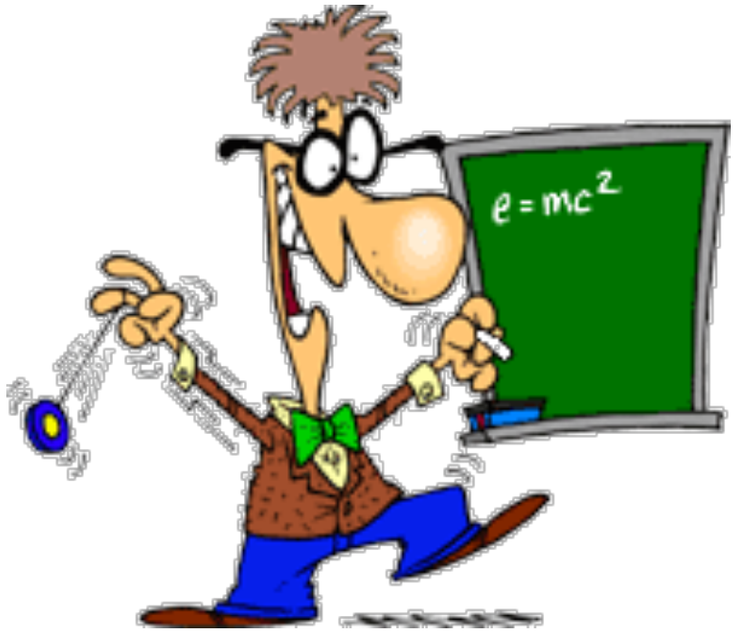
CERN Summer Student Lecture Program 2018

Thierry Gys
Andrea Wulzer
on behalf of the SSLP committee



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With these lectures we should:

- Give an overview of what we do at CERN and why
- Teach some physics/statistics/computing/engineering/…
- All this, to a varied audience.

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Don’t miss the opportunity to learn from them!

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Aim is not to teach you how to e.g. build an accelerator.

We give you basic **concepts** and **ideas**, to further stimulate your interest in science.

Programme Overview

A simple scheme …

Accelerator	Particle Accelerators and beam dynamics Accelerator technology challenges Future high-energy collider projects
Detectors	Detectors Electronics, DAQ and triggers
Experiment	Particle World From raw data to physics results Experimental physics at hadron colliders Experimental physics at lepton colliders Physics and medical applications Heavy Ions Nuclear Physics at CERN Flavour Physics Antimatter in the lab
Theory	Theoretical concepts in particle physics The Standard Model Beyond the Standard Model Making predictions at hadron colliders Introduction to cosmology Astroparticle physics What is string theory?
Statistics/ Computing	Foundations of statistics Separate **openlab programme**

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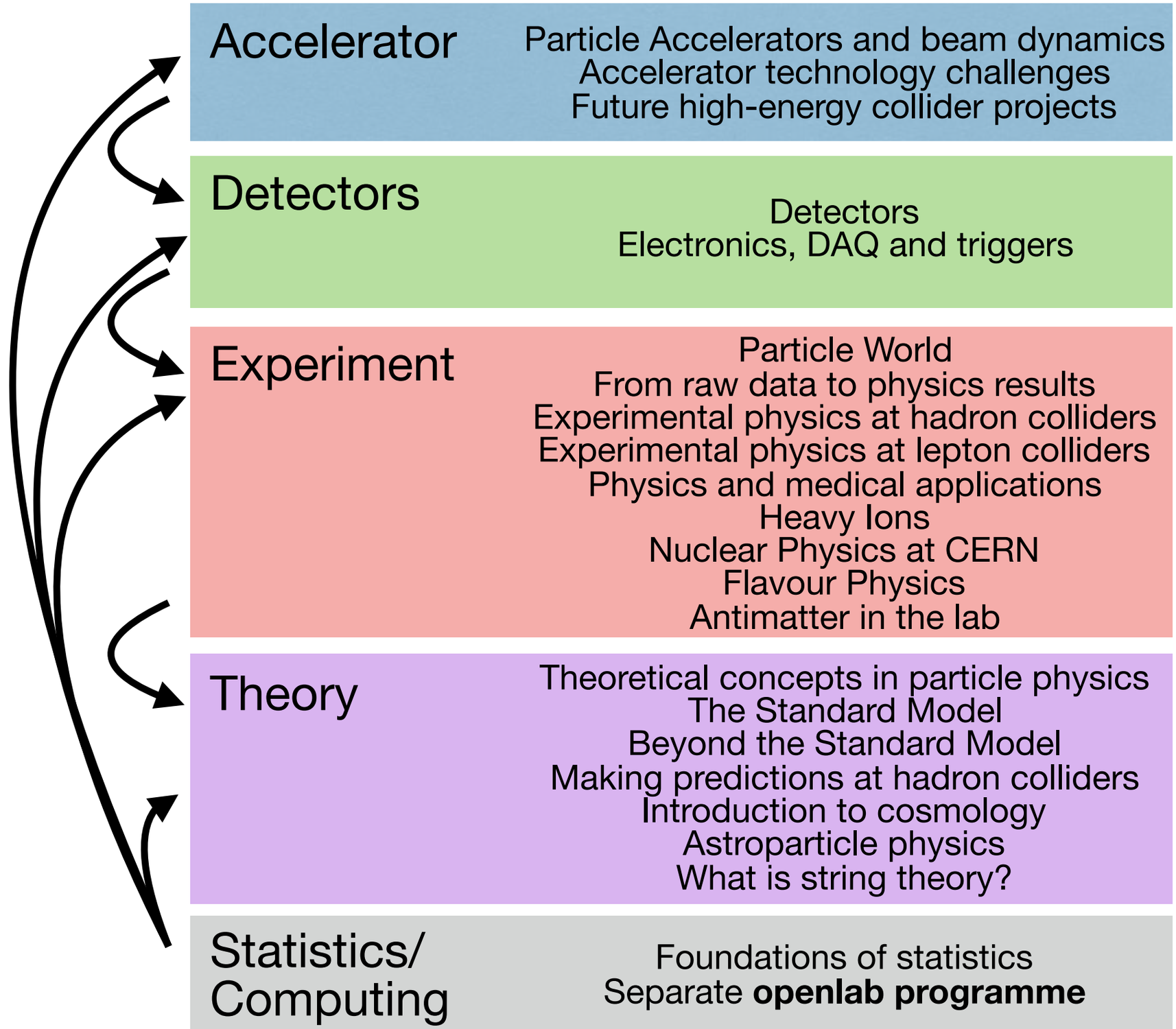

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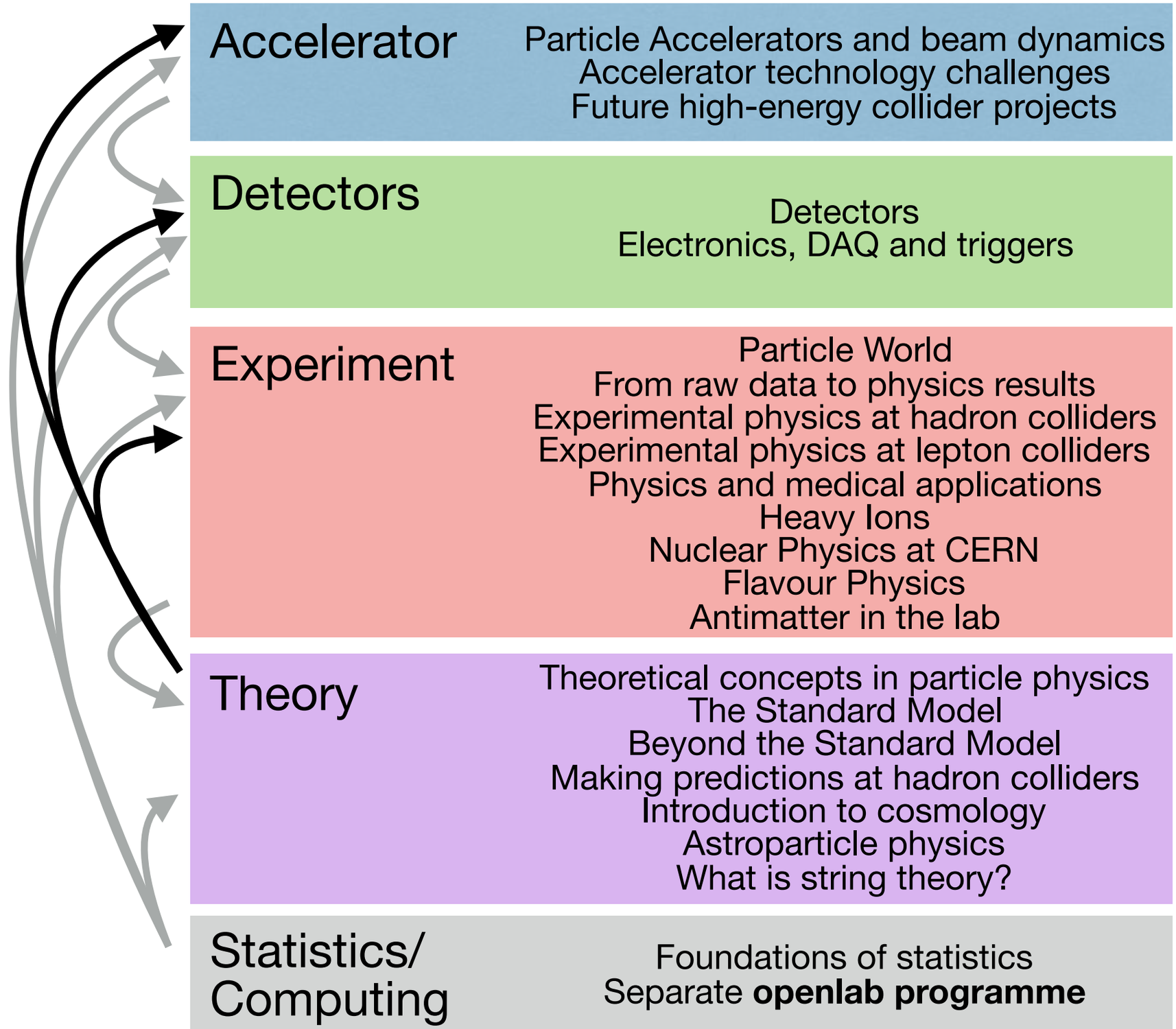

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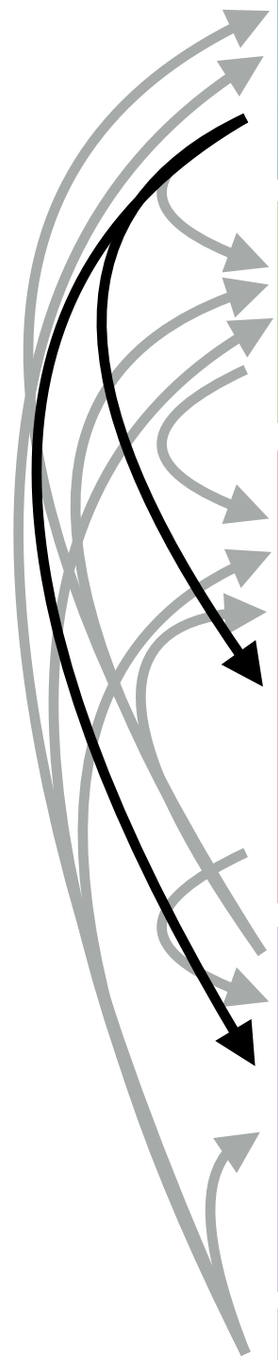

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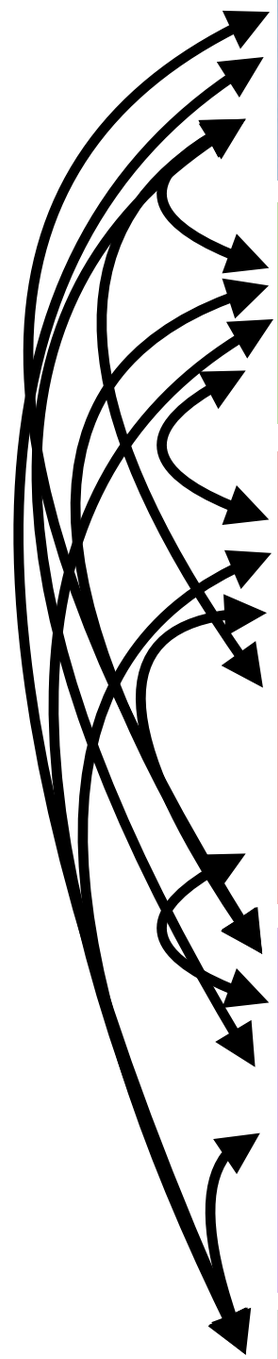

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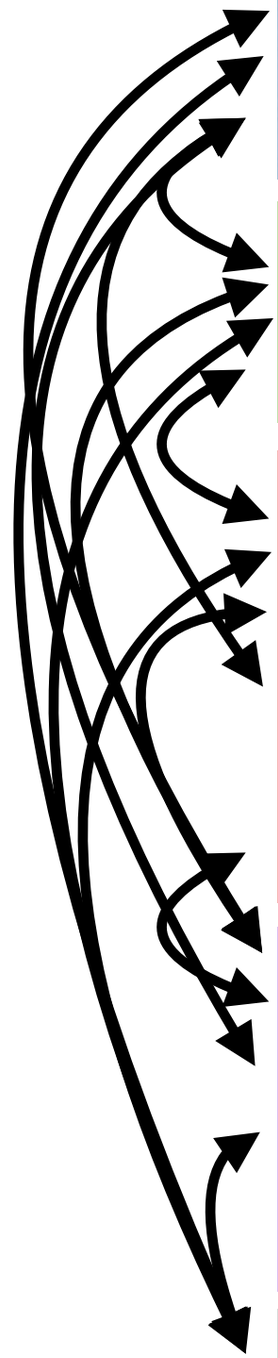
All subjects are **inextricably linked**



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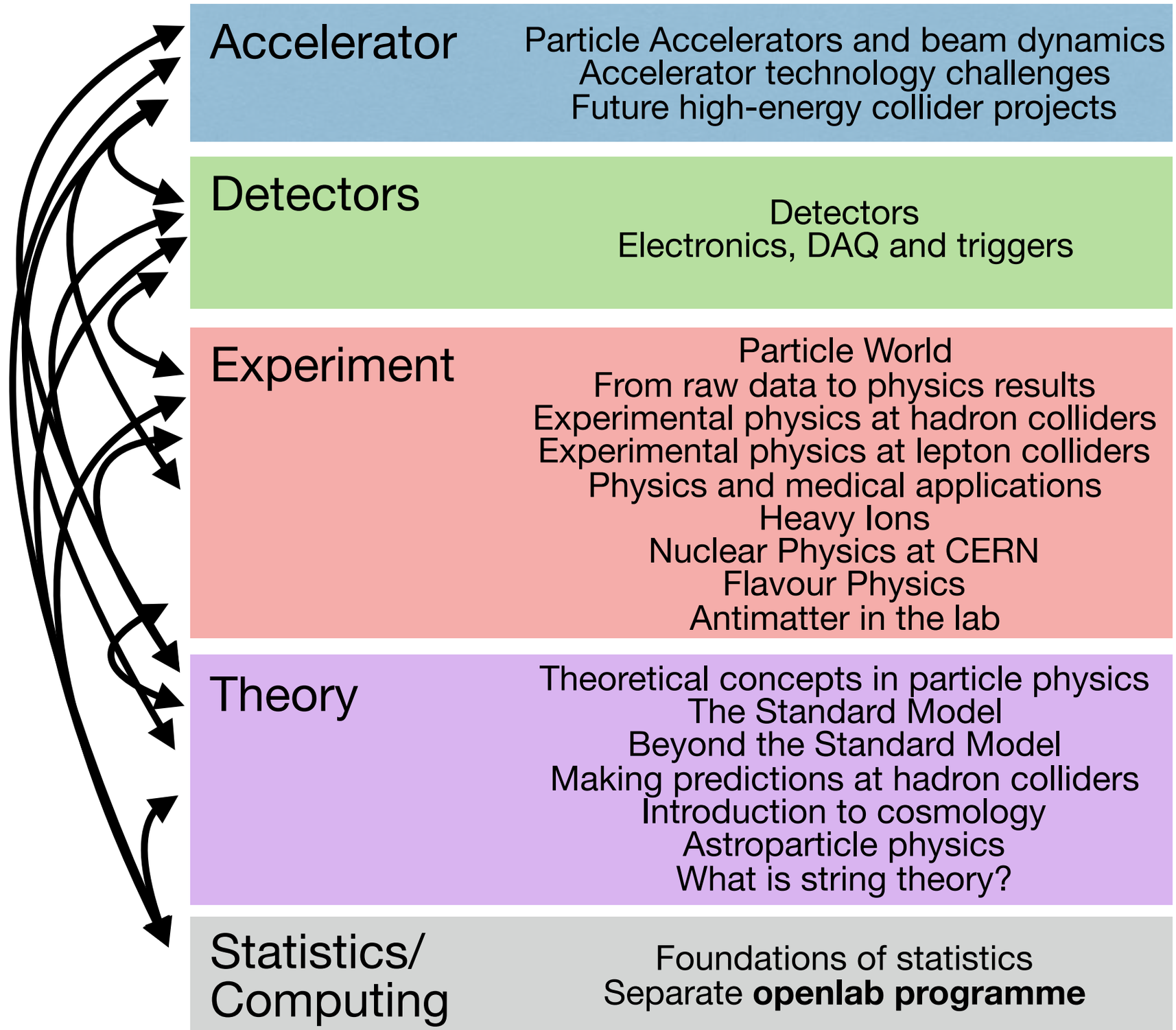

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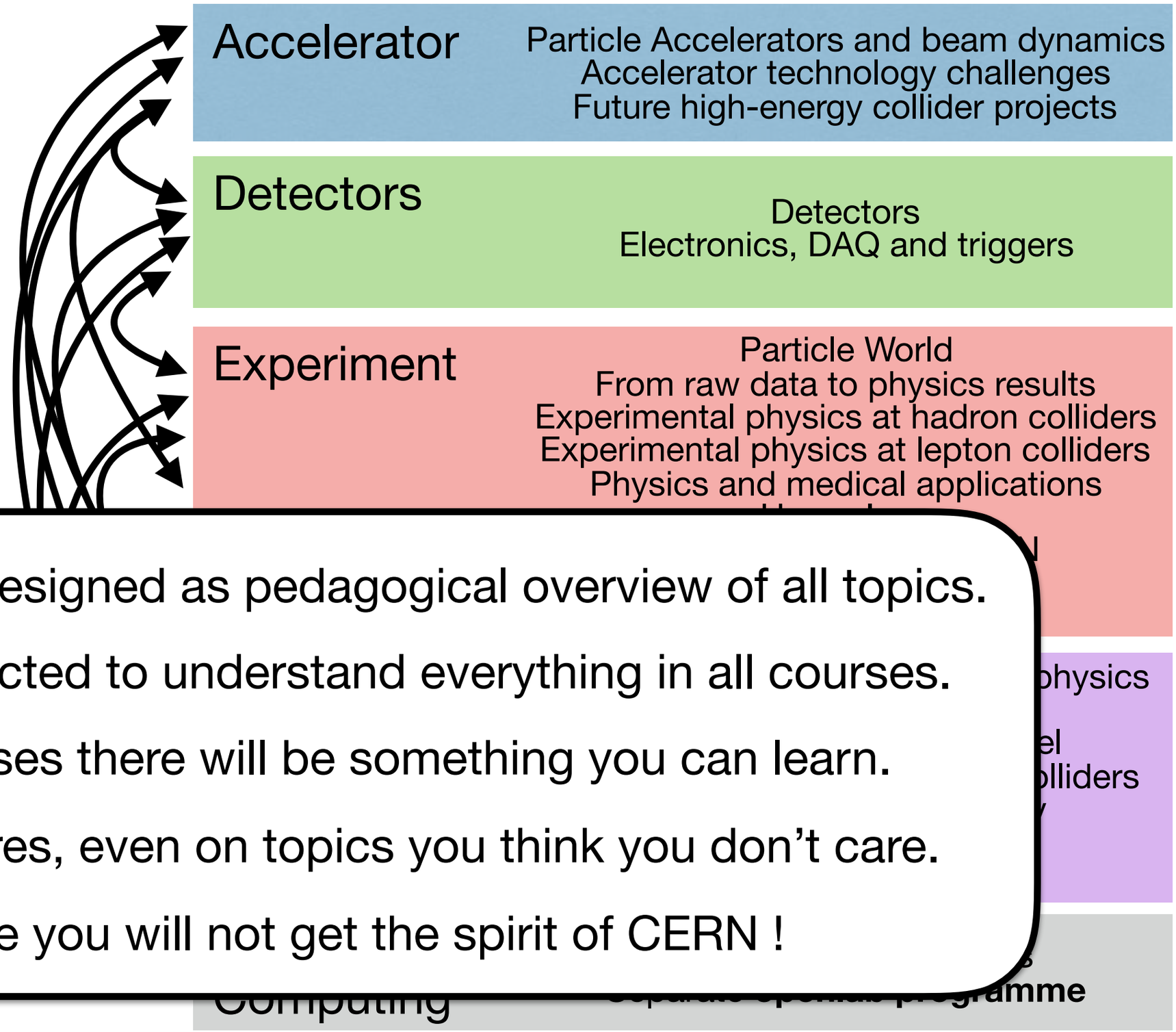

Lecture program designed as pedagogical overview of all topics.

You are not expected to understand everything in all courses.

But in all courses there will be something you can learn.

Attend the lectures, even on topics you think you don't care.

Otherwise you will not get the spirit of CERN !

Practical Informations

Lectures every morning at **9:15**, **10:25**, **11:35**, here (Main Auditorium)

- lectures are 45’
- followed by 10’ questions (stay in the room !)
- and by 15’ coffee break

Use back door if you are late

Follow lecture actively

- unfortunately there is WiFi in the room, don’t get distracted !
- try the exercises the lecturer may propose
- **ASK QUESTIONS!** lecturers love that, there are no stupid questions!

Lecture slides and recording available online [https://indico.cern.ch/category/345/]
Instructions in backup

Practical Informations

Feedback Questionnaire !!

You will be asked to fill one (anonymous) questionnaire for each course.

DO THAT !

Your evaluation is carefully reviewed by the SSLP committee.
Help us a lot to improve the program.

Practical Informations

The SSLP committee:

Eszter Badinova (HR)
Adriana Bejaoui (HR)
Jennifer Dembski (HR)
Despoina Driva (HR)
Kfir Blum (TH)
Francesco Cerutti (EN)
Maria Girone (IT)
Richard Hawkings (EP)
Hermann Schmickler (ATS)

The SSLP committee chairs

Thierry Gys (EP) thierry.gys@cern.ch
Andrea Wulzer (TH) andrea.wulzer@cern.ch

For administrative and scheduling questions: summer.student.info@cern.ch

More introduction to follow …

09:00 → 09:15 **Welcome and Introduction to Lecture Programme** 15m

Speakers: Andrea Wulzer (CERN), Andrew Robert Purcell (CERN), Thierry Gys (CERN)

CO SSP - Introducti… CO SSP - Introducti…

09:15 → 09:35 **Computer Security at CERN** 20m

Speaker: Sebastian Lopienski (CERN)

09:35 → 09:55 **Summer Student Workshops** 20m

Speaker: Rainer Schwemmer (CERN)

09:55 → 10:05 **Library Service** 10m

Speaker: Tullio Basaglia (CERN)

SS_presentation_2… SS_presentation_2…

10:05 → 10:20 **Safety at CERN** 15m

Speaker: Andre Henriques (CERN)

SS_safety_slides_2… SS_safety_video_2…

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Summer Student Lecture Programme Course

Presentation by the CERN Director for Research and Computing

by Eckhard Elsen (CERN)

Friday 29 Jun 2018, 11:35 → 12:30 Europe/Zurich

500-1-001 - Main Auditorium (CERN)

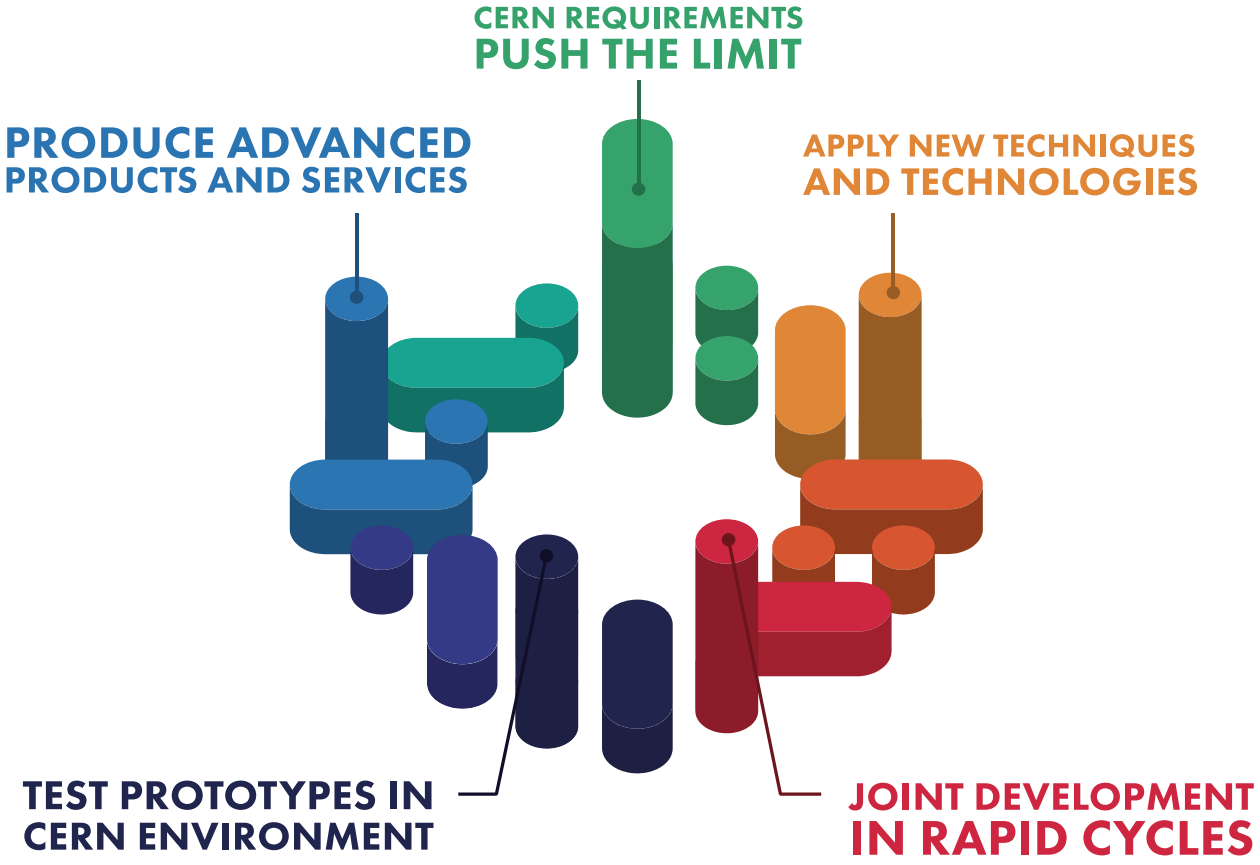
Enjoy CERN, your project, and the lectures !!

CERN openlab is a unique public-private partnership.

We work to drive innovation in ICT.

We collaborate with leading ICT companies (including Intel, Oracle, Siemens, and Huawei).

We also work with other research laboratories (including Fermilab, GSI, INFN, and EMBL-EBI).



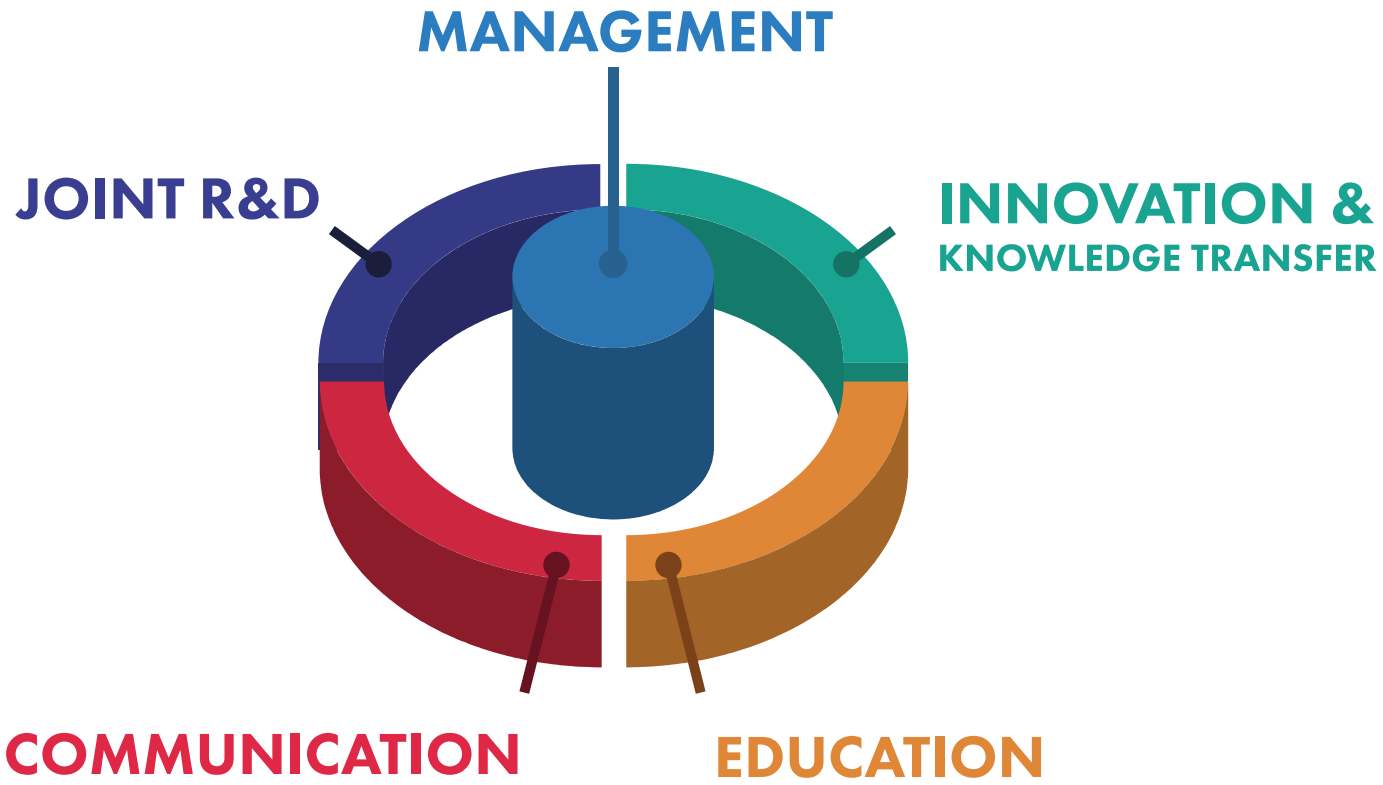
Education and training are important aspects of our work.

Over 1800 aplicants for this year's CERN openlab summer-student programme.

41 students selected from 23 different countries.

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

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



The lecture programme

All students from all programmes are welcome to attend!

Computing in high-energy physics
Dirk Duellmann
IT Amphitheatre (31-3-004)
13:30-15:30, 3 July

Computing Security
Sebastien Lopienski
IT Amphitheatre (31-3-004)
13:30-15:30, 5 July

Machine Learning (2)
Michael Kagan
Main auditorium (500-1-001)
13:30-15:30, 10 July

From Grids to Clouds
Ian Fisk
IT Amphitheatre (31-3-004)
13:30-15:30, 16 July

DAQ-Filtering Data from 1 PB/s to 600 MB/s
Niko Neufeld
IT Amphitheatre (31-3-004)
13:30-15:30, 4 July

Machine Learning (1)
Michael Kagan
Main auditorium (500-1-001)
13:30-15:30, 9 July

How to give presentations and pitches
Manuela Cirilli
Main auditorium (500-1-001)
16:30-17:30, 11 July

Discovering the Higgs with software/computing
Ken Bloom
IT Amphitheatre (31-3-004)
13:30-15:30, 17 July

The lecture programme

All students from all programmes are welcome to attend!

Web application security workshop (1)
Sebastien Lopienski
513-1-024
13:00-18:15, 18 July

Evolution in Computing Hardware (2)
Andrzej Nowak
IT Amphitheatre (31-3-004)
13:30-15:30, 26 July

Web app security workshop (2)
Sebastien Lopienski
513-1-024
13:00-18:15, 1 August

Evolution in Computing Hardware (1)
Sverre Jarp
IT Amphitheatre (31-3-004)
13:30-15:30, 24 July

Writing code that's less bad
Axel Naumann
IT Amphitheatre (31-3-004)
13:30-15:30, 31 July

Introduction to code optimizations
Sofia Vallecorsa
IT Amphitheatre (31-3-004)
13:30-15:30, 2 August

indico.cern.ch/category/10155

Lightning talks

- Students work on projects over nine weeks, gaining hands-on experience with latest ICT solutions.
- 5-minute presentations by each student, with prizes for best talks.
- Split into two sessions: 14 August at 13:30 and 16 August at 15:00.
- Both take place in IT amphitheatre (31-3-004).

Webfest

- A weekend-long hackathon: run by students for students.
- Takes place 27-29 July here in main amphitheatre and R1.
- Collaborate on science-related projects using open-web technologies.
- Submit your ideas for projects or join exisitng ones.
- Full details on the event website: **webfest.web.cern.ch**.
- Additional (optional) preparatory sessions:
  - Evening session on hackathon essentials by Mayank Sharma on 19 July from 17:00 to 20:00 (513-R-070) .
  - AI presentation by Sharada Prasanna Mohanty on 25 July from 13:30 to 15;30 (31-3-004).

Backup Slides

Indico Page

[https://indico.cern.ch/category/345/]

Summer Student Lecture Programme Course

click to expand

There are 59 events in the future. Show

June 2018

- 29 Jun Eckhard Elsen, "Presentation by the CERN Director for Research and Computing"
- 29 Jun Verena Kain, "Particle Accelerators and Beam Dynamics (3/3)"
- 29 Jun Andreas Hoecker, "Foundation of Statistics (4/4)"
- 28 Jun Verena Kain, "Particle Accelerators and Beam Dynamics (2/3)"
- 28 Jun Andreas Hoecker, "Foundation of Statistics (3/4)"
- 28 Jun Tara Shears, "Particle World (3/3)"
- 27 Jun Verena Kain, "Particle Accelerators and Beam Dynamics (1/3)"
- 27 Jun Andreas Hoecker, "Foundation of Statistics (2/4)"
- 27 Jun Tara Shears, "Particle World (2/3)"
- 26 Jun Andreas Hoecker, "Foundation of Statistics (1/4)"
- 26 Jun Tara Shears, "Particle World (1/3)" ← click
- 26 Jun Introduction Presentation

There are 1656 events in the past. Show

Indico Page

Example from past year:

Summer Student Lecture Programme Course

Particle World (1/3)

by Tara Shears (University of Liverpool (GB))

Tuesday 27 Jun 2017, 10:30 → 11:25 Europe/Zurich

500-1-001 - Main Auditorium (CERN)

intro_pp_17.pdf | prerequisites.pdf | Recording

Slides.
Available shortly
before the lecture.

Video.
Available shortly
after the lecture.