**Possible final exam projects**

1. Extend the 2D unstructured finite volume code to second order of accuracy implementing the reconstruction and the limiter proposed in the paper of Barth & Jespersen, *The design and application of upwind schemes on unstructured meshes*, AIAA-89-0366
2. Extend the 2D unstructured **RKDG** code to *nonlinear* hyperbolic PDE systems by simply *replacing* the implemented orthogonal modal basis with a *non-orthogonal nodal* basis of classical continuous Galerkin finite elements with nodal Lagrange basis of polynomial approximation degree N=2. As a governing PDE system you may choose, for example, the shallow water equations, or the Euler equations of compressible gasdynamics.

1. Adapt the 2D unstructured **ADER-DG** code to solve the Maxwell equations of electrodynamics with GLM divergence cleaning in two space dimensions.

1. Implement a second order path-conservative MUSCL-Hancock finite volume scheme with minmod slope limiter for the shallow water equations with variable bottom topography based on the Osher-Solomon Riemann solver with numerical quadrature of the Roe matrix and the numerical dissipation matrix, employing the straight line segment path.