



Numerical methods and complex fluids

The "Numerical methods and complex fluids" team has three main lines of research:

1. Numerical methods and mathematical modeling for PDE	1
2. Modeling of physical phenomena	1
3. Development of computing codes	1

Numerical methods and mathematical modeling for PDE

- Mixed, nonconforming and stabilized finite element methods
- Nitsche's, NXFEM and discontinuous Galerkin methods

- Finite volume methods
- Particle and hybrid grid-particle methods
- Shape optimization and consideration of uncertainties
- Stochastic optimization
- Approximation and optimal gridding

- Scientific computing and High-Performance Computing (HPC)

Modeling of physical phenomena

- Mechanics of Newtonian and non-Newtonian fluids
- Multiphase and reactive flow
- Oil & gas engineering
- Microfluidics in porous media
- The environment and CO₂ storage
- Safety and storage of nuclear waste
- Mathematics for medicine and biomechanics

Development of computing codes

- Contribution to the Salome2 platform, Homogenizer++.