

**System of Conservative  
Fluids Equations:  
PDEs (+ ODEs)**

$$\rho \left( \frac{\partial \underline{v}}{\partial t} + \underline{v} \cdot \nabla \underline{v} \right) = -\nabla p + \nabla \underline{\tau} + \underline{F}$$

**Geometric  
Discretisation**

Structured Grids (Cartesian,  
non-orthogonal)  
Unstructured Grids  
etc

**Discretisation  
Methods**

**System of Algebraic  
Equations**

**Space**  
Finite Difference Methods (FDM), Finite  
Volume Methods (FVM), Finite Element  
Methods (FEM), Boundary Element  
Methods (BEM), Spectral Element  
Methods (SEM), Spectral FEM (SFEM),  
etc.

**Time (Explicit/Implicit)**  
Forward-Euler (Exp), Backward-Euler  
(Imp), Crank Nicolson (Imp), Runge-Kutta  
(Exp/Imp), etc.

**Solution Methods  
(Solvers)**

$$\underline{\underline{A}} \underline{x} = \underline{b}$$

**Direct**  
Gauss-Elimination, LU  
Decomposition, Tridiagonal  
Matrix Algorithm (TDMA),  
etc.

**Iterative**  
Jacobi, Gauss-Seidel,  
Successive Over-Relaxation  
(SOR), Conjugate Gradient  
Methods, Multigrid  
Methods, etc

**Numerical Solutions**