M. Vretenar, CERN, Project Coordinator

I.FAST online kick-off meeting, 4 May 2021

Welcome to the I.FAST kick-off

Setting sail for a new adventure!

- This kick-off marks the official start of the I.FAST Project and of the I.FAST Community – still a virtual one, the pandemic has prevented us from inviting you at CERN as usual for the kick-offs of our accelerator projects
- The **173 registered participants**, more than half new to our accelerator R&D projects, show the success of this new project.
- This kick-off will give us a chance to present the Work Packages and some key individual Tasks, resulting in a long list of presentations concentrated in

courtesy anotherworldadventures.com

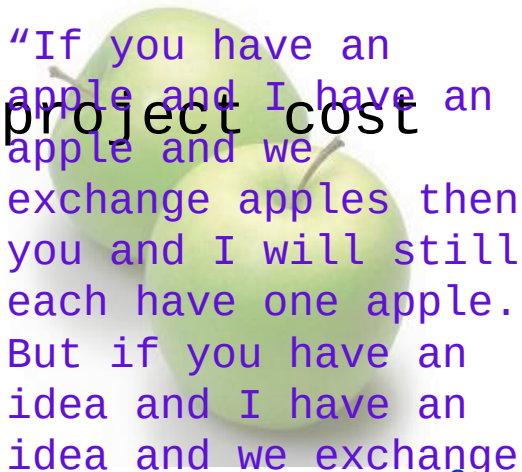
What is I.FAST ?

Innovation Fostering in Accelerator Science and Technology, an Innovation Pilot Project of Horizon 2020 Framework Programme for Research and Innovation, addressing Research Infrastructure (RI) Advanced Communities.

- Goal: demonstrating the role of RI's in the translation of Open Science into Open Innovation.
- How: **48 beneficiaries** – 8 large RI operators, 12 national research centres, 12 universities, 16 industrial partners (**1/3**, including 11 SMEs) - from 15 European Countries, supported by 12 partner organisations and >20 collaborating institutions, jointly developing technologies for the next generation of particle accelerators.
- Timeline: **4 years**, starting 1 May 2021
- Resources: **10 M€** EC contribution, project cost of **18.7 M€.**

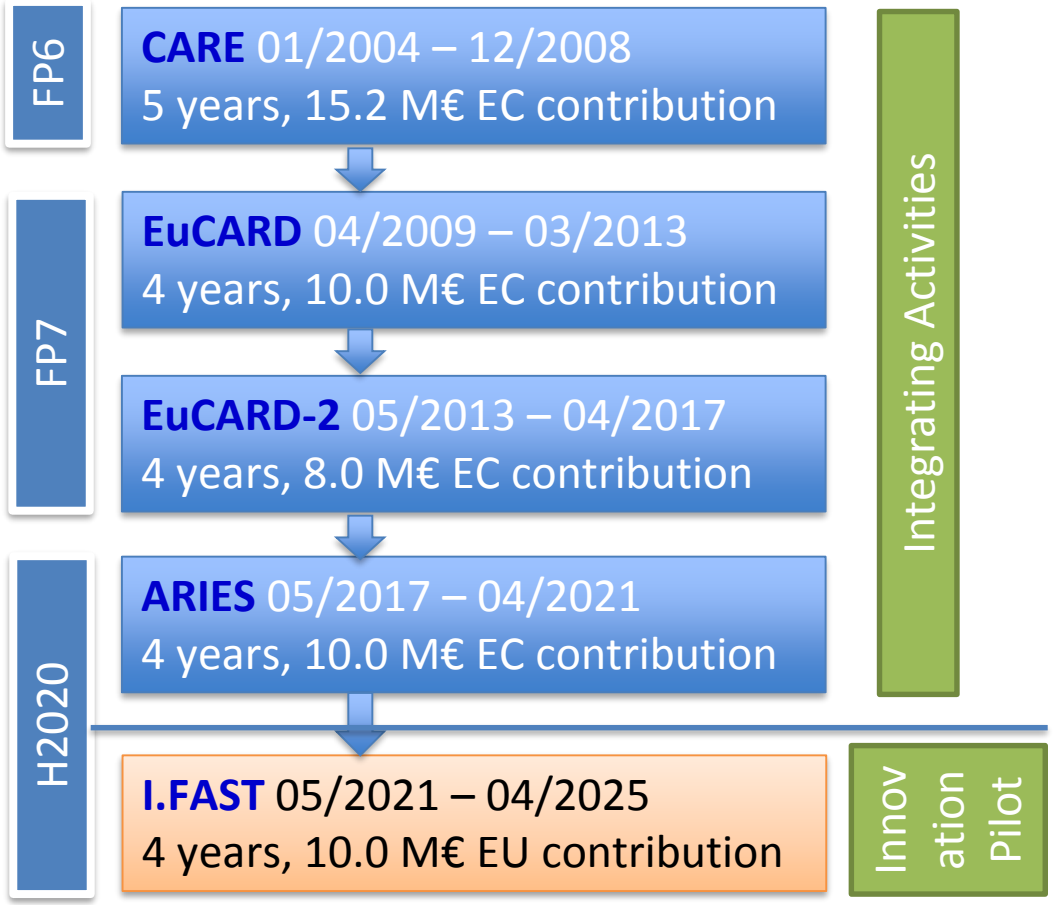
Particle accelerator community entering the age of open innovation:
Sharing of ideas between scientific institutions and companies, to improve high technology products and to find new products and markets.

Creation of an innovation



"If you have an apple and I have an apple and we exchange apples then you and I will still each have one apple. But if you have an idea and I have an idea and we exchange these ideas, then each of us will have

I.FAST: last of a series, first of a kind!



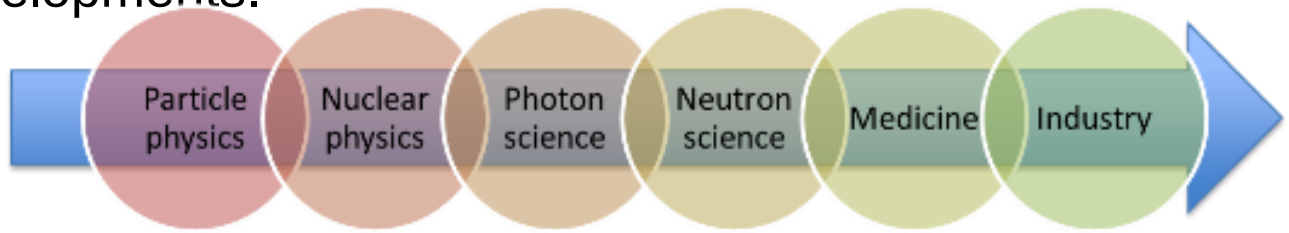
Long tradition of EC support to generic accelerator R&D: four successful Integrating Activities have raised 43 M€ EC funding over **16 years** (2.7 M€/yr).

Development of cross-boundary subjects, not directly followed by large laboratories, with added value coming from collaboration and sharing of resources

I.FAST is a new crucial step in our progress.
Integrating Activities disappear from the RI Work Programmes, replaced by other tools.
No more Transnational Access (goes to dedicated projects), accent on common development of instruments in collaboration with industry.

I.FAST Strategic Goals

- The «**Innovation Pilot**» is a completely new instrument to support Particle Accelerator R&D in Europe in 2021-25.
- With respect to our old “Integrating Activities” (IA), the core is now made of “**co-innovation**” R&D activities with industry, at different Technology Readiness Levels (TRL).
- We keep the same strategic goals of our IA’s:
  1. **Transverse approach** based on synergies between accelerators for different users: particle and nuclear physics, photon and neutron science, medicine and industry.
  2. **Collaborative schemes** involving laboratories, university and industry.
  3. Priority to **long-term R&D** topics, beyond the specific needs of approved projects and developments.



Genesis and structure of I.FAST

- Bottom-up call analysed by a by an internal Committee (13 nominated by the Directors of the TIARA partners, 4 from industry).
- 101 proposals submitted, **37** selected for I.FAST.
- 13 Workpackages: 9 "**thematic areas**" strategic to the future of accelerators, and 4 "transverse" WPs (Coordination, Training, Industry, Innovation).
- Thematic WPs made of a «strategy» with one or more «developments» (low TRL) and «prototypes» (high TRL).
- 1 M€ for a second internal call (new proposals or 2nd phase) covering 2023-25.
- Enlarging and coordinating the activities: WP on AMICI-related themes, coordination structure with LEAPS and AIDA, interaction with ATTRACT.
- Project structured at end 2019, about **1.5 year ago**!

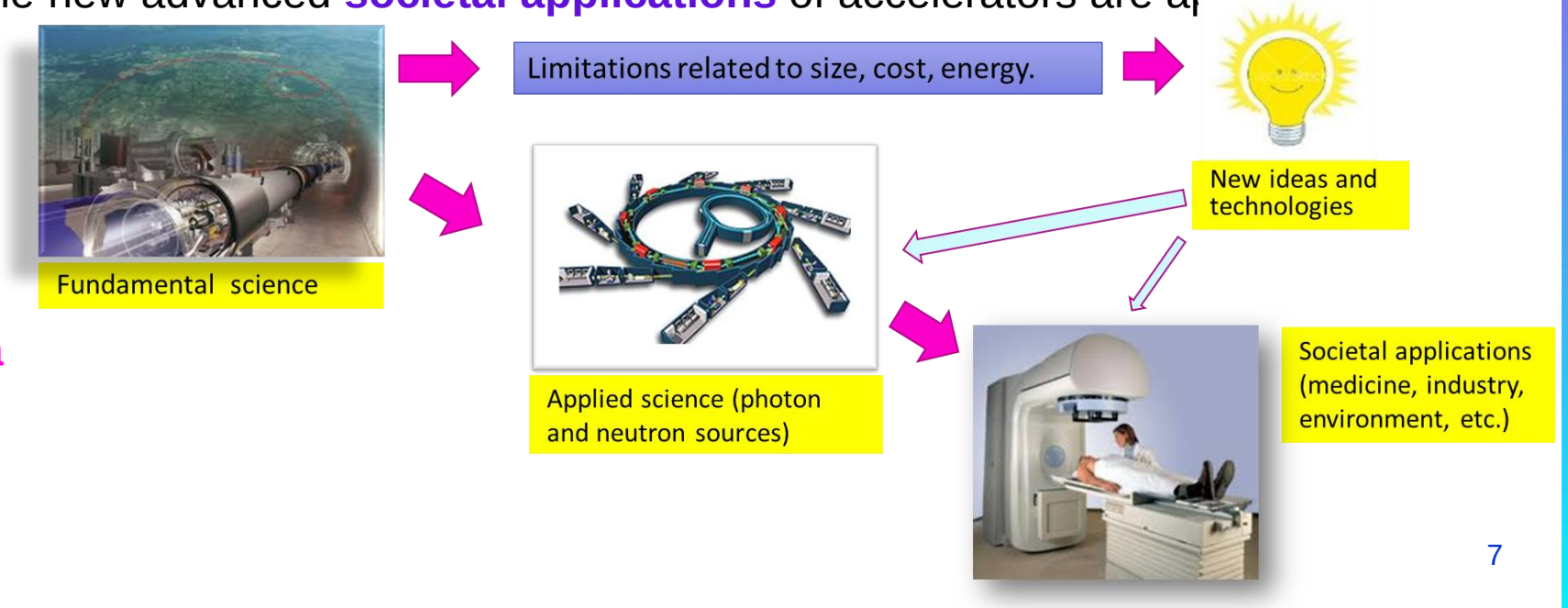
9 thematic areas

WP	
1	Coordination, dissemination
2	Training, communication, outreach
3	Industry engagement
4	Managing Innovation, new Materials
5	New concepts, performance improvements
6	Novel particle accelerators concepts and technologies
7	High brightness synchrotron light sources
8	Innovative superconducting magnets
9	Innovative superconducting cavities
10	Advanced accelerator technologies
11	Sustainable concepts and technologies
12	Societal applications
13	Technology Infrastructure
14	Ethics Requirements

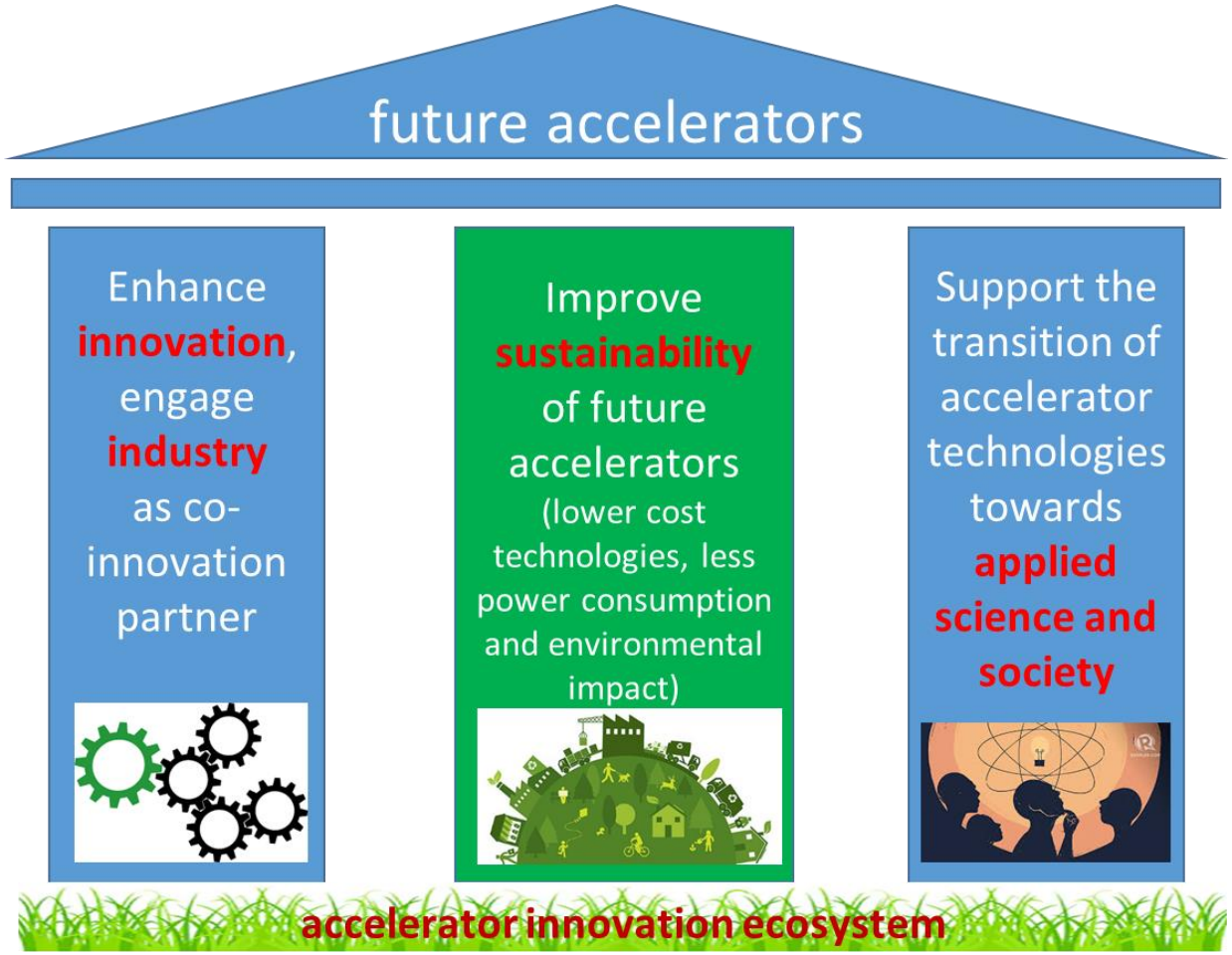
The role of I.FAST in accelerator research

- For the entire XX century, **fundamental science** as driving force for the development of new accelerators, with its continuous quest for higher energies required to discover new particles.
- In this early XXI century, **extrapolating** present technologies to reach new physics may soon bring accelerators towards the **limits of sustainability** (dimensions, complexity, affordability in cost and energy consumption).
- In parallel, increasing demands are coming from accelerators for **applied science** (photon and neutrons) and **healthcare**, while new advanced **societal applications** of accelerators are a

The scientific goal of I.FAST is to **support the development of new more sustainable technologies** for basic and applied science, promoting at the same time the **transfer of these technologies to society and to a wider accelerator market**.



The three I.FAST pillars



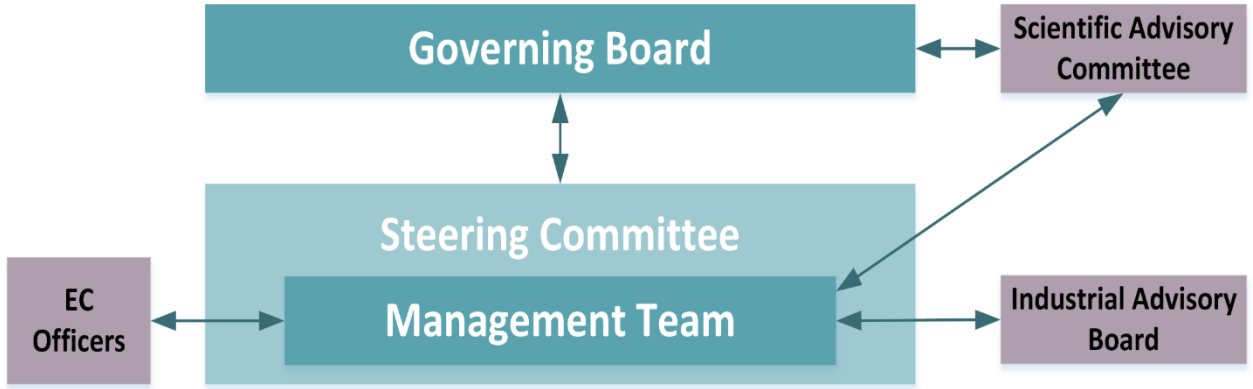
- These goals correspond to the three I.FAST «pillars», which defined the priorities given in the selection of I.FAST activities following the bottom-up call.
- Additional focus areas: training and management of technology infrastructure.
- This strategy is coherent with the priorities announced in the 2020 Update of the European Strategy for Particle Physics, and more at large with the priorities of the particle accelerator user communities.

I.FAST Structure, Coordinators, Task Leaders

					Task Leader	Deputy
WP1	Management, coordination and dissemination	M. Vretenar (CERN)	1.1	Project management, external coordination, sustainability	M. Vretenar (CERN)	
			1.2	Information flow management and cross-coordination	T. Torims (RTU)	
			1.3	Internal communication and dissemination	P. Foka (GSI)	
			1.4	Relation with other innovation pilots	M.Losasso (CERN)	
WP2	Training, communications and outreach for accelerator science and technology in Europe	P. Burrows (UOXF)	2.1	Management	P. Burrows (UOXF)	
			2.2	Communication and outreach	D. Antonio (CERN)	
			2.3	Challenge-based innovation (CBI) with particle accelerators	N. Delerue (CNRS)	
			2.4	Industrial Training associated with knowledge transfer	T. Ekelof (UU)	
WP3	Industry engagement	M. Morandin (INFN)	3.1	Coordination and industrial partnership support	M. Morandin (INFN)	
			3.2	Knowledge transfer and business opportunities in accelerators R&D	A. Willner (DESY)	
			3.3	Extended participation of industry in collaborative R&D activities	Jose M. Perez (CIEMAT)	
WP4	Managing innovation, new materials	M. Losasso (CERN)	4.1	Innovation management and committee	M. Losasso (CERN)	
			4.2	Management of the Innovation Fund	M. Losasso (CERN)	
			4.3	Innovative beam windows for high-power accelerator applications	M. Losasso (CERN)	M. Tomut (GSI)
			4.4	Large scale Carbide-Carbon Materials for multipurpose applications	F. Carra (CERN)	
WP5	Strategies and Milestones for Accelerator Research and Technologies	F. Zimmermann (CERN), N. Pastrone (INFN), P. Fork (GSI)	5.1	MUon colliders STrategy network (MUST)	N. Pastrone (INFN)	
			5.2	Pushing Accelerator Frontiers (PAF)	F. Zimmermann (CERN)	G. Franchetti (GSI)
			5.3	Improvement of Resonant slow EXtraction spill quality (REX)	P. Fork (GSI)	
WP6	Novel Particle Accelerators Concepts and Technologies	R. Assmann (DESY)	6.1	Novel Particle Accelerators Concepts and Technologies	R. Assmann (DESY)	
			6.2	LASers for PLasma Accelerators	I. Gizzi (CNR)	
			6.3	Multi-scale Innovative targets for laser-plasma accelerators	C. Thaury (CNRS)	
			6.4	Laser focal spot stabilization systems	F. Mathieu (CNRS)	
WP7	High Brightness Accelerators for Light Sources	R. Bartolini (DESY)	7.1	Coordination & communication	R. Bartolini (DESY)	
			7.2	Enabling Technologies for Ultra-Low Emittance Ring	R. Bartolini (DESY)	
			7.3	Variable Dipole for the upgrade of the ELETTRA storage ring	Y. Papaphilippou (CERN)	
			7.4	Very high gradient RF Guns operating in the C-band RF technology	D. Alesini (INFN)	
			7.5	CompactLight Prototype Accelerating Structure	G. D'Auria (Elettra)	
WP8	Innovative superconducting magnets	L. Rossi (INFN), L. Quettier (CEA), G. Roux (GSI)	8.1	Coordination and HTS Strategy Group	L. Rossi (INFN)	D. Schoerling (CERN)
			8.2	Preliminary Engineering design of curved CCT magnet	L. Rossi (INFN)	
			8.3	Preliminary Engineering design of HTS CCT	L. Quettier (CEA)	D. Schoerling (CERN)
			8.4	Construction of curved CCT magnet demonstrator	M. Gehring (BNG)	M. Vieweg (Scanditronix)
			8.5	Construction of HTS CCT magnet demonstrator	F. Forest (Sigmaphi)	A. Echeandia (Elytt)
			8.6	Development of ReBCO HTS nuclotron cable	T. Winkler (GSI)	G. Roux (GSI)
WP9	Innovative superconducting thin film coated cavities	C. Antoine (CEA), O. Malyshev (UKRI)	9.1	Coordination and Strategy for Innovative SC Cavities	C. Antoine (CEA)	O. Malyshev (UKRI)
			9.2	Innovative Superconducting Accelerating Cavities	C. Pira (INFN)	
			9.3	Optimisation of process parameters and target development	R. Valizadeh (UKRI)	
			9.4	Surface Engineering by Atomic Layer Deposition (ALD)	T. Proslier (CEA)	
			9.5	Improvement of mechanical and SC properties by laser radiation	A. Medvids (RTU)	
			9.6	Optimization of flat SRF thin films production procedure	O. Kugeler (HZB)	
WP10	Advanced Accelerator technologies	T. Torims (RTU)	10.1	Coordination and communication	T. Torims (RTU)	
			10.2	Additive Manufacturing – Survey of applications and potential developments	M. Vedani (POLIMI)	
			10.3	Refurbishment of accelerator components by AM technologies	T. Torims (RTU)	
			10.4	Development of AM-manufactured superconductive RF cavities	M. Pepato (INFN)	
			10.5	Photon Stimulated Desorption (PSD) from NEG coatings	O. Malyshev (UKRI)	
			10.6	Machine learning techniques for accelerator and target instrumentation	T. Shea (ESS)	
			10.7	Electro-optical waveguide sensors as beam electric field sensors	S. Gibson (RHUL)	
WP11	Sustainable concepts and technologies	M. Seidel (PSI)	11.1	Sustainable Concepts for Accelerator driven Research Infrastructures	M. Seidel (PSI)	
			11.2	High Efficiency Klystron Industrial Prototype	O. Brunner (CERN)	
			11.3	Permanent Magnet Quadrupoles & Combined Function Magnets for ULE Rings	B. Shepherd (UKRI)	
WP12	Societal Applications	R. Edgecock (HUD)	12.1	A Strategy for Implementing Novel Societal Applications of Accelerators	R. Edgecock (HUD)	
			12.2	Design of advanced electron accelerator plant for biohazards treatment	A. Chmeliewski (INCT)	
			12.3	Design of Internal Rf Ion Source for Cyclotrons	J. Perez (CIEMAT)	
WP13	Technology Infrastructure	S. Leray (CEA)	13.1	Strategy for the development of the AMICI TI	S. Leray (CEA)	
			13.2	Developing and promoting services to industry in AMICI TFs	DESY	
			13.3	New RF amplifiers based on GaN Semiconductors	D. Dancila (UU)	
WP14	Ethics Requirements	P. Foka (GSI)	14.1	Data Protection, Health and Safety	P. Foka (GSI)	

- 56 Tasks
- A complex structure requiring everyone's help and support to make it work!
- My apologies, not all Task Leaders will have a presentation today, some smaller activities are presented by the WP Coordinator.

I.FAST Governance and Communication



My committment: keep meetings and the administration at the minimum, to leave you time to do the work!

Body	Composition	Goal	Meetings
Governing Board	Representatives of all parties	Changes to contract, financial matters	1 / year
Steering Committee	All WP Coordinators	Scientific decisions on work programme	2 / year
Enlarged Steering Comm.	WP Coordinators + Task Leaders	Information, feedback on activities	2 / year
Project Management Team	Coordinator, 2 Deputies, Admin. Manager, Assistant, Comm. officer	Day-to-day follow up of administrative, financial and communication issues	6 / year
Advisory Bodies	Experts nominated by Gov.		1 / year

A European project in a nutshell

Partners

European Commission

I.FAST:
52 Deliverables
60 Milestones

Deliverables and reporting

Science and Innovation

Project coordinator

Maurizio Vretenar

Deputies: Toms Torims (RTU)
Marcello Losasso (CERN)

Administrative Manager

Svetlomir Stavrev

Admin. Support:
Sabrina El Yacoubi

Project assistant

Valérie Brunner

Communication:
D. Antonio (CERN)

Dissemination:
Y. Foka (GSI)

Revision of the mill (servicing):

Every year at the annual project meeting (April – May)

Tools and support, acknowledgements

- The next presentations will cover some tools that we have prepared for you:
  - Web site: https://ifast-project.eu/
  - Sharepoint to share internal documents and information and to follow-up milestones and deliverables: https://espace.cern.ch/project-IFAST-Intranet
  - Zenodo to publish notes, reports, presentations and other documents for an external audience: https://zenodo.org/communities/ifast/?page=1&size=20
- Please never forget in your publications and presentations the acknowledgement to EU support:

This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under GA No 101004730.

iFAST

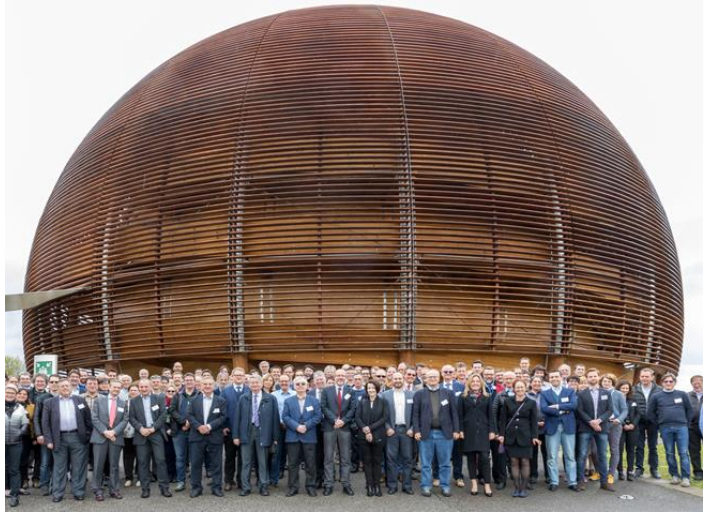
I.FAST Status

- Grant Agreement signed by all partners on 22/04.
- Pre-financing payment authorised by EC on 28/04. It will soon be received by CERN and distributed to Parties who have signed the Consortium Agreement.
- 2nd and Final Version of Consortium Agreement sent to Partners on 03/05 with a few days deadline for a final check, then the electronic signature process will start.
- The project has officially started, from this week eligible expenditures can be charged to the I.FAST budgets that you are invited to open at the beneficiary institutions.

I.FAST Next Meetings

- Our goal is to build a community based on collaboration and mutual trust: in-person meetings are essential!
- Because of the pandemic we are now online instead of the CERN Globe as was the case for ARIES kick-off.
- We need to plan for a virus-free future, at least after summer:
  - **June 2021**: Virtual Meetings of Steering Committee and Governing Board.
  - **24 to 26 November 2021**: we are planning a large meeting in Lisbon "From ARIES to I.FAST to the new Horizon Europe: the strategic role of EU programmes for European particle accelerator research". It will include: a) the final ARIES meeting; b) one day dedicated to I.FAST with a 1st in-person meeting of enlarged steering committee, and c) a special session on future EC programmes and accelerator initiatives.
  - **May/June 2022**: 1st I.FAST Annual Meeting, possibly at the CERN Globe: presentations and reports on the first

ARIES kick-off, May 201

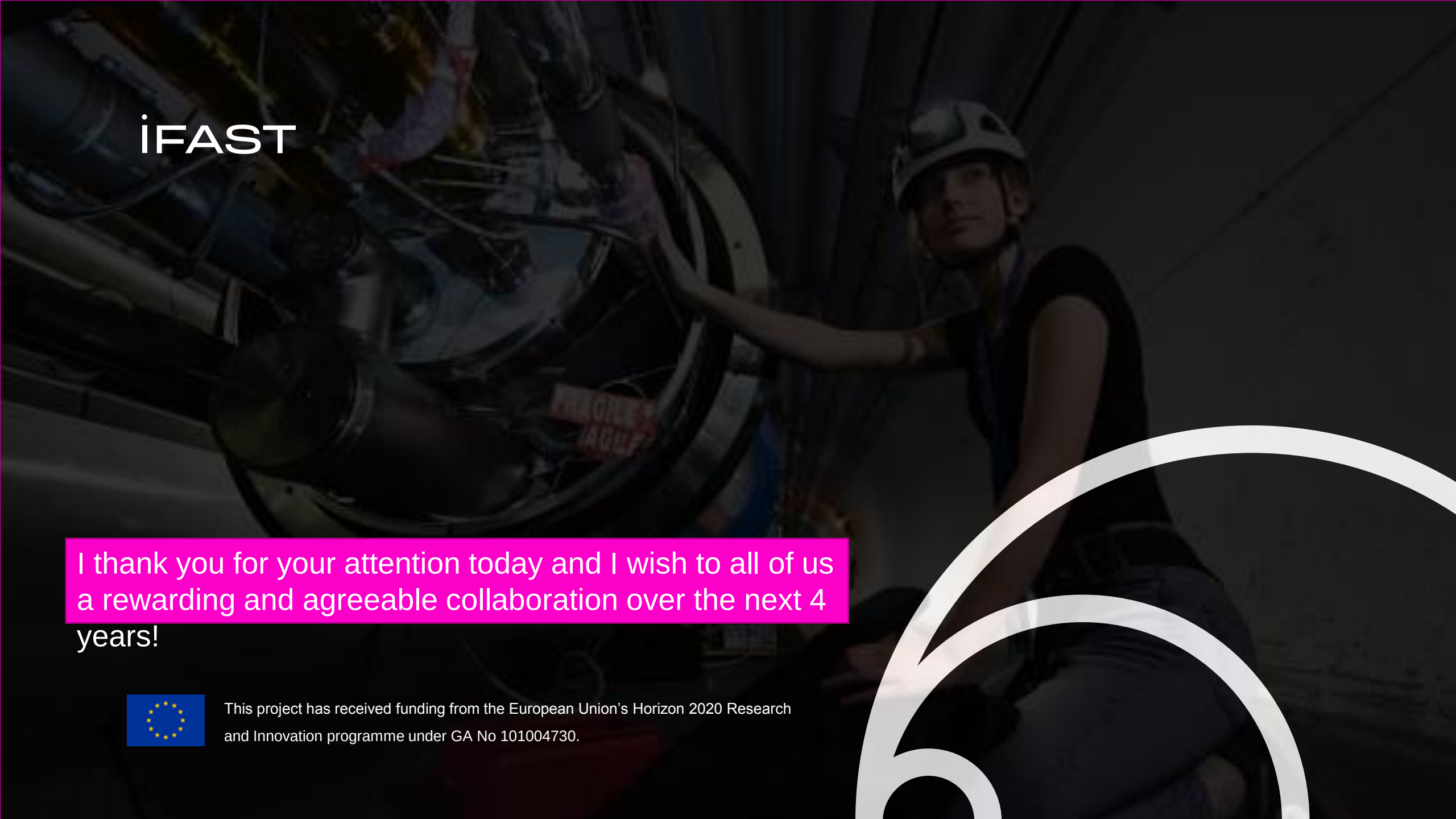


Three, two, one, START!

Ready to start!

Many thanks to all those who have contributed to making this start possible (in difficult Covid times!):

- Our Project Assistant, Valérie;
- The CERN Administrative and Legal teams;
- The I.FAST management team;
- Our WP Coordinators and Task leaders;
- The administrative and legal services from all partners;
- The EC Project Officers and the EC services.



iFAST

I thank you for your attention today and I wish to all of us a rewarding and agreeable collaboration over the next 4 years!

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