

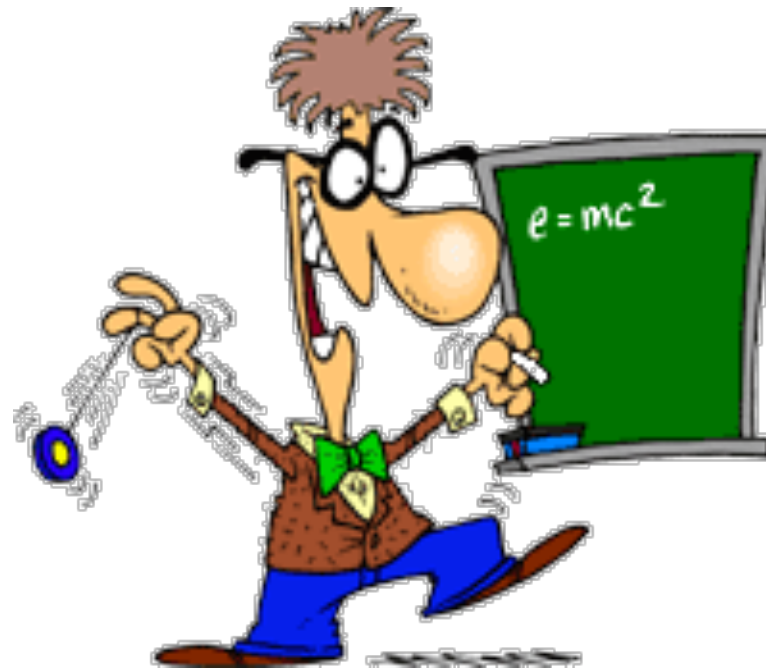
# Online CERN Summer Student Lecture Programme 2021

Thierry Gys (EP)

**Andrea Wulzer (TH)**

on behalf of the SSLP committee →

Ana Dordevic (IR)  
Stavie Kotsi (IR)  
Anastasiia Khrapchun (HR)  
Francesco Cerutti (SY)  
Maria Girone (IT)  
Kristina Gunne (IT)  
Richard Hawking (EP)  
Valerie Domcke (TH)  
Bernhard Holzer (BE)



# Goals

With these lectures we should:

# Goals

With these lectures we should:

- Give an overview of what we do at CERN and why

# Goals

With these lectures we should:

- Give an overview of what we do at CERN and why
- Teach some physics/statistics/computing/engineering/...

# Goals

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.

# Goals

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.
- And, in this difficult period ...

# Goals

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.
- And, in this difficult period ...

Not an easy task!

# Goals

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.
- And, in this difficult period ...

Not an easy task!

For this reason, our lecturers are at the same time **top researchers** in their field and **experienced lecturers**.

Don't miss the opportunity to learn from them!



# Goals

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.
- And, in this difficult period ...

Not an easy task!

For this reason, our lecturers are at the same time **top researchers** in their field and **experienced lecturers**.

Don't miss the opportunity to learn from them!

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

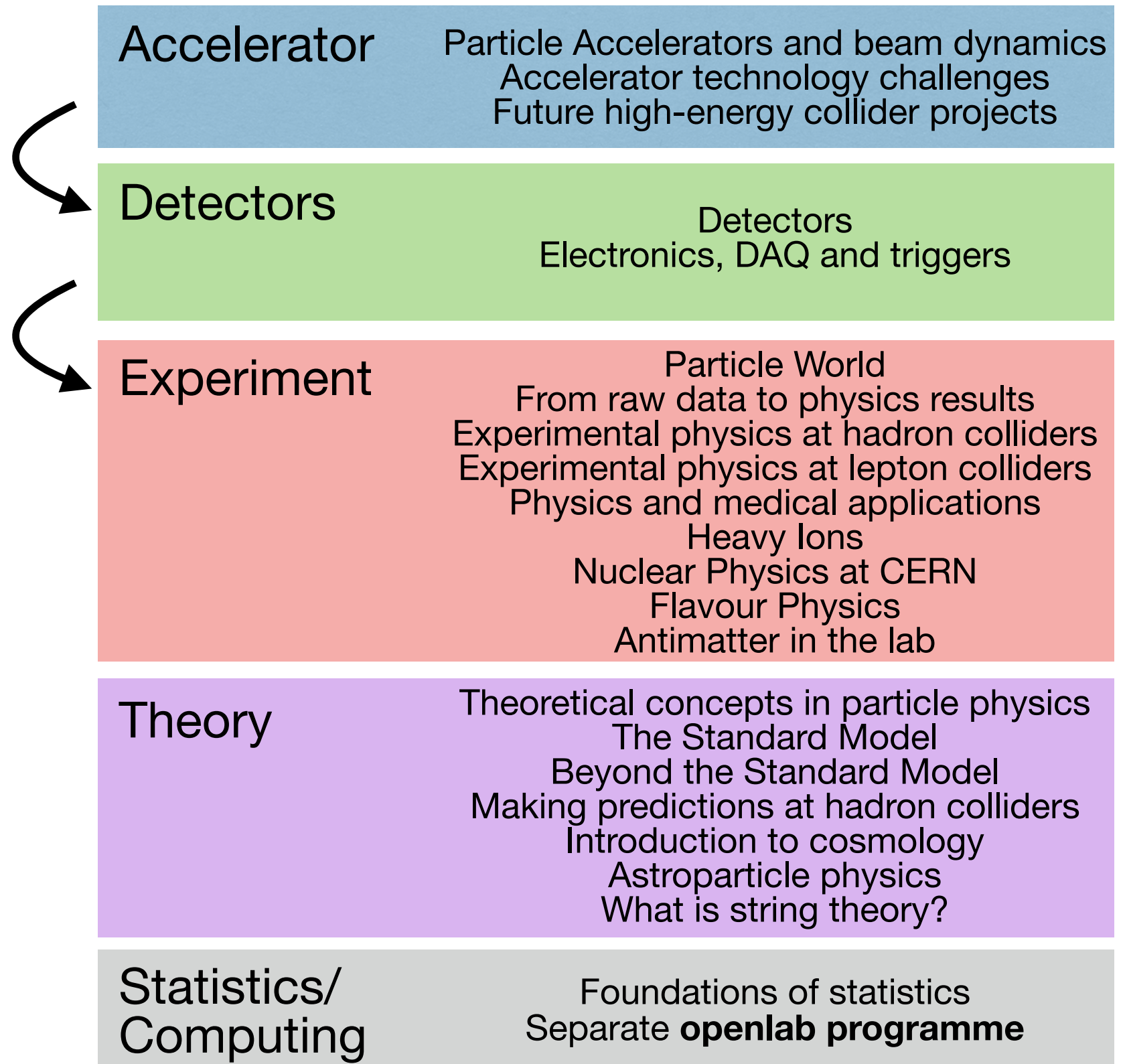
Theoretical concepts in particle physics  
The Standard Model  
Beyond the Standard Model  
Making predictions at hadron colliders  
Introduction to cosmology  
Astroparticle physics  
What is string theory?

## Statistics/ Computing

Foundations of statistics  
Separate **openlab programme**

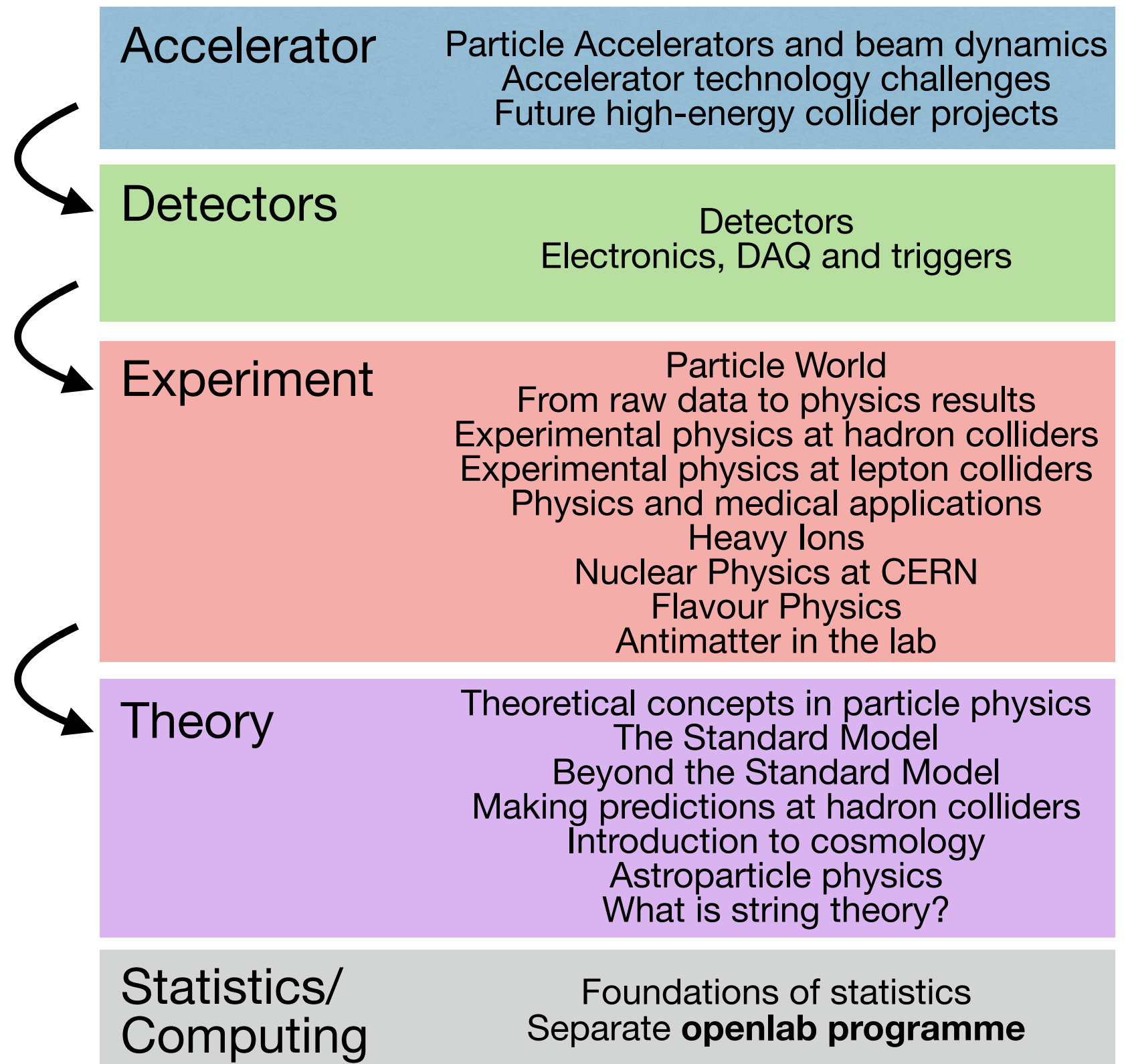
# Programme Overview

A simple scheme ...



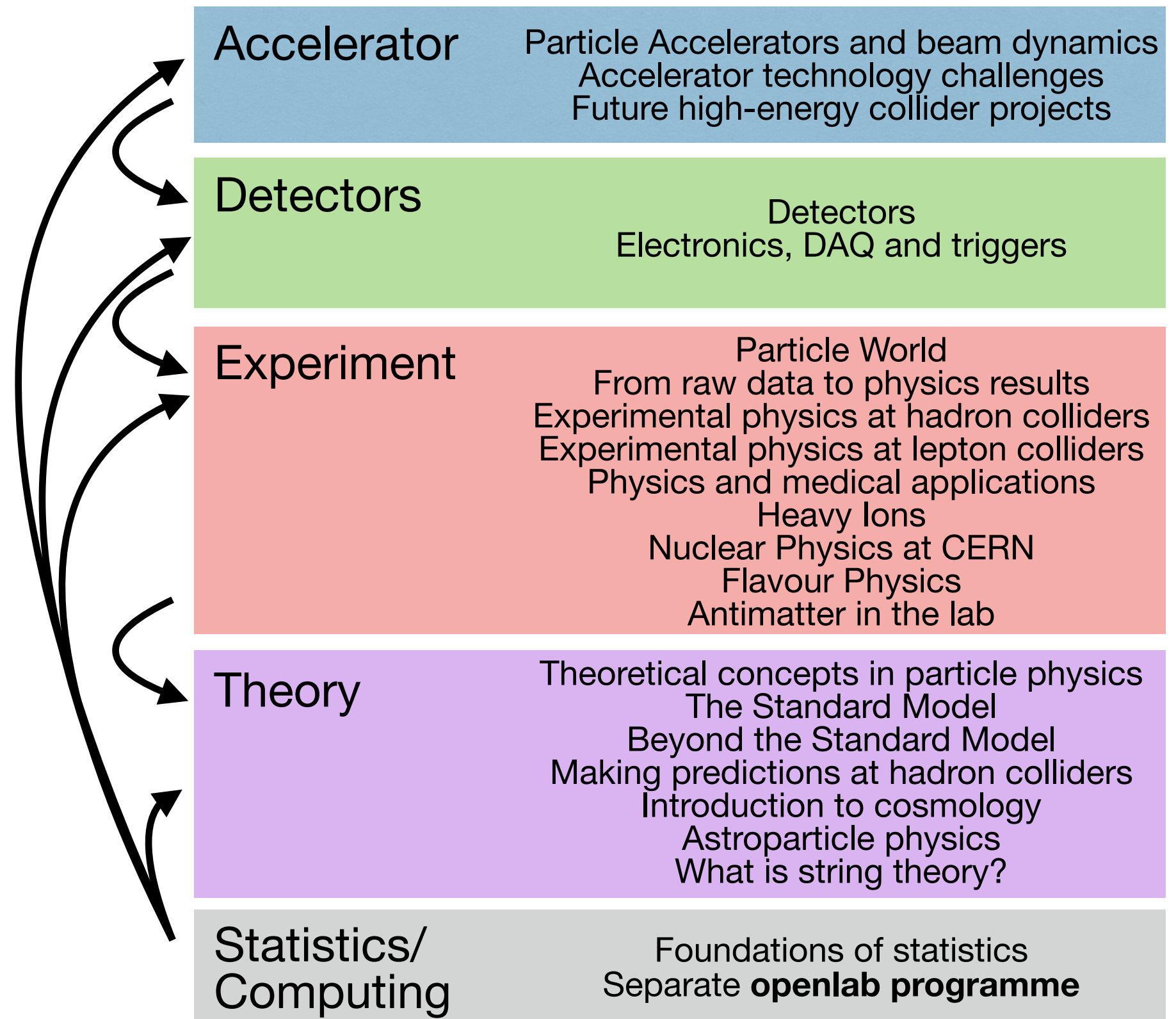
# Programme Overview

A simple scheme ...



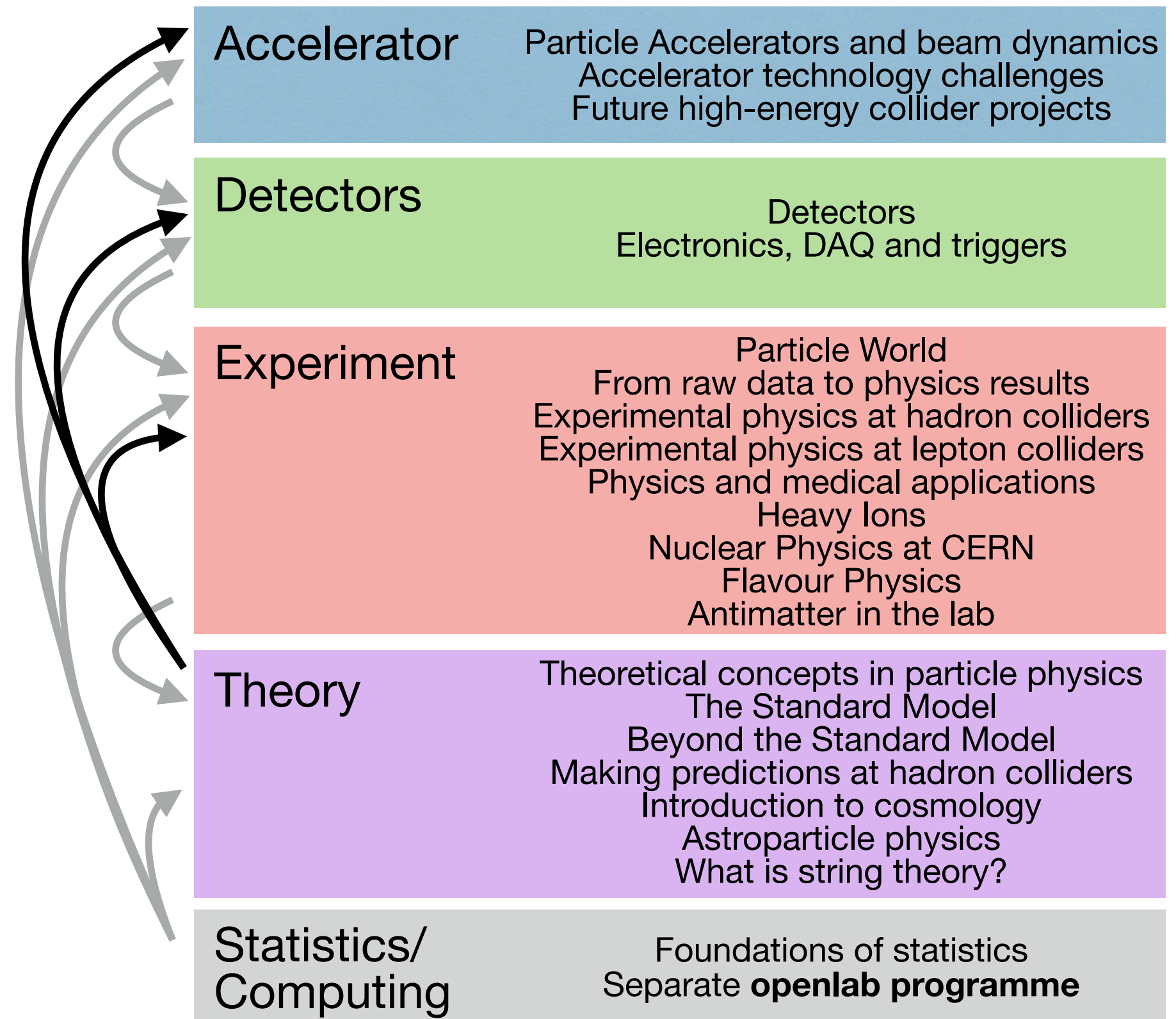
# Programme Overview

A simple scheme ...



# Programme Overview

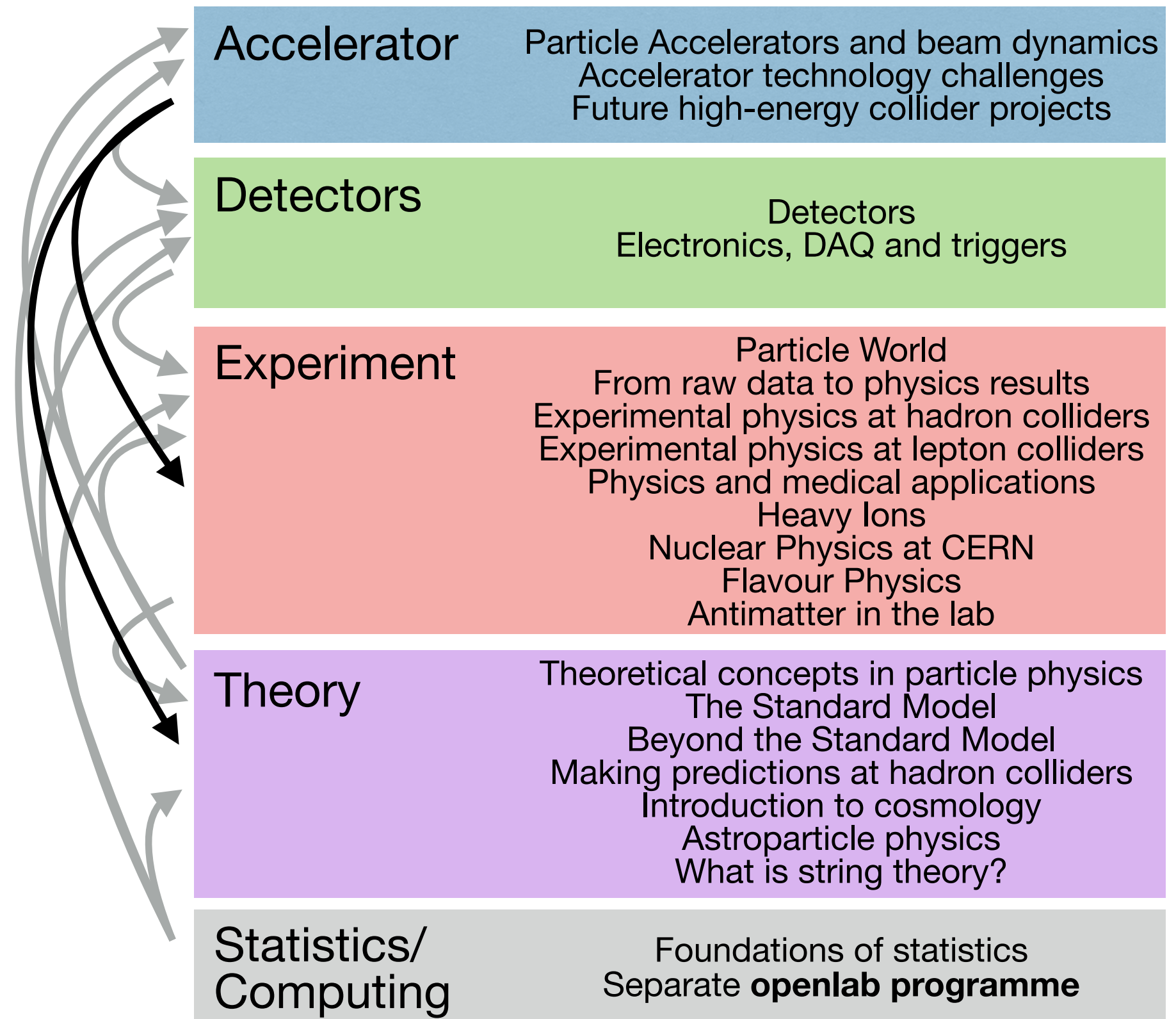
A simple scheme ...  
... however ...





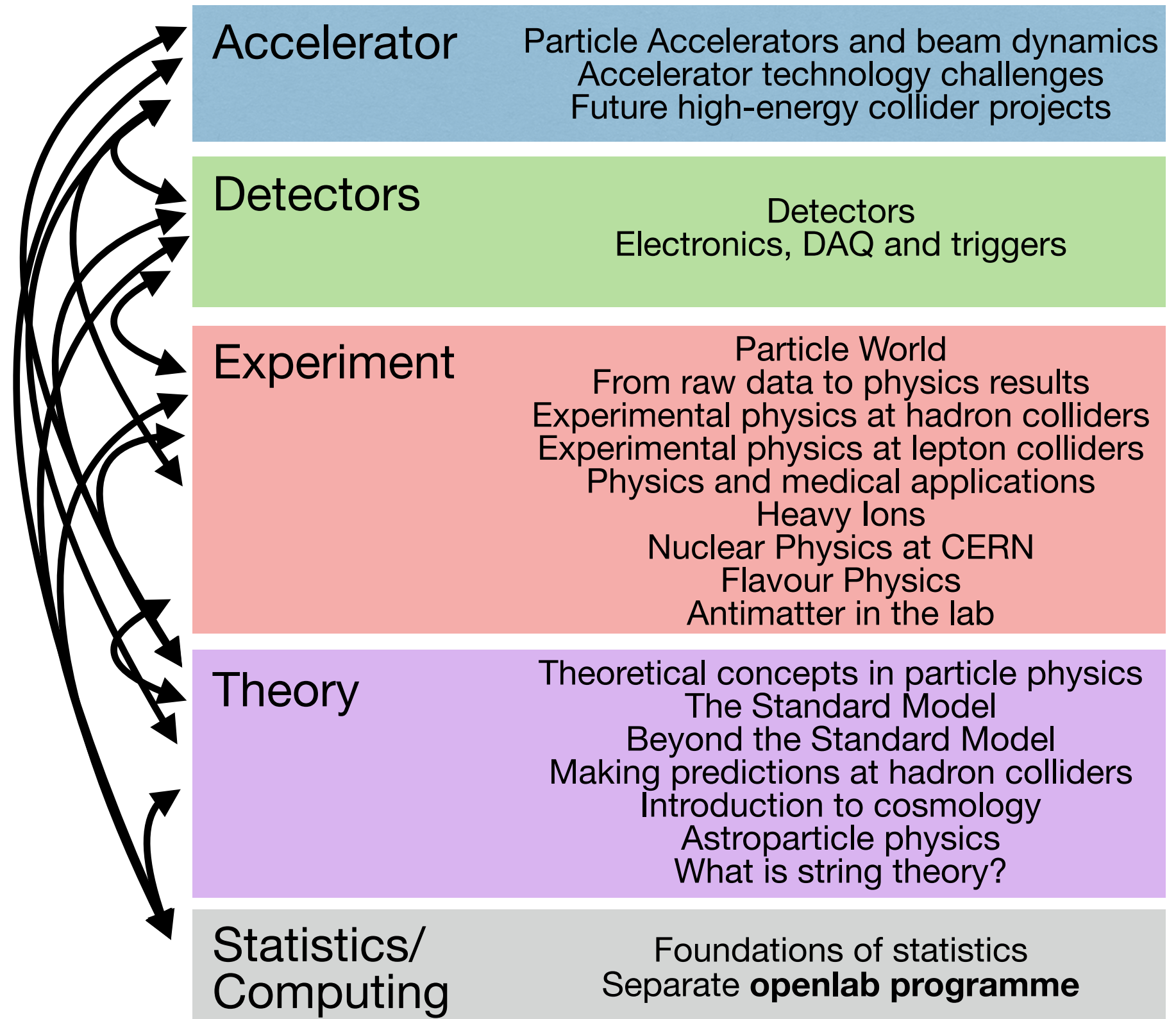
# Programme Overview

A simple scheme ...  
... however ...



# Programme Overview

A simple scheme ...  
... however ...



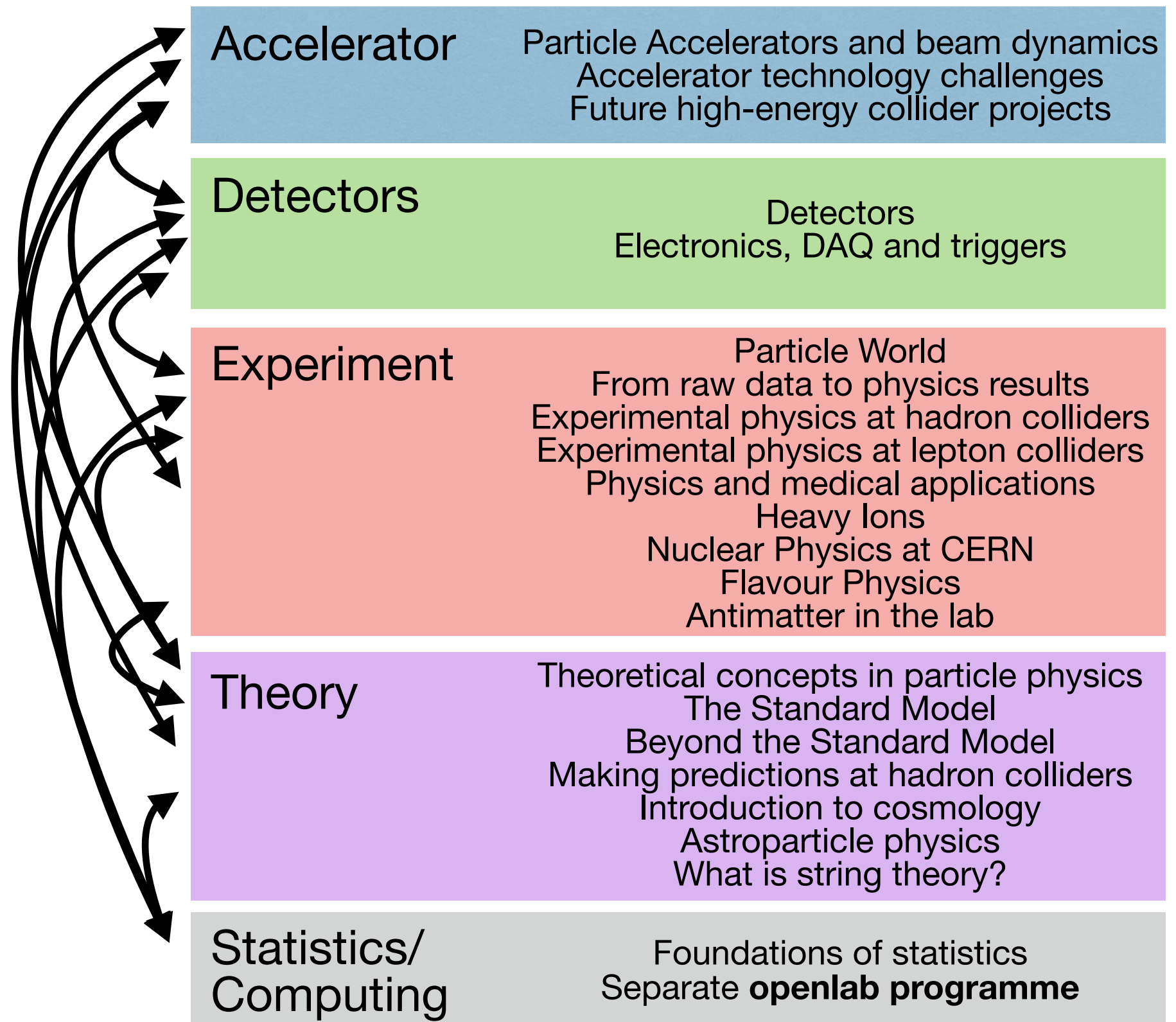


# Programme Overview

A simple scheme ...

... however ...

All subjects are  
**inextricably linked**



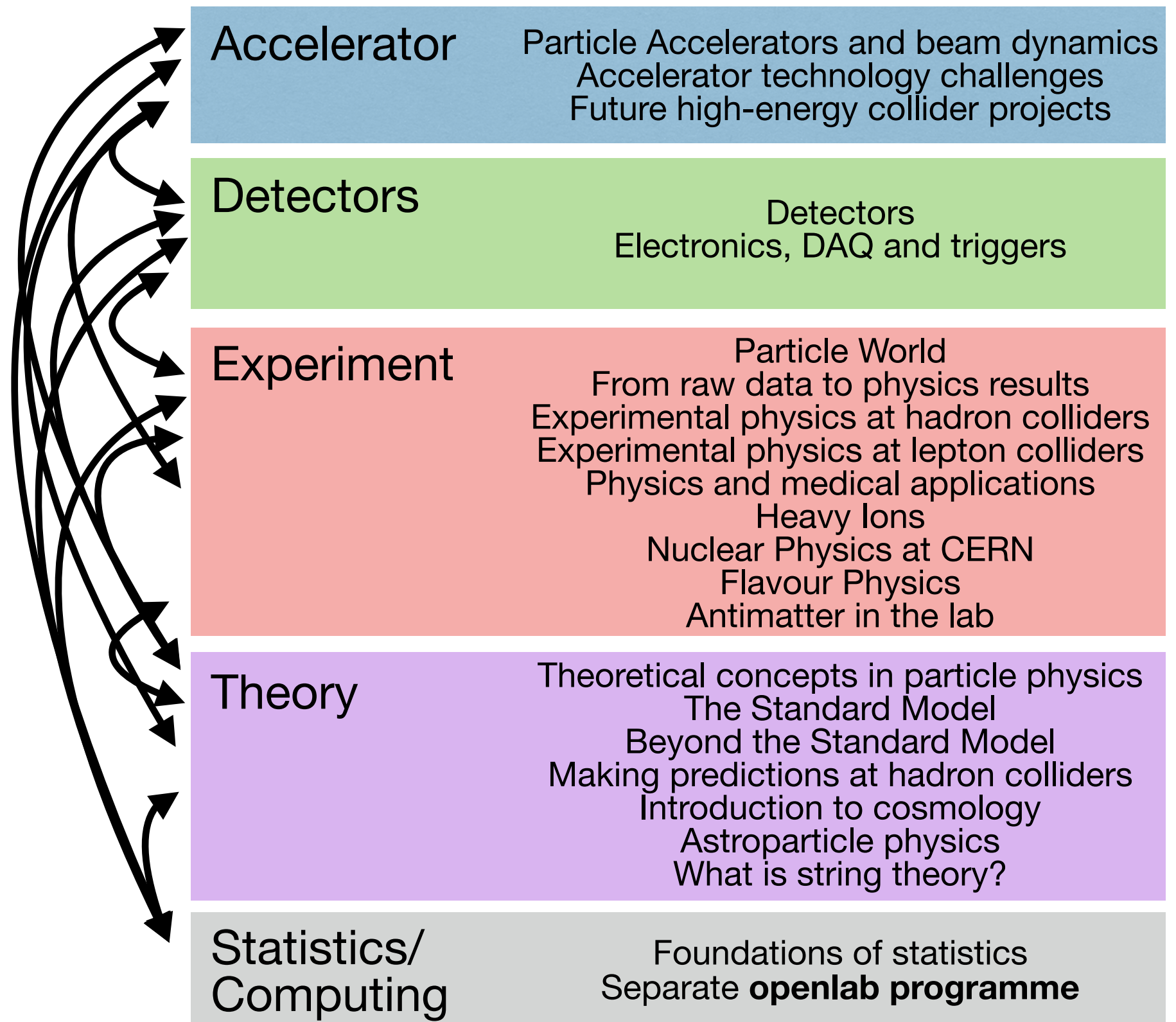
# Programme Overview

A simple scheme ...

... however ...

All subjects are  
**inextricably linked**

CERN is great because  
it brings them together

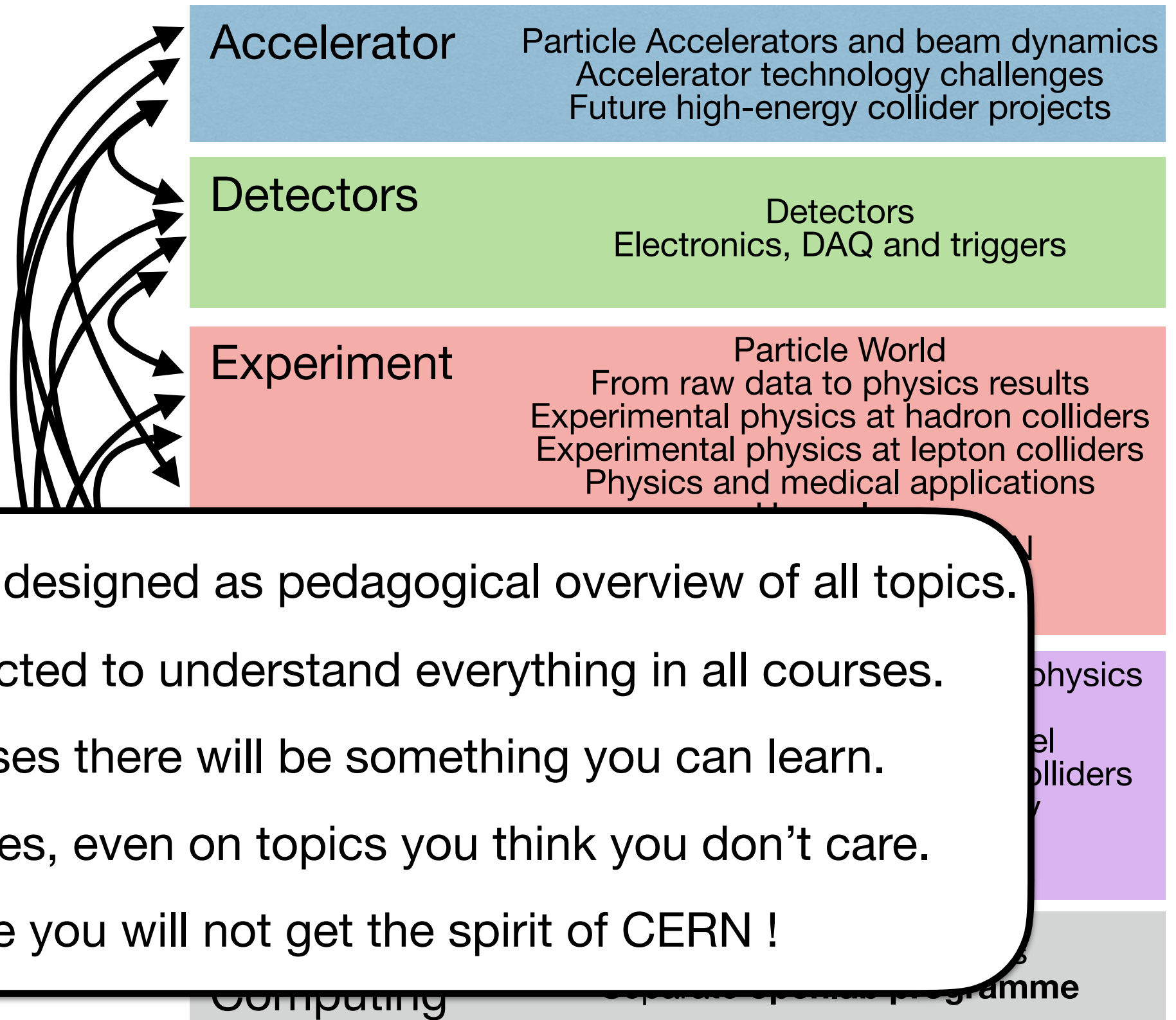


# Programme Overview

A simple scheme ...  
... however ...

All subjects are  
**inextricably linked**

CERN is great because  
it brings them together



Lecture programme 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.

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

Otherwise you will not get the spirit of CERN !

# Practical Information

## Homepage of the online programme:

<https://summerstudent.web.cern.ch/lectures-2021>

- If you experience problems with the links, and/or with the videos, let us know immediately!! [summer.student.info@cern.ch](mailto:summer.student.info@cern.ch) [nms.summerstudent@cern.ch](mailto:nms.summerstudent@cern.ch)

## Courses have multiple format (check the webpage)

- Some are **live**. May or not have also **Q&A Session**
- Others based on **2019 recordings**. These ones, all have **Q&A**.

## Register for the Q&A Sessions

- **Post** your questions. As soon as possible. **First Come, First Answered**
- **Attend Live Q&A Session**, with the lecturers
- You can ask clarifications, and interact with the lecturer
- You can ask also “live” questions, if time allows

**Hint:** Not to forget the Q&A sessions, and not to get lost with timezones, [save the events in your calendar](#)

# Disclaimer

It is the first (last?) time we run the programme online.

Because of the special circumstances, we are all part of a pedagogical experiment!

# Disclaimer

second

It is the ~~first~~ (last?) time we run the programme online.

Because of the special circumstances, we are all part of a pedagogical experiment!

# Disclaimer

second

It is the ~~first~~ (last?) time we run the programme online.

Because of the special circumstances, we are all part of a pedagogical experiment!

We are sure you would have preferred to be physically here, as much as we would have preferred to welcome you in person.


We wish you to have the opportunity to come to CERN, at some point !


# Introduction Presentation

 Tuesday Jun 29, 2021, 9:15 AM → 10:10 AM Europe/Zurich



 Andrea Wulzer (CERN and EPFL) , Andrew Robert Purcell (CERN) , Thierry Gys (CERN)

## Videoconference

 sslp2021

 Please log in



**Contact**  [nms.summerstudent@cern.ch](mailto:nms.summerstudent@cern.ch)  
 [summer.student.info@cern.ch](mailto:summer.student.info@cern.ch)

**9:15 AM** → 9:35 AM **Welcome and Introduction to the Online Lecture Programme**

**Conveners:** Andrea Wulzer (CERN and EPFL) , Thierry Gys (CERN)

**9:35 AM** → 9:40 AM **Introduction to CERN openlab lectures**

**Convener:** Andrew Robert Purcell (CERN)

**9:40 AM** → 10:00 AM **Questions and Answers**