and Navier-Stokes equations.
- **Chris Johnson** has provided many bug fixes.
- **Puneet Matharu** works on the implementation of geometric multigrid solvers, particularly for Helmholtz equations. He then did his PhD on exotic wakes in the flow past circular cylinders and has become one of the maintainers of oomph-lib,
- **Chihebeddine Hammami** worked on the implementation of Yulii Shikhmurzaev's interface formation theory.
- **Narjes Akriche** worked on pseudo-resonances in acoustic fluid-structure interaction problems.
- **Aman Rajvardhan** worked on implementing surfactant transport equations in two- and three-dimensional geometries.
- **Jordan Rosso** worked on topological fluid mechanics of the the Karman vortex street.
- **Florian Molinier** did some early work on the coupled solution of the axisymmetric free-surface Navier-Stokes equations and the axisymmetric Foeppl von Karman equations.
- **Jonathan Deakin** worked on a glaciology-related melt problem (and has since returned as PhD student to work on the numerical solution of acoustic fluid-structure interaction problems and optimal PML methods. He has since become one of the maintainers of oomph-lib.
- **Draga Pihler-Puzovic** worked on the the coupled solution of the Foeppl von Karman equations and the Reynolds lubrication equation to model wrinkling/fingering in elastic-walled Hele-Shaw cells.
- **Joris Ferrand** worked on the solution of the Foeppl von Karman equations.
- **Harsh Ranjan** worked on multiple solutions of Navier–Stokes flows in curved tubes.
- **Anton Martinsson** implemented the machinery required to output `oomph-lib` data in paraview format, bypassing the need for running the time-consuming tecplot to paraview conversion scripts. He also implemented the displacement-based axisymmetric Foeppl von Karman equations.
- **André Von Borries** is working on free-surface Navier–Stokes and lubrication theory problems.
- **Matthew Walker** implemented PML methods for the azimuthally Fourier-decomposed Helmholtz equations.
- **Joris Ferrand** implemented the axisymmetric Foeppl von Karman equations.
- **Philippe Mesnard** worked on acoustic FSI problems and introduced many improvements to `oomph-lib's` machinery for handling such problems.
- **Florian Molinier** worked on the coupling of the free surface Navier-Stokes equations and the axisymmetric Foeppl von Karman equations (in the context of simulating flows in elastic-walled Hele-Shaw problems).
- **David Nigro** developed and implemented much of the machinery for acoustic fluid-structure interaction problems.
- **Matthew Russell** implemented the Foeppl-von-Karman equations; he now continues to work on poro-elastic FSI problems.
- **Raphael Perillat** worked on the simulation of flows in elastic-walled Hele-Shaw cells.
- **Robert Harter** works on acoustic fluid-structure interaction problems.
- **Radu Cimpeanu** implemented the PML boundary conditions for the Helmholtz equations and the time-harmonic equations of linear elasticity.
- **Julio Perez Sansalvador** works on parallel unstructured mesh adaptation.
- **David Shepherd** works on the numerical solution of micromagnetic problems.
- **Ray White** is working on block preconditioners.

- **Nico Bergemann** made significant contributions to the adaptive unstructured mesh (re-)generation capabilities for free-surface problems. He then did his PhD on the simulation of viscous and visco-plastic free surface flows.
- **Ben Saxby** works on hp adaptivity and XFEM.
- **Michael Crabb** worked on Discontinuous Galerkin (DG) methods.
- **Peter Ashcroft** worked on eigenvalue problems.
- **Jeremy van Chu** contributed to the completion the tecplot to paraview conversion scripts and significantly extended the `the paraview tutorial.` He also developed the `LineVisualiser` machinery (which allows the extraction of computational data along lines in a higher-dimensional domain) and wrote the domain-based tube mesh.
- **Guilherme Rocha** developed elements to simulate Hele-Shaw problems (by solving the free-surface Reynolds lubrication equations).
- **Ahmed Wassfi** extended **Tarak Kharrat's** work on the Helmholtz equation and implemented the Fourier-decomposed version of this equation.
- **Alexandre Raczynski** keeps providing bug fixes and contributed to the completion the tecplot to paraview conversion scripts discussed in the `the paraview tutorial.`
- **David Rutter** wrote the `tutorial for the linear elasticity equations.`
- **Tarak Kharrat** implemented the Helmholtz elements and the methodology to apply the Sommerfeld radiation condition.
- **Luigi Collucci** continued Benjamin Metz's work and developed the interface from `oomph-lib` to `Triangle`.
- **Francisco Jose Blanco Rodriguez** worked on free-surface problems and wrote the driver code that simulates the Rayleigh instability of an axisymmetric jet.
- **Wassamon Phusakulkajorn** worked on C1-continuous triangular finite elements for shell, beam and biharmonic problems.
- **Benjamin Metz** worked on adaptivity and solution transfer for unstructured meshes.
- **Amine Massit** worked on outflow boundary conditions for Navier-Stokes problems and physiological FSI problems based on meshes generated by `vmtk`.
- **Patrick Hurley** works on free surface Navier-Stokes problems.
- **Andy Gait** worked on parallelisation, in particular the problem distribution and the subsequent distributed mesh adaptation.
- **Angelo Simone** wrote python scripts that convert `oomph-lib's` output to the vtu format that can be read by `paraview`; see `the paraview tutorial` for details.
- **Sophie Kershaw** worked on the Navier-Stokes equations in spherical coordinates.
- **Floraine Cordier** developed the driver codes and tutorials for the `flow past the elastic leaflet` and `Turek & Hron's FSI benchmark`. In the process she significantly extended `oomph-lib's` FSI capabilities.
- **Stefan Kollmannsberger** and his students Iason Papaioannou and Orkun Oezkan Doenmez developed early versions of the code for `Turek & Hron's FSI benchmark` and its `non-FSI counterpart.`
- **Cedric Ody** developed the `YoungLaplace` elements and their refineable counterparts to study capillary statics problems.
- **Alice Gaertig** developed interfaces to the third-party mesh generators `Triangle,` `TetGen,` , `Geompack++,` and `CQMesh.`

- **Claire Blancon** developed the demo drivers for the collapsible channel problem (with and without fluid-structure interaction).
- **Nick Chapman** worked on the implementation of triangular and tet-elements.
- **Chris Gold** implemented explicit timestepping schemes.
- **Phil Haines** worked on bifurcation detection and tracking for the Navier-Stokes equations and developed the formulation of the equations in plane polar coordinates.
- **Richard Muddle** worked on the block preconditioning techniques for the biharmonic (and many other) equations, and parallel solvers.
- **Glyn Rees** worked on iterative linear solvers and multigrid
- **Alberto de Lozar** worked on 3D free-surface Navier-Stokes problems.
- **Jonathan Boyle** developed the initial interfaces to third-party iterative solvers and is now involved in the further parallelisation of the code and the implementation and application of block-preconditioning techniques for Navier-Stokes and fluid-structure interaction problems.
- **Renaud Schleck** completed the octree-based mesh refinement procedures and wrote the MPI-based parallel assembly routines and the interfaces to SuperLU_dist.
- **Sharaf Al-Sharif** provided the initial implementation of nodal spectral elements.
- **Daniel Meyer** used oomph-lib to study a variety of axisymmetric Navier-Stokes problems, with and without free surfaces, and developed drafts for many of our tutorials.
- **Alexandre Klimowicz** worked on block-preconditioning methods.
- **Jean-Michel Lenoir** implemented the first part of the octree-based 3D mesh refinement procedures.
- **Gemma Barson** provided the initial implementation for the 2D Delaunay mesh generation procedures.

We're always looking for more help! Get in touch if you're interested in joining the team.

1.1 PDF file

A `pdf version` of this document is available.