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A Massive Open Online Course about Particle Accelerators

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Motivation

- The European Union funded a project called TIARA (Test Infrastructure and Accelerator Research Area) under FP7 (2011-2015). See http://www.eu-tiara.eu/
- One of the goals of this project was to make a survey Accelerator training in Europe.
  A database was setup with the survey answers. It is available at http://tiara.physics.ox.ac.uk/database-of-survey-results/
- Two reports were produced:
  - Survey report https://cdsweb.cern.ch/record/1442599
  - Recommendations: https://cds.cern.ch/record/1627600
- The first recommendation of the report was to implement:
  An 'e-learning' course, 'Introduction to Accelerator Science and Technology', primarily aimed at physics and engineering students at the undergraduate level, but potentially accessible to any interested person.

TIARA => ARIES

- The TIARA project has been succeeded by the ARIES (Accelerator Research and Innovation for European Science and Society) project funded under the European Commission's Horizon 2020 Research and Innovation programme.
- ARIES will implement some of the recommendation of TIARA, including the e-learning course under work package 2.4.
- ARIES includes transnational access (TNA) to several research infrastructures (accelerators).
- Research groups from EU country and Euratom associated countries (Switzerland and Ukraine) are eligible.

ARIES Project

Aims:

- To improve the reliability, sustainability, performance and availability of European particle accelerator infrastructures.
- To transfer the benefits & applications of accelerator science to society.
- To enlarge & integrate the European particle accelerator community.

Acronym: Accelerator Research and Innovation for European Science and Society

Duration: 4 years (May 2017 -> April 2021)

Consortium: 41 partners, 18 countries

Programme: Horizon 2020

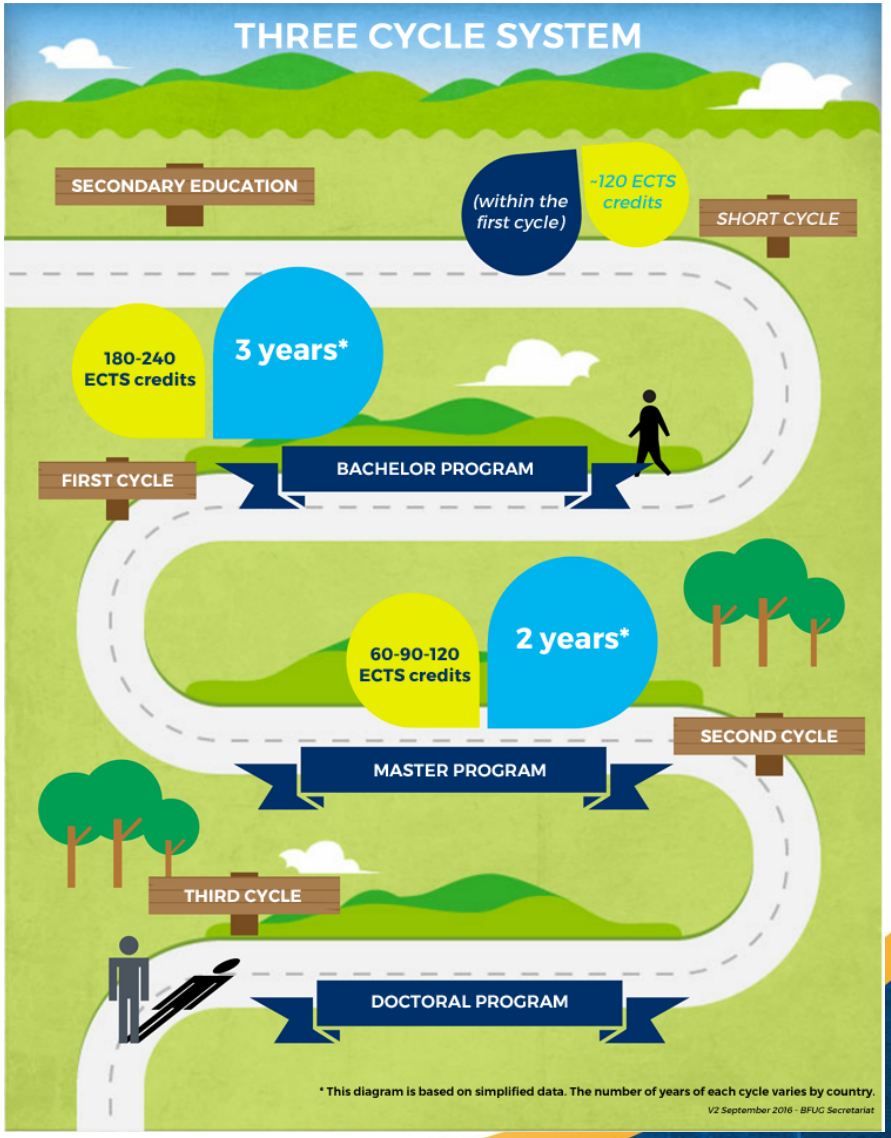
ARIES WP2.4: A Massive Open Online Course

- The aim of ARIES WP 2.4 is to prepare a Massive Open Online Course (MOOC) about particle accelerators.
- This MOOC will be aimed at undergraduate students before they choose which graduate studies path to follow (more on the next slide).
- This is typically before they attend other accelerator schools like JUAS (Joint Universities Accelerator School) or CAS (CERN accelerator School).
- It will also be opened to young professional working on accelerators.
- Like most MOOC it will also be open to anybody else interested in accelerators.
- Because it is a EU funded project we will ensure that anyone can follow it for free.

About our target audience

- Studies in the European Higher Education Area are organised according to a 3 cycle system.
- This is often called the “Bologna process”.
- In the EHEA students are awarded credits (ECTS) for successfully attending a course.
- At the end of the first cycle, “bachelor program” (3 years of studies) they will have earned between 180 and 240 ECTS.
- Our target audience is students at the end of the first cycle or at the beginning of the second cycle.
- That is student who have earned between 200 and 300 ECTS in physics or related subjects.

Source: https://www.ehea.info/pid34438/three-cycle-system.html



Schedule

- 1st May 2017: Start of the ARIES project
- Until May 2018:
  - Define the syllabus of the course
  - Identify lecturers
  - Define the technical infrastructure
  - Write a report on the MOOC
- May 2018-2019:
  - Record the lectures
  - Prepare the MOOC for delivery
- Before May 2020 (Compulsory milestone):
  - MOOC ready for delivery
- Autumn 2019 or Autumn 2020:
  - First delivery of the MOOC on an online platform

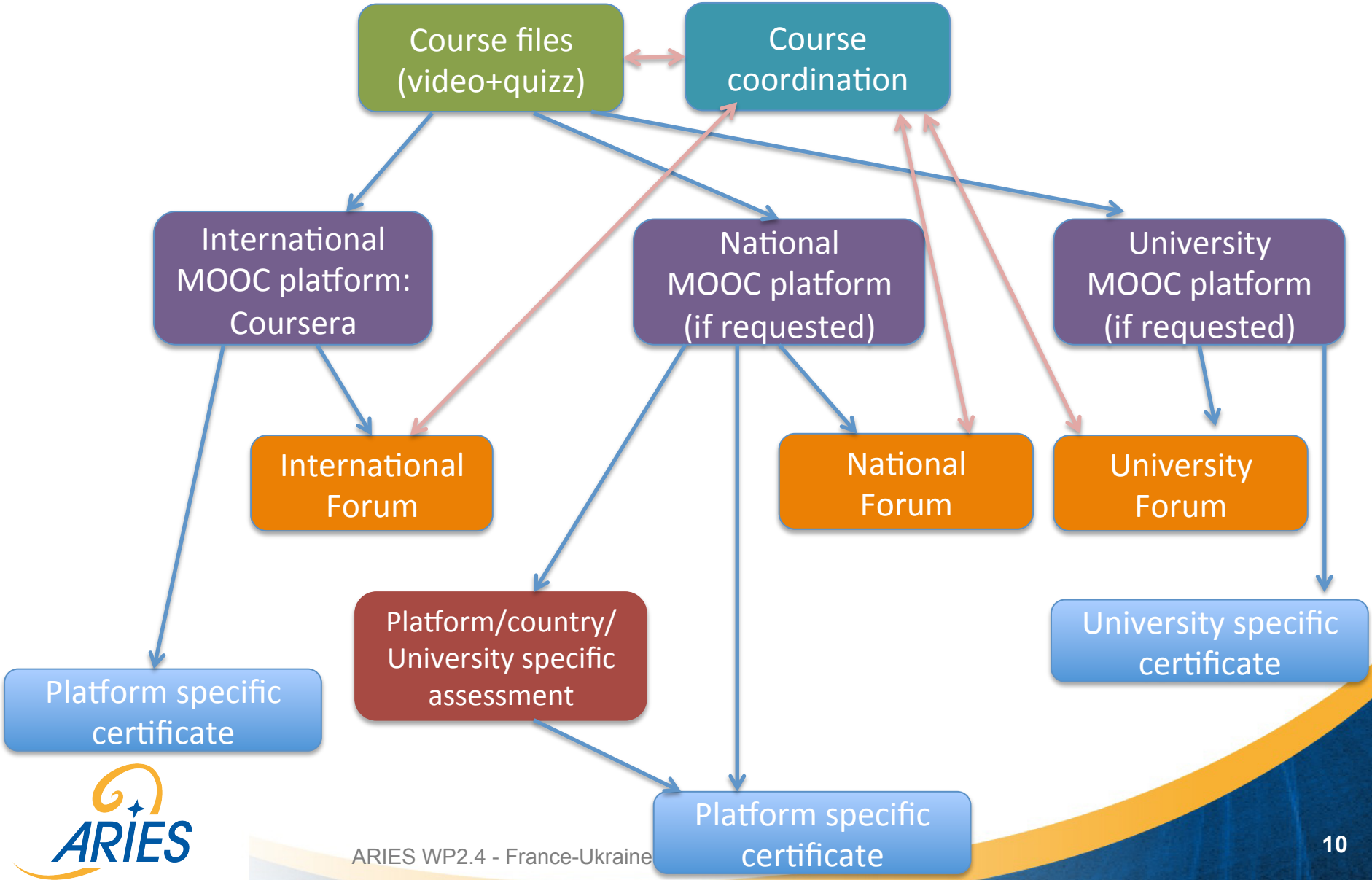
The current team

- Contributions from several institutes from the Europe Union but also from other countries:
  - CNRS and Paris-Sud
  - Oxford
  - CERN
  - ESS and Nordic Universities
  - JUAS
  - GSI
  - Riga Technical University
  - INFN Frascati and University of Roma 2
  - Moscow Engineering Physics Institute
  - …
- Open to other contributors involved in the field of accelerators!

Current status

- The working group has met several times (by video).
- The MOOC is taking shape:
  - The course will be released under Creative Commons license (CC-BY-NC-SA).
  - Recording format has been decided.
  - It will be about 8-10 hours of video (equivalent to a 30 hours conventional course).
  - There will be several “learning path”.
  - The main broadcasting platform is likely to be Coursera but other platforms will be possible if needed (see next slides).
  - It will be possible to translate it in other languages if the need arises.
  - Each University will decide on its procedure to deliver certificates to its own students (in complement to the Coursera certificate).
- Our next step will be to define the syllabus of the course.

Proposed broadcast model for the MOOC



Outlook

- Still work in progress!
- The ARIES MOOC will provide online training in accelerator physics to undergraduate students.
- This training will be free.
- The aim is to raise awareness of accelerator science among European undergraduates.
- The course will be ready by May 2020 at the latest!

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Thank you