

4th INTERNATIONAL SUMMER SCHOOL

Bacoli - Naples, Italy

July 13th – 17th 2026



UNIVERSITY OF NAPLES
FEDERICO II

Department of Structures for
Engineering and Architecture



DIPARTIMENTO
DI ECCELLENZA
MUR

Within the courses of the Ph.D.
program in *Structural & Geotechnical
Engineering and Seismic Risk*

LOCATION

Villa Ferretti - Via Castello, 14
80070 Bacoli - Naples, Italy

<https://flegrei.it/bacoli/villa-ferretti.html>

CHAIRS

Costantino Menna

University of Naples Federico II

Freek Bos

Technical University of Munich

WHO SHOULD ATTEND

Ph.D. students, postdoctoral
researchers, practitioners interested in
research and applications of additively
manufactured structures

CONTACTS

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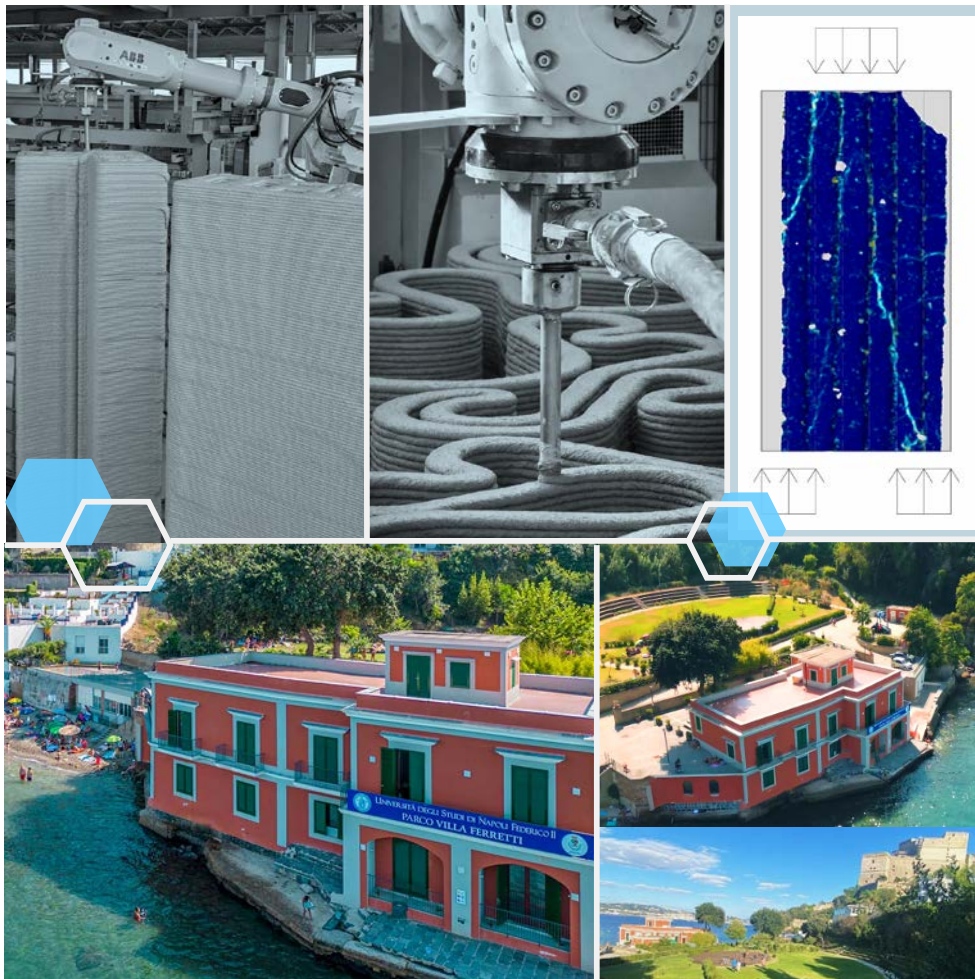
phd.dist@unina.it

PRE-REGISTRATION

Please note that the number of participants
is limited, and pre-registration is required:

<https://tinyurl.com/2khxsse>

ADDITIVELY MANUFACTURED CONCRETE STRUCTURES



AIM and SCOPE

The field of Additive Manufacturing (AM) of cementitious materials, particularly through 3D Concrete Printing (3DCP), is undergoing rapid development and growing interest within the construction industry. Building on the success of the three previous editions - which brought together participants and experts from across the globe - the *fourth* edition of the Summer School further benefit from the experience gained in delivering high-level academic and practical training in this emerging domain. Significant advancements continue to be made in materials science, production technologies, and the innovative design of high-TRL (Technology Readiness Level) projects. However, a structured academic framework for researchers involved in the digital design-to-fabrication workflow is still urgently needed to enhance the socio-economic and environmental benefits of 3DCP implementation.

The main objective of this Summer School is to equip participants with advanced multidisciplinary skills, covering analytical, numerical, and practical aspects of 3DCP (leveraging both field-scale demonstrations and interlaboratory knowledge) for the design and construction of concrete structures. Expert-led lectures from internationally recognized researchers will address cutting-edge scientific topics. Participants will also be encouraged to share and discuss their own research, fostering meaningful peer-to-peer exchange and professional development.

INTERNATIONAL LECTURERS

Costantino Menna - University of Naples Federico II (Italy)

Freek Bos - Technical University of Munich (Germany)

Arnaud Perrot - Université Bretagne Sud (France)

Jacques Kruger - Stellenbosch University (South Africa)

Previous edition details and updates: https://www.dist.unina.it/en_GB/didattica/postdoc/summer-school

Supported by:



In collaboration with:

DATES

13-17 July 2026

24 hours (3 CFU)

REGISTRATION

Link: <https://forms.gle/YvHhwZeTCBop4LSm7>

Deadline: May 30, 2026

Fee: 350 € for Master and PhD students
– 600 € for post-doc, senior researchers, professionals, companies

Included: lunches and coffee breaks for the 5 days of Summer School, social event and dinner, printed book of lecture notes, printing of the poster for the summer school competition (350€ prize).

VENUE

The Summer School will be held at **Villa Ferretti**, a beautifully restored historical villa located in Bacoli, in the heart of the Campi Flegrei area, just west of Naples. Overlooking the Gulf of Naples and set against the backdrop of the Aragonese Castle of Baia, the venue offers a unique blend of architectural heritage, natural beauty, and cultural significance.



Originally commissioned in the 1940s and later acquired by the Campania Region, Villa Ferretti has been repurposed as a center for education and public engagement. Surrounded by a panoramic terrace and Mediterranean gardens, it provides an inspiring setting for learning, discussion, and international collaboration.



The Campi Flegrei, or "Phlegraean Fields," are a large volcanic area known since antiquity for their geothermal

INVITED TALKS

Liberato Ferrara - Politecnico di Milano (Italy)

Daniel Weger - Schiessl Gehlen Sodeikat Ingenieurbüro GmbH (Germany)

Inka Mai - Technische Universität Berlin (Germany)

COURSE OUTLINE

- Additive Manufacturing processes using concrete
- Construction materials adopted in 3DCP
- Rheological requirements to control the printing process
- Mechanical-physical characterization in the fresh state
- Mechanical-physical characterization in the hardened state
- Analytical and numerical modeling of the printing process/layered structure
- Reinforcement technologies
- Structural optimization based on free-form capabilities
- Structural analysis and approval in large-scale applications
- Examples and practical applications

FINAL PROGRAM

Monday July 13, 2026 – Day 1

12.00 – 12.45: *Registration of participants*

12.45 – 14.00: *Welcome Lunch*

14.00 – 14.45 | **Menna - Bos**: Introduction and presentation of AMCS-2026

14.45 – 15.30 | **Bos**: AM Processes with concrete

15.30 – 16.30 | **Kruger**: How to print & cure

16.30 – 17.00: *Coffee Break*

17.00 – 17.45 | Invited Talk nr.1 – **Liberato Ferrara**: 3DCP Rheology: advanced simulation tools

17.45 – 18.15 | Invited Talk nr.2 – **Daniel Weger**: 3DCP applications in practice

18.15 – : Walking/Aperitif around Villa Ferretti (not included in the SC fee)

Tuesday July 14, 2026 – Day 2

09.00 – 09.45 | **Bos**: 3DCP Projects in practice

09.45 – 10.45 | **Perrot**: Materials & Rheology basics – Part I

10.45 – 11.05: *Coffee Break*

11.05 – 12.05 | **Perrot**: Materials & Rheology basics – Part II

12.05 – 13.05 | **Kruger**: Fresh state characterization – Part I

13.05 – 14.15: *Lunch Break*

14.15 – 15.15 | **Kruger**: Fresh state characterization – Part II

15.15 – 19.15: Guided Tour - *Piscina Mirabilis* and *Submerged Archaeological Park of Baia*

19.30 – : Social dinner (offered by the Summer School)

Wednesday July 15, 2026 – Day 3

09.00 – 10.00 | **Perrot**: Materials & Rheology – modeling and applications – Part I

10.00 – 11.00: | **Perrot**: Materials & Rheology – modeling and applications – Part II

11.00 – 11.20: *Coffee Break*

11.20 – 12.20 | **Kruger**: Modeling of print process

12.20 – 13.20 | **Bos**: Hardened state characterization and properties

13.20 – 14.30: *Lunch Break*

14.30 – 16.30 | Printing Session preparation – **Galdi** (Etesias), **Esposito** (HeidelbergMaterials)

16.30 – 17.00: *Coffee Break*

17.00 – 17.30 | Invited Talk nr.3 – **Inka Mai**: Injection 3D Concrete Printing

Thursday July 16, 2026 – Day 4

08.30 – 10.00: Transfer to printing site for practical session

10.00 – 13.30 | *Laboratory Visit* - **Practical printing session**

13.30 – 14.30: *Lunch Break*

14.30 – 15.30: Transfer to the SC venue

15.30 – 16.30 | Poster Session and research presentation by participants

activity and mythological significance. This territory was a vital part of the Roman Empire, hosting imperial villas, thermal baths, and ports, many of which are still visible today in an exceptional concentration of archaeological sites. The area continues to be a crossroads of history, science, and landscape, offering a truly immersive experience in one of Italy's richest cultural regions.

Villa Ferretti is part of the numerous historical buildings of the University of Naples Federico II.



The University of Naples Federico II celebrated its **800th anniversary** on 2024, a milestone celebrated with the entire city.

The Federico II University, in addition to being one of the oldest in Europe, was the first university institution founded by a secular public authority. This prestigious distinction traces its origins to the enlightened Frederick II, the emperor who, 800 years ago, on June 5, 1224, founded the University where knowledge was made accessible to anyone in the Kingdom



Social Event

The Social Event of this year's Summer School will take place in the fascinating setting of Bacoli, with a guided tour of two of the most iconic cultural sites in the Phlegraean Fields: the **Piscina Mirabilis** and the **Submerged Archaeological Park of Baia**.

The Piscina Mirabilis is one of the most impressive Roman cisterns in the Mediterranean, carved into the tuff hill of Bacoli. With its monumental pillars and vaulted spaces, it offers a striking

16.30 – 17.00: *Coffee Break*

17.00 – 18.00 | Feedback Session

Friday July 17, 2026 – Day 5

09.00 – 10.30 | **Bos**: Reinforcement technologies

10.30 – 11.00: *Coffee Break*

11.00 – 12.30 | **Menna**: Structural analysis and principles

12.30 – 13.30: *Lunch Break*

13.30 – 14.15 | **Menna**: Structural Optimization - basics for 3DCP applications

14.15 – 15.00 | Final Discussion Session

15.00 – 15.30 | **Poster Session Award** and **Closing of the Summer School**

15.30 – 16.30: “Goodbye” *Coffee Break*

SOCIAL EVENT - GUIDED TOUR

We are delighted to announce that we will be organizing and offering all participants a half-day guided tour of the **Piscina Mirabilis** and the **Submerged Archaeological Park of Baia** on Tuesday, July 14th (**Day 2**). Both sites are located within short distance of the Summer School venue. The *Piscina Mirabilis* is one of the most impressive Roman hydraulic engineering work of the Mediterranean area, while the *Submerged Archaeological Park of Baia* (visible through a boat tour) is ancient Roman seaside city now lying below sea level. Together, they offer a unique cultural and historical experience in the heart of the Campi Flegrei area. We will conclude the visit with a social dinner at a nearby restaurant, providing a relaxed occasion for informal networking and discussion.

Further details:

- Piscina Mirabilis:
https://en.wikipedia.org/wiki/Piscina_Mirabilis
- Submerged Archaeological Park of Baia:
<https://parcoarcheologicodibaia.it/en>

All costs related to the tour tickets and social dinner are fully covered for Summer School participants.

TRAVEL INFO - How to arrive to Villa Ferretti (Bacoli)

From Rome to Naples:

- From *Rome Airport* (Leonardo da Vinci-Fiumicino Airport): take the Leonardo Express train or other regional trains to Roma Termini, the main train station in Rome. From the airport, you can follow the pedestrian path to take the Leonardo Express (<https://www.trenitalia.com/en/services/connections-to-and-from-rome-fiumicino-airport.html>). The journey takes approximately 30 minutes. Train tickets can be purchased at the airport or at the train station.

- By train, from *Roma Termini*, the main train station in Rome. Take a train to Naples Central Station (Napoli Centrale). The journey takes approximately 1-2 hours, depending on the type of train (fast or regional, respectively). Train tickets can be purchased at the station or online in advance (<https://www.trenitalia.com/en.html>).

From Naples to Villa Ferretti - Bacoli:

- From *Naples Airport* (Napoli Capodichino Airport): take the Alibus shuttle service (https://www.aeroportodinapoli.it/en_GB/collegamenti-con-napoli-centro) that connects the airport to Naples Central Station (“Napoli Centrale”, in Italian). The journey takes approximately 20-30 minutes.

example of Roman hydraulic engineering and architectural mastery.

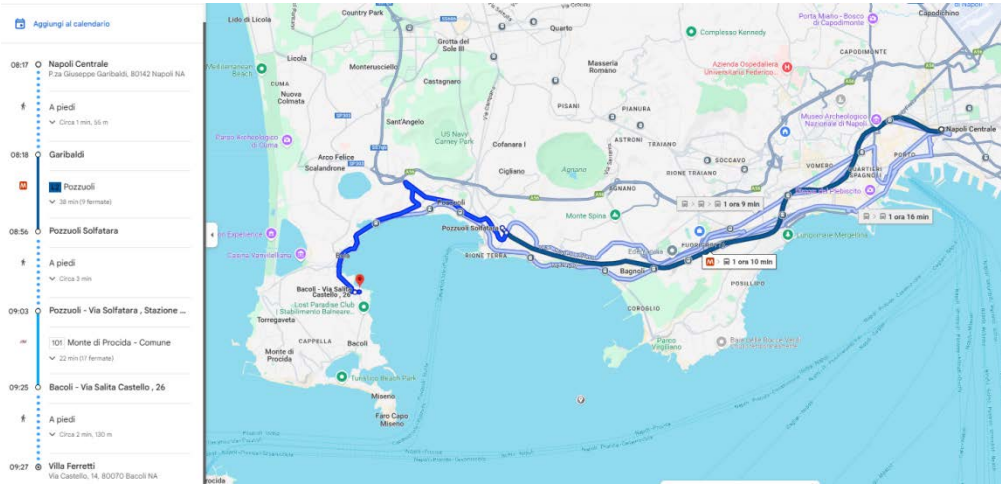


The visit continues to the Submerged Archaeological Park of Baia which offers a unique view of the ancient Roman seaside city now lying below sea level. Through a glass-bottom boat tour, participants will be able to observe submerged villas, mosaics, columns, and archaeological remains while experiencing the cultural landscape of the Phlegraean coast from the sea



This immersive cultural experience will be followed by a social dinner, offering participants the chance to network and exchange ideas in a relaxed and inspiring environment.

- From *Naples Train Station*: once you arrive in Naples Central Station (“Napoli Centrale”, in Italian), make your way to Bacoli and Villa Ferretti. Participants can reach Villa Ferretti in Bacoli using public transportation in approximately 1 hour and 30 minutes. Below is the recommended option:
 - Metro Line 2: From Napoli Centrale, take Metro **Line 2** towards *Pozzuoli Solfatara*. The journey takes about 30 minutes.
 - Bus 101: Exit the station and walk to the nearby bus stop on Via Solfatara. Board the EAV Bus Line 101 heading towards Monte di Procida. Stop at the Bacoli - Via Castello stop. The bus ride takes approximately 50 minutes.
 - Walk to Villa Ferretti: From the bus stop, it's a short 2-minute walk to Villa Ferretti, located at Via Castello, 14.



SUGGESTED HOTELS

The list includes some suggested accommodation in Bacoli and Pozzuoli. Please be aware that July is the high season in Naples and surrounding areas. If no options within walking distance from Villa Ferretti are available, we recommend considering accommodation in the Pozzuoli municipality, as the Summer School organization will provide a shuttle service to and from the venue (approximately 15-20 minutes by shuttle). This option is also convenient for those who choose to stay in Naples as their base location.

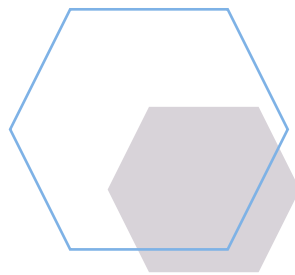
Bacoli	Pozzuoli
La Rada B&B	Villa Avellino Historic Residence
Shanti Rooms & Apartments Lucullo	Hotel Terme Neronensis
Villa Principe	Boutique Hotel Palazzo Donna Iulia
Castello Apartment	Anfiteatro House
Tenuta Calidarius	DIMORA FLEGREA Room & Breakfast
Il Barbacane	B&B SOFIA
La Dimora di Lucullo Appartament & Relax	Six Luxury Rooms Pozzuoli
La Rada B&B (duplicate)	Suite Experience Accommodation
La Sabbia B&B	Altre Stelle Suite Apartments
Casa Nina - Bacoli Elegant & View	
Domus Diana	

DETAILS

Please check periodically the link below for updates and further instructions.
<https://www.dist.unina.it/-/109070611-additively-manufactured-concrete-structures-2026>

PARTNERS

The summer school is supported by:



Collaborations:



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