



# Project Coordinator Report

## 2<sup>nd</sup> ARIES Annual Meeting

### Budapest, 9 April 2019

Maurizio Vretenar, CERN



# Summary

---

- ARIES in a nutshell: quick recap for newcomers
- 2019-20: key time for accelerator science
- The ARIES contribution to the global accelerator challenges.
- ARIES life: outreach, communication, outlook.
- The Budapest meeting: schedule, events, participants.
- The future...

**The best way  
to predict the future  
is to invent it.**

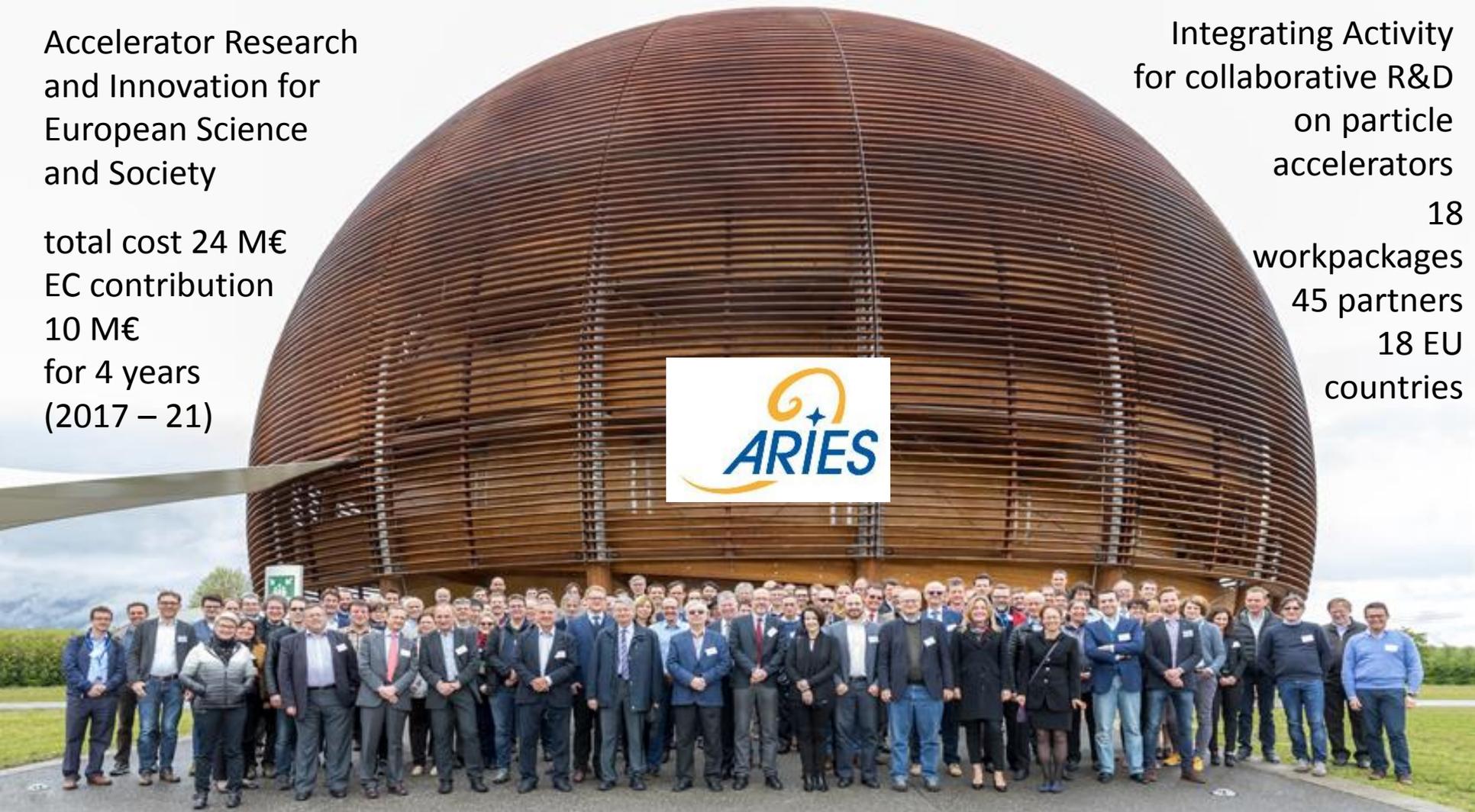
Alan Kay, American computer scientist  
Speech given at Xerox PARC (1971)

# ARIES in a nutshell

Accelerator Research  
and Innovation for  
European Science  
and Society

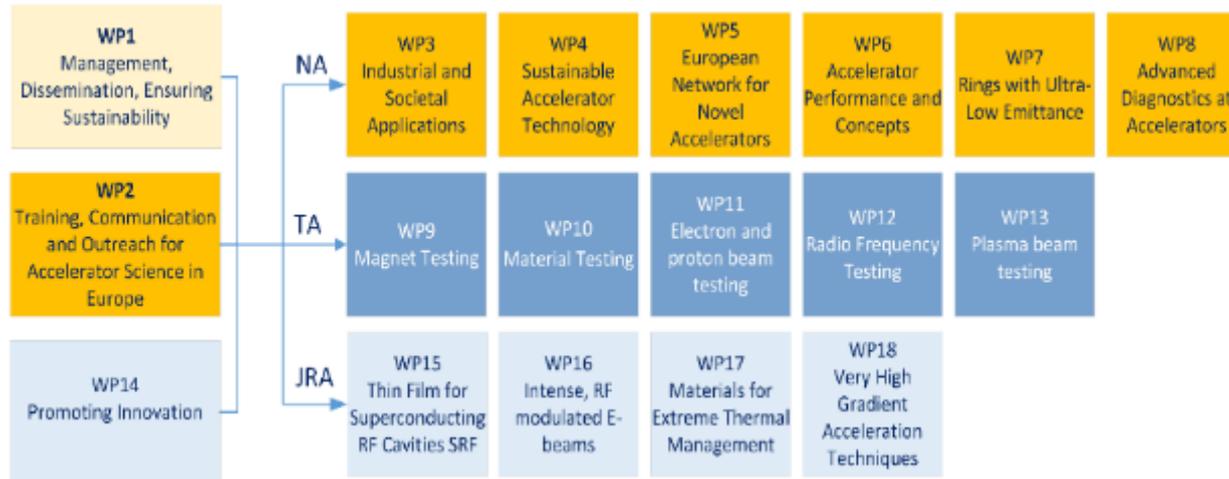
total cost 24 M€  
EC contribution  
10 M€  
for 4 years  
(2017 – 21)

Integrating Activity  
for collaborative R&D  
on particle  
accelerators  
18  
workpackages  
45 partners  
18 EU  
countries



First of all people: 400 participants working together for the progress of accelerator science and technology

# Structure and ambition



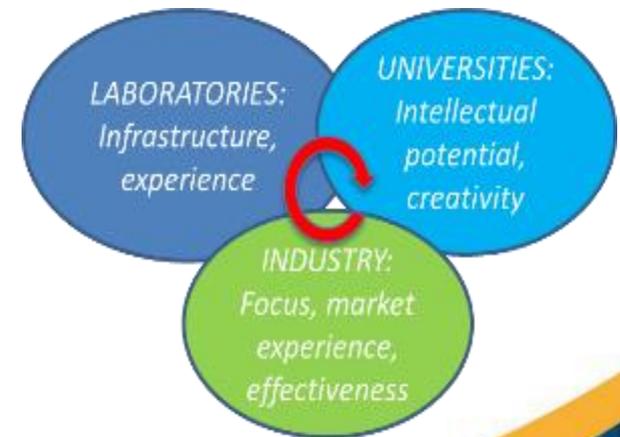
Quite rigid structure imposed by EU project rules:

- Networks (NA)
- Transnational Access (TA)
- Joint Research Activities (JRA)

## AMBITION

Generate innovation in accelerator science and technology, by:

- cross-fertilisation between fields, and between laboratories, universities and industries;
- promoting long-term objectives, beyond the immediate needs of our projects;
- favouring the transition of accelerator technologies towards society.



# 2019: European Strategy on Particle Physics

The process by which every 7 years the European particle physics community updates its strategy and priorities.

Timeline:

- December 2018: deadline for submission of scientific input
- May 2019: open symposium in Granada (Spain)
- January 2020: strategy document drafting
- May 2020: approval by CERN Council

Inputs related to the ARIES community:

- **FCC Conceptual Design Report** (4 volumes)
- **Muon collider document** (11 pages)
- **ALEGRO proposal** (10 pages + 80 pages addendum)
- **EuroNNAC** statement
- **TIARA** statement

CERN Council Open Symposium on the Update of  
**European Strategy for Particle Physics**  
13-16 May 2019 - Granada, Spain



Physics Preparatory Group	Local Organizing Committee
Julius Aigner-Aulevski (Chair)	Francois David Huet
Shih-Gang	Antonio Bussiere (Chair)
Stefan Dierckx	Alberto Cruz
Caterina Driacari	Alfonso Gallo
Marta Garcia	Javier Garcia
Alexis H. Hoell	David Garcia
Rolf Klees	Maria Jose Lopez
Wolfgang Kunk	Jose Luis Lopez
Frank Lesler	Antonio Lopez
	Ignacio Lopez

<https://cafpe.ugr.es/eppsu2019/eppsu2019eppsu2019>



Sponsored by:



The Integrating Activities for particle accelerators have been started by the needs and the challenges of the particle physics community.

We have now evolved towards covering other communities (high-energy nuclear physics, synchrotron light, neutron science, medical and industrial applications,...) but particle physics remains our main user community and the origin of most of our challenges!

# The time scale is stretching out... time for R&D!

FCC time scale, from F. Gianotti Jan-2019 speech at CERN

**Purely technical** schedule, assuming green light to preparation work in 2020.  
**A 70 years programme**

8 years preparation	10 years tunnel and FCC-ee construction	15 years FCC-ee operation	11 years FCC-hh preparation and installation	25 years FCC-hh operation pp/PbPb/eh
2020-2028		2038-2053		2064-2090

Time for much more accelerator R&D !

Can new technologies become competitive by 2050?

Example: ALEGRO timescale, ALIC TDR in 2037

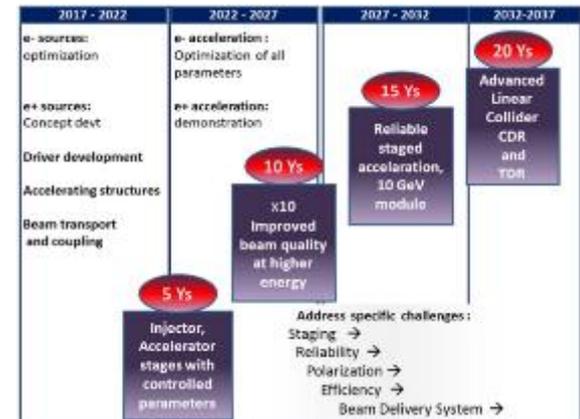
ALIC = 30 TeV c.o.m. e+/e-/gamma collider based on advanced technologies



### TIARA contribution to the European Strategy of Particle Physics

In order to enable the development of a programme allowing the realization of future accelerators for particles physics on the medium and long term, it is essential that some general statements be highlighted in the coming update of the European Strategy. In particular, it is important that

- accelerator science and technology be acknowledged as a vital need with the highest priority within the update of the European Strategy of Particle Physics,
- this message be widely conveyed to the European Commission and national funding authorities with a recommendation to expand their investment effort in the area of accelerator R&D across all relevant fields of research,
- the education and training in the field of accelerator science and technology be strengthened
- the collaboration of joint R&D and co-innovation between laboratories, universities and the industry sector be strongly encouraged and supported
- a strong support be given to promote and develop further the collaborative and sustainable state-of-the-art research and innovation in Europe in the field of accelerator

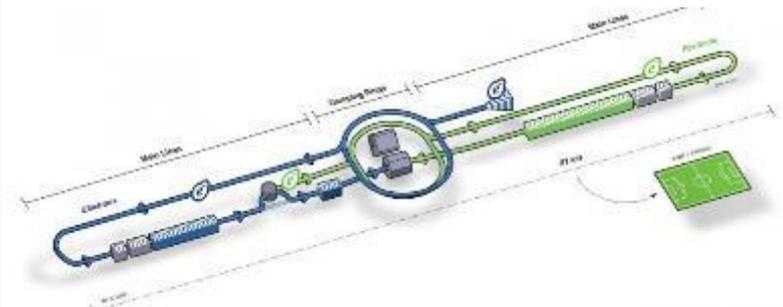


# A challenge from Japan

From the **19 December 2018** report of the Science Council of Japan on the construction of an International Linear Collider in Japan:

*“The 250-GeV ILC project will require a large budget both for construction and operation over a long period of time. On the other hand, the major expected outcome is that it has the potential to suggest the future direction of elementary particle physics if a deviation from the Standard Model is found in the precision measurements of the Higgs coupling constants. This review committee, however, did not reach a recognition that the **expected scientific achievements, which are to suggest the future direction, are sufficient to justify the major part of the huge project cost that Japan is expected to bear.**”*

*“In view of the finite resources available to humanity, the research style that presupposes an ever-growing scale-up of gigantic experimental facilities would eventually reach the limit of sustainability. The future way of “big science” is a theme to be deliberated by the whole academic community.”*



# The big challenge for accelerator science

---

Making accelerator-based particle physics research sustainable is going to be one of the main challenges to the accelerator community for this XXIst century.



We need new ideas  
We need a collaborative and creative  
environment for these ideas to grow

We need ARIES ... and its successors!

# ARIES Life



# ARIES Communication and Outreach

- ARIES featured in December 2018 **DG-RTD communication campaign**: article, special version of video, short text for social media (89k followers).

A new generation of particle accelerators, more powerful, more efficient and more affordable than their predecessors, will help physicists explore the mysteries of the universe, provide engineers with novel tools to combat pollution and enable doctors to more effectively treat cancer. The #EUfunded ARIES project is leading the advance, developing technologies that are set to have a profound impact on science and society. #H2020

- ARIES **Bulletin** issue #1 October 2019
- Communication and Outreach Workshop: 16 science communicator from accelerator labs (particle physics and synchrotron light).



THE ARIES CONSORTIUM  
INVITES YOU TO THE  
**ACCELERATOR  
COMMUNICATION &  
OUTREACH WORKSHOP**  
5-6 NOVEMBER  
CERN, GENEVA

INVITATION ONLY



Programme: H2020 (Underpinning Activity)  
Grant Agreement No.: 101011  
Project Coordinator: Maurizio Vinciguerra (CERN)



### ARIES Bulletin | Issue #1

#### 2nd ARIES Annual Meeting - Budapest, 8-12 April 2019



We have started the preparation for the 2nd ARIES Annual Meeting that will be organized by the MTA RCF in Budapest (Hungary), from Monday 8 April to Friday 12 April 2019.

The first day (8 April) will be, at least, devoted to parallel sessions. The plenary sessions, where all ARIES activities are presented, will take place from Tuesday (9 April) to Thursday (11 April), in the morning. A laboratory visit will be organized on Thursday (11 April) afternoon, and a WP14 Industry Workshop will follow on Friday (12 April).

The Annual Meetings are the most important events in the life of a project, so please schedule the date in your agendas as soon as possible.

#### CALL FOR PROPOSALS

ARIES Proof-of-Concept Fund

#### ARIES Proof-of-Concept

We are happy to announce the winners of the ARIES Proof-of-Concept call, each of whom will receive EUR 50,000 in funding.

All the 10 projects submitted to the call were of great quality and the task of the Evaluation Committee was made extremely difficult. We thank them for their effort and all projects, selected and not, for taking part to this contest [\[read more\]](#)

#### 1st ARIES Annual Report

The 1st Annual Report of ARIES, covering the period from 1 May 2017 to 30 April 2018, is ready and available at <https://arises.web.cern.ch/ARIES1/ARIES1.html>

#### Publications

# The monograph series is back again!

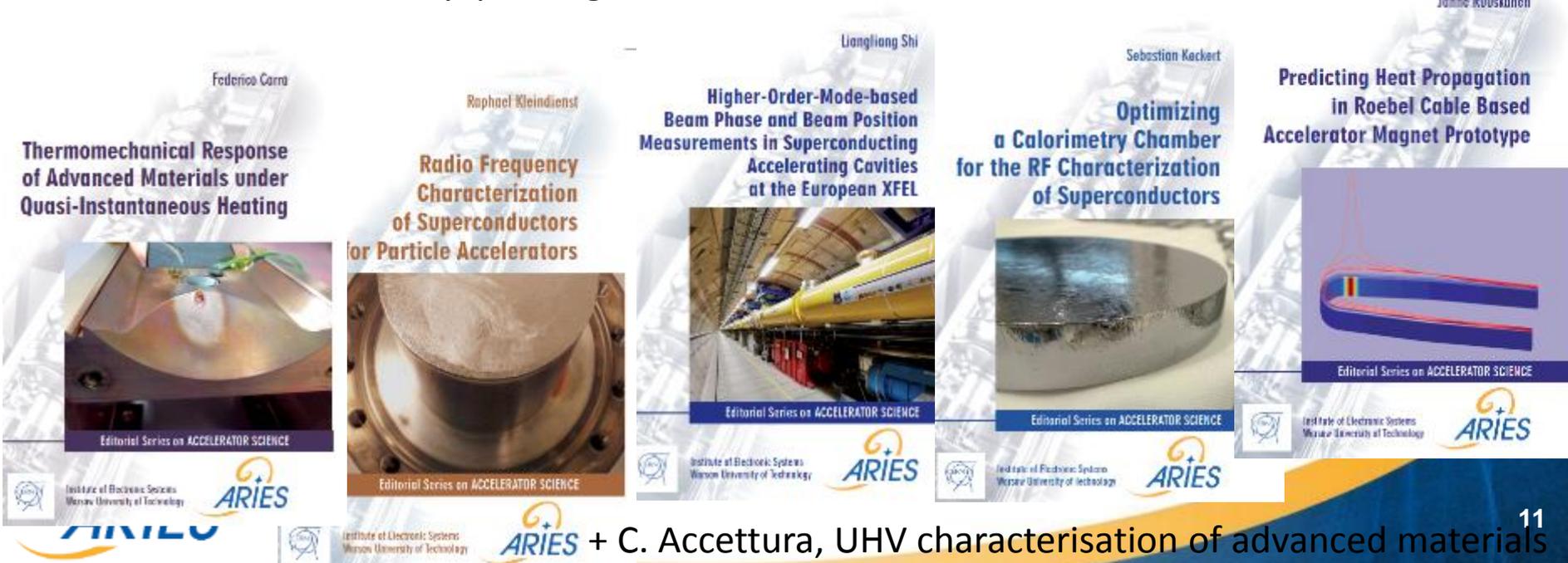
The Editorial Series on Accelerator Science («the booklets»)

Already 45 volumes published in EuCARD and EuCARD2 since 2008

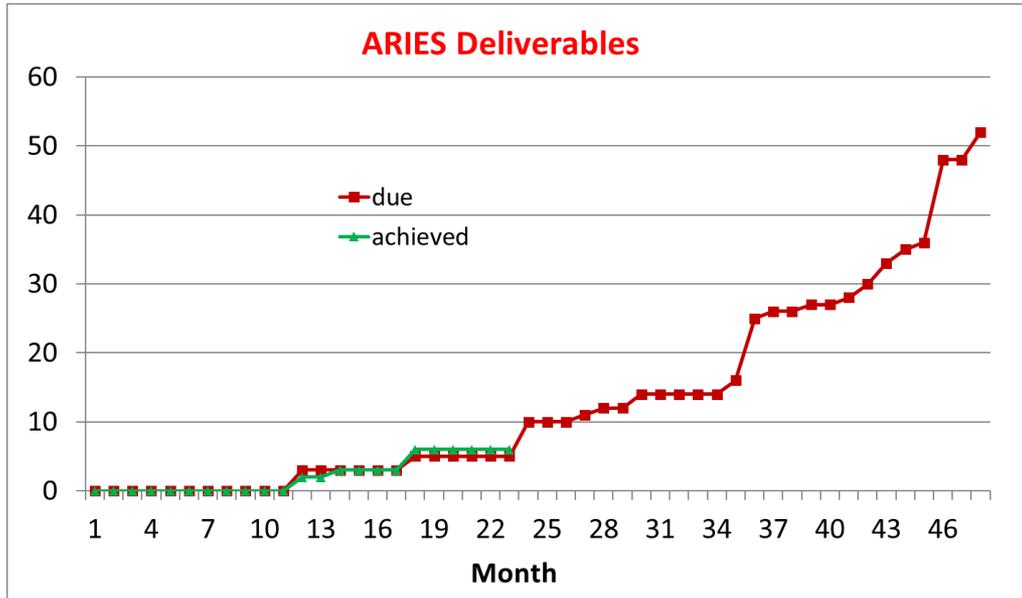
- Research & Technical Monographs
- Ph.D Theses, very good M.Sc. Theses
- Ordered/polished laboratory reports
- Interim TDRs

Please contact  
[R.Romaniuk@ise.pw.edu.pl](mailto:R.Romaniuk@ise.pw.edu.pl)  
If you are willing to use this  
instrument to disseminate  
your work!

After some initial delay, printing under ARIES has restarted



# Deliverables and Milestones



6 Deliverables produced (/5)

4 are due at end of April  
(1 received, 3 still in preparation!)

WP3 D3.1 - Applications of electron beams in the environmental area (M24)	Received
WP14D14.2 - Academia meets industry event 1 (M24)	Event ongoing
WP15D15.2 - Evaluation of systems 1 and 2 (M24)	Waiting
WP16D16.1 - Electron beam dynamics studies (M24)	Waiting

Milestones achieved 29 / 29

13 Milestones due in April 19

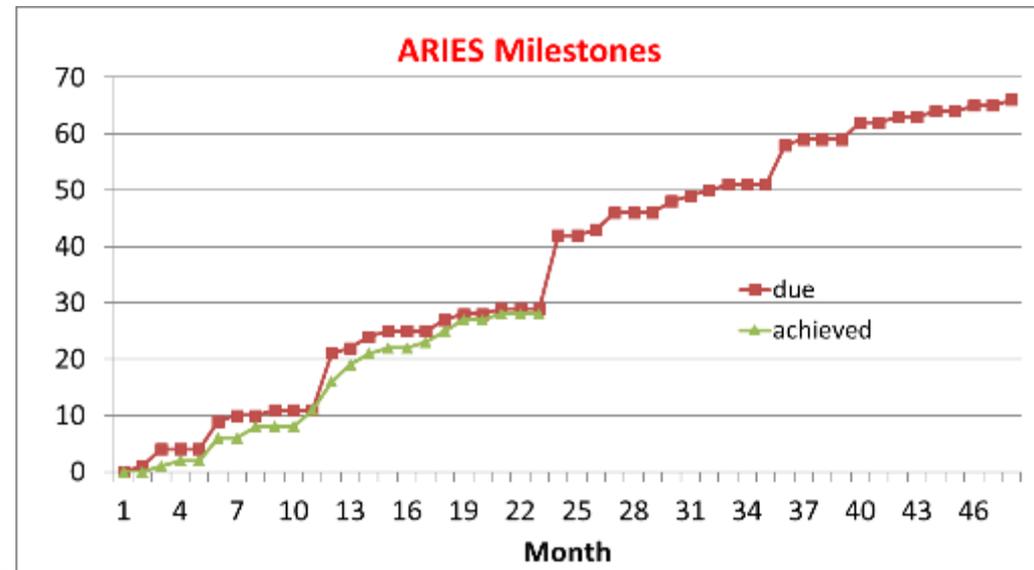
3 received

1 promised

4 delayed for technical reasons

2 delayed by WP16

3 unknown



# Practical issues: Mid-Term Review, Double Funding

---

## MID-TERM REVIEW

A thorough review of the project by the EC that takes place at mid project (end April 2019)

- Agreement with the EC Officer for a light oral review (no written document to prepare!)
- The Research Infrastructure unit of DG-RTD is restructuring: the Review will be only in September
- External reviewer (to be confirmed): Katherine Harkay, APS Argonne
- ARIES delegation: Coordinator + 2 WP Coordinators (covering new techniques, materials)

## BEWARE OF BEING ACCUSED OF DOUBLE-FUNDING

There are several ongoing projects on particle accelerators (ARIES, AMICI, FuSuMaTech, Easytrain, 3 Design Studies, other initiatives...) and the EC is worried of «**double funding**» = the same activity charged to two projects.

There is no way to track if e.g. the working time of a person is claimed twice, to two different projects. There is going to be an increase in scientific scrutiny, to be sure that there are no overlaps between projects.

In this optics, **publications acknowledging support from two or more EU projects** are going to be carefully scrutinised – the risk is to receive an audit. To avoid problems, please:

- avoid **acknowledging two projects** in your publications (select for acknowledgement the one with the largest contribution), or
- to acknowledge 2 or more projects, **give details on their different contribution**

# The 2019 Annual Meeting

128 participants, 12% more than last year in Riga (114)!



**ARIES**  
**2<sup>ND</sup> ANNUAL MEETING**

8-12 APRIL 2019  
Hotel Mercure Korona  
Budapest, Hungary



The ARIES project invites its wide accelerator R&D community to convene at Budapest in April 2019, to share recent results and to discuss future activities.

**PROGRAMME**

**Monday 8 April**  
Workshop on Additive Manufacturing Technologies for Accelerators

**Tuesday 9 April – Thursday 11 April**  
Plenary Sessions

**Thursday 11 April – Friday 12 April**  
Workshop on Accelerator in HTS (WAMHTS-5)



**ORGANISING COMMITTEE:**  
Wolfgang Fischer (chair)  
Günther Vosseler (Vice Chair)  
T. Hwa-Ming (Co-organiser)  
Dimitris Katerinis (Co-organiser)

ARIES has received funding from the European Union's Horizon 2020 Research and Innovation programme (GA No 730671)



# Features of this year programme

---

Following input and suggestions after Riga:

- Overview of Milestones and Deliverables at the Governing Board meeting (presentation by each WP coordinator).
- Shorter WP presentations at plenary sessions concentrate on scientific progress.
- Maximum 1 highlight/activity, 20'.
- New topical sessions, with discussion time:
  - ✓ Future accelerators for medicine, 4 talks 20' + 40' discussion
  - ✓ Future high-power accelerator applications, 2 talks 40'+20', 20' discussion.
- Special session to present plans for future EU projects (30' + 30' disc.)

Two side events:

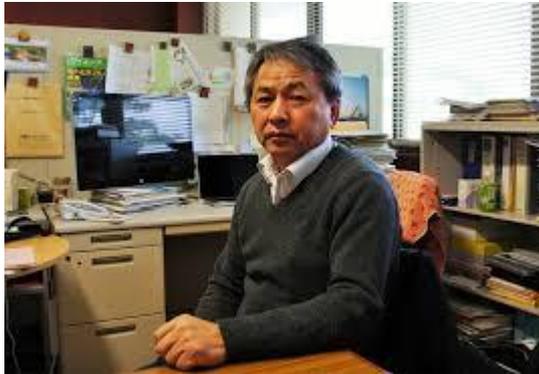
- Monday 8.4: **Additive Manufacturing Workshop** WP14.
- Thursday 11.4 – Friday 12.4: **WAMHTS Workshop on Accelerator Magnets in HTS.**

# Scientific Advisory Board

---

We welcome this year two members of our Scientific Advisory Board:

Akira Yamamoto (KEK), who will join us from Wednesday,  
Tor Raubenheimer (SLAC), our new member from US.



Their main assignment this year will be providing their advice on the structure of the new programme that will follow ARIES

# Tuesday

MONDAY 08/04/2019					
9:00	16:00	7:00	WP14 Additive manufacturing Workshop in Wigner Institute		
14:00	18:00	4:00	PARALLEL WP MEETINGS in Korona Mercure Hotel		
TUESDAY 09/04/2019 ARIES Plenary Session					
8:30	10:30	2:00	ARIES SHIP Exhaust Project Meeting		T. Torims
9:00	10:30	1:00	Sustainability working group meeting		
8:30	10:30	2:00	PARALLEL WP MEETINGS in Korona Mercure Hotel		
10:00	11:00	1:00	Coffee break		
10:30	12:00	1:30	Governing Board and Steering Committee Meeting		
12:30	13:45	1:15	Buffet Lunch		
Session 1: Introduction to ARIES and reports from the Networks (Chair: N. Sammut)					
13:45	14:05	0:20	Opening address and introduction to Wigner RCP		P. Levai, Z. Tandi (Wigner)
14:05	14:25	0:20	Report from the Project Coordinator		M. Vretenar (CERN)
14:25	14:40	0:15	Communication, Training and Outreach: report from WP2		D. Antonio (CERN)
14:40	14:55	0:15	Industrial and societal applications: report from WP3		R. Edgecock (STFC)
14:55	15:10	0:15	Efficient energy management at accelerators: report from WP4		M. Seidel (PSI)
15:10	15:25	0:15	The European Network on Novel Accelerator Concepts, report from WP5		R. Assmann (DESY)
15:25	15:40	0:15	Accelerator Performance and Concepts: report from WP6		F. Zimmermann (CERN)
15:40	16:10	0:30	Coffee break		
Session 2: Networks and Network Highlights (Chair: A.-S. Müller)					
16:10	16:25	0:15	Ultra-low emittance rings: report from WP7		R. Bartolini (Oxford)
16:25	16:40	0:15	Advanced accelerator diagnostics: report from WP8		P. Fork (GSI)
16:40	17:00	0:20	The ARIES Massive Online Open Course		N. Delerue (LAL)
17:00	17:20	0:20	Reliability information databases and feasibility within accelerator community		H. Humer (AIT)
17:20	17:40	0:20	The impact of magnetic flux trapping on SRF efficiency		A. Ivanov (CERN)
17:40	18:00	0:20	Progress with experimental tests of CLIC damping ring kickers at ALBA		F. Perez (ALBA-CELLS)
18:00	18:20	0:20	State-of-the-art closed orbit feedback		S. Mirza (GSI)
18:30	20:30	2:00	Welcome Drink at Mercure Korona Budapest Hotel		

# Wednesday

## WEDNESDAY 10/04/2019 ARIES Plenary Session

Session 3: Reports from Transnational Access and Joint Research Activities (Chair: P. McIntosh)					
9:00	9:10	0:10	Testing of magnets and components at cryogenic temperatures, report from TNA WP9	M. Bajko (CERN)	
9:10	9:20	0:10	Material testing with extreme beams, report from TNA WP10	Y. Kadi (CERN)	
9:20	9:30	0:10	Testing with beams, report from the TNA WP11	J. Schwindling (CEA)	
9:30	9:40	0:10	Testing of advanced RF structures, report from TNA WP12	R. Ruber (Uppsala U.)	
9:40	9:50	0:10	Plasma beam testing, report from the TNA WP13	B. Cros (CNRS)	
9:50	10:05	0:15	Very high gradient acceleration techniques: report from WP18	A. Specka (CNRS)	
10:05	10:20	0:15	Materials for extreme thermal management: report from WP17	A. Bertarelli (CERN), M. Tomut (GSI)	
10:20	10:35	0:15	Intense RF modulated e-beams: report from WP16	D. Ondreka (GSI)	
10:35	10:50	0:15	Thin film coatings for superconducting cavities: report from WP15	O. Malyshev (STFC)	
10:50	11:20	0:30	Coffee break		
Session 4: Highlights from TA and Joint Research Activities, sustainability (Chair: R. Romaniuk)					
11:20	11:40	0:20	Fibre optic sensors based on Colloidal Crystal structures	M. Giordano (CNR)	
11:40	12:00	0:20	Deposition and Characterisation of Superconducting thin films of Nb, NbN and Nb <sub>3</sub> Sn for SRF applications	R. Valizadeh (STFC)	
12:00	12:20	0:20	Design of the electron gun for the GSI space charge compensation lens	K. Schulte-Ulrichs (GSI)	
12:20	12:40	0:20	Laser light with Orbital Angular Momentum and its Applications	J. Vieira (IST)	
12:40	13:45	1:05	Lunch break		
Session 5: Innovation projects and applications (Chair: M. Tomut)					
13:45	14:05	0:20	Innovation and industry programmes: report from WP14	M. Losasso (CERN)	
14:05	14:25	0:20	PoC project: Development of hybrid electron accelerator system for the treatment of marine diesel exhaust gas	T. Torims (RTU)	
14:25	14:45	0:20	PoC project: Investigation of new methods for the manufacturing of Cooper-Diamond Composites with tailored thermo-physical properties	M. Kitzmantel (RHP)	
14:45	15:05	0:20	PoC project: Atomic Layer Deposition: An innovative approach for next generation particle accelerator	C. Antoine (CEA)	
15:05	15:25	0:20	PoC project: Accelerator Diagnostic using innovative Adaptive Optics	M. Iblson (Liverpool)	
15:25	15:40	0:15	HTS for accelerator magnets	L. Rossi (CERN)	
15:40	16:10	0:30	Coffee break		
Session 6: Special session on future accelerators for medicine (Chair: M. Vretenar)					
16:10	16:30	0:20	Designs for the next generation of medical accelerators	E. Benedetto (SEEIIST-TERA)	
16:30	16:50	0:20	Laser plasma proton and ion accelerators for therapy	U. Schramm (HZD)	
16:50	17:10	0:20	Superconducting magnets for medical accelerators	S. Prestemon (LBNL)	
17:10	17:30	0:20	New electron linac therapies and accelerator designs	A. Faus Golfe (LAL)	
17:30	18:00	0:30	Discussion: future directions for particle therapy accelerators		
19:30	22:00	2:00	Banquet Dinner		

# Thursday

THURSDAY 11/04/2019				
Session 7: Invited talks (Chair: Y. Kadi)				
9:00	9:40	0:40	Accelerators for applications in energy and nuclear waste transmutation	H.A. Abderrahim (SCK-CEN)
9:40	10:00	0:20	The ESS target	F. Sordo (ESS Bilbao)
10:00	10:15	0:15	<i>Discussion: future high-power accelerator applications</i>	
10:15	10:35	0:20	Static and oscillating EDM- experiments at storage rings	A. Stahl
9:00	12:00	3:00	SAC Meeting	
9:00	11:00	2:00	IAB Meeting	
10:35	11:05	0:30	Coffee break	
Session 8: Future accelerator projects and SAC report (Chair: R. Aleksan)				
11:05	11:35	0:30	Sustainability and the new Innovation Pilot project	R. Aleksan (CEA), M. Vretenar (CERN)
11:35	12:05	0:30	<i>Discussion: structure and themes of the new program, industry involvement</i>	
12:05	12:25	0:20	SAC Report	
12:25	12:35	0:10	Close-out from Coordinator	
12:35	13:35	1:00	Lunch break for WAMHTS-5 Workshop	
13:00			Departure for PAKS visit	
15:30	21:30	6:00	PAKS visit	
13:35	18:05	4:30	WAMHTS-5 Workshop	
19:00	22:00	3:00	Dinner for PAKS visit participants	
19:30	22:30	3:00	Dinner for WAMHTS-5 participants	
FRIDAY 12/04/2019				
9:00	12:00	3:00	WAMHTS-5 Workshop	
9:00	12:00	3:00	PARALLEL MEETINGS WP15	
12:00	13:00	1:00	Lunch break	
13:00	17:00	4:00	WAMHTS-5 Workshop	
13:00	17:00	4:00	PARALLEL MEETINGS WP15	
			End of Meeting	

# Presentation and discussion on ARIES2

---

Don't miss the presentation and discussion on Thursday morning (11:00-12:00) on the project that will (hopefully) follow ARIES, the new «Innovation Pilot» for accelerators.

The Innovation Pilot will be entirely different from our long series of Integrating Activities (CARE – EuCARD – EuCARD2 – ARIES) and we will have a large freedom in shaping the new programme accordingly to our needs and to the priorities of the Commission.

We have a unique opportunity of shaping our future, and we want to do it together!

