

Cerfacs is a mutualized centre of research, development, transfer and training regarding simulation and high performance computing for the benefit of its industrial and public shareholders (Airbus, CNES, EDF, Météo-France, Onera, SAFRAN and TOTAL) on a set of major themes. Cerfacs codes are used for fundamental research as well as for industrial applications; they run on the most powerful computers presently available. Cerfacs hosts interdisciplinary teams, both for research and

advanced training: parallel algorithms, code coupling, aerodynamics, gas turbines, combustion, climate, environmental impact, data assimilation, data science... Part of the research activity of Cerfacs is associated with CNRS (French National Centre for Scientific Research), INRIA (French National Institute for computer science and applied mathematics, and IRIT (Informatics Research Institute of Toulouse).



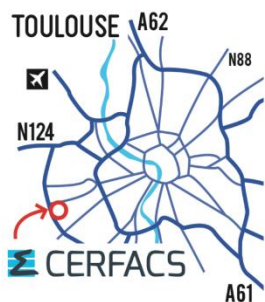
TRAINING COURSE FEE (PER DAY)

TRAINEES, PhDs, POSTDOCS: 112,00 €
CERFACS SHAREHOLDERS,
CNRS and INRIA: 280,00 €
OTHERS: 560,00 €

The fee includes course materials, coffee breaks and lunches. The fee does not includes taxes (VAT 20%).

SPOC FEE (PER WEEK)

TRAINEES, PhDs, POSTDOCS: 60,00 €
CERFACS SHAREHOLDERS,
CNRS and INRIA: 90,00 €
OTHERS: 120,00 €



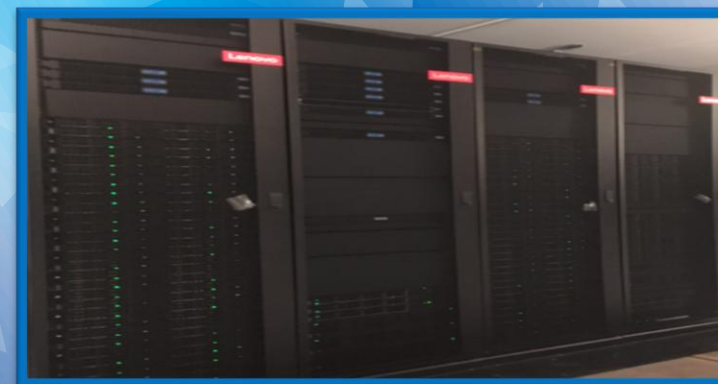
FROM THE RAILWAY STATION
(Transit time: about 30 mns)
• Take the underground at Matabiau station to Basso Cambo station.
• With the same ticket, take bus n°18 going towards Lycée Polyvalent. Get off at Météopole stop in front of Météo-France.

FROM BLAGNAC AIRPORT
• Taxi (Quickest way – Transit time: about 10 mns)
• Bus/Underground (Transit time: about 1h) Shuttles to the city centre leave every 20 mns daily. Get off at Jean-Jaurès station, take the underground to Basso Cambo station and finally bus n°18 going towards Lycée Polyvalent. Get off at Météopole stop.

BY CAR
• Take the “périphérique” (towards Foix-Tarbes from the Paris-Bordeaux highway, towards Blagnac from the Montpellier highway).
• Take Exit 27 ‘La Cépière’.
• Follow the signs ‘Cugnaux’, then ‘Pradettes’, finally ‘Météo-CERFACS’.

TRAINING SESSIONS AT CERFACS 2025

Enter the world of high performance ...



New **FREE** online training session :
“Introduction to HPC for decision-makers”



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TRAINING SESSION	SCOPE OF THE SESSION	DATES
Introduction to programming practices for scientific computing	Enhance the candidate's ability to excel in professional settings that involve scientific software programming.	10 March
Advanced programming practices for scientific computing	Explore more sophisticated strategies in code organisation, style conventions, and documentation, enabling you to create sustainable codebases.	14 March
High order spectral methods for massively parallel LES	Discover the High-Order spectral discontinuous methods for LES which are becoming increasingly popular because of their ability to produce an accurate solution. The course proposes to introduce the state of the art of the most popular ones and to realize academic test-cases using the JAGUAR in house solver.	24 March
Mesh generation using CENSAUR	Understand the basics of unstructured and hybrid meshing using the CENSAUR software.	28 March 24 Nov.
Numerical methods for Large Eddy Simulation using AVBP	Understand the underlying basics of Large Eddy Simulation of compressible flows in complex geometries (with specific emphasis on aerodynamics, acoustics and combustion). The CFD codes AVBP co-developed by CERFACS and IFPEN is used for the hands-on.	31 March- 4 April 17-21 Nov.
Versioning systems : introduction to GIT	Learn the main functionalities of the source code management system GIT.	7 April 28 Nov.
Code coupling using CWIPI	Understand the concepts around the coupler and to learn how to use the interface of the CWIPI routines to quickly become autonomous on the instrumentation of the codes to be coupled and the use of the various features of the coupler. This training is very pragmatic with practical works.	8 April
Implementation and use of the Lattice Boltzmann Method	Discover the Lattice Boltzmann Method (LBM) which is based on the resolution of the Boltzmann equation and not the Navier-Stokes ones. The aim is to provide a basic understanding of the LBM through academic test-cases.	19 May
Advanced Lattice Boltzmann Methods	Provide the audience with an additional knowledge of methods based on Discrete Velocity Boltzmann Equations, with a particular emphasis on Lattice-Boltzmann Methods. Key elements of discretization and time integration will be discussed, along with classical CFD topics.	20 May
High fidelity simulations of turbomachinery flows	Learn some basics about the numerical simulation of complex flow in turbomachinery, both for compressor and turbine components with a particular emphasis on unsteady flow phenomena.	2-5 June
Data assimilation	Understand the general objectives, the main applications and the most commonly used algorithms for data assimilation problems.	23-27 June
Machine learning for data science	Enable the participants to reinforce their theoretical and practical knowledge in order to implement machine learning techniques for the automatic analysis of data. The main statistical methods for data analysis are presented, both for data exploration (non-supervised learning) and for prediction (supervised learning).	6-9 Oct.

FREE

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Fundamentals to understand and analyse high fidelity compressible LES	Present and analyse numerical methods, boundary conditions, signal processing and unsteady turbulence models to perform high fidelity compressible Large Eddy Simulation	3-5 Nov.
Numerical tools for complex chemistry simulations: the open source CANTERA solver	Present the open source object-oriented software CANTERA which solves problems involved chemical kinetics, thermodynamics, and/or transport processes. Learn how to compute academic cases such as chemical equilibrium in constant pressure reactors, 1D freely propagating flames and 1D counterflow diffusion flames.	13 Nov.
Chemistry reduction using ARCANE	Present the reduction code ARCANE co-developed by CERFACS and Cornell University as well as the main reduction methods used to generate reduced kinetics computationally affordable for reacting LES. Learn how to employ ARCANE and to use its post-processing tools to analyze the properties of the reduced kinetics obtained.	14 Nov.
Parallel programming methods MPI, OpenMP	Learn programming using Message Passing Interface (MPI) and Open-MP.	26-27 Nov.
Artificial Intelligence for computational physics	Have a general theoretical background on AI methods, and to apply them using open-source libraries (ScikitLearn, Keras/TensorFlow, DeepXDE) for both regression and control tasks encountered in physics.	1-5 Dec.

SPOC (Small Private Online Courses)

Check the dates on our website

Fundamentals of Turbulent Combustion 7 weeks	This online course presents the basics of combustion science and one specific field of applications which is turbulent flames. The course describes all the basic physics required to understand flames and shows how turbulent flames are modeled and computed today. No a priori knowledge of combustion is needed. The course is built on the textbook "Theoretical and numerical combustion" of T. Poinot and D. Veynante. A free copy of the book will be sent to each participant.
Fundamentals of thermo-acoustic instabilities 4 weeks	Coupling between acoustic waves has become a central issue in the development of many modern combustion systems. This course presents the theoretical background needed to tackle such problems.
Code coupling using OASIS 2 weeks	This on-line training covers basic concepts in code coupling using the OASIS3-MCT coupler developed by CERFACS and CNRS, focussing on the ocean-atmosphere context. You will learn to implement the coupling between two toy models with OASIS3-MCT in a hands-on tutorial session. This training is planned over four consecutive weeks with weekly online learning activities requiring about 2-hour of work per week from the participants.
Introduction to HPC for decision-makers (SMES) 4 weeks	High-Performance Computing (HPC) brings together very high-power computing resources capable of solving extremely complex problems. It is at the heart of innovation and major advances. This course presents the theoretical background needed to tackle these issues.

FREE

INFORMATION

Check the CERFACS website : <https://cerfacs.fr/en/training-at-cerfacs/>

The dates are confirmed on the website at least 1 month before the beginning of the training.