



UNIVERSITÀ
DI PAVIA

DICAr

Dipartimento di Ingegneria Civile e Architettura
Università degli Studi di Pavia

NONLINEAR COMPUTATIONAL SOLID & STRUCTURAL MECHANICS

Theoretical formulations, technologies, and computations

May 21 – 25, 2018



The NL18 course has a very high scientific profile due to the expertise of the professors and to the discussed topics, ranging from classical basics to the most advanced state-of-the-art of linear and nonlinear computational mechanics.

Moreover, the course has a strong international character in terms of teaching body, including renown experts from the **University of California at Berkeley** and the **University of Stuttgart**, along with professors from academic institutions in Pavia.

The main objective of the course is to provide engineers who use computer codes, graduate students, and researchers with a **review of numerical techniques and solution algorithms for nonlinear mechanics**. The course indeed introduces the current state-of-the-art in finite element modeling of nonlinear problems in solid and structural mechanics and illustrates issues (and possible solutions) that could appear in a number of applications.

The course reviews systematically different sources of nonlinear behavior, paying special attention to ***nonlinear constitutive behavior of materials, large deformations and rotations of structures,***

contact and instability problems with either material (localization) or geometric (buckling) nonlinearities, which are needed to fully grasp weaknesses of structural design.

The course also provides insight both on advanced mathematical aspects and on the practical aspects of several computational techniques, such as the **finite element method, isogeometric analysis, meshless techniques and virtual element methods**.

Objective of the course is thus to provide the participants with a solid basis for using computational tools and software to achieve the optimal design, and/or to carry out a refined analysis of nonlinear behavior of structures.

The course finally provides a basis to account for multi-physics and multi-scale effects, likely to achieve a significant break-through in many industrial applications.

NL18 was held **from May 21st to May 25th**, in a wonderful historical palace in the centre of Pavia, **Palazzo Vistarino**, managed by Alma Mater Ticinensis Foundation, an Italian University Foundation which has two founding members, including the University of Pavia.



The course was joined by **38 participants**, 8 of which from industries.