



FORTISSIMO

# Fortissimo

## Enabling manufacturing SMEs to benefit from HPC



I4MS

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CINECA

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# The Fortissimo Project

- Building a Cloud of HPC Resources to solve SMEs' business challenges
- One of the I4MS\* projects within the “Factories of the Future” initiative
- Complementing generic SME initiatives in EC FP7 Programme - specific support to deliver economic growth through modelling and simulation
- Focus on problem solving – not technology development
- Brings together all of the players in a marketplace

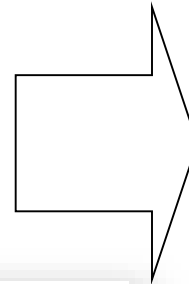
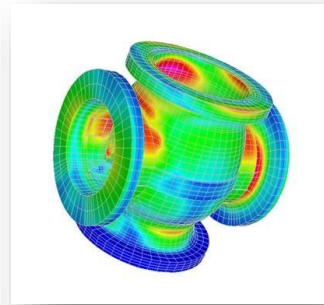
I4MS



# Our goal

To improve company competitiveness  
through the use of HPC to deliver  
new or improved products and services

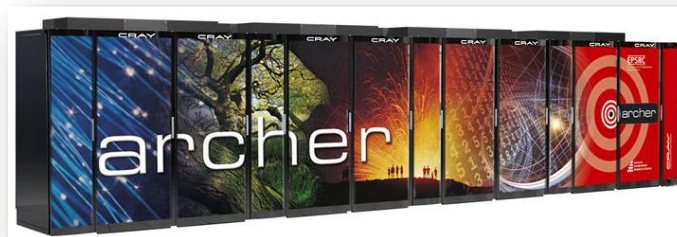
Modelling and Simulation  
using HPC is being increasingly  
deployed to provide a  
competitive edge



Economic  
growth for  
Europe



Europe has world class HPC  
assets and expertise



# HPC and economic growth

- It is understood worldwide that to compete in the global marketplace companies need to innovate
- Many industrialised economies (both developed and developing) have identified HPC as a key tool for innovation
- In the USA the phrase *“to out compute is to out compete”* has been used to make the case to Government
- Very few funding agencies have properly tried to study the true economic benefit of HPC to their company base

# HPC and economic growth

- IDC: “Each dollar invested in HPC returned, on average, \$356 in revenue and \$38 in profits or cost savings.”
- IDC: “The pilot study IDC recently completed for the Department of Energy provided further proof that HPC is one of the best investments many companies can make.”

Source: Steve Conway, IDC research vice president for HPC, IDC study “HPC: ROI You Can’t Ignore!”, Nov 2013, <http://www.idc.com/getdoc.jsp?containerId=244316>



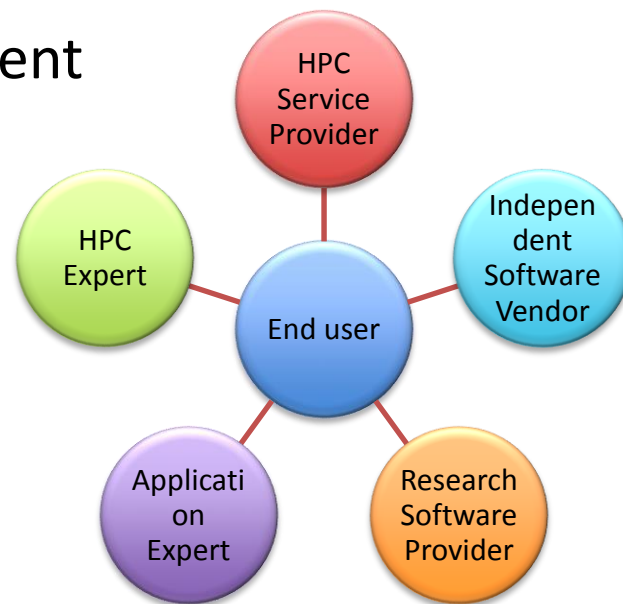
# HPC adoption best practice

- Many companies don't make use of HPC because there is a large hurdle to overcome
- Initial costs are high: modelling, software, skills
- Fortissimo is designed to help companies overcome that hurdle and become regular users of HPC
  - Demonstrating its value
- Based on existing model best practice for working with SMEs
  - E.g. Supercomputing Scotland

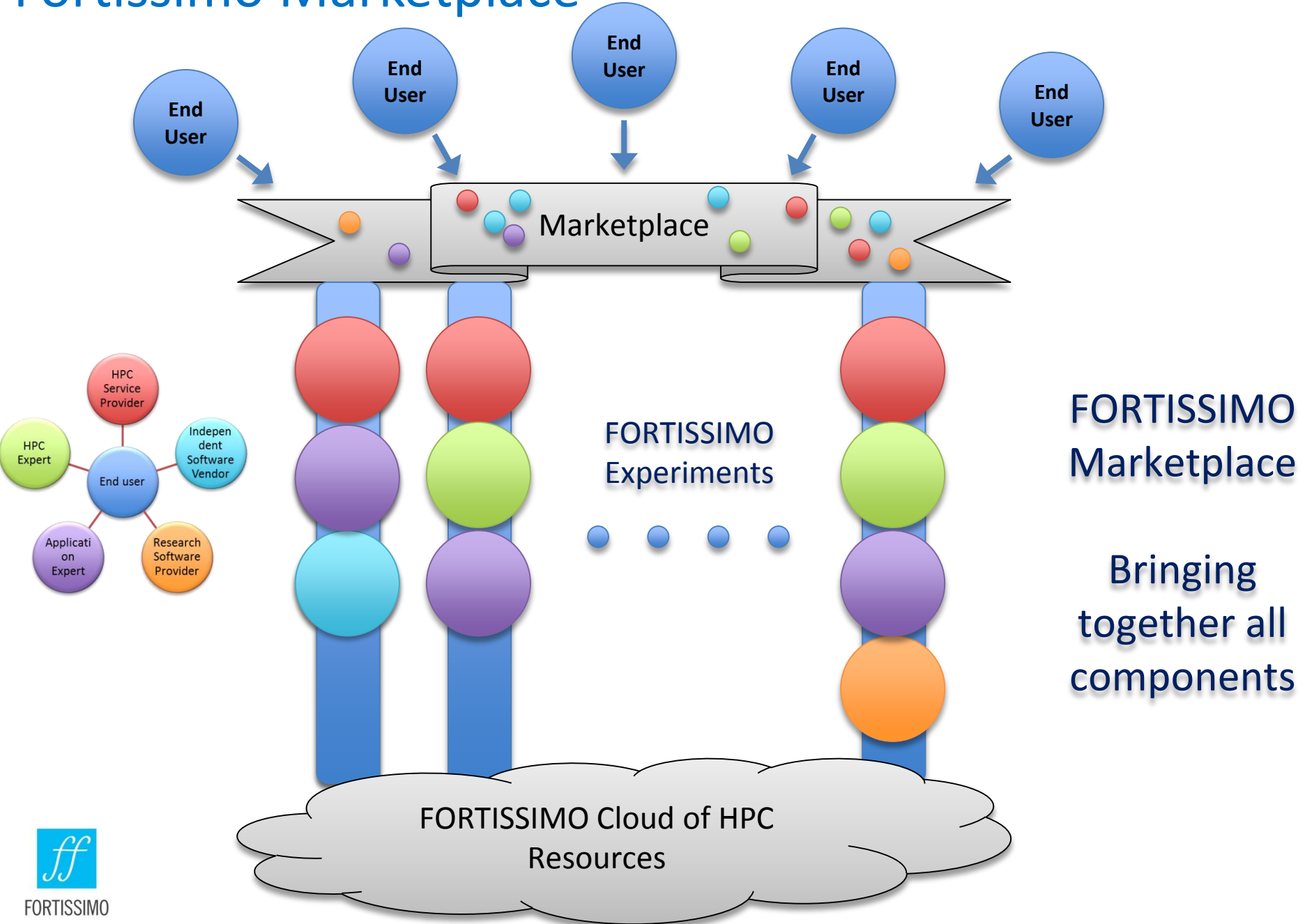


# Fortissimo – scale & structure

- €22m costs, €16m EC funding, 45 partners growing to 90+ over the 3 year duration
- 20 initial “Experiments” with SMEs
- Each experiment has 2-6 partners
- Funding of up to €250,000 per experiment
- 2 Open Calls for proposals
  - First Call has closed January 2014 – 22 experiments funded
  - Second Call has closed June 2014 – 11 experiments funded
- Optimised financial and legal structure to assist SMEs

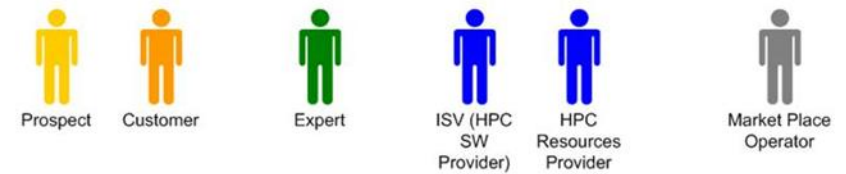
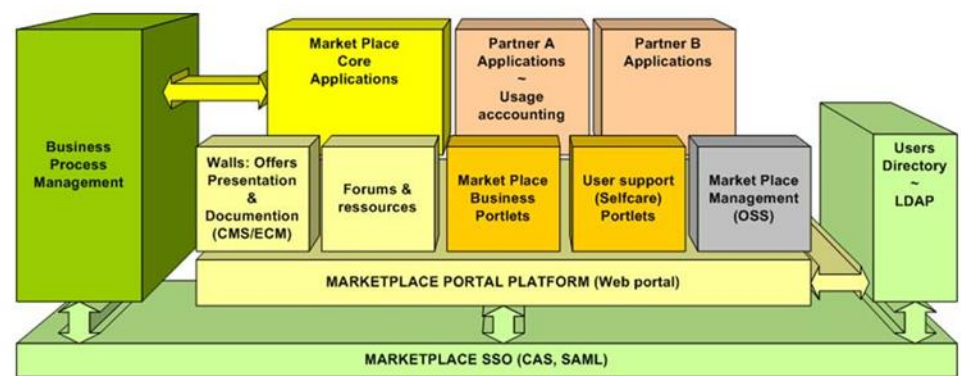
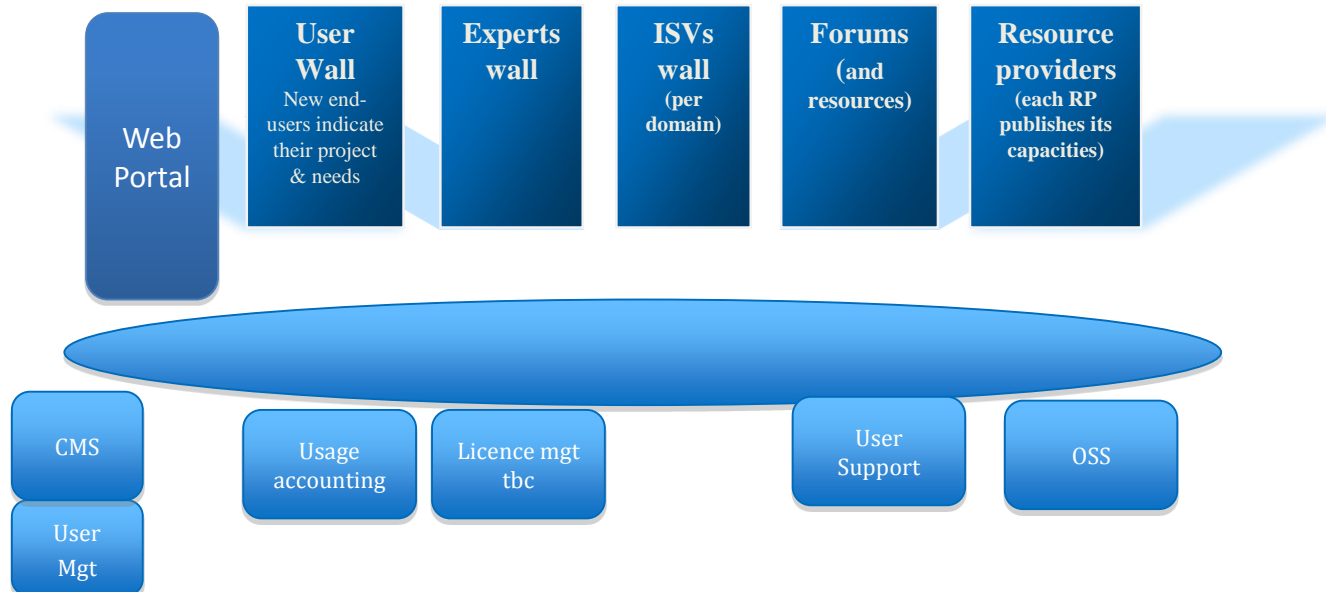


# Fortissimo Marketplace





# Fortissimo Marketplace – Functional View & Architecture (work in progress)



# Key Call Details – 1<sup>st</sup> Call

- 65 proposals
- 5 M€ total funding
- 22 proposed experiments have been selected for integration
- Industrial sectors covered by the new experiments:  
Automotive, Aerospace, Construction, Energy & Renewable Energy, Environmental, Maritime, Metal Processing, Oil & Gas, Pharmaceutical & Biotech, Plastics
- Execution phase will be July 2014 – December 2015
- 34 SME's will join with the 22 new experiments

# The original “cloud” of experiments

....aerodynamics  
of light aircraft

.. Multiphysics simulation

.. CFD ... automotive design

...continuous casting

... tools for urban  
planning

... routing architecture  
optimisation..

...high pressure  
vessels

.. correlation ..  
simulation & tests for  
mechatronics

... air-quality over cities

..design of metal flanges

.. CO2 emission prediction  
for automotive engines

... molecular simulation  
for industrial chemical  
engineering

... risers, moorings  
and flowlines

... low-pressure  
die-casting ...

... commercial  
computational chemistry

... structural crash tests

... CFD for  
turbomachinery

... eolian snow transport  
for civil engineering ...

Information available at:

[www.fortissimo-project.eu/experiments](http://www.fortissimo-project.eu/experiments)



# Key Call Details – 2<sup>st</sup> Call

- 107 proposals
- 3 M€ total funding
- 11 proposed experiments have been selected for integration
- Industrial sectors covered by the new experiments:  
Automotive, Aerospace, Construction, Energy & Renewable Energy, Environmental, Maritime, Metal Processing, Plastics
- Execution phase will be October 2014 – March 2016
- 17 SME's will join with the 11 new experiments

# The 2nd “cloud” of experiments

Manufacturing processes... laser welding, sheet-metal forming, advanced casting

Manufacturing design... camshafts, gear transmission, high temp. chimneys, boat design

optimisation ... steel component manufacture  
... operational decision support for manufacturing

... rapid prototyping  
... 3D printing

Renewable energy ... hydraulic turbines ...tidal farm engineering  
...environment engineering services

... high temperature superconductors

... radar reflectors & antennas

Time-temp integrators ...

seismic processing .. oil & gas exploration

... electrical harnesses

Pharma logistics

.... drug target binding

... simulation of pipeline components

....platform for map conversion

crowd sensing ... smart cities & large facilities

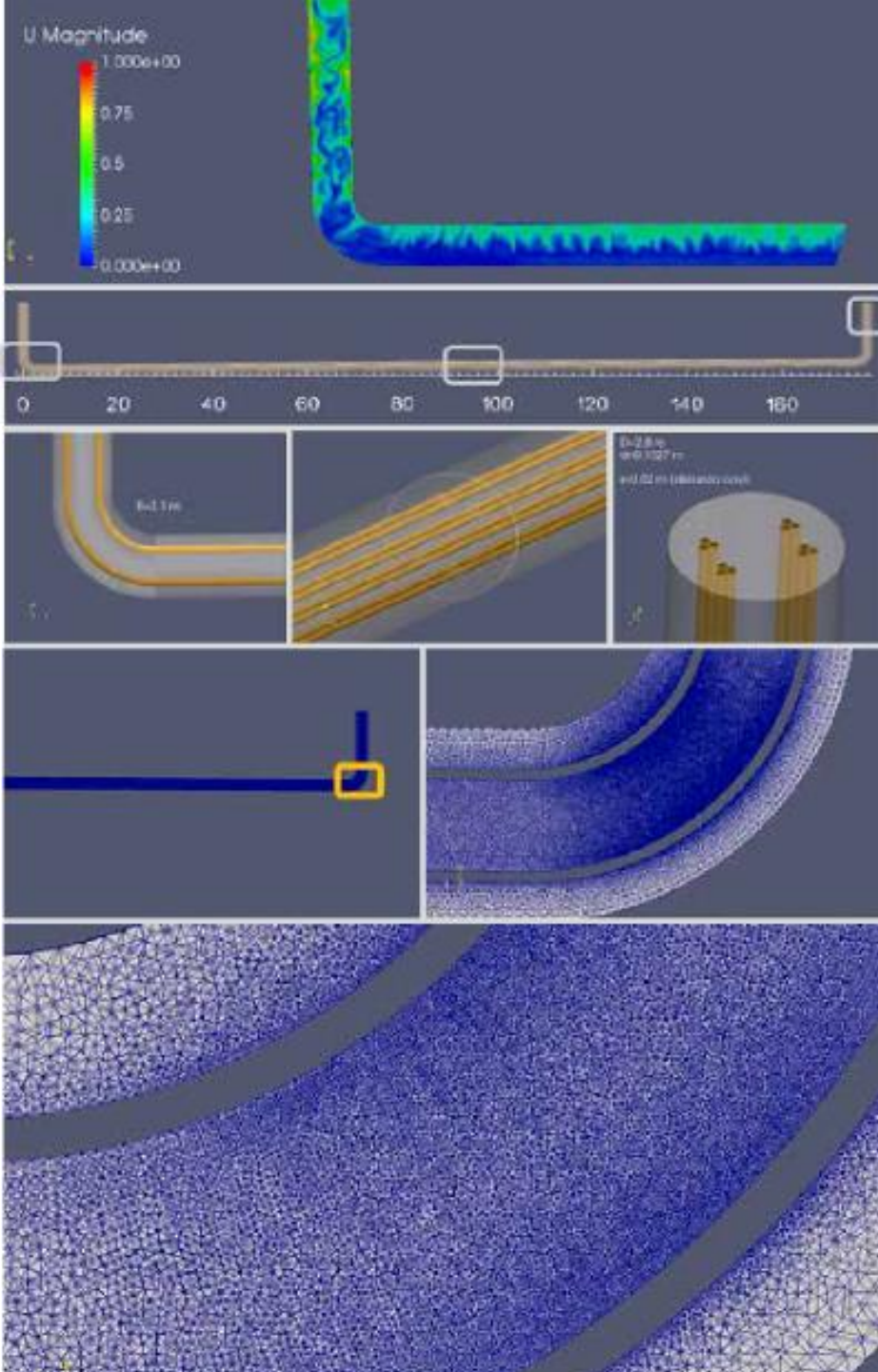
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Exp 4.05

# Prysmian Group





**Koenigsegg**

www.koenigsegg.com

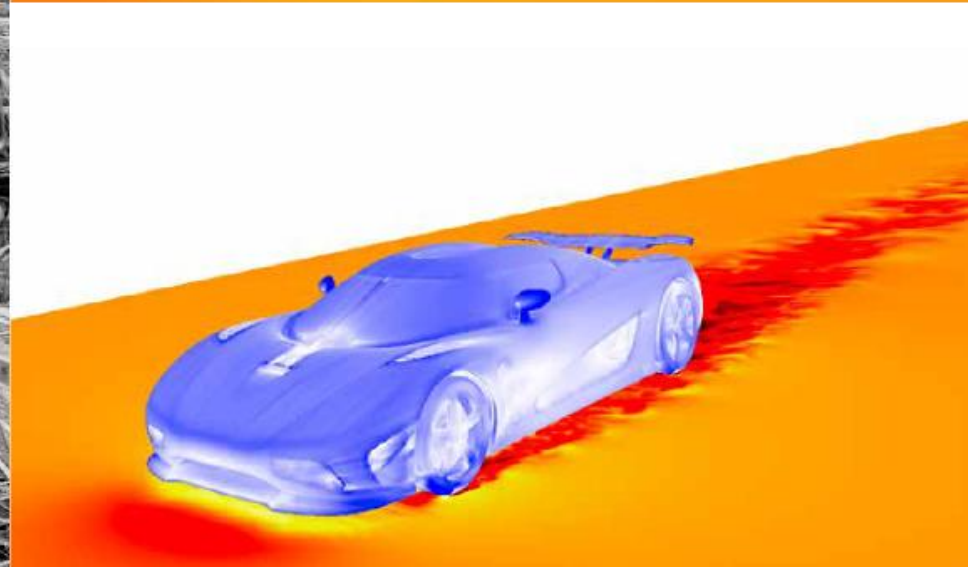
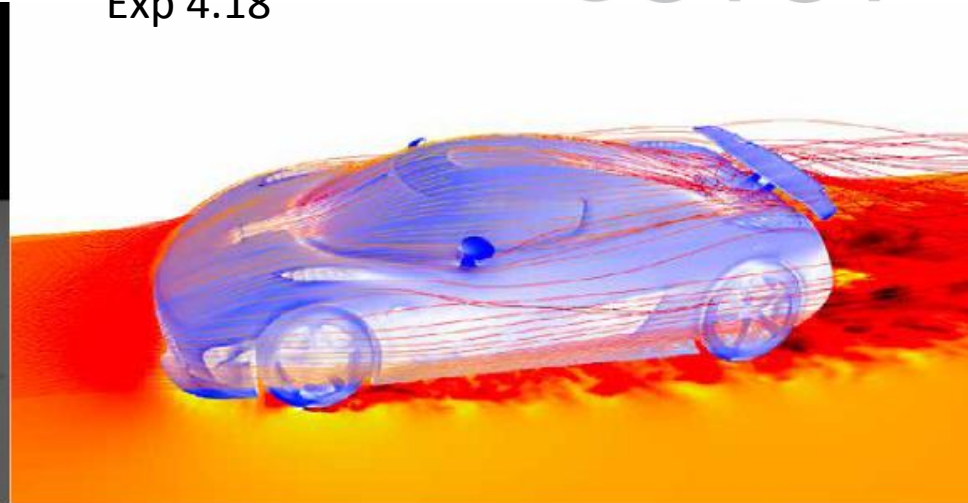
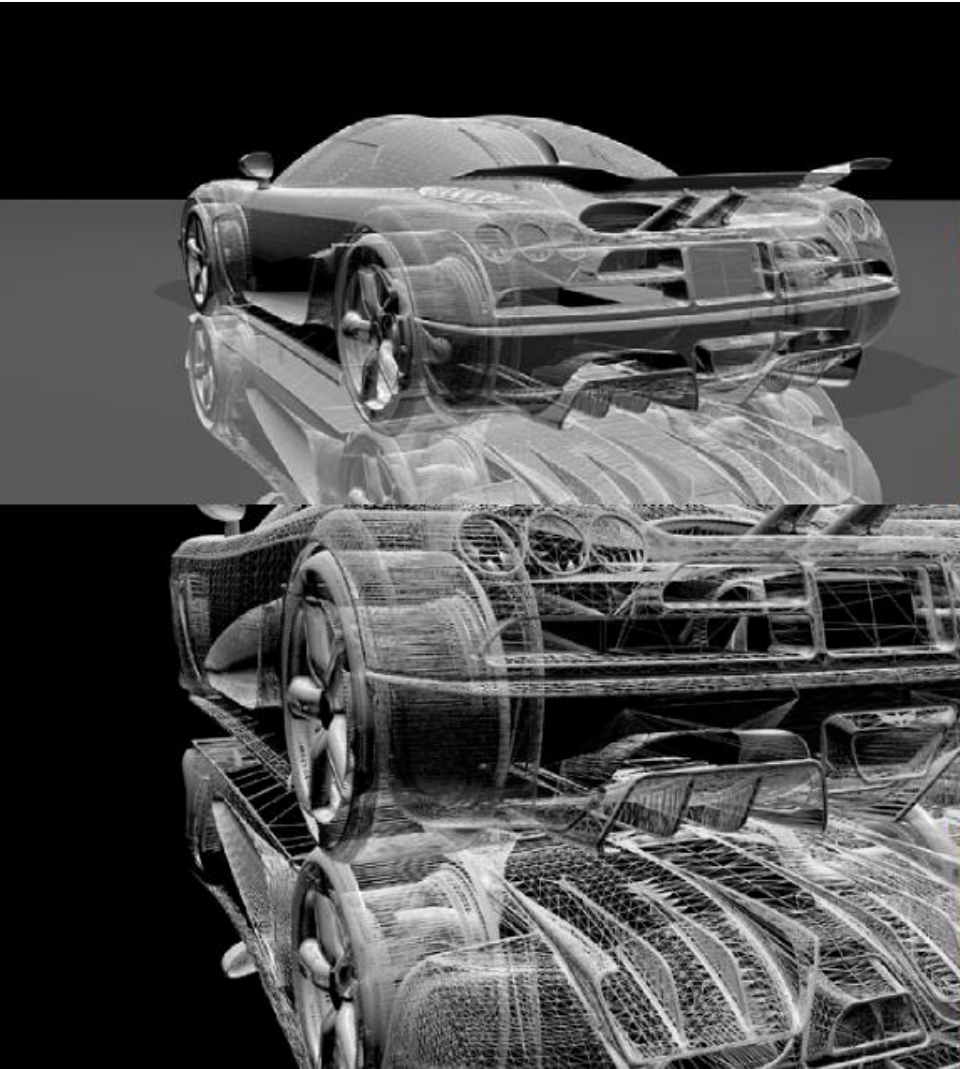


**ICON**

Technology • Process • Consulting

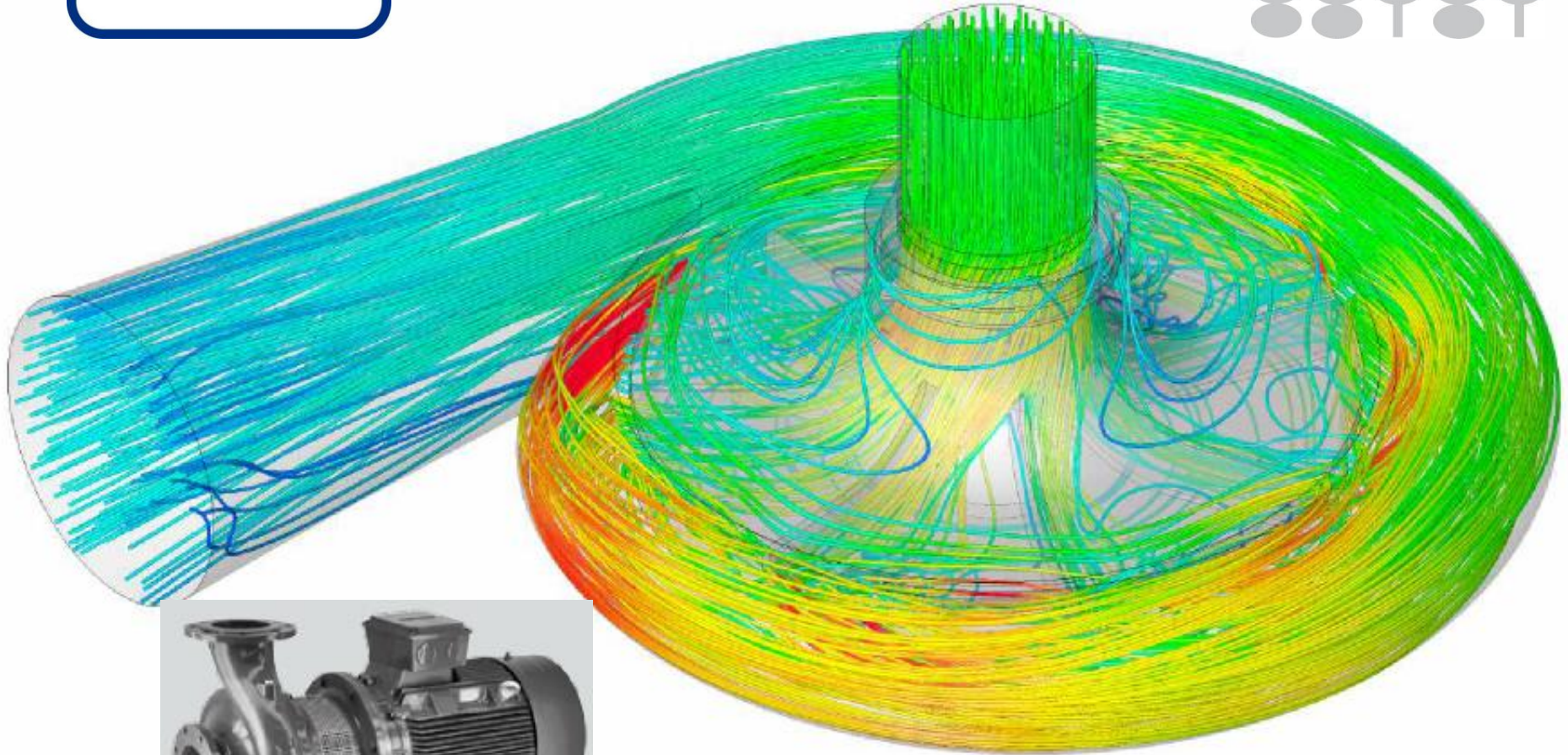


Exp 4.18





Exp 4.19





# Further Information

- Fortissimo web page:  
[www.fortissimo-project.eu](http://www.fortissimo-project.eu)
- I4MS web page:  
[www.i4ms.eu](http://www.i4ms.eu)
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