

2ND INTERNATIONAL ADVANCED SCHOOL

30 September – 3 October 2025
Naples, Italy



UNIVERSITY OF NAPLES
FEDERICO II

Department of Structures for
Engineering and Architecture

Within the course of the PhD program in
*Structural & Geotechnical Engineering
and Seismic Risk*

DATES

30 September – 3 October 2025

24 hours (3 CFU)

LOCATION

Department of Structures for
Engineering and Architecture
Via Claudio, 21 - 80125 Naples (Italy)
Building 7, 1st floor, Manfredi Romano
room

CHAIR

Fulvio Parisi
University of Naples Federico II

AUDIENCE

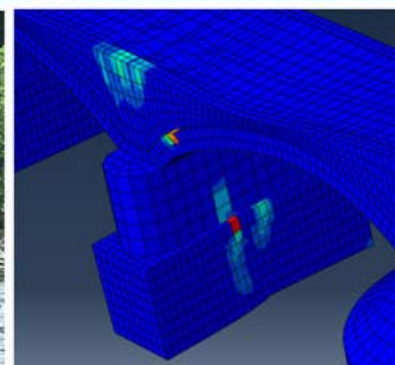
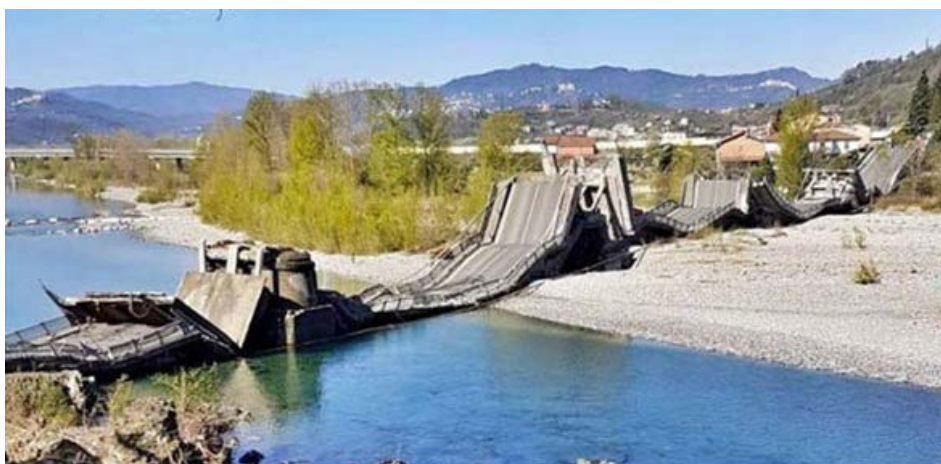
PhD students, postdoctoral
researchers, professionals,
facility managers

CONTACTS

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DIPARTIMENTO
DI ECCELLENZA
MUR



STRUCTURAL ROBUSTNESS AND RESILIENT INFRASTRUCTURE AGAINST EXTREME HAZARDS SARAH 2025

Final announcement

AIM

Civil engineering structures are increasingly subjected to extreme hazards, which are not usually considered in structural design and assessment. On one hand, such hazards have a very low probability of occurrence, and on the other, they are expected to produce huge consequences on people and property. Extreme events include but are not limited to natural events (e.g. landslides, floods, hurricanes), technological events (e.g. impact, fires, explosions), man-made events (e.g. malicious actions, human errors in design, construction or maintenance), deterioration phenomena (e.g. steel corrosion, concrete carbonation), and cascade events (e.g. natural-technological events). Climate change and strong urbanization in some areas have further exacerbated the occurrence of extreme hazards and their impact. This has significantly increased the awareness of governments and standardization bodies to develop guidelines for collapse prevention and provisions in national and international structural codes.

SARAH School aims at providing fundamentals of structural robustness, large-displacement inelastic response of structures, disaster risk and resilience of structures and infrastructures, as well as methods for structural design, assessment and retrofitting against extreme hazards.

LECTURERS

José M. Adam (Universidad Politécnica de Valencia, Spain)
André T. Beck (University of São Paulo, Brasil)
Robby Caspeele (Ghent University, Belgium)
Bassam Izzuddin (Imperial College London, UK)
Fulvio Parisi (University of Naples Federico II, Italy)

THEMATIC LECTURERS

Emanuele Brunesi (EUCENTRE, Italy)
Alex Cao (ETH Zurich, Switzerland)
Tom Molkens (KU Leuven, Belgium)
Francesco Petrini (La Sapienza University of Rome, Italy)

REGISTRATION

Registration:

<https://forms.gle/gCkPsH4tazeMx8zG6>

Registration fees:

- Students/Postdoc: **350 €**
- Professionals: **450 €**

Payment by **Bank transfer** to:

Dip. di Strutture per l'Ingegneria e l'Architettura - IBAN code:

IT81P0623003543000058328001

SWIFT code: **CRPPIT2P549**

Bank: **Credit Agricole Italia**

Deadline: **10th September 2025**

VENUE

SARAH Advanced School will be held in Manfredi Romano room of the Department of Structures for Engineering and Architecture.



COURSE OUTLINE

Starting from forensic analysis of catastrophic failures in buildings and bridges, the course will move across several issues as follows: progressive and disproportionate collapses of structures; structural and non-structural measures for collapse risk mitigation; definitions of structural robustness; design criteria and detailing rules for structural robustness; guidelines and code provisions at both national and international levels; robustness quantification; modelling of abnormal loads due to extreme events; extreme structural behaviour during experimental tests; nonlinear structural modelling; performance limit states under extreme structural response; simplified and advanced methods for progressive collapse analysis; performance-based robustness design and assessment; scenario-based and probabilistic simulations; component-level and system-level fragility for progressive collapse risk assessment; multi-hazard design and assessment; and relationship between structural robustness and disaster resilience. Besides theoretical lectures, several case studies of structures subjected to notional local damage, specified abnormal loads or retrofitting operations will be discussed. Design classes will allow participants to deeply understand and implement methodologies and tools.

COURSE SCHEDULE

Day 1 | September 30th, 2025

- 9:00 – 9:30 *Registration of participants*
- 9:30 – 10:00 **Fulvio Parisi**: Opening of SARAH Advanced School
Welcome to the University of Naples Federico II
Presentation of Lecturers
School organization and lectures
Extreme Hazards, Structural Robustness and Disaster Resilience
- 10:00 – 10:30 *Coffee break*
- 10:30 – 12:00 **Robby Caspeele**: Structural robustness and reliability in codes and guidelines
- 12:00 – 13:30 **Fulvio Parisi**: Progressive collapse and extreme resisting mechanisms under abnormal loads: disasters and experimental evidence
- 13:30 – 15:00 *Lunch break*
- 15:00 – 16:30 **Robby Caspeele**: Experimental assessment of membrane action in concrete elements through large-scale testing
- 16:30 – 17:00 *Coffee break*
- 17:00 – 18:30 **Fulvio Parisi**: Computational strategies and alternate load path analysis for robustness assessment

Day 2 | October 1st, 2025

- 9:30 – 11:00 **Fulvio Parisi**: Scenario-based robustness assessment of buildings and bridges
- 11:00 – 11:30 *Coffee break*
- 11:30 – 13:00 **André Beck**: Methodologies for reliability-based and risk-based design optimization
- 13:00 – 14:30 *Lunch break*
- 14:30 – 16:00 **André Beck**: Optimal redundancy allocation in structural systems: some fundamental results
- 16:00 – 16:30 *Coffee break*
- 16:30 – 18:00 **André Beck**: Risk-based cost-benefit analysis of structural strengthening systems to mitigate disproportionate collapse
- 19:30 – Social dinner at Ristorante "Al 53"

Day 3 | October 2nd, 2025

- 9:30 – 11:00 *Visit to the experimental facilities of the Department of Structures for Engineering and Architecture*
- 11:00 – 11:30 *Coffee break*
- 11:30 – 13:00 **Bassam Izzuddin**: Simplified robustness assessment framework for multi-storey buildings with application to steel-composite buildings
- 13:00 – 14:30 *Lunch break*
- 14:30 – 16:00 **Bassam Izzuddin**: Tying force method: shortcomings of existing approach and recent developments
- 16:00 – 16:30 *Coffee break*
- 16:30 – 18:00 **Bassam Izzuddin**: Exercises on simplified robustness framework and tying force method for multi-storey buildings

PARTNERS



Day 4 | October 3rd, 2025

- 9:30 – 11:00 **José Adam**: Fuse-based segmentation method for robustness design of concrete buildings
- 11:00 – 11:30 *Coffee break*
- 11:30 – 13:00 **José Adam**: Evidence from full-scale testing of concrete frame buildings
- 13:00 – 14:30 *Lunch break*
- 14:30 – 16:00 *Hybrid-mode session and debate on specific topics:*
 - Emanuele Brunesi** (EUCENTRE, Italy): Floor slabs and infill walls in RC framed buildings: Test-informed modelling for progressive collapse response assessment
 - Alex Cao** (ETH Zurich, Switzerland): Modelling progressive collapse of timber buildings
 - Tom Molkens** (KU Leuven, Belgium): Robustness performance of hybrid CLT-concrete floors based on experimental tests
 - Francesco Petrini** (Sapienza University of Rome, Italy): Structural robustness of steel buildings to fire
- 16:00 – 16:30 *Coffee break*
- 16:30 – 18:00 **José Adam**: Robustness of steel truss bridges to local failure: recent developments and exercises
- 18:00 – 18:30 *Final exam* (only for PhD students who need a certificate by the director of SARAH School)
- 18:30 – *Closure of SARAH School*

DETAILS

Please periodically check the [dedicated webpage](#), also through this QRcode



ADMINISTRATIVE STAFF

Dott.ssa Immacolata Diez - immacolata.diez@unina.it
Dott.ssa Valeria Peluso - valeria.peluso@unina.it

SOCIAL EVENTS

Wednesday, October 1st, 19h30 - Social dinner at Ristorante "Al 53"
Piazza Dante, 53 - 80135 Napoli

ACCOMODATION

Check availability in the **Fuorigrotta** area or in **town center**, preferably close to Metro lines 2 and 6 stations.

Since the end of September is still high season in Naples, participants are encouraged to explore accommodation options as soon as possible.