National Aeronautics and
Space Administration

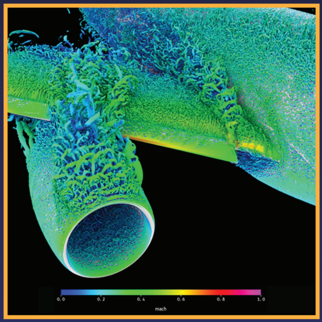
CFD Vision 2030

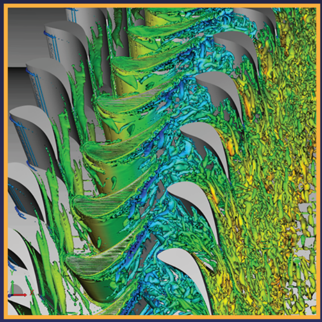
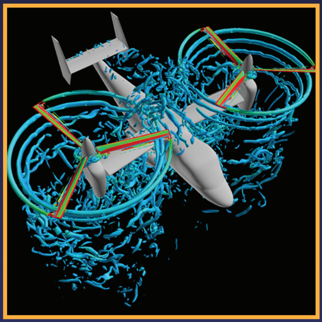
Vision Statement

"A engineer/scientist must be able to generate, analyze, and interpret a large ensemble of related simulations in a time-critical period (e.g., 24 hours), without individually managing each simulation, to a pre-specified level of accuracy and confidence."

Vision Elements

- **Emphasize physics-based, predictive modeling:** Includes turbulence, transitional flow, unsteady/time-accurate, chemically-reacting flows, radiation, heat transfer, acoustics, etc.
- **Manage simulation errors and uncertainties:** Quantification of errors and uncertainties arising from physical modeling, mesh and discretization, etc.
- **Develop automation in all steps of the analysis process:** Geometry creation, meshing, large databases of simulation results, extraction and understanding of simulation information, etc.
- **Harness future HPC architectures:** Multiple memory hierarchies, latencies, bandwidths, programming paradigms and runtime environments, etc.
- **Enable seamless integration with multi-disciplinary analyses and optimizations:** High fidelity CFD tools, interfaces, coupling approaches, the science of integration, etc.



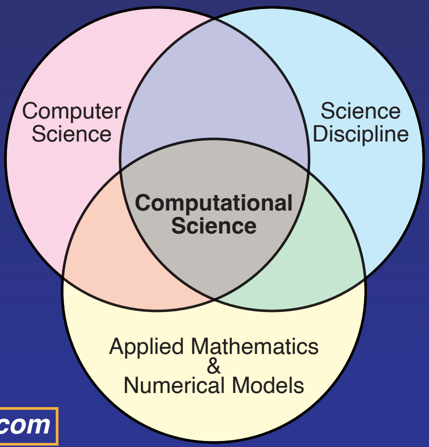



AIAA CFD 2030 Integration Committee

Integration Committee Mission

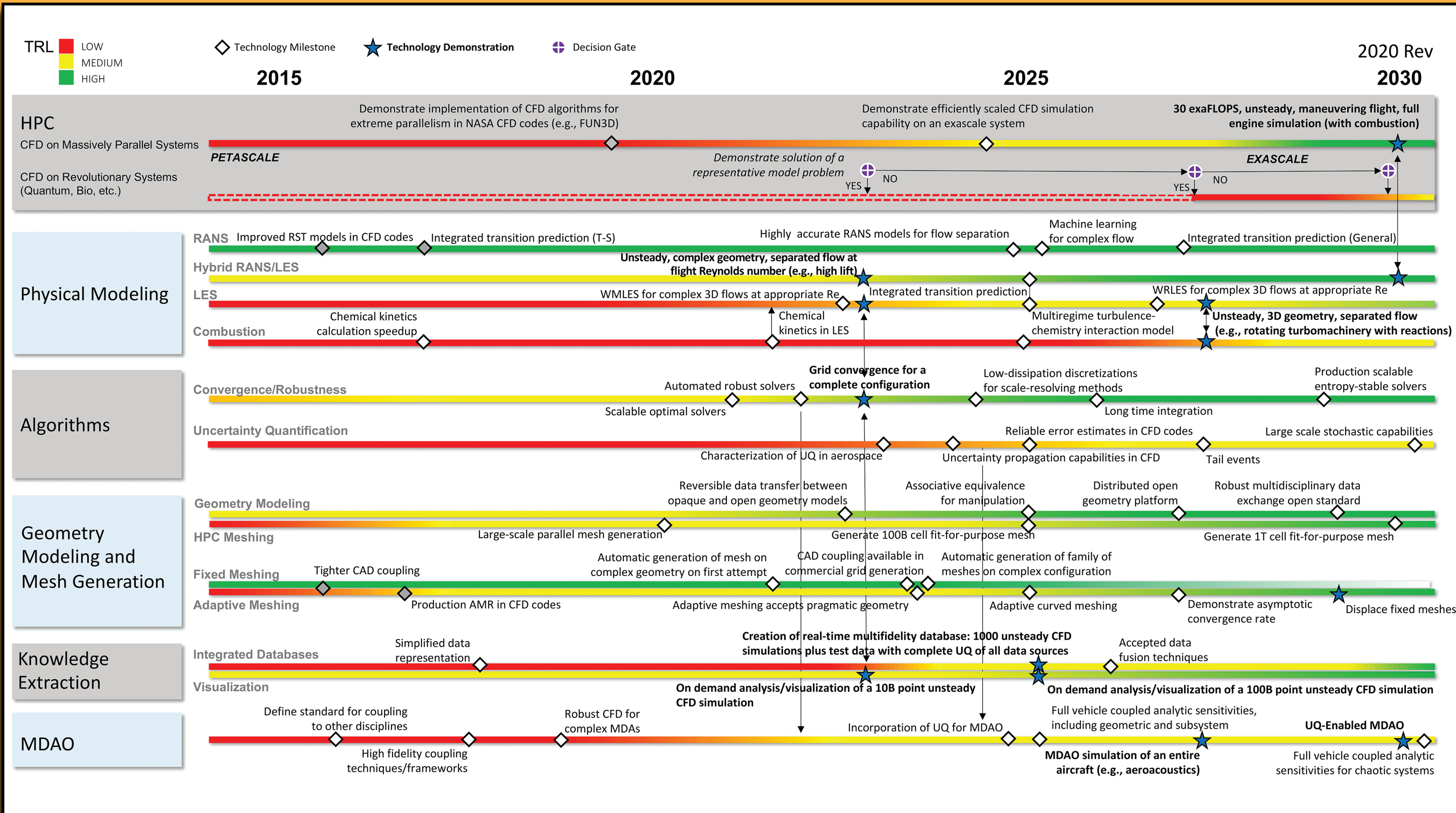
- **Promote a community of practice** engaged in developing methods, models, physical experiments, software, and hardware for revolutionary advances in computational simulation technologies for analysis, design, certification, and qualification of aerospace systems
- **Guide the leveraging and integration of enabling technologies** such as high-performance computing, physical modeling, numerical methods, geometry/grids, validation quality experiments,multidisciplinary analysis and optimization, with quantified uncertainties, to expand computational simulation capabilities.
- **Communicate** with other AIAA committees and communities to assure that IC membership engages with their peers and external constituencies in **shaping the future of simulation-based engineering.**
- **Ensure CFD** is an integral component of the **Digital Transformation** of engineering by advocating for its advancement toward the Vision 2030.

CFD2030
Advancing Integrated Computational Science



Keep up with the latest information and activities via the IC's website: ***www.cfd2030.com***

CFD Vision 2030
Technology Development Roadmap



A copy of the roadmap can be found at ***www.cfd2030.com/report.html***