



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 730871.



# WP2: Training, Communication and Outreach for Accelerator Science

15 July 2022

Philip Burrows (John Adams Institute, Oxford University)

# WP2 tasks

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- **Task 1: Management and coordination**
- **Task 2: Coordination, support and enhancement of communication/outreach activities for accelerators in Europe**
- **Task 3: Coordination, support and enhancement of training activities for accelerators in Europe**
- **Task 4: Provide an e-learning course: introduction to accelerator science, engineering and technology**

# ARIES WP2 participants

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**Beneficiaries: CERN, ESS, CNRS, RTU, UOXF**

**Associated partners:**

**Aarhus University (AU), Univ. Helsinki,  
European Scientific Institute (ESI),  
Univ. Oslo (UiO), Stockholm University (SU),  
Univ. Lancaster (ULANC), Univ. Liverpool (UNILIV)**

**Affiliates:**

**CEA, Lund Univ, CIEMAT, GSI, KIT, INFN, PSI, Warsaw Inst.  
Tech.**



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**All well integrated and have delivered!**

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**All have contributed!**

**Affiliates:**

**CEA, Lund Univ, CIEMAT, GSI, KIT, INFN, PSI, Warsaw Inst.**

**Tech. All have made valuable input!**



# Management procedures and methods

Meetings at one-on-one, WP, and task levels

Since March 2020 largely virtual meetings

Reports at Annual Meetings, Steering Committee, and Governing Board

Eg. Period-3 meetings:

<i>Dates</i>	<i>Type of meeting</i>	<i>Venue</i>
30/4/20	WP2 task leaders: task status reports	virtual
3/6/20	WP2.3 survey discussion	virtual
22/6/20	WP2.3 report preparation	virtual
23/6/20	WP2.3 report preparation	virtual
5/11/2020	WP2.4 Lecture #4 progress meeting	Virtual
30/11/2020	WP2.4 Lecture #5 progress meeting	Virtual
5/1/21	WP2 task leaders: task status reports	virtual
24/1/2021	WP 2.4 Lecture #1 Progress meeting	Virtual
13/4/2021	WP 2.4 Lecture #1 Final review	Virtual
23/4/2021	WP 2.4 Lecture #5 Final review	Virtual
2/6/21	WP2 task leaders: status and hand-over of actions to I.FAST project	Virtual
31/8/2021	WP 2.4 Final Pedagogical review	Virtual

# Milestones & Deliverables for WP2

## Tasks

2.2	Internal and external project communications and outreach activities
2.3	Monitor provision for training in Europe and within a global context
2.4	Produce an introductory e-learning course on accelerator science

## Milestones

<b>MS10</b>	Project website launched	2.2	M6	Oct 2017
<b>MS11</b>	Meeting to agree MOOC platform and academic structure and content of e-learning course	2.4	M12	May 2018
<b>MS12</b>	Workshop on training activities in Europe in a global context	2.3	M24	April 2019

## Deliverables

<b>D2.1</b>	E-learning course	2.4	M36	<b>April 2020</b>
<b>D2.2</b>	Final report on coordination of communication/outreach activities	2.2	M37	<b>May 2020</b>
<b>D2.3</b>	Final report on coordination of training activities	2.3	M39	<b>July 2020</b>

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D2.2	Final report on coordination of communication and outreach activities	2.2	M37	May 2020
D2.3	Final report on coordination of training activities	2.3	M41	Sept 2020

**Completed**

**Completed**

# Major Achievements

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Updated survey of training provision + needs in Europe (Rutambhara Yogi)

- [https://edms.cern.ch/ui/file/1816951/1.0/ARIES-Del-D2.3\\_Final.pdf](https://edms.cern.ch/ui/file/1816951/1.0/ARIES-Del-D2.3_Final.pdf)



# ARIES Training Survey



## ARIES

Accelerator Research and Innovation for European Science and Society  
Horizon 2020 Research Infrastructures GA n° 730871

### DELIVERABLE REPORT

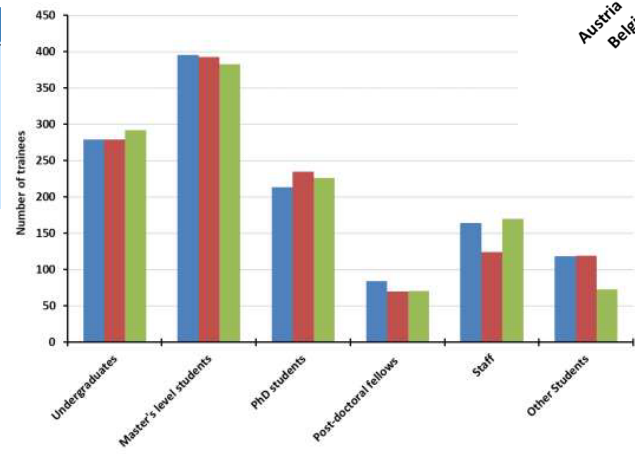
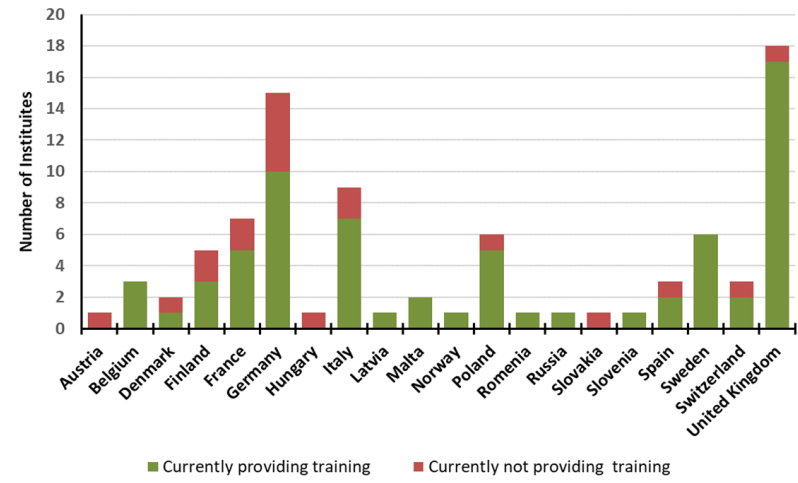
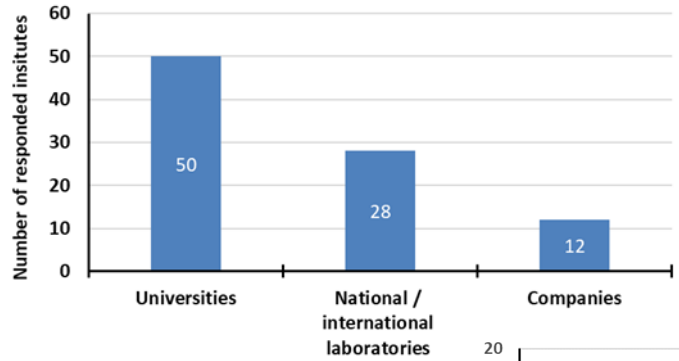
#### Final report on coordination of training activities

DELIVERABLE: D2.3

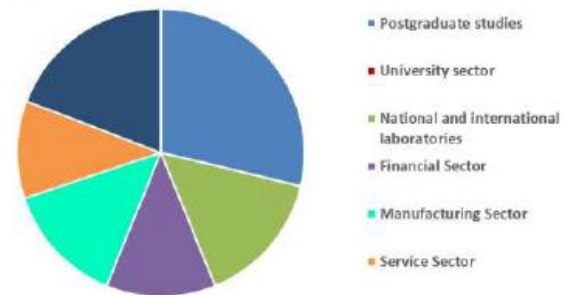
Document identifier:	ARIES-D2.3
Due date of deliverable:	End of Month 39 (July 2020)
Justification for delay:	Delay due to COVID19
Report release date:	30/09/2020
Work package:	WP2: Coordination, support and enhancement of training activities for accelerators in Europe
Lead beneficiary:	ESS
Document status:	Final

#### ABSTRACT

This report describes the extent of ongoing proposed training activities on particle accelerators in Europe, as well as their coordination and interaction. The data used for the report is collected by carrying out a web-based survey. In total, 90 institutes and companies from 21 countries have participated in the ARIES survey on "Training in Accelerator Science". Out of 90 responders, 50 responders were universities, 28 responders were national and international laboratories and 12 were companies. The report presents the provision of training, trainee numbers, training time, training subjects of the responding institutes, including training needs of companies. Coordination of training activities - accelerator schools, developments of MOOCs and use of facilities - is also outlined.



#### Undergraduate



# Major Achievements

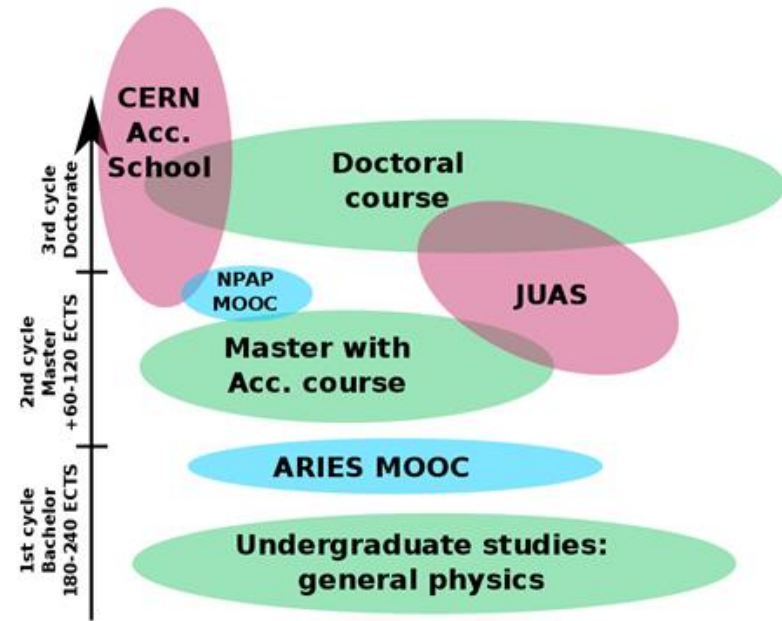
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Provided an E-learning course ('MOOC') (Nicolas Delerue)

- [https://edms.cern.ch/ui/file/1816950/1.0/ARIES-Del-D2.2-Final\\_v2.pdf](https://edms.cern.ch/ui/file/1816950/1.0/ARIES-Del-D2.2-Final_v2.pdf)



Tatiana Pieloni (EPFL)

$$\left. \begin{aligned} t' &= \gamma(t - vx/c^2) \\ x' &= \gamma(x - vt) \\ y' &= y \\ z' &= z \end{aligned} \right\}$$

RELATIVISTIC GAMMA FACTOR  $\gamma = \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}$



## APPLICATIONS OF ACCELERATORS

- Colliders for High Energy Physics
- Material analysis
- Health applications
- Industrial applications

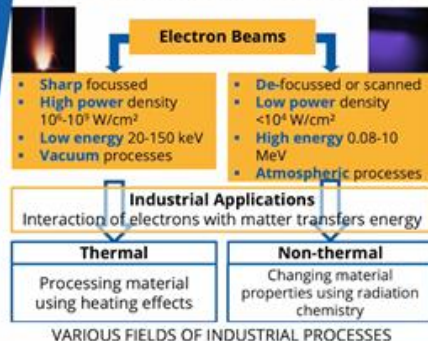
ACCELERATORS HAVE A VERY IMPORTANT, BUT OFTEN UNSEEN, IMPACT ON OUR EVERYDAY LIVES

Angeles Faus-Golfe (CNRS)

Frank Holm Roegner (Fraunhofer Institute)



## INDUSTRIAL APPLICATIONS



## Electron beam processing

- Electron accelerators are producing beams of energy from 80 keV up to 10 MeV.

Dagmara Smietanko (INCT, Warsaw)



OVER 2500 INDUSTRIAL ACCELERATORS ARE WORKING OVER THE WORLD

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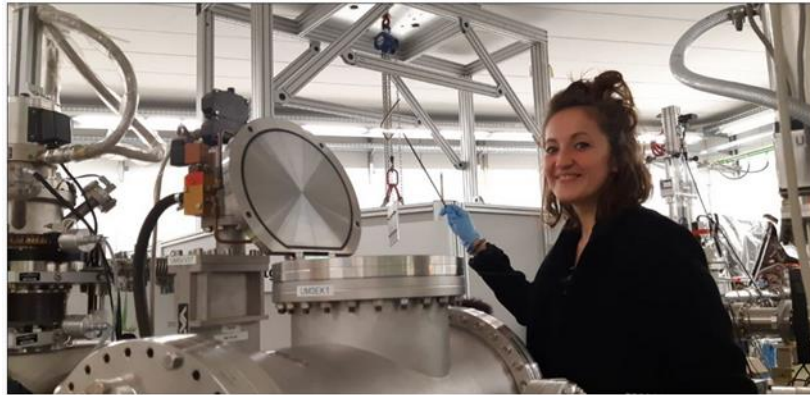
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- Internal + external communications, dissemination of news etc.
- Preparations for Annual Meetings + other events
- Input and editorial support for Accelerating News
- Two dedicated workshops for professional communicators from major European accelerator laboratories

# ARIES Communications & Outreach

## ARIES Women's Day Celebration

In February, we asked the ARIES community to contribute to a celebration of women in Science. Thank you to our colleagues for sharing the start of their scientific careers; read on for their amazing stories.

M.Sc. Carlotta Accettura



### Acceleration of relativistic beams using laser-generated terahertz pulses

Laser-driven electron accelerator operating at terahertz frequencies.

Issue 34 | Particle Accelerators (ACC) | 21 October, 2020



### Accelerator sensitivity to ultra-low stray magnetic fields

Stray magnetic fields are a serious consideration in the design CLIC. Measurements to characterise stray magnetic fields at CERN are presented and a mitigation technique for CLIC is discussed.

Issue 34 | Compact Linear Collider (CLIC) | 20 October, 2020



### Cold diodes for the inner triplet circuit of the High Luminosity LHC

The cold diodes of the new triplet circuits will be installed in a dedicated cryostat in the LHC tunnel downstream of the triplet magnets and close to the LHC beam pipe.



**SAVE THE DATE!**

**27-28 FEBRUARY 2020**

2nd Accelerator Communication and Outreach Workshop



## Best Practices

- Establish goals and evaluate communication results;
- Communications team should have close links the project's management;
- Communication for accelerator R&D is never just about the accelerator.

## Recommendations

- Production of a targeted newsletter for key audience segments;
- Working with the major accelerator conferences to include communication;
- Provide supporting marketing and educational material;
- PCST-style mailing list to which any interested party could subscribe.

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## Ensured a smooth transition to 'TCO' actions in I.FAST (WP2: Philip Burrows)

- Internal + external communications – Antoine Le Gall (CERN)
- Challenge Based Innovation scheme – Nicolas Delerue (CNRS)
- Industrial training/knowledge transfer scheme – Tord Ekelof (Uppsala)

# Conclusions

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**Everyone agrees that training, communication + outreach are essential activities**

**Most EU projects have dedicated tasks particular to the respective project area**

**In ARIES WP2 we took an agnostic + inclusive overview:**

**universities**

**national and international accelerator-related laboratories + facilities**

**industrial companies**

**providers and recipients of training**

**professional + non-professional communicators**

**from across Europe (and beyond)**

**We engaged with multiple stakeholders:**

**designers, builders, suppliers, operators and users of accelerators**

**Paid attention to societal applications of accelerator technology**

**→ Future coordinated approach for accelerator field, with a broad horizon, that maximizes efficiency and utilization of precious resources**