

3rd INTERNATIONAL SUMMER SCHOOL

Bacoli - Naples, Italy

July 14th – 18th 2025



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://bacoli.it/visitare/monumenti/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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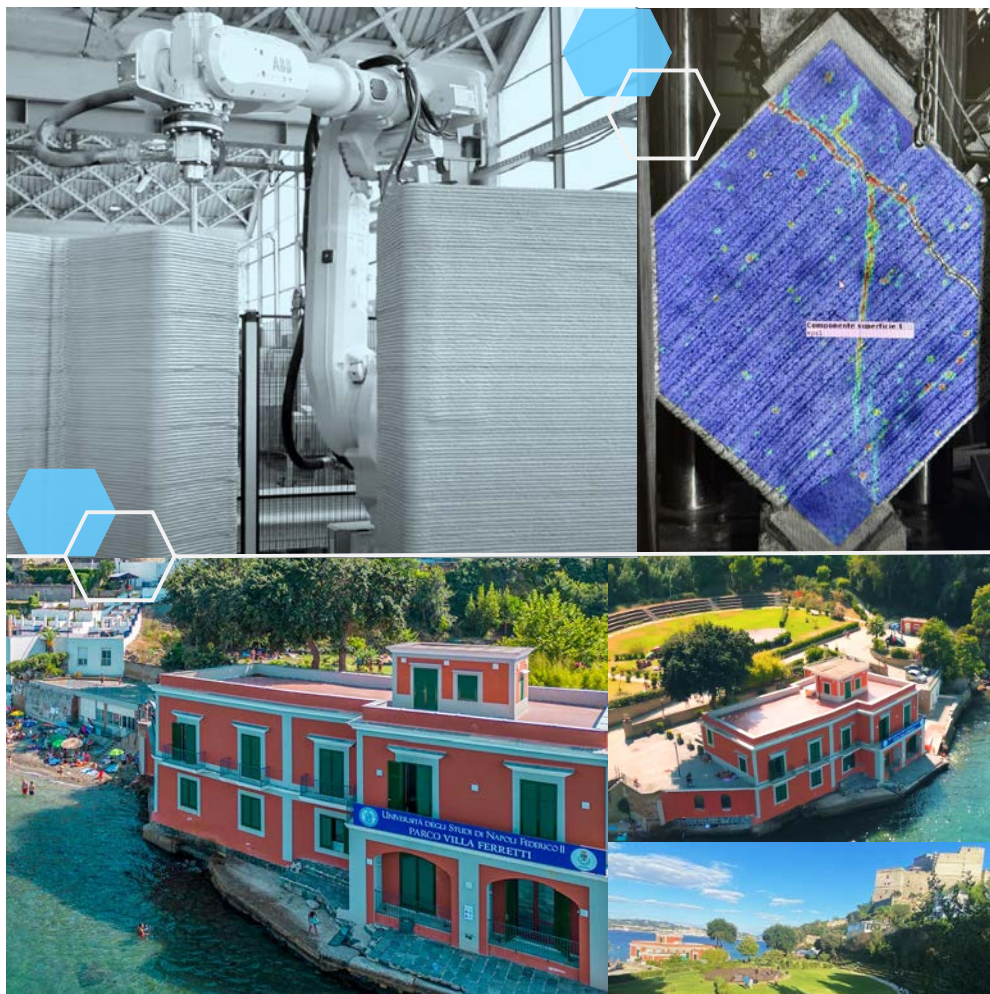
phd.dist@unina.it

PRE-REGISTRATION

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

<https://tinyurl.com/2r9rebes>

ADDITIVELY MANUFACTURED CONCRETE STRUCTURES



AIM and SCOPE

The field of additive manufacturing (AM) of cementitious materials, particularly through 3D Concrete Printing (3DCP), is experiencing rapid growth within the construction industry. Significant advancements are being made in material science, production technologies, and the innovative design of high-TRL (Technology Readiness Level) projects. Currently, there is a critical need to establish a strong academic framework for researchers involved in the digital design-to-fabrication process of cutting-edge 3D-printed structures. Advancing technological and engineering expertise in 3DCP not only enhances understanding within the construction sector but also maximizes the socio-economic and environmental advantages that arise from its efficient implementation. The main goal of this Summer School is to equip participants with advanced technical skills—spanning analytical, numerical, and practical 3DCP sessions—necessary for the design and construction of structures using 3DCP. The program features expert-led sessions by renowned guest lecturers, focusing on specific research topics and real-world applications of 3DCP. Additionally, it provides increased opportunities for students to engage actively with their own research. This initiative is designed to encourage meaningful exchanges and in-depth discussions, enriching participants' knowledge and enabling them to address the opportunities and challenges of 3DCP more effectively.

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)

Check for updates: https://www.dist.unina.it/en_GB/didattica/postdoc/summer-school

Supported by:



In collaboration with:



DATES

14-18 July 2025

24 hours (3 CFU)

REGISTRATION

Link: <https://tinyurl.com/y2f4s7tn>

Deadline: May 30, 2025

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, 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 activity and mythological significance. This territory was a vital part of the

INVITED TALKS

Ksenija Vasilic - Deutscher Beton- und Bautechnik-Verein E.V. (Germany)

Lucija Hanzic - Slovenian National Building and Civil Engineering Institute (Slovenia)

Gianluca Cusatis - Northwestern University (USA)

Venkatesh Nerella - Putzmeister Deutschland (Germany)

Harald Kloft - TU Braunschweig (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 14, 2025 – 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-2025

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

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

16.30 – 16.45: *Coffee Break*

16.45 – 17.15 | Invited Talk nr.1 - **Ksenija Vasilic**: Getting 3DCP to practice

17.15 – 18.15 | *Poster Session and research presentation by participants*

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

Tuesday July 15, 2025 – 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 - *Parco archeologico delle Terme di Baia and Casina Vanvitelliana*

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

Wednesday July 16, 2025 – 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 – 18.00 | Feedback Session I

Thursday July 17, 2025 – Day 4

08.30 – 10.00: Transfer to printing site for practical session

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 **Archaeological Park of the Baiae Baths** (Terme di Baia) and the **Casina Vanvitelliana**.

The Archaeological Park of Baiae showcases the remains of one of the largest thermal complexes of the Roman Empire, built into the volcanic slopes overlooking the sea. Participants will walk through ancient vaulted chambers, mosaics, and domed structures that

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 – 16.00 | Invited Talk nr.2 - **Lucija Hanzic**: Durability aspects in 3DCP

16.00 – 16.30 | Invited Talk nr.3 - **Gianluca Cusatis**: Advanced numerical modeling in 3DCP

16.30 – 17.00: *Coffee Break*

17.00 – 18.00 | *Feedback Session II*

Friday July 18, 2025 – Day 5

09.00 – 09.30 | Invited Talk nr.4 - **Venkatesh Nerella**: 3DCP in large scale projects

09.30 – 11.00 | **Bos**: Reinforcement technologies

11.00 – 11.30: *Coffee Break*

11.30 – 13.00 | **Menna**: Structural analysis and principles

13.00 – 14.00: *Lunch Break*

14.00 – 14.45 | **Menna**: Structural Optimization - basics for 3DCP applications

14.45 – 15.15 | Invited Talk nr.5 - **Harald Kloft**: Recent trends in AM with concrete

15.15 – 15.45: *Coffee Break*

15.45 – 16.30 | *Final Discussion Session*

16.30 – 17.30 | **Poster Session Award** and **Closing of the Summer School**

SOCIAL EVENT - GUIDED TOUR

Parco archeologico delle Terme di Baia and Casina Vanvitelliana

We are delighted to announce that we will be organizing and offering all participants a half-day guided tour of the **Parco Archeologico delle Terme di Baia** and the **Casina Vanvitelliana** on Tuesday, July 15th (**Day 2**). Both sites are located within walking distance of the Summer School venue. The Archaeological Park of Baiae is one of the most impressive Roman thermal complexes, while the Casina Vanvitelliana is a charming 18th-century architectural landmark set on Lake Fusaro. 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:

- Parco Archeologico delle Terme di Baia:
<https://pafleg.cultura.gov.it/it/4388/localit/51/parco-archeologico-delle-terme-di-baia>
- Casina Vanvitelliana:
<https://www.casnavanvitelliana.net/>

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:

reveal the advanced engineering and refined lifestyle of Roman elites.

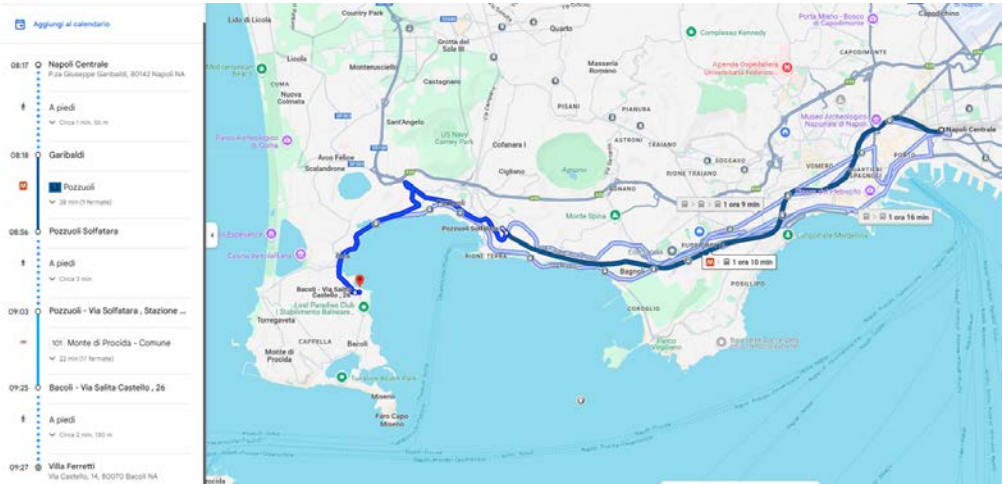


The visit continues to the Casina Vanvitelliana, a picturesque 18th-century hunting lodge designed by Luigi Vanvitelli, located on a small island in Lake Fusaro. With its baroque architecture and scenic setting, it has long been a symbol of elegance and historical charm in the region.



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 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.
- 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.

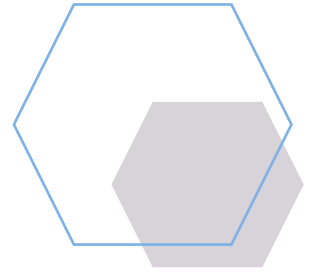
Bacoli	Pozzuoli
La Rada B&B	Villa Avellino Historic Residence
Shanti Rooms & Apartments Lucullo	Hotel Terme Neronensis
Villa Principe	Boutique Hotel Palazzo Donna Iulia
Castello Apartment	Anfiteatro House
Tenuta Calidarius	DIMORA FLEGREA Room & Breakfast
Il Barbacane	B&B SOFIA
La Dimora di Lucullo Appartamento & 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.

PARTNERS

The summer school is supported by:



Collaborations:



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