

# Birds-of-a-Feather Session on Mesh Quality

**Mikhail Shashkov - Facilitator**

**Mikhail Shashkov, T-7, LANL,  
shashkov@lanl.gov  
webpage: [cnls.lanl.gov/~shashkov](http://cnls.lanl.gov/~shashkov)**



# Suggested questions

- What do you consider to be significant recent technical advances with mesh quality?
- What are the open problems within mesh quality?
- Are there particular types, or classes, of problems that you are being ask to solve within mesh quality that current technology cannot address adequately? What are they?
- What do you propose as possible solutions to these problems?
- How can the Meshing Roundtable Community best address these problems (either individually or collectively)?



# Topics

- **Valid mesh, Geometrical Quality, Quality with respect to application, Quality with respect to method.**
- **Type of Application**
  - **PDEs**
  - **Interpolation**
  - **Computer Graphics**
  - **Geographic Information Systems**



- **PDEs (Stationary, Time-dependent)**
  - **Stationary PDEs.**
    - \* **Discontinuities, interfaces**
    - \* **Discretization (FE, FV, Mimetic)**
    - \* **Linear and non-linear solvers**
  - **Time-dependent PDEs**
    - \* **Explicit method (stability conditions)**
    - \* **Implicit method (solvers)**
    - \* **Stationary or time dependent grids**

- **Type of the grid**
  - Structured
  - Unstructured
  - triangles, quads, general polygons, AMR
- **Adaptive grids**
  - Adaptive to geometry
  - Adaptive to solution (error estimates)
    - \* r-adaptation
    - \* h-adaptation
    - \* p-adaptation
- **Adaptation - Strategy Metric, Monitors, Springs, Elasticity, Harmonic Maps, Deformation Method**

