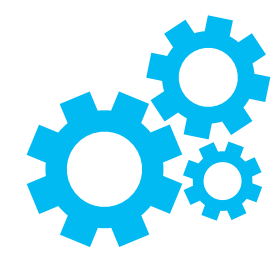# HPC-Cloud-based simulation of steel casting

⚙ The Challenge

In the field of continuous steel casting there is an increasing industrial demand for the **development of new technologies** for preventing slag transfer from the ladle to the tundish. In order to develop an effective detection system, it is necessary to correlate the vibrational signal, that liquid slag induces, with the fluid dynamics of the system. Such a correlation requires **a complex, detailed simulation**, which can only be carried out on an HPC system.
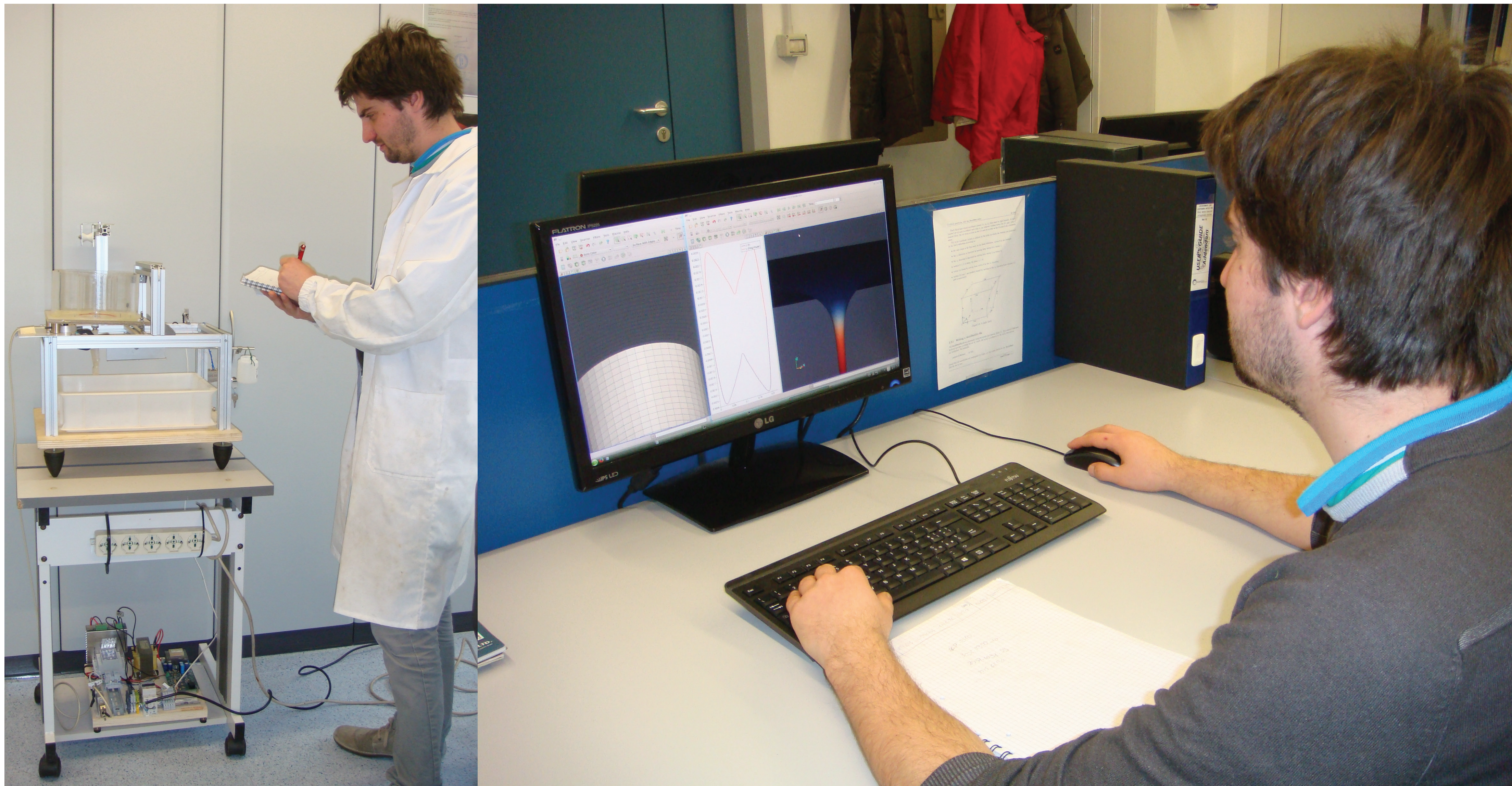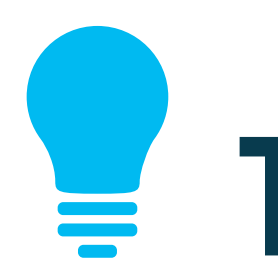

Organisations Involved

End User:

ergolines
INNOVATION PARTNER

HPC Expert and Centre:

ARCTUR

💡 The Solution

- With dedicated **HPC-based simulations** followed by case experimental validation, it has been possible to establish a correlation between the shroud vibrational signal and the fluid dynamics of the system.
- The results enabled development of **an innovative slag monitoring technology**, which would significantly contribute to both better occupational safety and greater productivity of steel plants.

✓ The Benefits

- Given the complexity of the phenomenon to be simulated, **a very fine discretization in terms of geometry and time is needed**, therefore adequate computational capabilities are required.
- The results attained by the HPC-based fluid-dynamic analysis set the stage for the development of a new product for automatic slag detection in steel continuous casting.
- Using the proposed slag monitoring technology, **60% of that lost steel can be saved** and since casting is high energy-consuming process, there is also **reduction in energy consumption** for the re-melting of the steel.