



4th ARIES Annual Meeting

Welcome and Report from the Coordinator

21 April 2021

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Overview



We are approaching the end of a long journey that we started together 4 years ago.

Goal of this meeting is to prepare for a **safe landing** of ARIES, by:

- Agreeing on the plan for **project termination**;
- Identifying the key messages and outcomes of ARIES (our “**legacy**”);
- preserving the **network of personal connections** that we have established, during the covid unsocial times and after the end of the project.
- planning the **transition** to the next EU programmes (our next sailing!)



Land ho!

(courtesy of Picton Castle, approaching Pitcairn Island in Southern Pacific)

Outlook of the presentation

1. Structure of the meeting, objectives
2. Status of ARIES, termination schedule, reporting
3. Deliverables and Milestones
4. ARIES legacy
5. Horizon Europe and future accelerator projects
6. Meeting (and celebration!) calendar until the end of the project

The 2021 4th Annual Meeting

(CERN kick-off – Riga – Budapest – virtual)

Because of covid, again in 2021 an Annual Meeting in reduced format: only two days, no highlight talks.



Our programme:

- Presentations by WP Coordinators (Wednesday);
- Two «plenary» talks: HTS by L. Rossi and summary by the chair of the Scientific Advisory Committee, A. Yamamoto (Wednesday end of day).
- Presentation of the 4 Proof-of-Concept projects (Thursday morning);

The Governing Board will meet on Thursday afternoon, and the Steering Committee will make a final wrap-up on Thursday 4pm.

Please help me by highlighting in your presentations some **key messages for the ARIES Final Report**: achievements, innovations, measurable results, etc.

Information: two new WP Coordinators

New Coordinators for two Transnational Access Work Packages:

- WP11 (beam testing): **Robert Ruprecht (KIT)** replaces Jérôme Schwindling (CEA) whose facility (IPHI) is no longer active in ARIES.
- WP 10 (material testing): **Nikolaos Charitonidis (CERN)** replaces Yacine Kadi (CERN), who takes the consolidation of the North Experimental Area.

We thank both Jérôme and Yacine for their fruitful contribution to ARIES!

Information: ARIES Amendment

ARIES Amendment #2 has entered into action at the end of 2021.

It includes:

1. An extension by 12 months of all Transnational Access (WP9-13), with redistribution of access units and related budget, to ensure that the project will provide all contractual access before its termination.
2. An extension of 4 to 8 months of most Joint Research Activities (WP14 and WP16-18), of the Diagnostics network WP8, and of Task 2.4, related to the delays induced by the Covid crises.
3. A change in the programme for Task 18.2 (Enabling multi-stage LWFA) with a descope of the corresponding deliverable.
4. some minor budget transfers between partners, previously approved by the Governing Board.

New ARIES timeline

Workpackage	Task(s) and Extension	Termination	New deliverable dates	Comments
1	1.1-1.2: 12 months	M60 (4/22)	D1.1: M48	Coordination till project end
2	2.4: 6 months	M54 (10/21)		Only MOOC delayed
3	No extension	M48		
4	No extension	M48		
5	No extension	M48		
6	No extension	M48		
7	No extension	M48		
8	All Tasks: 8 months	M56 (12/21)	D8.1-D8.4: M52	Delayed personnel exchange
9	All: 12 months	M60 (4/22)		
10	All: 12 months	M60 (4/22)		
11	All: 12 months	M60 (4/22)		
12	All: 12 months	M60 (4/22)		
13	All: 12 months	M60 (4/22)		
14	All Tasks: 4 months	M52 (8/21)	D14.5: M50	Minimum delay
15	No extension	M48	D15.424 : M48	Continue in I.FAST
16	All Tasks: 8 months	M56 (12/21)	D16.1: M46, D16.2: M46, D16.3: M53	Several delays to be compensated
17	All Tasks: 8 months	M56 (12/21)	D17.2: M50, D17.3: M54	
18	All Tasks: 8 months	M56 (12/21)	D18.2: M54, D18.5: M54	New 18.2 Workplan

ARIES will finish only in April 2022: for one full year we will have ARIES and IFAST in parallel, without intersections.

New termination dates and reporting

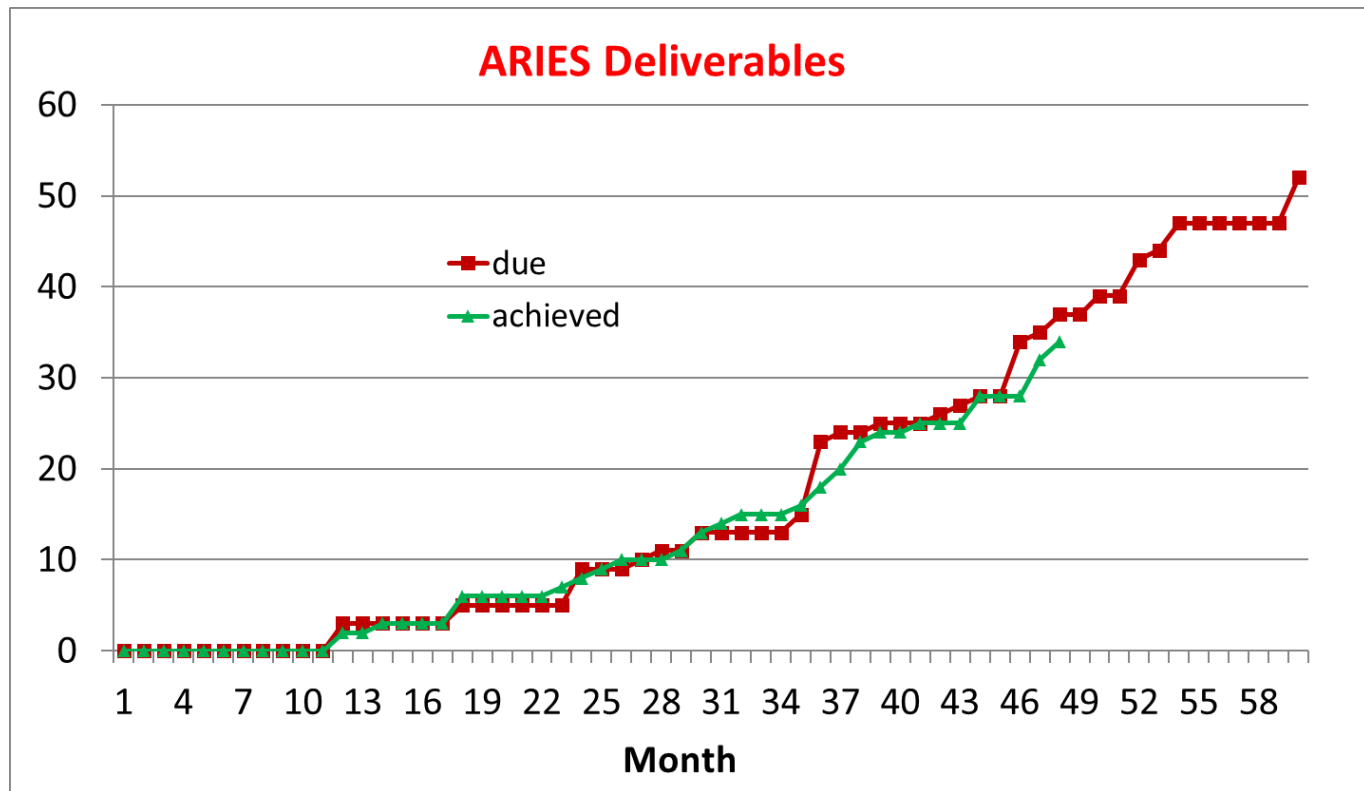
New termination dates	
M48 (April 2021)	WP3, 4, 5, 6, 7, 15
M52 (August 2021)	WP14
M54 (October 2021)	WP2 (2.4)
M56 (December 2021)	WP 8, 16, 17, 18
M60 (April 2022)	WP1 (1.1-1.2), WP 9, 10, 11 ,12, 13

For 6 Work Packages this is the last report at an ARIES Meeting!

- The **last reporting period** (P3) becomes officially the **24 month period M37 – M60** (May 2020 – April 2022) – PR3 Report due only in June 2022.
- Added as intermediate Deliverables in WP1 **reports on the terminating activities**, which will then be used to build the last Periodic Report and the Final Report - covering the period starting in May 2020.

	New deliverables in WP1	Dates	Concerns
D1.2	Report on cumulative expenditure 2020	M44, 12/20	Financial services
D1.3	Technical report on Workpackages completed at M48	M50, 6/21	WP2, 3, 4, 5, 6, 7, 15
D1.4	Technical Report on Work packages completed at M56 and Report on cumulative expenditure 2021	M56, 12/21	WP2.4, 8, 14, 16, 17, 18 Financial services

Status of Deliverables (after amendment)



3 late deliverables:

- D16.1, Electron Beam Dynamics Studies, M46, M. Droba / D. Ondreka
- D7.4, Final Report on the RULE Network, M46, A.S. Mueller / R. Bartolini
- D1.1, Final Report on European Strategy, M48, R. Aleksan / M. Vretenar

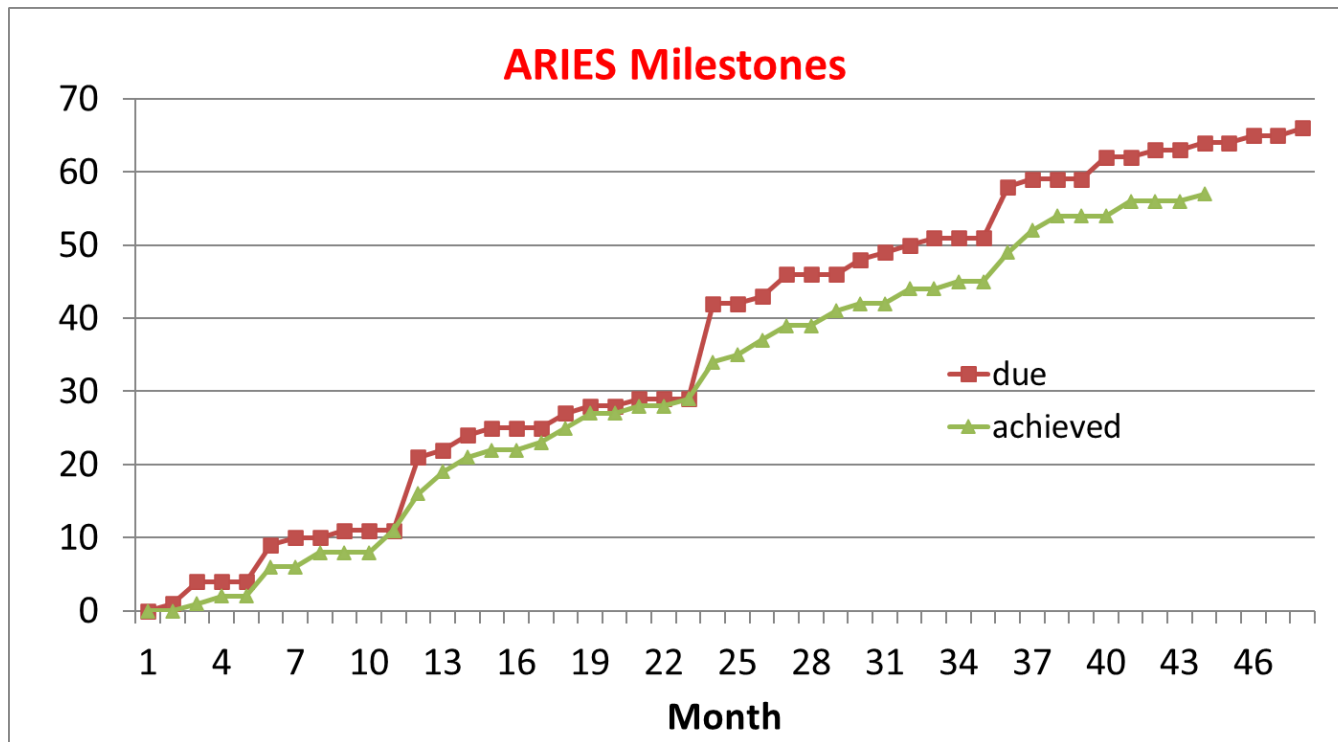
Deliverables until end of project

WP1	D1.3- Technical report on Work Packages completed at M48 and summary of Transnational Access at M48	50	M. Vretenar
WP14	D14.5 - Real-time Event Distribution Network brought to openly accessible “product grade level (M46)	50	Cosylab, J. Gutleber
WP17	D17.2 - Irradiation effect simulations (M44)	50	A. Bertarelli
WP8	D8.1 - Report on progress in beam diagnostics for hadron LINACs (M46)	52	P. Forck
WP8	D8.2 - Report on advances in beam diagnostics for hadron synchrotrons (M46)	52	R. Jones
WP8	D8.3 - Report on advances in beam diagnostics for 3rd generation light sources (M46)	52	F. Perez
WP8	D8.4 - Report on advances in beam diagnostics for FELs (M46)	52	K. Wittenburg
WP16	D16.3 - Tests of electron gun at test stand completed (M46)	53	M. Droba
WP17	D17.3 - Irradiation test results (M46)	54	L. Peroni
WP18	D18.2 - Multi-stage Laser Wakefield Acceleration demonstrated	54	A. Chance
WP18	D18.5 - Pushing back the charge frontier (M45)	54	C. Thauray
WP1	D1.4- Technical report on Work Packages completed at M56 and report on cumulative expenditure 2021	56	M. Vretenar
WP9	D9.1 - Transnational Access to magnet testing facilities ((M48)	60	M. Bajko
WP10	D10.1 - Transnational Access to material testing facilities (M48)	60	N. Charitonidis
WP11	D11.1 - Transnational Access to electron and proton beam testing facilities (M48)	60	R. Ruprecht
WP12	D12.1 - Transnational Access to radio frequency testing facilities (M48)	60	R. Ruber
WP13	D13.1 - Transnational Access to plasma beam testing facilities (M48)	60	B. Cros

Still, 18 Deliverables to go...

- End of June: Final Technical Report for the 6 WP's coming to an end – contributions end of May
- 2 Deliverables end of June (reminders soon), 4 Deliverables end August, 1 in July, 3 in August
- the list ends with the 5 Deliverables on Transnational Access at the end of the project.

Milestones



The Milestone schedule was not updated in the Amendment!

December: 58/64 achieved, 6 are still missing.

3 concern late workshops or events, 2 are from WP16, 1 from WP18

Slowly approaching the end

Towards the definition of an ARIES legacy...

Here below, a non-exhaustive **selection of highlights** that we can present as a indicators of ARIES impact on accelerator science and technology, surviving after the end of ARIES:

- WP2: the MOOC (**Massive Online Open Course**) on accelerator science and technology
- WP3 & WP11: the **HERTIS collaboration** on Ship Exhaust Cleaning
- WP5: the **EuPRAXIA proposal** for ESFRI
- WP6: the renewed European interest in **muon colliders**, the review and prioritization of **far future concepts**.
- TAs: the conversion of ANKA/KARA into a **test beam facility**, the start-up of **FREIA**, the success of **HiRadMat**, the success of **LULAL**.
- WP14: the four **PoC projects**, the successful **collaboration with industry** that resulted in IFAST, the record current on **HTS** samples.
- WP15: increase **operating temperature** of thin SC films (1.8K to 4.5K) for lower operational costs. New techniques for creating SC thin films and characterizing them.

And, we are still waiting for WP7, WP8, WP16, WP17, WP18 final results !

Last but not least, all the ARIES themes that went into the ESPP...

ARIES and the new Strategy for Particle Physics

The strategic objectives of ARIES and of our collaborative projects have been well recognised in the recommendations of the ESPP Update:

- **Strengthen the European ecosystem of research centres:** *our basic principle, associating industry on top.*
- **Launch a vigorous R&D on innovative accelerator technologies:** *our main goal: we have kept HTS alive over the last 7 years, we have relaunched the muon colliders studies in Europe, we have supported and structured plasma wakefield research, ...*
- **Develop synergies with neighbouring fields:** *another of our main goals*
- **Mitigate environmental impact of particle physics:** *working since 7 years in this direction (Energy efficiency in EuCARD2-ARIES-IFAST).*
- **Knowledge and technology transfer, training of next generation, education and communication:** *dedicated Work Packages in all our projects.*

Out of the 20 ESPP statements, as many as 10 are connected to the ARIES programme!

IFAST – a (partial) successor to ARIES



Innovation Pilots,
a new EC instrument for «super-advanced»
Research Infrastructure communities

- In November 2020, the EC has approved the **Innovation Pilot Project I.FAST** (Innovation Fostering in Accelerator Science and Technology), submitted to the last call of Horizon 2020.
- **I.FAST** is a collection of joint R&D activities with industry and strategy groups to develop ideas and technologies for the next generation of particle accelerators, grouped into **13 thematic areas**.
- There is no Transnational Access, some Networks activities continue as strategy groups, and the largest fraction of the project is made of JRA-type activities with strong industry participation.

Status of I.FAST

- Project will start on 1 May 2021.
- More information at the web site: <https://ifast-project.eu/>
- Kick-off meeting on 4 May 2021, open to all participants from the accelerator and industry community, at the link <https://indico.cern.ch/event/1024993/>.

WP	WP Name	WP Coordinator	Coord. Lab.
1	Coordination, dissemination	M. Vretenar	CERN
2	Training, communication, outreach	P. Burrows	UOXF
3	Industry engagement	M. Morandin	INFN
4	Managing Innovation, new Materials	M. Losasso	CERN
5	New concepts, performance improvements	F. Zimmermann	CERN
6	Novel particle accelerators concepts and technologies	R. Assmann	DESY
7	High brightness synchrotron light sources	R. Bartolini	DESY
8	Innovative superconducting magnets	L. Rossi	INFN
9	Innovative superconducting cavities	<i>C. Antoine, O. Malyshev</i>	CEA/STFC
10	Advanced accelerator technologies	T. Torims	RTU
11	Sustainable concepts and technologies	M. Seidel	PSI
12	Societal applications	R. Edgecock	HUD
13	Technology Infrastructure	S. Leray	CEA

In I.FAST, Work Packages correspond to thematic areas and generally include a strategy Task and one or more Prototyping or Development Task.

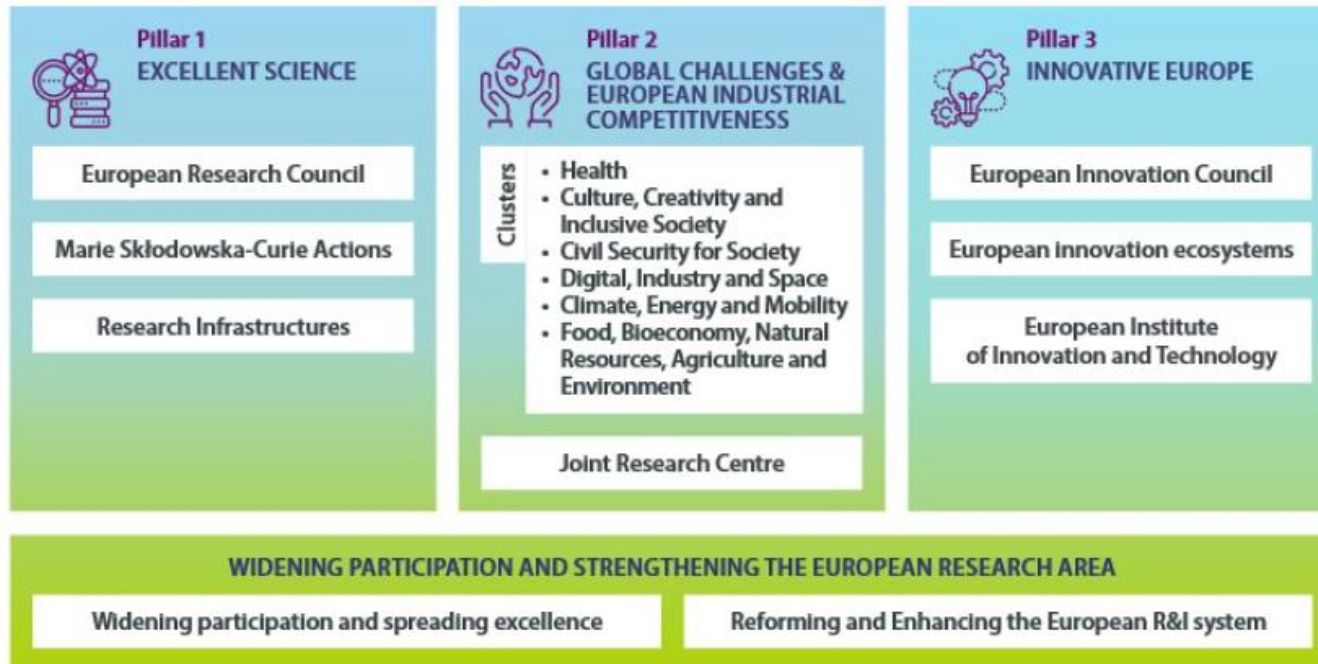
After I.FAST – accelerators in Horizon Europe

- Horizon2020 has been completed at end 2020.
- The new Horizon Europe is taking over, launched in February 2021.
- Budget of ≈€95.5 billion, including €5.4 billion from NextGenerationEU to boost recovery. Total is higher than H2020 (≈€80b)
- Includes new instruments, such as European Innovation Council, Research Missions and Partnerships.



Horizon Europe - structure

THREE PILLARS FOR IMPLEMENTATION



Higher budget, but in general **more targeted** towards global challenges and impact on society, with less space for **curiosity-driven research**.

Priority to 5 EU Missions:

- ✓ cancer
- ✓ adaptation to climate change including societal transformation
- ✓ healthy oceans, seas coastal and inland waters
- ✓ climate-neutral and smart cities
- ✓ soil health and food

Support to Research Infrastructures in Horizon EU

- Support to **Research Infrastructures** (RI) within DG/RTD has been completely restructured on April 1st. Management of calls and follow-up of projects (including ARIES and I.FAST) is now **subcontracted** to the REA (Research Executive Agency). The RI Unit of DG/RTD has disappeared, merged into the Unit «**R&I Actors and Research Careers**».
- The first Horizon Europe **Work Programme for RI 2021/22** should become public at the end of this month, listing the calls for the next years.
- **Integrating Activities** (like ARIES) will disappear, after more than 20 years of faithful service to the scientific community.
- They are replaced by calls devoted to **supporting RI services** (basically Transnational Access) and calls devoted to **developing next generation RI instruments and tools** (basically JRA's).
- **Design Studies** will continue, under the new name of “Research Infrastructure Concept Development”.
- A consistent fraction of the calls will be **targeted to the 5 mission areas**.
- In the 2021/22 Programme, we expect **two calls** interesting for **collaborative projects involving the accelerator community**.

HORIZON-INFRA-2021-SERV-01-08

“Destination 3: Research Infrastructures services advancing frontier knowledge”

Access Activities (Trans-national Access and/or Virtual activities), consideration on facilitating and integrating the access procedures, to improve the services the infrastructures provide and to further develop their on-line services.

Integrating Activity	HORIZON-INFRA-2021-SERV-01-08:		
2 Targeted community	<ul style="list-style-type: none">Particle and Nuclear PhysicsGeosphere, including geo-hazards and geo-resources		
Total Budget	30 M€		
Max budget/project	15 M€		
Date opening	8 June 2021		
Deadline	23 September 2021	VERY Tight Schedule!	

Targeted call, intended to support TNA for the particle physics community (detectors, ex-AIDA, and accelerators, ex-ARIES) and for the nuclear physics community (ex-ENSAR).

After long negotiations with the nuclear physics community, it has been decided that the 3 communities (nuclear, detectors, accelerators) will submit a common proposal with INFN as coordinating institution and N. Alahari (GANIL) as Scientific Coordinator. He will be supported by 3 Deputies from the 3 communities.

The project will be called **EURO-LABS: European Laboratories for Accelerator-Based Science**.

The budget will be shared with slightly more than 50% to the nuclear community, and slightly less than 25% to the other two. The reason is that we have I.FAST and AIDAInnova, while the nuclear community was unsuccessful in their last submission of ENSAR.



Accelerator Test Facilities in the new TA programme

Present status: some ARIES facilities willing to continue, plus 2 new large facilities willing to start. With respect to ARIES, less focus on innovative facilities and more on facilities providing a service to community.

	Facility	Location	Contact	Users	# Units
From ARIES	Gersemi/HNOSS	U. Uppsala	R. Ruber	Test SC magnets and RF	5,600
	HiRadMat	CERN	N. Charitonidis	Material testing (collimators, etc.)	4,000
	UNILAC	GSI	D. Severin	Materials (collimators, etc.)	480
	KARA	KIT	R. Ruprecht	High-int. e-beam testing	tbd
	VELA	Daresbury	A. Gleeson	Test e-beam	160
	Lydl	CEA Saclay	S. Dobosz	Laser-driven acceleration	tbd
New	CLEAR	CERN	R. Corsini	Ex-CTF	tbd
	SparcLab/BTF	INFN Fr.	A. Gallo	Wakefield acc. / e-beam test	tbd

Foreseen budget share for accelerators: 3.5M

This can be divided as:
0.5M common WPs
0.6M developments
2.4M TA support

Other expressions of interest received		Contacts	
Technological Infrastructures	Test accelerator components	S. Leray, J.L. Biarrotte	CNRS (Orsay Supratech), CEA, DESY, etc.
Accelerator applications (environment, etc.)	Low-energy electron beams	A. Chmliewski, F.H. Roegner	INCT Warsaw, IAP Dresden

A new Destination 4 project to support ESPP R&D

Destination 4 : « R&D activities »

Next generation of scientific instrumentation, tools and methods and advanced digital solutions

The aim of Destination 4 is the **development of ground-breaking RI technologies**, including scientific instruments, tools, methods, and advanced digital solutions, to enable new discoveries and keep Europe's RIs at the highest level of excellence in science, while paving the way to innovative solutions to societal challenges and new industrial applications, products and services. New instruments and tools (such as advanced sensors, imaging devices, light source detectors, **high-tech developments for accelerators**, robots/automated solutions) and advanced digital solutions (e.g. digital twins, data analytics and AI tools, etc.) for RI upgrade, will enable solutions to be found even for the most demanding scientific and societal challenges.

	HORIZON-INFRA-2022-TECH-01
Total Budget	110M€
Max budget/project	10 M€
Date opening	2021 Nov. 10
Deadline	2022 March 24

The accelerator community plans to submit a proposal for R&D intended to **support the conclusions of the European Strategy for Particle Physics** (HFM, plasmas&lasers, high gradient, muon colliders, ERLs).

Coming back to ARIES

Is this the end (i.e. the last Annual Meeting)?

No! We have built this project on the **connections** and **relationships** that we have created between laboratories, nations, and communities and we must strive to get together one more time, when vaccination will cover a large fraction of the European population and travel will hopefully restart within the EU (and UK...).

We are considering **three options** for the last get together of ARIES:

1. Meet in Lisbon as foreseen since a long time: the University Conference Centre in Lisbon is again booked for us for the week **22 - 26 November 2021** (and we thank J. Vieira for his infinite patience and kind collaboration), for a meeting covering the end of our remaining JRAs in December. This will be followed by a TNA-only meeting in April.
2. Merge the **ARIES Final Meeting with an IFAST in-person kick-off** and meet at CERN in **September-October 2021**.
3. Skip the end of 2021 that will be full of delayed meetings and convene again in person in **April 2022** – but many WP's will have ended and probably there will be some lack of interest.

The decision will be taken by the Steering Committee at its meeting tomorrow



Dreaming of Lisbon...



Back to the past...

Our first meeting,
4 May 2017





THANK YOU FOR YOUR ATTENTION
and
FOR YOUR COLLABORATION AND SUPPORT
OVER THE PAST 4 YEARS

and I hope to see you all for a last get
together and then in many more European
projects!