

# Extreme-scale big data analytics and scientific computing on heterogeneous platforms

Lake Como School of Advanced Studies, September 26-30, 2022

[Home](#)
[Organizers](#)
[Speakers](#)
[Program](#)
[Application](#)
[Venue and accommodation](#)
[Contact us](#)


## Home

In the last years, we assisted to an explosion of applications that require the elaboration of vast amounts of data. These applications search for hidden relations among data (big data analytics) or perform multidisciplinary computations to solve complex problems (scientific computing). These applications can unleash breakthrough innovation in society and industry but have extremely high computational demands. While heterogeneous platforms are well established for specific, embedded applications, they require substantial effort to optimize the execution of large, complex applications. Designers need to understand in depth the domain of the computation that often is complex and interdisciplinary, including Physics and Mathematics for scientific and machine learning applications, and to master hardware design for specializing the hardware platform and creating the proper data management infrastructure. This problem requires multidisciplinary skills and proper design environments.

This summer school aims at establishing a living and interdisciplinary environment to bridge the gap between system researchers and application developers. The former will learn most common application requirements, while the others will understand the potential of modern heterogeneous platforms and how to use them to solve their problems. The school will provide a bird's-eye view on modern big data and scientific applications, highlighting their challenges and computational demands. Then, it will present the technology behind modern heterogeneous platforms from both industrial and research perspectives. Finally, it will discuss advanced design environments from bridging the gap between these two communities.



In the last years, we assisted to an explosion of applications that require the elaboration of vast amounts of data. These applications search for hidden relations among data (**big data analytics**) or perform multidisciplinary computations to solve complex problems (**scientific computing**). These applications can unleash breakthrough innovation in society and industry but have extremely high computational demands. While **heterogeneous platforms** are well established for specific, embedded applications, they require substantial effort to optimize the execution of large, complex applications. Designers need to understand in depth the domain of the computation that often is complex and interdisciplinary, including Physics and Mathematics for scientific and machine learning applications, and to master hardware design for specializing the hardware platform and creating the proper data management infrastructure. This problem requires multidisciplinary skills and proper design environments.

This summer school aims at establishing a **living and interdisciplinary environment** to bridge the gap between system researchers and application developers. The former will learn most common application requirements, while the others will understand the potential of modern heterogeneous platforms and how to use them to solve their problems.

The school will provide a bird's-eye view on modern big data and scientific applications, highlighting their challenges and computational demands. Then, it will present the technology behind modern heterogeneous platforms from both industrial and research perspectives. Finally, it will discuss advanced design environments from bridging the gap between these two communities.

### Application and Registration

The school is open to up to 40 participants.

Application deadline: **July 14, 2022**  
Notification deadline: **July 20, 2022**  
Registration deadline: **August 5, 2022**

Contacts and Information: [christian.pilato@polimi.it](mailto:christian.pilato@polimi.it)



POLITECNICO  
DI TORINO



### ORGANIZERS

- Christian Pilato (School Director)  
Politecnico di Milano
- Antonella Galizia  
IMATI-CNR and CIMA Foundation
- Francesco Regazzoni  
University of Amsterdam and USI

### CONFIRMED SPEAKERS

- Alessio Merlo  
Università di Genova
- Christoph Haglmeier  
IBM Research Europe
- Dieter Kranzmueller  
LMU and LRZ Munich
- Enrico Bazzi  
Jakala
- Fabrizio Ferrandi  
Politecnico di Milano
- Gabriele Provana  
Eni
- Jan Martinovic  
IT4Innovations
- Jeronimo Castrillon  
TU Dresden
- Lana Jospovic  
ETH Zurich
- Luca Caviglione  
IMATI-CNR
- Ryan Kastner  
University of California San Diego
- Stanislav Bohm  
IT4Innovations





# Extreme-scale big data analytics and scientific computing on heterogeneous platforms

*Lake Como School of Advanced Studies, September 26-30, 2022*

[Home](#)[Organizers](#)[Speakers](#)[Program](#)[Application](#)[Venue and accommodation](#)[Contact us](#)

## Organizers

- **Christian Pilato** (School Director, [christian.pilato@polimi.it](mailto:christian.pilato@polimi.it)), Politecnico di Milano
- **Antonella Galizia**, IMATI-CNR and CIMA Foundation
- **Francesco Regazzoni**, University of Amsterdam and USI





# Extreme-scale big data analytics and scientific computing on heterogeneous platforms

Lake Como School of Advanced Studies, September 26-30, 2022

[Home](#)[Organizers](#)[Speakers](#)[Program](#)[Application](#)[Venue and accommodation](#)[Contact us](#)

## Speakers

- **Alessio Merlo**, Università di Genova
- **Christoph Hagleitner**, IBM Research Europe
- **Dieter Kranzlmüller**, LMU and LRZ Munich
- **Enrico Bazzi**, Jakala
- **Fabrizio Ferrandi**, Politecnico di Milano
- **Gabriele Provana**, Eni
- **Jan Martinovic**, IT4Innovations
- **Jeronimo Castrillon**, TU Dresden
- **Lana Josipovic**, ETH Zurich
- **Luca Cavaglione**, IMATI-CNR
- **Ryan Kastner**, University of California San Diego
- **Stanislav Bohm**, IT4Innovations

You can download more info on the speakers and on the talks here: [talks\\_PhDSchool](#)



# Extreme-scale big data analytics and scientific computing on heterogeneous platforms

Lake Como School of Advanced Studies, September 26-30, 2022

[Home](#)

[Organizers](#)

[Speakers](#)

[Program](#)

[Application](#)

[Venue and accommodation](#)

[Contact us](#)



## Program

Extreme-scale big data analytics and scientific computing on heterogeneous platforms  
Lake Como School of Advanced Studies, September 26-30, 2022

	Monday, Sept 26, 2022	Tuesday, Sept 27, 2022	Wednesday, Sept 28, 2022	Thursday, Sept 29, 2022	Friday, Sept 30, 2022
09:00	Intro (Christian Pilato)	Intro	Intro	Intro	Intro
09:15					
09:30	Keynote 1: Gabriele Provana (ENI)	Keynote 2: Ryan Kastner (UC San Diego)	Keynote 3: Dieter Kranzmueller (LMU and LRZ Munich)	Keynote 4: Luca Cavaglione (IMATI-CNR)	Lecture: Jan Martinovic (IT4I)
09:45					
10:00					
10:15					
10:30	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break
10:45					
11:00					
11:15					
11:30	Lecture: Stanislav Bohm (IT4I)	Lecture: Jeronimo Castrillon (TU Dresden)	Lecture: Christoph Hageltnier (IBM)	Lecture: Lana Josipovic (ETH Zurich)	Hands-on Session: High-Level Synthesis
11:45					
12:00					
12:15					
12:30					
12:45					
13:00	Lunch	Lunch	Lunch	Lunch	Lunch
13:15					
13:30					
13:45					
14:00					
14:15	Interactive Workshop - with intro by Enrico Bazzi (Jakala)	Lecture: Francesco Regazzoni (USI & Univ. Amsterdam)	Lecture: Fabrizio Ferrandi (PolIMI)	Lecture: Alessio Merlo (Univ. Genova)	Closing Session/Test
14:30					
14:45					
15:00					
15:15					
15:30	Coffee Break	Coffee Break	Coffee Break	Coffee Break	
15:45					
16:00					
16:15					
16:30	Poster Session	Hands-on Session: Application Description	Round Table / Mentoring: How to build your career	Hands-on Session: Hardware Generation Flow	Farewell Party
16:45					
17:00					
17:15					
17:30					
17:45					
18:00	Welcome Reception				
18:15					
18:30			Social Dinner		