



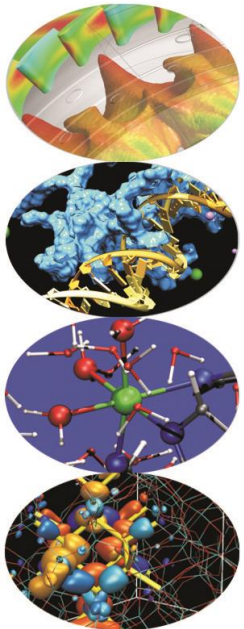
# HPC Computer Aided Engineering @ CINECA

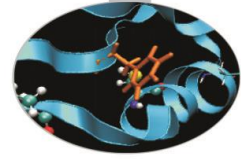
*Raffaele Ponzini Ph.D.*

*CINECA*

*SuperComputing Applications  
and Innovation Department – SCAI*

16-18 June 2014  
Segrate (MI), Italy



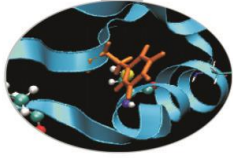


# Outline

- Analysis of student background
- Overview and timing of the school
- Timing of the day

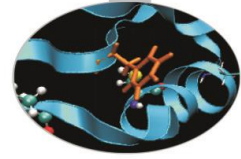


# What is Paraview



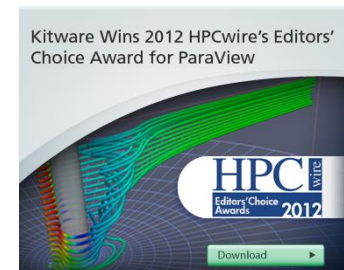
- ParaView is an open-source application for visualizing 2D/3D data.
- To date, ParaView has been demonstrated to process billions of unstructured cells and to process over a trillion structured cells.
- ParaView's parallel framework has run on over 100,000 processing cores.
- ParaView's key features are:
  - An open-source, scalable, multi-platform visualization application.
  - Support for distributed computation models to process large data sets.
  - An open, extensible, and intuitive user interface.
  - An extensible, modular architecture based on open standards.
  - A flexible BSD 3-clause license.
  - Commercial maintenance and support.

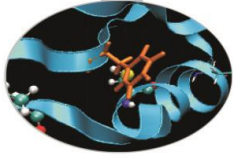




# PARAVIEW: a standard de-facto

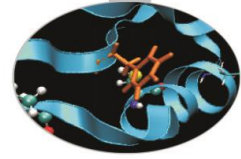
- ParaView is used by many academic, government, and commercial institutions all over the world.
- 
- ParaView is downloaded roughly 100,000 times every year.
- ParaView also won the HPCwire Readers' Choice Award and HPCwire Editors' Choice Award for Best HPC Visualization Product or Technology.





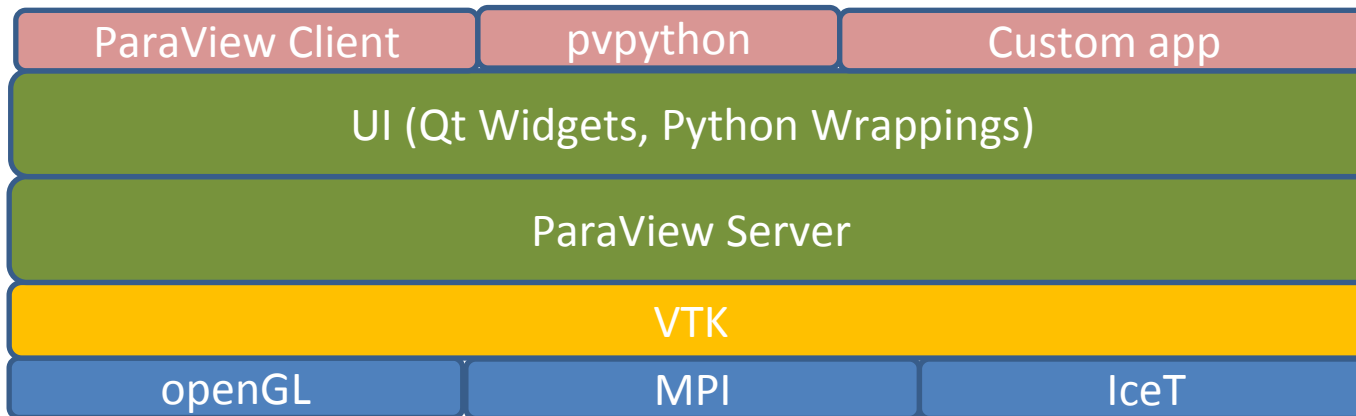
# Obtaining Paraview & Official Resources

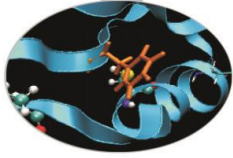
- Main website:
  - <http://www.paraview.org/>
- Download page:  
<http://www.paraview.org/paraview/resources/software.php>
- Resources (video):  
<http://www.paraview.org/paraview/resources/webinars.html>
- Resources (wiki):
  - <http://www.paraview.org/Wiki/ParaView>



# The big picture

- The application most people associate with ParaView is really just a small client application built on top of a tall stack of libraries that provide ParaView with its functionality.
- ParaView comes with a pvpython application that allows you to automate the visualization and post-processing with Python scripting.
- A ParaView Server library provides the abstraction layer necessary for running parallel, interactive visualization. It relieves the client application from most of the issues concerning if and how ParaView is running in parallel.
- The Visualization Toolkit (VTK) provides the basic visualization and rendering algorithms.





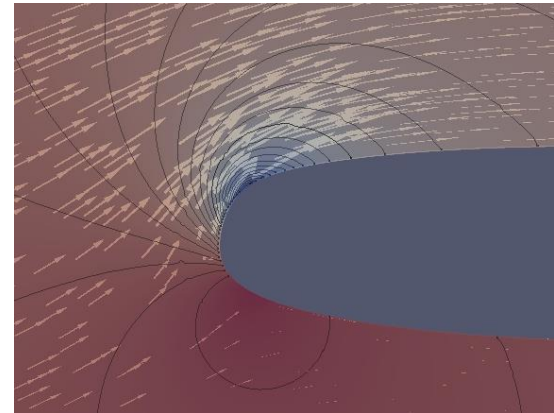
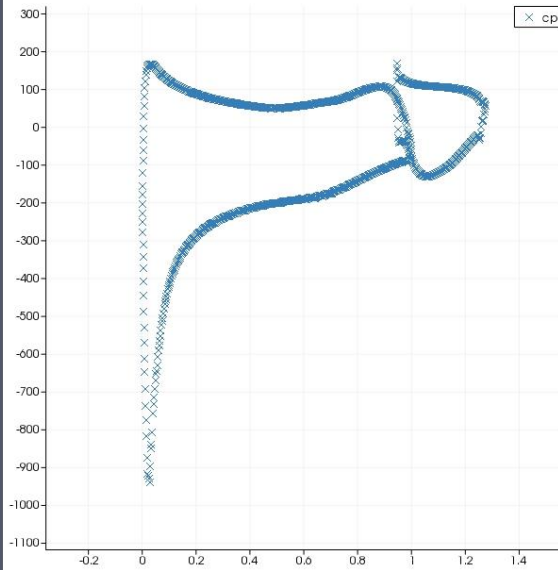
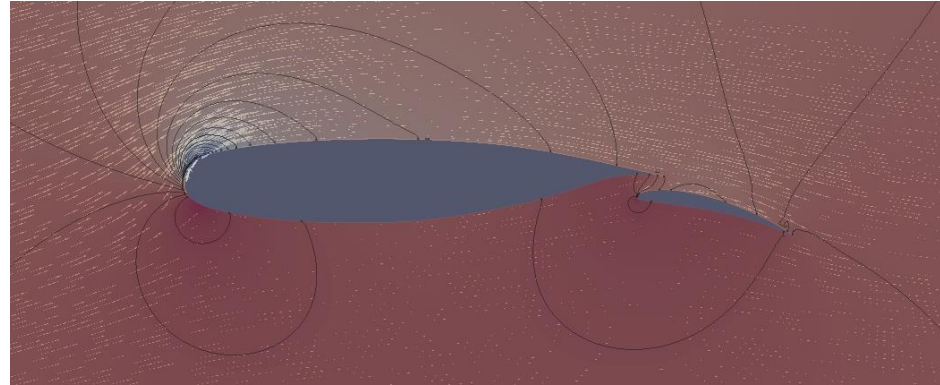
# Post-processing workflow

- Load the data file
- Inspect available variables and ranges
- Slice your data and visualize scalars/vectors/streamlines/isolines
- Adjust view and display settings
- Adjust representation and coloring
- Adjust text and legend

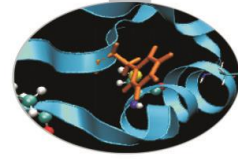


# External aerodynamics post

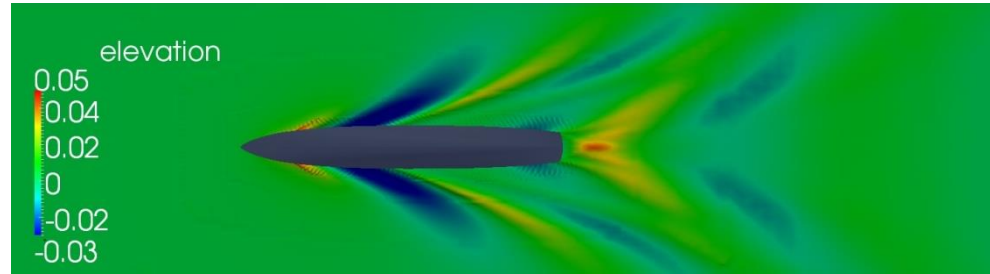
- Stagnation point
- Acceleration point
- Isolines (pressure)
- Vectors (U)
- Pressure coeff







# Two phase marine post



- Elevation
- Hull surface pressure
- Waterline
- Forces (pressure, viscous)

