
CERN
openlab

CERN openlab summer student lectures

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CERN openlab

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

We work to drive **innovation in computing technologies**.

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

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

Education and **training** are important aspects of our work.

Over 2000 applicants for this year's CERN openlab summer student programme.

30 students selected from **21** different countries.

More info on our website: **openlab.cern**

Follow us on Twitter/Facebook: **@CERNopenlab.**

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, 28 June
09:15-10:10, 29 June
10:25-11:20, 30 June

Foundation of Statistics
Glen Cowan
Main Auditorium (500/1-001)
09:15-10:10, 4 July
10:25-11:20, 5 July
09:15-10:10, 6 July
11:35-12:30, 7 July

Openlab lecture programme

Based on openlab pillars. **In-person for openlab students,** webcast available for the others.

Welcome and introduction to CERN
Alberto Di Meglio, Maria Girone, Anna Cook
IT Amphitheatre (31/3-004)
14:00-15:00, 4 July

Tackling computer challenges at CERN
Alessandro Di Girolamo, Maria Girone
IT Amphitheatre (31/3-004)
15:00-16:00, 4 July

DAQ-filtering data from 50 TB/s to 1GB/s
Flavio Pisani
IT Amphitheatre (31/3-004)
14:00-16:00, 10 July

Computer Security: Past, Present & Future
Stefan Lueders
IT Amphitheatre (31/3-004)
14:00-16:00, 11 July

Openlab lecture programme (2)

AI and High-performance Computing (HPC).

Introduction to Machine Learning and Deep Learning
Michael Kagan
IT Amphitheatre (31/3-004)
14:00-16:30, 13 July

Graph Neural Networks: From fundamentals to Physics application
Ilias Tsaklidis
IT Amphitheatre (31/3-004)
14:00-16:00, 17 July

Hyperparameter Optimization for Deep Learning Models Using High Performance Computing
Eric Wulff
IT Amphitheatre (31/3-004)
14:00-16:00, 18 July

Reinforcement learning and its applications at CERN
Matteo Bunino
IT Amphitheatre (31/3-004)
14:00-15:30, 20 July

Openlab lecture programme (3)

Quantum computing.

Basics of quantum computing (theory)
Alice Barthe
BE Auditorium Meyrin (6/2-024)
14:00-15:30, 27 July

Basics of quantum computing (practice)
Su Yeon Chang
BE Auditorium Meyrin (6/2-024)
15:30-17:00, 27 July

Applications of Quantum Computing: CERN use case, Quantum Machine Learning and optimization
Carla Sophie Rieger
IT Amphitheatre (31/3-004)
14:00-15:30, 31 July

Quantum Kernel Methods (hands-on on Quask)
Francesco Di Marcantonio, Roman Wixinger
IT Amphitheatre (31/3-004)
15:30-16:00, 31 July

Openlab lecture programme (4)

Advanced programming techniques.

GPU programming
Stephan Hageboeck
IT Amphitheatre (31/3-004)
14:00-16:00, 1 August

Best practices: the theoretical and practical underpinnings of writing code that is less bad
Axel Naumann
IT Amphitheatre (31/3-004)
14:00-15:30, 3 August

Openlab lecture programme (5)

Digital twins and advanced storage solutions.

Agent-based modeling: BioDynaMo
Lukas Breitwieser
IT Amphitheatre (31/3-004)
14:00-16:00, 25 July

Digital twins and their application at CERN
Ilaria Luise, Alexander Zoechbauer, Kalliopi Tsolaki
IT Amphitheatre (31/3-004)
14:00-16:00, 7 August

Highly durable and dense data storage through synthetic DNA
Raja Appuswamy
IT Amphitheatre (31/3-004)
14:00-16:00, 8 August

More info on the lectures on Indico:
https://indico.cern.ch/category/16988/

Evening lectures

Open to all summer students!

Introduction to quantum computing (1/2)
Ahmed Abdelmotteleb
IT Amphitheatre (31/3-004)
17:00-18:30, 25 July

Introduction to quantum computing (2/2)
Ahmed Abdelmotteleb
IT Amphitheatre (31/3-004)
17:00-18:30, 26 July

Movie night: “Particle Fever”
Mark Levinson
Main Auditorium (500/1-001)
19:30-22:00, 25 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: **15th and 16th of August.**
- Events will be online and open to all.

Webfest 2023

- Running **Friday 21 July – Sunday 23 July**
- Kick-off (Friday) in B40; Hacking day (Saturday) in R1; Closing and rewards (Sunday) in B40.
- This year’s theme is education, science, research.
- How CERN's cutting-edge technologies can be applied to science.
- Open to all! Students, fellows, staff members…