# CIMNE R

recognizes the participation of

## Shreyas Girish

as

## Student

in the 2024 edition of the

CIMNE R · EXCELENCIA SEVERO OCHOA

# WINTER SCHOOL

*An excursion into computational methods*

Barcelona, 26th of January 2024

**Riccardo Rossi**   **Sergio Zlonik**   **Jordi Pons-Prats**   **Lucía Barbu**   **Xavier Martínez**

Organizers of the CIMNE Winter School

**Eugenio Oñate**
Severo Ochoa
Scientific Director

**Javier Bonet**
Director of CIMNE

# WINTER SCHOOL

*An excursion into computational methods*

## January 22nd – 26th, 2024

Students attending to the CIMNE Winter School have taken a total of 25 hours of class, distributed in the courses detailed in the following program:

### Communication skills (Oral & Written) [3 hours]
**Teacher: Narges Dialami**

Communicating science effectively in the real world starting with the key elements of clear and persuasive speaking, writing and exhibiting.

### Continnum Mechanics (Theory & Practice) [3,5 hours]
**Teacher: Oriol Lloberas**

Basic knowledge on the description of motion and deformation are outlined together with the concept of stress.

### FEM Basics (Theory & Practice) [3,5 hours]
**Teacher: Ignasi de Pouplana**

A brief overview on the Finite Element Method.

### High Performance Computing (Theory & Practice) [3,5 hours]
**Teacher: Riccardo Rossi**

A general overview about the methods and programming environment which allow exploiting the use of supercomputers or even simply the internal parallelism of CPUs.

### Information search and information resources [1,5 hours]
**Teacher: Ruth Íñigo**

Structure of a information search strategy, find relevant bibliography and search for information in scientific databases and information resources.

### Numerical Lineal Algebra (Theory & Practice) [3,5 hours]
**Teacher: Alba Muixí**

A review of methods for solving linear systems of equations, from direct methods based on matrix factorization to iterative approaches.

### Programming: Good Practice Rules (Practice) [1,5 hours]
**Teacher: Sergio Zlonik**

Best practices to reduce (at least a bit) the burden of programming: testing, version control, coding style, pair programming...

### Computational Multiscale (Theory & Practice) [3,5 hours]
**Teachers: Fermin Otero**

Multiscale analysis is a fundamental approach in various scientific and engineering disciplines that aims to understand complex systems by examining their behavior and properties across multiple levels of scale.