CERN openlab Summer Student Lectures

Fariza Oulashova (CERN openlab)

ABOUT CERN OPENLAB

Since its inception, in 2001, CERN openlab has fostered the development of big data scientific research through **four primary missions.**

Four primary missions:

1. Establishing strategic industry collaborations
2. Fuelling technological innovation
3. Exposing technology to scientists
4. Nurturing knowledge and growth in young STEM researchers

ABOUT CERN OPENLAB

CERN openlab is a **unique public-private partnership**.

We work to **accelerate computing for science**.

We **collaborate with leading technology companies** (including Intel, Oracle, Siemens, Micron).

We also **work with other research laboratories** (including Fermilab and INFN).

Education and training are important aspects of our work.

Over 6000 applicants for this year's CERN openlab summer student programme.

30 students selected from 21 different countries.

Our members

intel
SIEMENS
Roche
ORACLE
Micron
E4 COMPUTER ENGINEERING
cerabyte
UNIVERSITÀ DEGLI STUDI DI TRIESTE
INFN

LECTURES FROM THE MAIN PROGRAMME

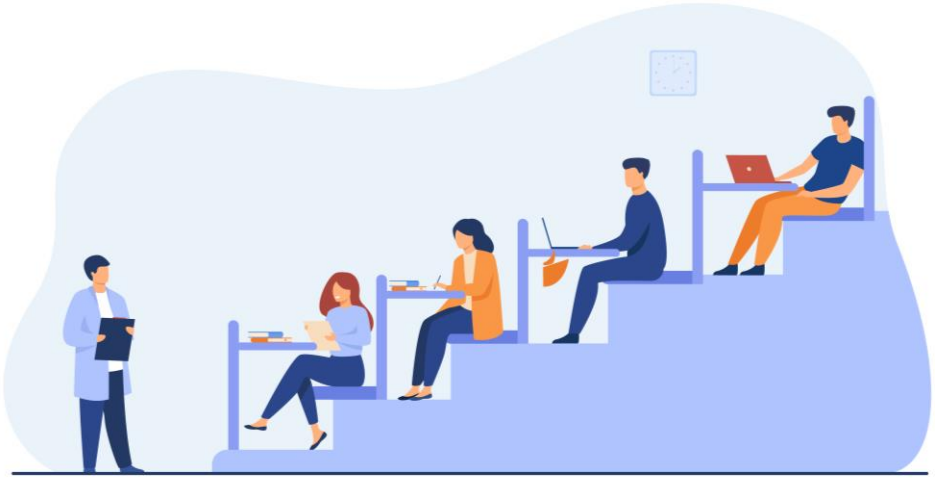
Particularly recommended to openlab students.

From Raw Data to Physics Results
Paul James Laycock

Main Auditorium (500/1-001)
11:35-12:30, 3 July
09:15-10:10, 4 July
10:25-11:20, 5 July

Foundation of Statistics
Glen Cowan

Main Auditorium (500/1-001)
11:35-12:30, 9 July
09:15-10:10, 10 July
11:35-12:30, 11 July
10:25-11:20, 12 July



CERN OPENLAB LECTURE PROGRAMME

Based on the CERN openlab R&D activities. In-person for openlab students, webcast available for other students.

Welcome and introduction to CERN
Maria Girone, Robert Paul Flower

IT Amphitheatre (31/3-004)
13:30-14:30, 2 July

Computer Security: Past, Present & Future
Stefan Lueders

IT Amphitheatre (31/3-004)
13:30-15:30, 3 July

Tackling computer challenges at CERN
Alessandro Di Girolamo

IT Amphitheatre (31/3-004)
14:40-16:00, 2 July

DAQ-filtering data from 50 TB/s to 1GB/s
Flavio Pisani

IT Amphitheatre (31/3-004)
13:30-15:30, 4 July

CERN OPENLAB LECTURE PROGRAMME

Machine Learning

Introduction to Machine Learning and Deep Learning
Michael Kagan

Main Auditorium (500/1-001)
13:30-16:30, 5 July

Hyperparameter Optimization for Deep Learning Models Using High Performance Computing
Eric Wulff

IT Amphitheatre (31/3-004)
13:30-15:30, 9 July

Reinforcement learning and its applications at CERN
Matteo Bunino

IT Amphitheatre (31/3-004)
13:30-15:30, 11 July

ML in DAQ and trigger systems
Thomas Owen James

IT Amphitheatre (31/3-004)
14:30-15:30, 16 July

CERN OPENLAB LECTURE PROGRAMME

Infrastructure and Modern Programming

Data Centre Hardware (in-person)
Luca Atzori

IT Amphitheatre (31/3-004)
13:30-15:00, 17 July

Storage
Abhishek Lekshmanan

IT Amphitheatre (31/3-004)
15:00-16:30, 17 July

High Performance Computing
David Southwick

IT Amphitheatre (31/3-004)
13:30-15:30, 18 July

Best practices: the theoretical and practical underpinnings of writing code that is less bad
Axel Naumann

IT Amphitheatre (31/3-004)
13:30-15:30, 22 July

GPU programming
Stephan Hageboeck

IT Amphitheatre (31/3-004)
13:30-15:30, 23 July

CERN OPENLAB LECTURE PROGRAMME

Emerging Technologies: Foundation Models and Digital Twins

Foundation models: from the transformer to ChatGPT, and beyond. Prompt engineering?
Sofia Vallecorsa

IT Amphitheatre (31/3-004)
13:30-15:30, 26 July

Digital twins and their application at CERN
Alexander Zoechbauer, Kalliopi Tsolaki

IT Amphitheatre (31/3-004)
13:30-15:30, 29 July

CERN OPENLAB LECTURE PROGRAMME

Emerging Technologies: Quantum Computing

Basics of Quantum Computing
Ema Puljak

IT Amphitheatre (31/3-004)
13:30-14:30, 30 July

Quantum computing hands-on
Giulio Crognaletti

IT Amphitheatre (31/3-004)
14:30-15:30, 30 July

Quantum Optimization and Quantum Machine Learning
Carla Sophie Rieger

IT Amphitheatre (31/3-004)
15:30-17:00, 30 July

Quantum inspired algorithm: Tensor Networks
Ema Puljak, Francesco Di Marcantonio

IT Amphitheatre (31/3-004)
13:30-15:00, 31 July

Software engineering/Quantum Kernels
Roman Wixinger

IT Amphitheatre (31/3-004)
15:00-16:30, 31 July

CERN OPENLAB LECTURE PROGRAMME

Evening Lectures: open to all summer students!

Physics-based deep learning
Peter Kicsiny

IT Amphitheatre (31/3-004)
17:00-18:00, 15 July

Movie night: "Particle Fever"
Mark Levinson

Main Auditorium (500/1-001)
19:00-21:00, 15 July

LIGHTNING TALKS

Students work on projects over nine weeks, gaining **hands-on experience with latest computing technologies**.

5-minute presentations by each student, with prizes for best talks.

Split into two sessions: **13th and 14th of August.**

Events will also be **online and open to all**.

GET IN TOUCH!

Send us a message ↓

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Website | openlab.cern

Phase VIII Brochure

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X