Maurizio Vretenar, CERN
Project Coordinator

Period 1 Review, 07.02.2023

# Programme of the Review

**09:00** → 09:10 **Introduction**
Speaker: Antonio Ventura (European Research Executive Agency)

**09:10** → 09:25 **Introduction to I.FAST : goals and structure**
Speaker: Maurizio Vretenar (CERN)

**09:25** → 09:40 **Main achievements and open issues during P1**
Speaker: Maurizio Vretenar (CERN)

**09:40** → 09:50 **Report on WP1 & WP14**
Speaker: Maurizio Vretenar (CERN)

**09:50** → 10:00 **Discussion**

**10:00** → 10:15 **Report on WP2 (10' presentation + 5' questions)**
Speaker: Philip Nicholas Burrows (University of Oxford (GB))

**10:15** → 10:30 **Report on WP3 (10' presentation + 5' questions)**
Speaker: Mauro Morandin (Universita e INFN, Padova (IT))

**10:30** → 11:00

**10:30** → 11:00 **Coffee Break**

**11:00** → 11:20 **Report on WP4 and Innovation Fund (15' presentation + 5' questions)**
Speaker: Marcello Losasso (CERN)

**11:20** → 11:30 **Report on Task 5.1 (5' presentation + 5' questions)**
Speaker: Nadia Pastrone (Universita e INFN Torino (IT))

**11:30** → 11:40 **Report on Task 5.2 and 5.3 (5' presentation + 5' questions)**
Speaker: Frank Zimmermann (CERN)

**11:40** → 11:55 **Report on WP6 (10' presentation + 5' questions)**
Speaker: Dr Leonida Antonio (Leo) Gizzi (CNR, Istituto Nazionale di Ottica, Pisa, Italy)

**11:55** → 12:00 **WP7 introduction**
Speaker: Riccardo Bartolini (DESY)

**12:00** → 12:10 **Report on Task 7.3 (5' presentation + 5' questions)**
Speaker: Yannis Papaphilippou (CERN)

**12:10** → 12:25 **Report on Task 7.4 and 7.5 (10' presentation + 5' questions)**
Speaker: David Alesini

**12:25** → 14:00 **Lunch Break**

**14:00** → 14:15 **Report on WP8 (10' presentation + 5' questions)**
Speaker: Ernesto De Matteis (INFN Milano - LASA)

**14:15** → 14:25 **Report on Task 8.6 (5' presentation + 5' questions)**
Speaker: Dr Tiemo Winkler

**14:25** → 14:40 **Report on WP9 and Task 10.5 (10' presentation + 5' questions)**
Speakers: Dr Claire Antoine (CEA) , Dr Oleg Malyshev (UKRI/STFC Daresbury Laboratory)

**14:40** → 14:55 **Report on WP10 (10' presentation + 5' questions)**
Speaker: Prof. Toms Torims (Riga Technical University (LV))

**14:55** → 15:00 **WP11 introduction**
Speaker: Mike Seidel

**15:00** → 15:10 **Report on Task 11.2 (5' presentation + 5' questions)**
Speaker: Olivier Brunner (CERN)

**15:10** → 15:20 **Report on Task 11.3 (5' presentation + 5' questions)** ¶
Speaker: Ben shepherd (To be confirmed)

**15:20** → 15:35 **Report on WP12 (10' presentation + 5' questions)**
Speaker: Rob Edgecock

**15:35** → 15:45 **Report on WP13 (5' presentation + 5' questions)**
Speaker: Dr Sylvie Leray

**15:45** → 15:55 **Report on Task 13.3 (5' presentation + 5' questions)**
Speaker: Dr Dragos Dancila

**15:55** → 16:15 **Discussion and concluding remarks**

**To all speakers:**

Please respect your time allocation and leave enough time for questions!

# Introduction by Project Coordinator

1. **Wider objectives and genesis of I.FAST**: to introduce the collection of activities that will be presented into a coherent global picture.
2. **Overview and highlights of Period 1**: Milestones and Deliverables, delays, achievements, critical issues.
3. **Report on WP1 and WP13**: governance, management, risks, ethics.

# I.FAST and Particle Accelerators

**Innovation Fostering in Accelerator Science and Technology**

An Innovation Pilot, supporting Innovation in Particle Accelerator technologies.

Comes after 4 successful Integrating Activities (CARE, EuCARD, EuCARD2, ARIES) started in 2004.

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

***Creation of an*** *innovation ecosystem*
*(Keywords: community, trust, openness, creativity, connection to industry)*

# Wider goal and Consortium

- Wider goal (from the Commission's Work Programme):
  "Demonstrate the role of Research Infrastructures in the translation of Open Science into Open Innovation".
- Consortium of **48 beneficiaries**
  8 large RI operators,
  12 national research centres,
  12 universities,
  16 industrial partners (**1/3**, including 11 SMEs)

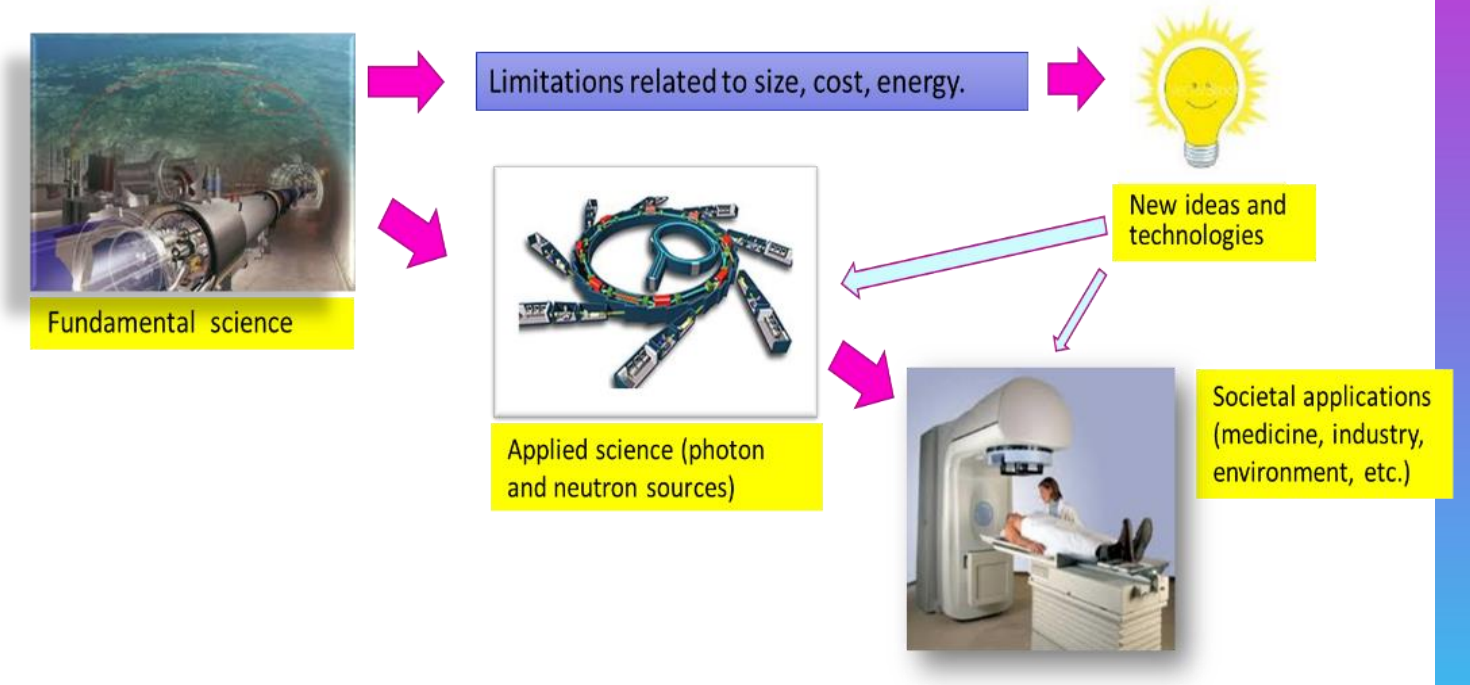

from 15 European Countries, supported by 12 partner organisations and >20 collaborating institutions, working on **40 R&D Tasks** to develop a portfolio of **technologies for the next generation of particle accelerators.**

- Timeline: **4 years**, starting 1 May 2021.
- Resources: **10 M€** EC contribution, out of a total project cost of about **19 M€** (co-funding principle).

# The role of I.FAST in accelerator research

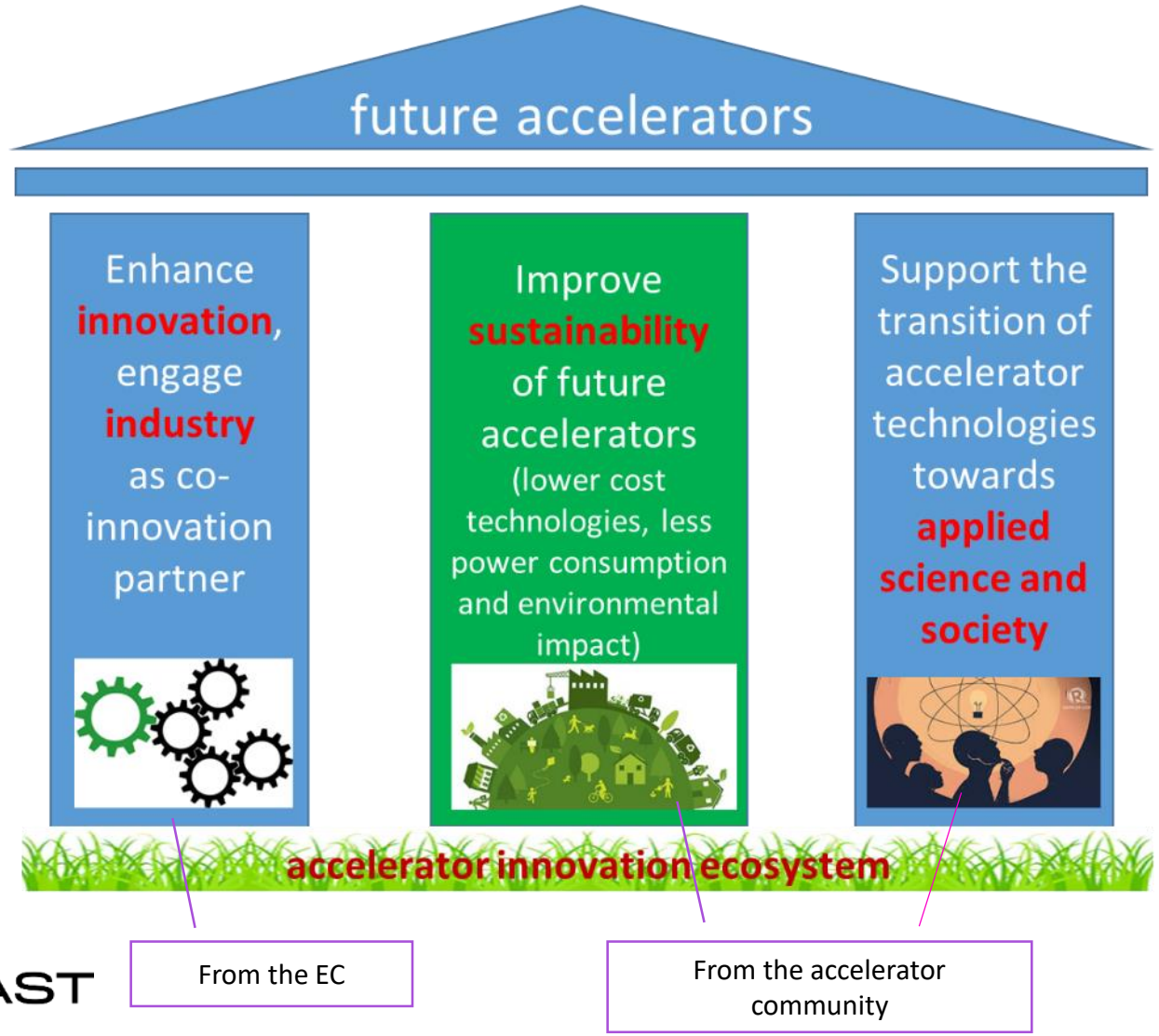
- For the entire XX century, **fundamental science** as driving force for the development of new accelerators, with its continuous quest for higher energies required to discover new particles.

- Today, **extrapolating** present technologies to reach new physics goals may soon bring accelerators towards the **limits of sustainability** (dimensions, complexity, cost, energy consumption).
- In parallel, increasing demands are coming from accelerators for **applied science** (photon and neutrons) and **healthcare**, while new **societal applications** are appearing.




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**.

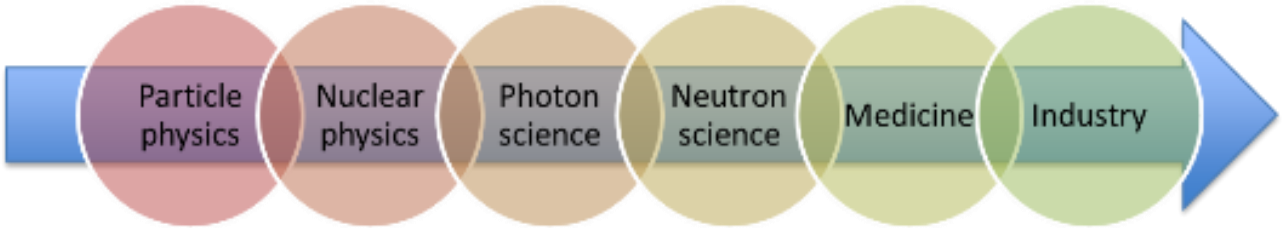
# The three I.FAST pillars




- 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 Priorities

- A project made of "**co-innovation**" R&D activities with industry, at different Technology Readiness Levels (TRL).
- On three priority lines:
  1. **Transversality,** exploiting 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 in 2019, 101 proposals submitted for:
  - Strategies: study groups to define “roadmaps” for specific technologies.
  - Prototypes: construction with industry of prototypes at high TRL, with EC contribution ~ 500 k€.
  - Developments: development, often with industry, of technologies at lower TRL, with EC contribution ~ 100 k€.
- **37** proposals selected by a special Committee on the basis of scientific excellence and coherence with the priorities of the accelerator community.
- Proposals grouped in 9 “**thematic areas**” (Work Packages), each made of a strategy with one or more prototypes and developments.
- 4 “transverse” WPs (Coordination, Training, Industry, Innovation).
- 1 M€ for a second internal call for proposals in 2023-25.

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 |

Each of the 37 proposals becomes a Task

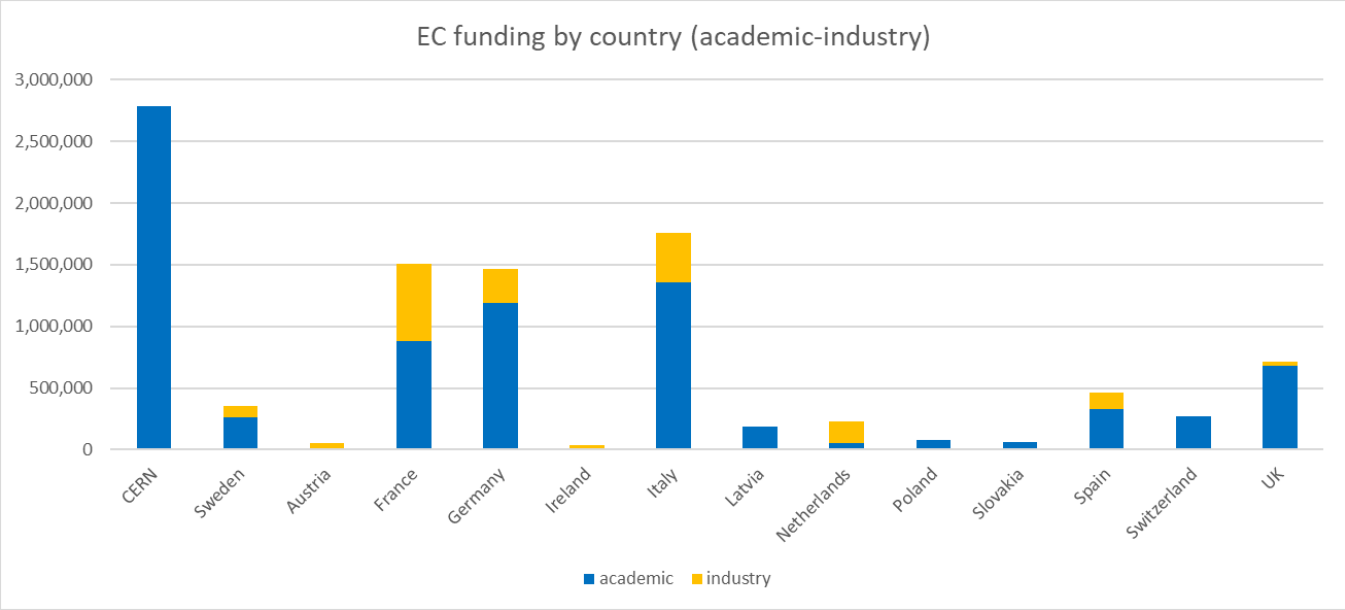
# The I.FAST Structure

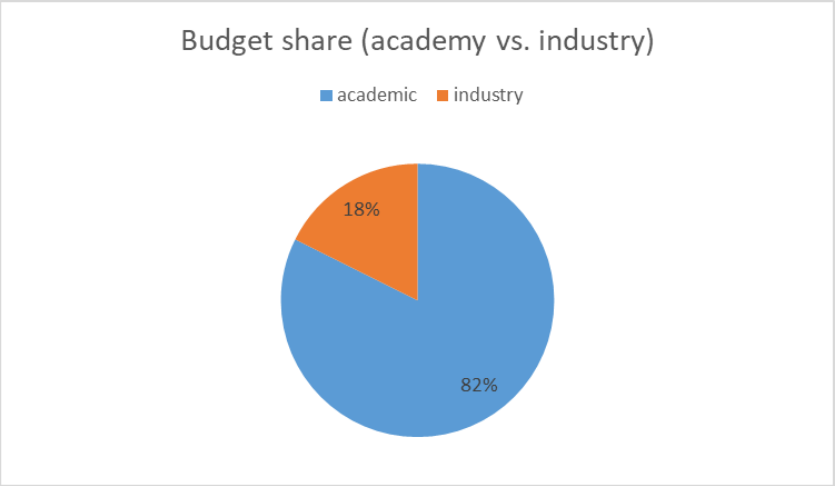
The result of this selection process is a large project covering many topics, where Coordinator and WP Coordinators provide the coherence.

In this Review, in some case the WP Coordinator will present all his Tasks, in other cases where technical aspects are prevailing, the activity will be presented by the Task Leader.

| | | | | | |
|---|---|---|---|---|---|
| WP1 | Management, coordination and dissemination | M. Vretenar (CERN) | Task 1.1 | Project management, external coordination, sustainability | M. Vretenar (CERN) |
| | | | Task 1.2 | Information flow management and cross-coordination | T. Torims (RTU) |
| | | | Task 1.3 | Internal communication and dissemination | P. Foka (GSI) |
| | | | Task 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) | Task 2.1 | Management | P. Burrows (UOXF) |
| | | | Task 2.2 | Communication and outreach | A. Le Gall (CERN) |
| | | | Task 2.3 | Challenge-based innovation (CBI) with particle accelerators | N. Delerue (CNRS) |
| | | | Task 2.4 | Industrial Training associated with knowledge transfer | T. Ekelof (UU) |
| WP3 | Industry engagement | M. Morandin (INFN) | Task 3.1 | Coordination and industrial partnership support | M. Morandin (INFN) |
| | | | Task 3.2 | Knowledge transfer and business opportunities in accelerators R&D | S. Djamschid (DESY) |
| | | | Task 3.3 | Extended participation of industry in collaborative R&D activities | J. M. Perez (CIEMAT) |
| WP4 | Managing innovation, new materials | M. Losasso (CERN) | Task 4.1 | Innovation management and committee | M. Losasso (CERN) |
| | | | Task 4.2 | Management of the Innovation Fund | M. Losasso (CERN) |
| | | | Task 4.3 | Innovative beam windows for high-power accelerator applications | M. Losasso (CERN) |
| | | | Task 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) | Task 5.1 | MUon colliders STrategy network (MUST) | N. Pastrone (INFN) |
| | | | Task 5.2 | Pushing Accelerator Frontiers (PAF) | F. Zimmermann (CERN) |
| | | | Task 5.3 | Improvement of Resonant slow EXtraction spill quality (REX) | P. Fork (GSI) |
| WP6 | Novel Particle Accelerators Concepts and Technologies | R. Assmann (DESY), … | Task 6.1 | Novel Particle Accelerators Concepts and Technologies | R. Assmann (DESY) |
| | | | Task 6.2 | LASers for PLasma Accelerators | I. Gizzi (CNR) |
| | | | Task 6.3 | Multi-scale Innovative targets for laser-plasma accelerators | C. Thaury (CNRS) |
| | | | Task 6.4 | Laser focal spot stabilization systems | F. Mathieu (CNRS) |
| WP7 | High Brightness Accelerators for Light Sources | R. Bartolini (DESY), … | Task 7.1 | Coordination & communication | R. Bartolini (DESY) |
| | | | Task 7.2 | Enabling Technologies for Ultra-Low Emittance Ring | R. Bartolini (DESY) |
| | | | Task 7.3 | Variable Dipole for the upgrade of the ELETTRA storage ring | Y. Papaphilippou (CERN) |
| | | | Task 7.4 | Very high gradient RF Guns operating in the C-band RF technology | D. Alesini (INFN) |
| | | | Task 7.5 | CompactLight Prototype Accelerating Structure | G. D'Auria (Elettra) |
| WP8 | Innovative superconducting magnets | L. Rossi (INFN), L. Quettier (CEA), C. Roux (GSI) | Task 8.1 | Coordination and HTS Strategy Group | E. De Matteis (INFN) |
| | | | Task 8.2 | Preliminary Engineering design of curved CCT magnet | D. Tommasini (CERN) |
| | | | Task 8.3 | Preliminary Engineering design of HTS CCT | S. Sorti (INFN) |
| | | | Task 8.4 | Construction of curved CCT magnet demonstrator | M. Gehring (BNG) |
| | | | Task 8.5 | Construction of HTS CCT magnet demonstrator | A. Echeandia (Elytt) |
| | | | Task 8.6 | Development of ReBCO HTS nuclotron cable | T. Winkler (GSI) |
| WP9 | Innovative superconducting thin film coated cavities | C. Antoine (CEA), O. Malyshev (UKRI) | Task 9.1 | Coordination and Strategy for Innovative Superconducting Accelerating Cavities | C. Antoine (CEA) |
| | | | Task 9.2 | Innovative Superconducting Accelerating Cavities | C. Pira (INFN) |
| | | | Task 9.3 | Optimisation of process parameters and target development for SRF cavity coating with A15 material | R. Valizadeh (UKRI) |
| | | | Task 9.4 | Surface Engineering by Atomic Layer Deposition (ALD) | T. Proslier (CEA) |
| | | | Task 9.5 | Improvement of mechanical and superconducting properties of RF resonator by laser radiation | A. Medvids (RTU) |
| | | | Task 9.6 | Optimization of flat SRF thin films production procedure | O. Kugeler (HZB) |
| WP10 | Advanced Accelerator technologies | T. Torims (RTU) | Task 10.1 | Coordination and communication | T. Torims (RTU) |
| | | | Task 10.2 | Additive Manufacturing – Survey of applications and potential developments | M. Vedani (POLIMI) |
| | | | Task 10.3 | Refurbishment of accelerator components by AM technologies | A.Ratkus (RTU) |
| | | | Task 10.4 | Development of AM-manufactured superconductive RF cavities | A. Pepato (INFN) |
| | | | Task 10.5 | Photon Stimulated Desorption (PSD) from NEG coatings for accelerator vacuum chambers | O. Malyshev (UKRI) |
| | | | Task 10.6 | Machine learning techniques for accelerator and target instrumentation | T. Shea (ESS) |
| | | | Task 10.7 | Development of electro-optical waveguide sensors as beam electric field sensors | S. Gibson (RHUL) |
| WP11 | Sustainable concepts and technologies | M. Seidel (PSI) | Task 11.1 | Sustainable Concepts for Accelerator driven Research Infrastructures | M. Seidel (PSI) |
| | | | Task 11.2 | High Efficiency Klystron Industrial Prototype | O. Brunner (CERN) |
| | | | Task 11.3 | Permanent Magnet Quadrupoles & Combined Function Magnets for Ultra Low-Emittance Rings | B. Shepherd (UKRI) |
| WP12 | Societal Applications | R. Edgecock (HUD), | Task 12.1 | A Strategy for Implementing Novel Societal Applications of Accelerators | R. Edgecock (HUD) |
| | | | Task 12.2 | Design of advanced electron accelerator plant for biohazards treatment | A. Chmeliewski (INCT) |
| | | | Task 12.3 | Design of Internal Rf Ion Source for Cyclotrons | J. M. Perez (CIEMAT) |
| WP13 | Technology Infrastructure | S. Leray (CEA) | Task 13.1 | Strategy for the development of the AMICI TI | S. Leray (CEA) |
| | | | Task 13.2 | Developing and promoting services to industry in AMICI TFs | H. Weise (DESY) |
| | | | Task 13.3 | New RF amplifiers based on GaN Semiconductors | D. Dancila (UU) |
| WP14 | Ethics Requirements | P. Foka (GSI) | Task 14.1 | Protection of Personal Data: POPD Requirements | P. Foka (GSI) |
| | | | Task 14.2 | Ethics Position Requirements: EPQ Requirements Nr 2 | P. Foka (GSI) |

# I.FAST Budget

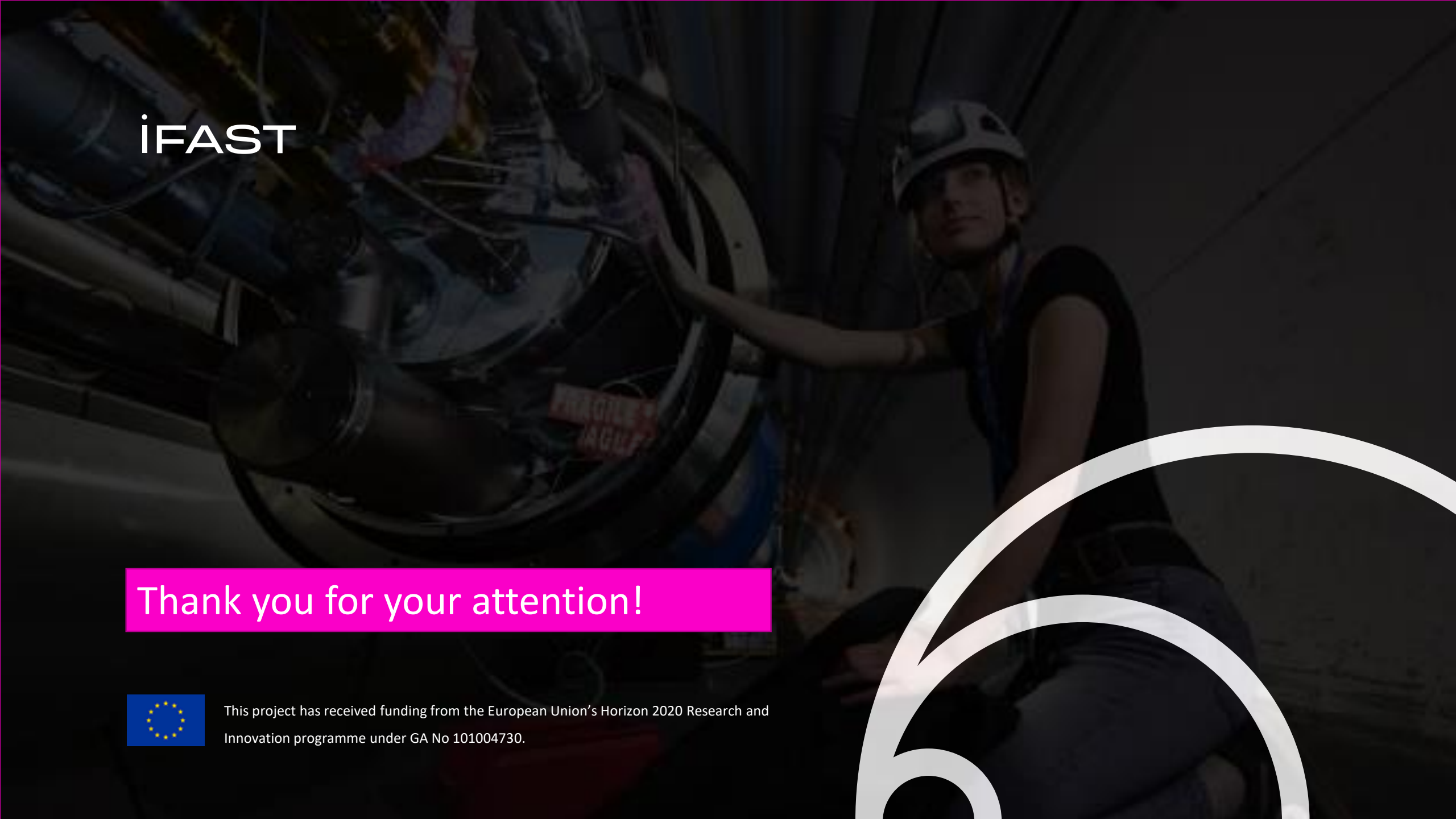



Counting only the R&D WPs (4-13), industry share is 24%

Note: CERN has 1.834 M€ of «coordination» budget (management, communication, KT, Innovation Fund). R&D part (WP 4-13) is only 955 k€.

Overall funding rate 44% (ratio EC contribution / total cost)
22.7 M€ total project cost



iFAST

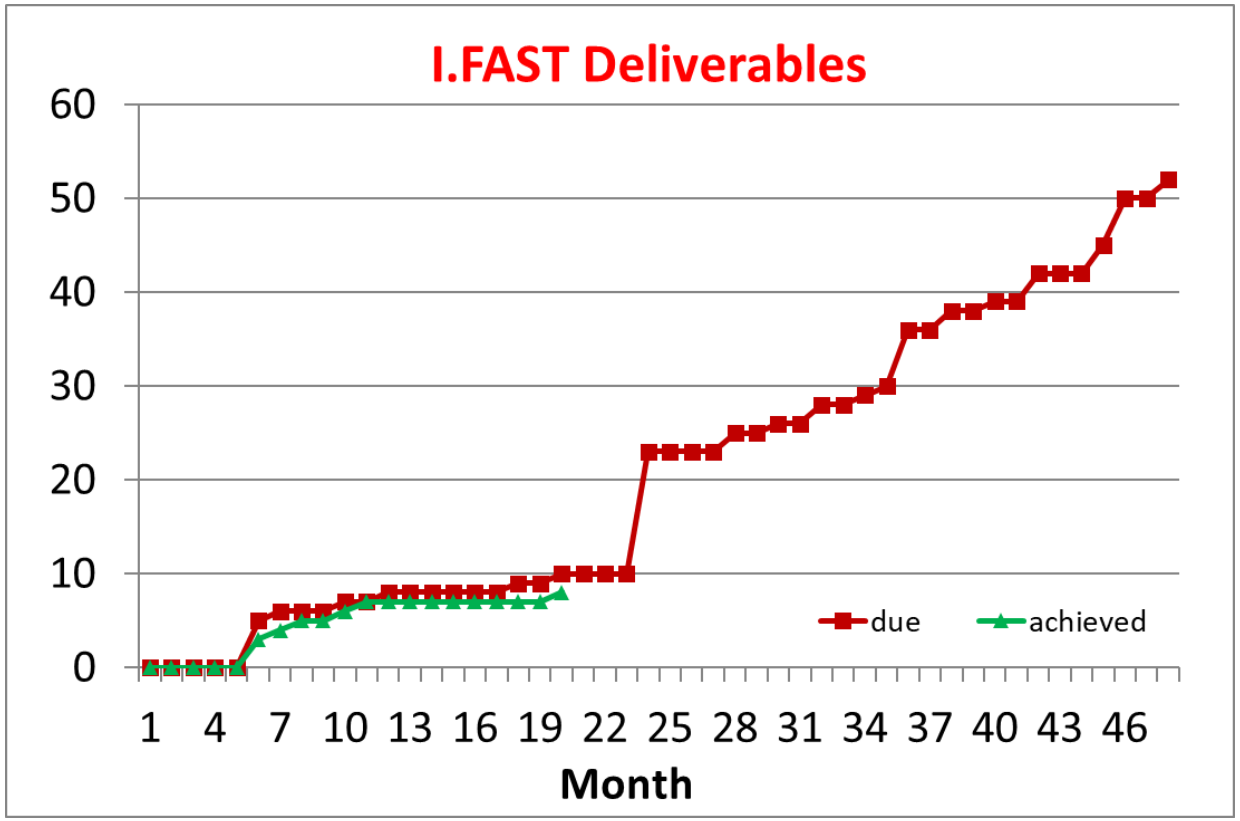
# Thank you for your attention!

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

Maurizio Vretenar, CERN
Project Coordinator

Period 1 Review, 07.02.2023

# Status of Deliverables

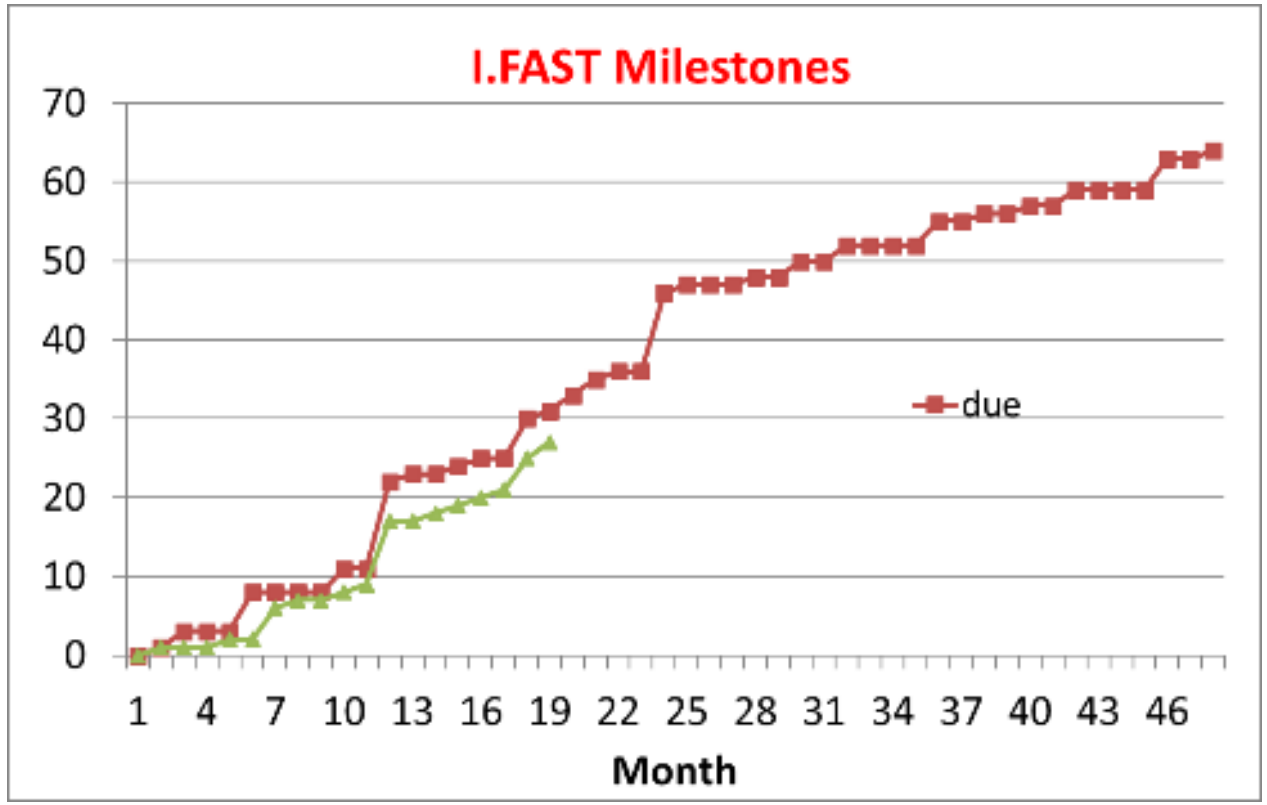



**9 Deliverables achieved out of 10**.

Only one delayed from M18 to M24 because of a shift of activities from CEA to INFN due to late recruitment at INFN:

D8.3 First Engineering design of HTS demonstrator

# Status of Milestones




**27 Milestones reached out of 30**.

Three delayed because of minor technical problems or organisational issues with no impact on the Work Plan.

MS46 Performance of Superconductive Cavities made by AM technology by Nb or Cu with Nb thin spattered film on the internal surface, M12 to M30

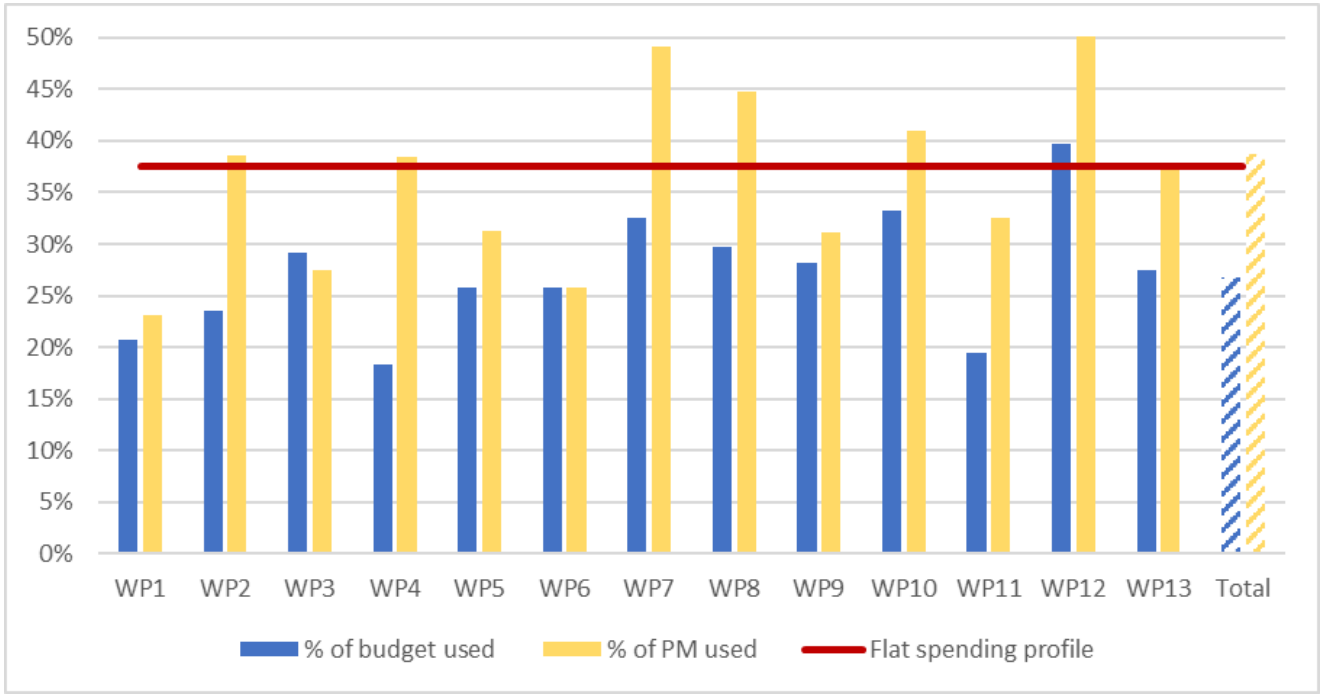
MS5 ACO workshop, M18 to M24

MS53 Workshop on sustainable materials and lifecycle management for accelerators, M18 to M22

# Use of resources – Full costs per WP

**Utilisation of personnel and resources for WP1 to WP13 during P1.**

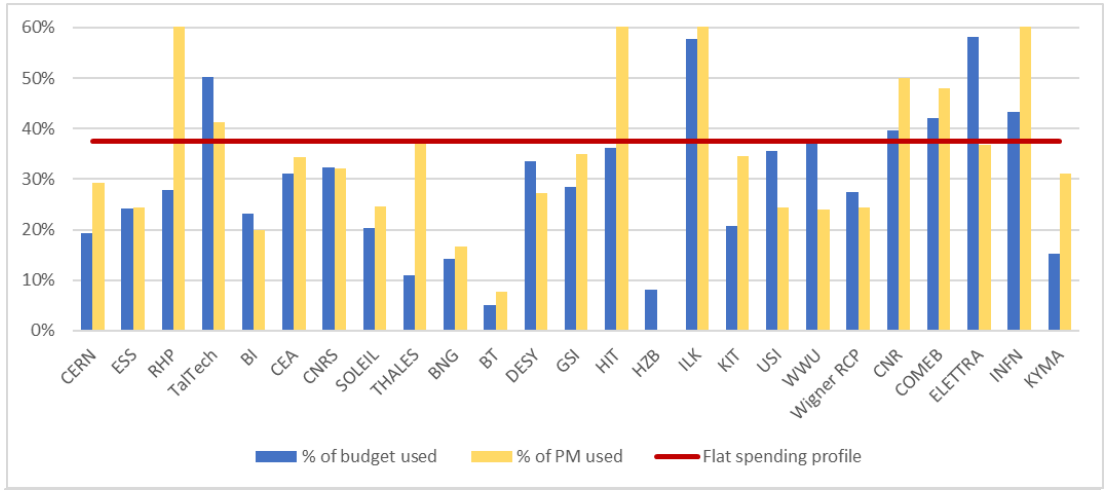
The resources cover the full costs incurred by the beneficiaries (EC contribution + matching funds, without overheads) and are shown as percentage of the estimated total man-power and budget for the complete duration of the project.

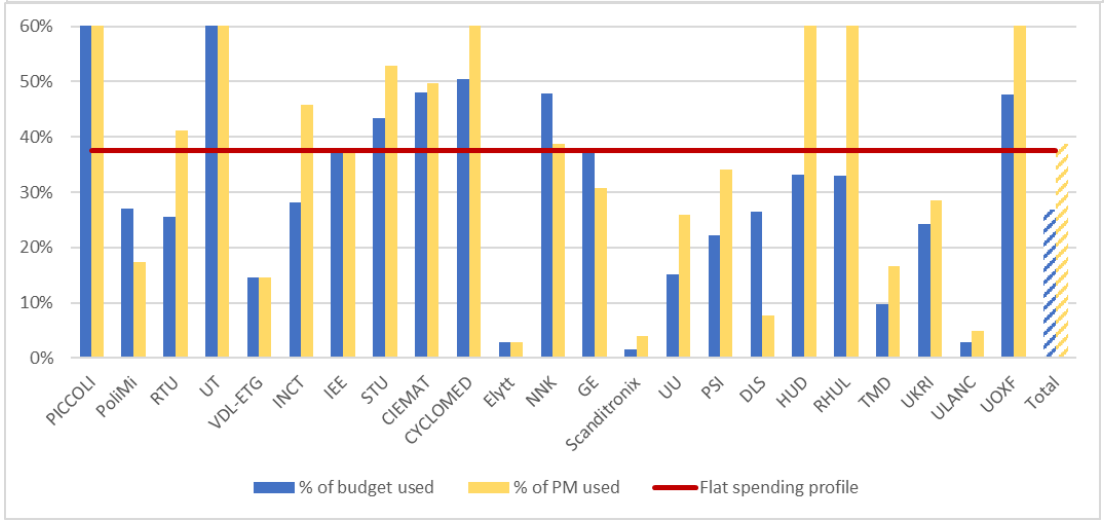


# Use of resources – Full costs per Beneficiary

**Utilisation of personnel and resources per beneficiary during P1.**

The resources cover the full costs incurred by the beneficiaries (EC contribution + matching funds, without overheads) and are shown as percentage of the estimated total man-power and budget for the complete duration of the project.



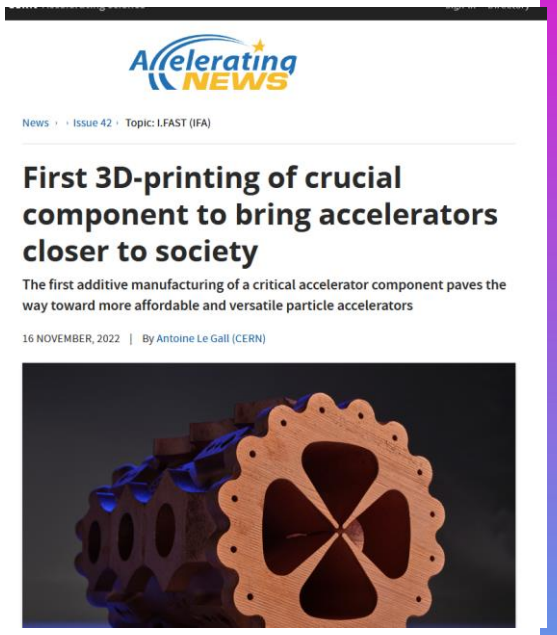
# Highlights: Additive-Manufactured RFQ

Task 10.2, **Additively-Manufacturing (AM)** survey and potential developments.

Aimed at identifying specific needs for AM (3D printing) in accelerators, no prototyping foreseen. At the start of work, the **Radio Frequency Quadrupole** (RFQ) compact copper linear accelerator for medical and industrial applications was identified as a component that could greatly profit from AM in terms of production time and cost.

The Task has contacted industrial partners, and Trumpf AG has agreed to produce at no cost for the project a full-scale prototype that is being tested by the Task. Trumpf is joining the Consortium as Partner Organisation.

**Wide impact**: articles, exhibitions, press release, CERN Bulletin, Accelerating News, CNRS newsletter, CORDIS.

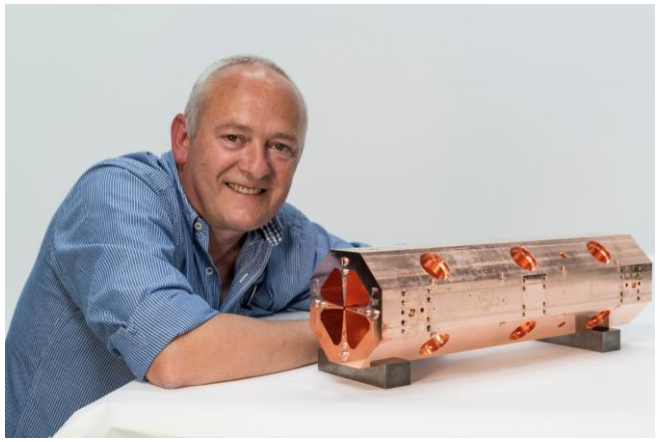

Accelerating NEWS

News › Issue 42 › Topic: I.FAST (IFA)

First 3D-printing of crucial component to bring accelerators closer to society

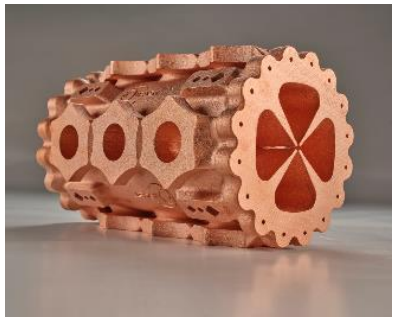
The first additive manufacturing of a critical accelerator component paves the way toward more affordable and versatile particle accelerators

16 NOVEMBER, 2022 | By Antoine Le Gall (CERN)



*The original RFQ, machined and brazed*

*The 3D-printed version*




cnrs

L'IN2P3 Recherche Technologie International Formation supérieure

Accueil > Actualités

I.FAST présente le premier accélérateur de particules produit en synthèse 3D métal

29 novembre 2022 DÉVELOPPEMENTS TECHNIQUES

Dans le cadre du programme européen I.FAST de R&D sur les accélérateurs de particules conduit par le CERN, un quadrupôle radiofréquence (RFQ), élément parmi les plus complexes des accélérateurs de particules, a été synthétisé d'un seul tenant en impression 3D métal. La pièce présentée lors du salon de Frankfort Formnext du 7 au 10 novembre dernier, doit prendre le chemin d'IJCLab où elle va subir un certain nombre de tests. Nicolas Delerue, chargé de recherche et spécialiste des accélérateurs l'attend avec impatience.

# Highlights: Challenge Based Innovation



Task 2.3, **Challenge-Based Innovation (CBI)** with particle accelerators.

Residential challenge for 24 master students with different backgrounds organised in 4 teams to propose new applications of accelerators for the environment.

Winner: project CYAN for stopping eutrophication (harmful algal bloom) in lakes.

Strong success, projects will be followed-up, articles on CERN Bulletin, Accelerating News and other newsletters, CORDIS. Will be repeated in 2023.

# Highlights: the I.FAST Innovation Fund


Task 4.2, **Management of the Innovation Fund**.

1 M€ funding to an internal competitive call for innovative projects, starting early 2023, for a duration of 2 years. In advance on schedule (awarding at M20 instead of M24)

1. Funding between 100 and 200 k€ per project;
2. Consortium: at least one I.FAST beneficiary and one industry;
3. Initial TRL 3 or higher (from proof-of-concept to laboratory/environment validation);
4. Project contributes to improving sustainability of particle accelerator technologies;
5. Project must have potential for industrialisation or commercialisation.
6. Project must have potential to attract more resources than what deployed by IFAST alone.

18 projects submitted, 8 selected by a 10-member Evaluation Committee:

2 on high-efficiency RF, 2 on superconductivity, 2 on particle sources, 1 on laser plasma acceleration, 1 on additive manufacturing.

Smooth selection procedure and excellent quality of the selected projects!

# Highlights: Industry participation



Task 3.1 **Industry engagement coordination and industrial partnership support**

Engagement of industry has been so far excellent:

- 16 industrial partners,
- 12 industry members in the I.FAST Industry Advisory Board,
- **230** registered participants in the 1st I.FAST Accelerator-industry co-innovation workshop**, 91 from industry**.

Many interesting discussions, resulting in the creation of the "**Accelerator Science and Technology Permanent Industry Forum**" that will continue after I.FAST. The Terms of reference will be presented and discussed at the next Annual Meeting.

The Coordinator was invited to present the I.FAST industrial strategy at the **2022 International Particle Accelerator Conference** (Bangkok, June 2022), at the EPS Forum in Paris, and at the Big Science Business Forum in Granada.

# Some problems…

Many minor issues linked with recruitment or loss of critical personnel, remaining Covid impact at the beginning of the Project, minor technical issues, but only one major problem:

The increase of material and energy costs (and related inflation and delays in deliveries) due to the ongoing worldwide crisis.

Strong impact in particular on industry, cost of prototypes to be realised was defined in 2019.

Mitigations: redistribution of work between partners to reduce costs (but increase risks), descoping of some activities (e.g. smaller prototypes), …

# Problems: withdrawal of 2 industrial partners

Work Package 8, Tasks 8.4, **Construction of a curved CCT magnet demonstrator** and Task 8.5, **Construction of the HTS CCT demonstrator**. They are not yet active, will start after magnet design done in two other Tasks.

Two industrial companies (BNG and Scanditronix) have sent a letter to the Coordinator asking to quit the Project because they "cannot fulfil the milestones to build the requested hardware with the budget available": "material and energy prices have risen dramatically since the start of the project. We are thus not any more in the position to allocate R&D money for the matching funds into I.FAST."

Actions:

Instead of declaring the companies as defaulting partners, the Project is ready to keep them in the collaboration, with 0 or minimum EC contribution, and try to redistribute their work to others.

- **Elytt** (3rd magnet company in the project) has already agreed to take BNG's part in Task 8.5.
- We have explored solutions for Task 8.4: internalisation to another I.FAST partner, or another magnet company. Possible descoping and increasing risks (technical and delay).
- A solution has been recently agreed (internalisation to **CIEMAT**). More details in WP8 talk.
- Implications to be discussed (do we need an Amendment?).

# Problems: the Industry training programme

Task 2.4, **Industrial Training associated with Knowledge Transfer.**

Traineeship programme to support exchanges of personnel between laboratories and industry, by providing grants that could be used for the trainee's salary, travels and subsistence costs.

The original work plan foresees "training of industrial engineers and technicians at European accelerator development laboratories" – one of the two (industry or laboratory) must be an I.FAST Beneficiary. Original scheme: 10 grants of 8'000 € each.

So far, the scheme had limited success, only 2 successful applications out of 10 positions foreseen.

Analysis of the reasons: companies have limited personnel availabilities to let their young engineers leave for 1 or 2 months.

To solve the issue within the general objectives of the Task, the Project has foreseen to extend the call to transfers in both directions, allowing also young engineers and technicians from accelerator development laboratories to train for 1 or 2 months in an accelerator-related industry.

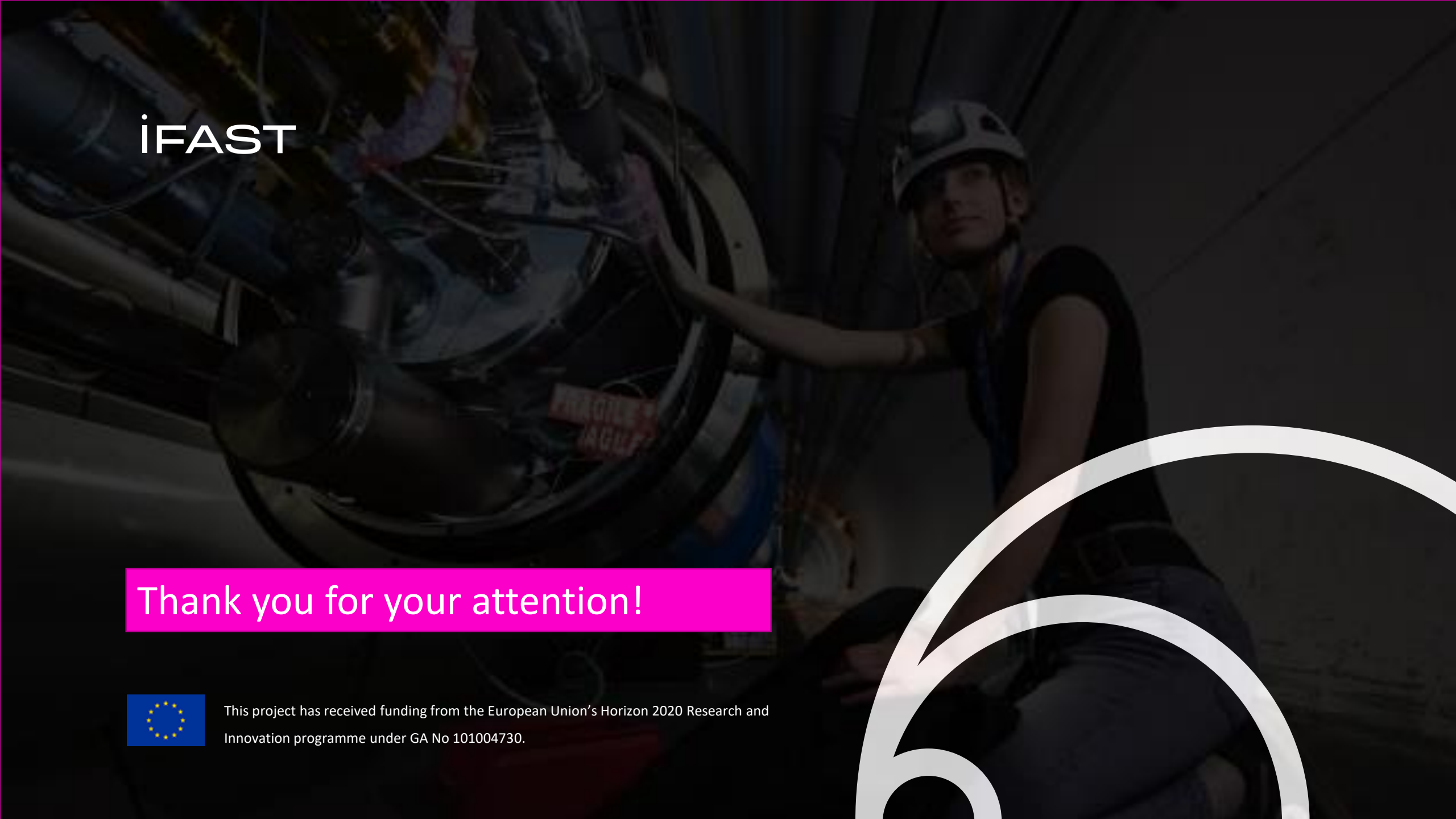
A call in this sense has been already issued, but before allocating grants we need the support of the Project Officer and possibly of the Reviewer.

# Summary of deviations

Section 5 of the Periodic report (Deviations from Annex I) reports a list of delays, all between 3 and 12 months with minor or no impact on the Work Plan.

The only sensitive deviations reported are those mentioned so far:

1. Modification to scope of Tasks 8.4. and 8.5 to build “combined-function” magnets and not “curved” magnets.
2. Modification to scope of Task 2.4, to allow Industry Training in both directions.
3. Modification to Beneficiaries responsible for the deliverables of Tasks 8.4 and 8.5 – details agreed recently, not yet included in the Report.
4. Integration of the projects awarded with the I.FAST Innovation Fund into the Work Plan (allocation of resources already approved by electronic vote of the Governing Board).



iFAST

# Thank you for your attention!

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

Maurizio Vretenar, CERN
Project Coordinator

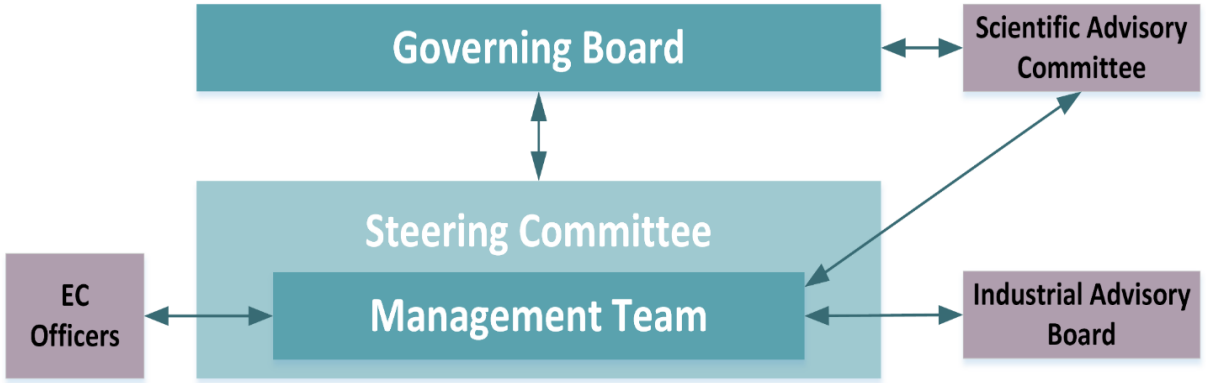
Period 1 Review, 07.02.2023

# WP1 Structure and objectives

- *Task 1: Project Management, external coordination, sustainability (CERN, RTU): management, Gov. Board, Steering Comm., Annual Meetings, reviews, financial follow-up, reporting, monitoring, strategy for acc. science (with TIARA)*
- *Task 2: Information Flow Management and Cross-coordination (RTU, CERN, GSI): interdisciplinary workshops, information exchange tools.*
- *Task 3: Internal Communication and Dissemination (GSI, CERN, RTU): repositories for documents, organisation of events, publication management.*
- *Task 4: Relations with the other Innovation Pilots (CERN, RTU): coordination.*

Goals: smooth functioning of the project, integration of all partners into a wide community covering both academia and industry.

# Activities in P1 – management, governance



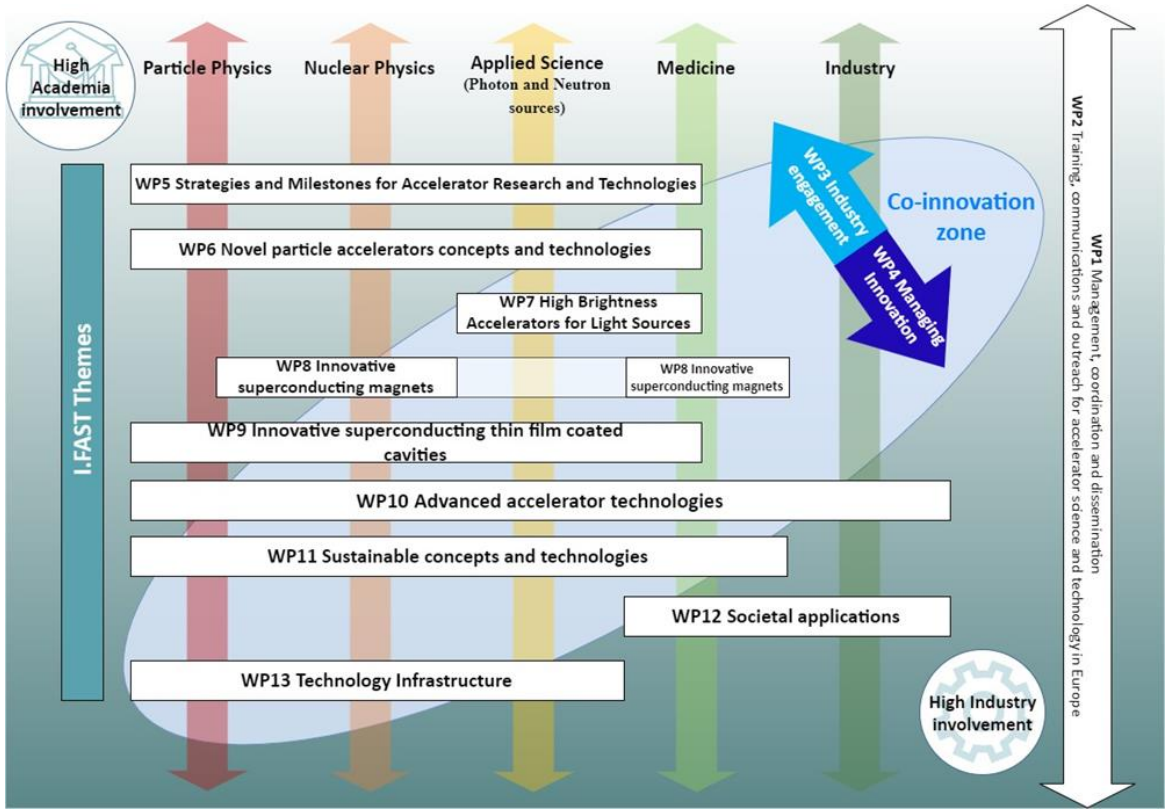

- Establishment of a Consortium Agreement
- Set-up of all projects Bodies

All meetings and minutes are registered in Indico:
https://indico.cern.ch/category/13033/
So far, 46 events in 20 months.

## Scientific Advisory Committee

- **Akira Yamamoto (KEK),** Head of Linear Collider Project Office at KEK, expert in applied superconductivity, already member of EuCARD2, ARIES and AMICI SAC.
- **Michiko Minty (BNL),** Head of Accelerator Division at the BNL Collider Accelerator Department, with wide experience in accelerator design and beam optics.
- **Carsten Welsch (U. Liverpool),** Head of Physics Department at U. Liverpool, has participated in many accelerator projects, with expertise in beam instrumentation and optics, science communication and outreach, etc.


# Activities in P1: information flow, dissemination




- SharePoint site to exchange information and follow milestones and deliverables: : https://espace.cern.ch/project-IFAST-Intranet
- "Transverse" workshops: Additive Manufacturing in Y1, Artificial Intelligence and ML in Y2.
- All notes and publications in Zenodo (open access) https://zenodo.org/communities/ifast
- Web site for general information https://ifast-project.eu/ .
- So far, **69** publications on Zenodo (average of 3.45/month).

9 meetings of the INFRA-INNOV Coordination (I.FAST, AIDAinnova, LEAPSinnova: coordination of industry events, common strategy for proposing future calls.

# Deliverables and Milestones P1

In Period 1, WP1 had 2 Milestones and 2 Deliverables:

- Milestone MS1: Information Flow management tool installed *(planned M3, achieved M5)*
- Milestone MS2: Dissemination plan *(planned M3, achieved M7)*
- Deliverable D1.1 RI Co-Innovation platform MoU *(planned M6, delivered M8)*
- Deliverable D1.2: Internal communication plan *(planned M6, delivered M6)*

# Relevance of objectives and impact

All objectives are still relevant
The impact of I.FAST is going beyond the boundaries of the project, for example in the definition of the new Work Programmes of Research Infrastructures.

# WP14 (Ethics) Deliverables

- Deliverable 14.1: Protection Of Personal Data, delivered on M6

*DPO appointment, creation of Privacy Notice, etc.*

*Data protection at I.FAST follows CERN Op. Circ. 11, fully compliant with EU Regulation 2018/1725.*

- Deliverable 14.2: Environmental Protection Questions, delivered on M7

*List of environmental and health hazards for I.FAST compiled after an extensive survey into a risk register, regularly updated. Risk categories: Ionising radiation, Non-ionising radiation, Electrical, Mechanical, Chemical, Flammable gas.*

# Diversity in I.FAST

**Nominated a Diversity Officer (Y. Foka, WP13 Coordinator), web page** https://ifast-project.eu/diversity

Diversity in the broadest sense is crucial for creativity and innovation **I.FAST: synonym of diversity**

**Diversity considerations in the most broad sense regarding:**
nationality/culture, competences/profession, age/generation, gender,
individual differences such as ethnic origin, belief, sexual orientation or disability

I.FAST collaborators from different nationalities and cultures, different professions/disciplines, including experienced professionals and young generation, from research institutes, academia, industry.

**I.FAST statement on Gender Imbalance:**
General observation and acknowledgement of Gender imbalance in STEM

- with physics and engineering largely below average
- **in business/enterprise sector severely under-represented**

**I.FAST general status on Gender Imbalance**
relative to previous Integrating Activity projects

- larger female researcher's participation from academic partners
- **very few female researchers present in the 17 industry partners**

# I.FAST opportunities and Gender Imbalance

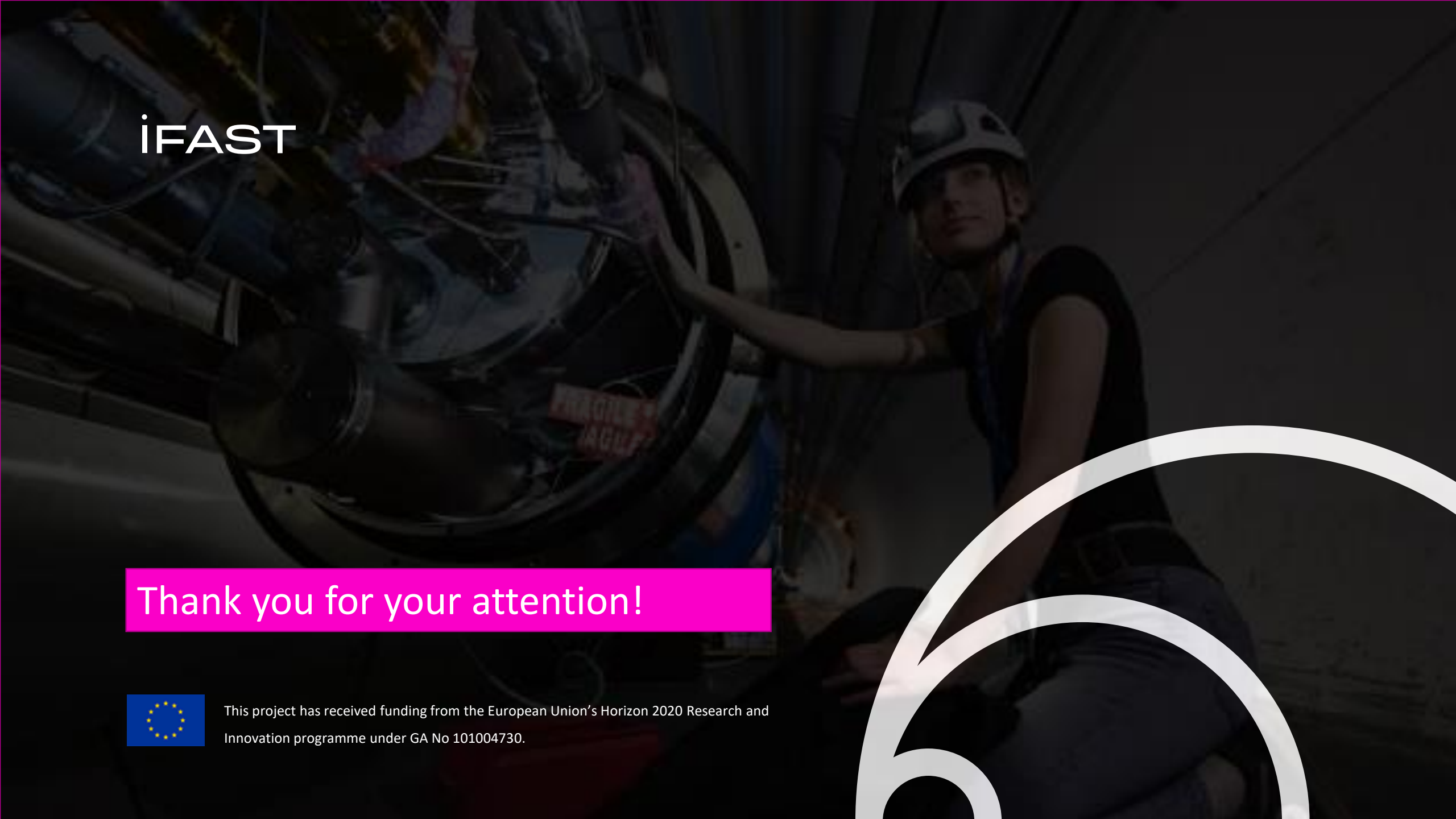
## I.FAST offers a good opportunity to:

- understand reasons for disparity
- discuss ways to improve situation
- discuss with industry partners: academia/research/industry attitudes

## I.FAST suggests and encourages:

- pro-active **measures** in sourcing and pre-selection **recruitment** stages (addressing gender distribution in project teams)
- enable women in decision-making positions appointing **women in leadership roles**
- make women contributors **visible as speakers**: provide role models
- encourage **outreach events**, with participation of women, targeting young scientists including women
- encourage participants to ensure working environment that allows **work/life integration**, family-friendly policies (e.g. avoid meetings after 17:30)
- communicate experiences and **best practices** in gender policies

iFAST



iFAST

# Thank you for your attention!

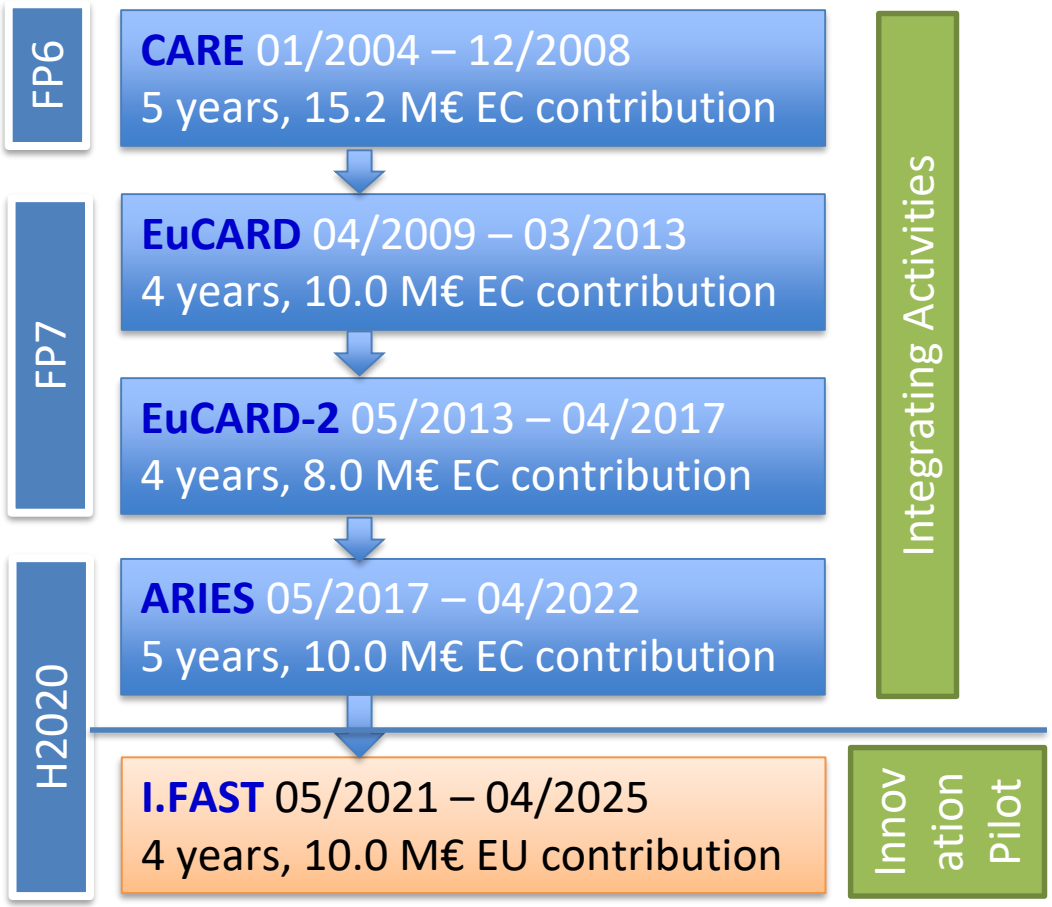
This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under GA No 101004730.

# Backup slides

# I.FAST Governance and management

| 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. Board | | 1 / year |

# Integrating Activities for accelerators and the new Innovation Pilot I.FAST




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

Integrating Activities (and Innovation Pilot): 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 step in this progress,** including for the first time a large industry representation (1/3 of participants!)

# The I.FAST Consortium

| Number | Beneficiary | Full name | Country | EC funding (without associates) | |
|---|---|---|---|---|---|
| 1 | CERN | European Organization | CERN | 2,596 | |
| 2 | ESS | European Spallation So | Sweden | 100 | |
| 3 | RHP | RHP Technology Gmbh | Austria | 50 | industry |
| 4 | BI | Bergoz Instrumentatior | France | 95 | industry |
| 5 | CEA | Commissariat à l'énergi | France | 371 | |
| 6 | CNRS | Centre national de la re | France | 332 | |
| 7 | ESI | European Scientific Inst | France | 125 | |
| 8 | Sigmaphi | | France | 60 | industry |
| 9 | SOLEIL | Synchrotron Soleil | France | 53 | |
| 10 | THALES | Thales Group | France | 475 | industry |
| 11 | BNG | | Germany | 64 | industry |
| 12 | BT | Barthel HF-Technik Gm | Germany | 95 | industry |
| 13 | DESY | Deutsches Elektronen-S | Germany | 273 | |
| 14 | FhG | Fraunhofer Gesellschaf | Germany | 140 | |
| 15 | GSI | GSI Helmholtzzentrum | Germany | 283 | FEP, IFAM, |
| 16 | HIT | Heidelberg Ion-Beam T | Germany | 60 | |
| 17 | HZB | Helmholtz-Zentrum Ber | Germany | 41 | |
| 18 | ILK | | Germany | 120 | industry |
| 19 | KIT | Karlsruhe Institute of T | Germany | 127 | |
| 20 | Uni Siegen | Universität Siegen | Germany | 141 | |
| 21 | WWU | University of Münster | Germany | 55 | |
| 22 | XILNIX | | Ireland | 40 | industry |
| 23 | CNR | | Italy | 70 | |
| 24 | COMEB | Comeb S.R.L. | Italy | 130 | industry |
| 25 | ELETTRA | Elettra Synchrotron Trie | Italy | 145 | |
| 26 | INFN | Istituto Nazionale di Fis | Italy | 1,022 | |
| 27 | KYMA | | Italy | 275 | industry |
| 28 | PoliMi | Politecnico di Milano | Italy | 88 | |
| 29 | RTU | Riga Technical Universit | Latvia | 183 | |
| 30 | UT | University of Twente | Netherlands | 50 | |
| 31 | VDL-ETG | VDL Enabling Technolog | Netherlands | 175 | industry |
| 32 | INCT | Instytut Chemii i Techni | Poland | 50 | |
| 33 | IEE | Institute of Electrical En | Slovakia | 60 | |
| 34 | CIEMAT | Centro de Investigacion | Spain | 317 | |
| 35 | CYCLOMED | CYCLOMED Technologie | Spain | 27 | industry |
| 36 | Elytt | Elytt Energy S.L | Spain | 60 | industry |
| 37 | NNK | Nanoker Research | Spain | 50 | industry |
| 38 | GE | General Electric | Sweden | 27 | industry |
| 39 | Scanditronix | | Sweden | 60 | industry |
| 40 | UU | Uppsala University | Sweden | 140 | |
| 41 | PSI | Paul Scherrer Institute | Switzerland | 274 | |
| 42 | DLS | Diamond Light Source | UK | 83 | |
| 43 | HUD | University of Huddersfi | UK | 74 | |
| 44 | RHUL | Royal Holloway, Univer | UK | 33 | removed s |
| 45 | TMD | TMD Technologies Limi | UK | 40 | industry |
| 46 | UKRI | United Kingdom Resear | UK | 330 | |
| 47 | ULANC | Lancaster University | UK | 70 | |
| 48 | UOXF | University of Oxford | UK | 55 | |

## Partner organisations

| Partner |
|---|
| CVR |
| BINP |
| JGU |
| TalTech |
| Amplitudes |
| FTMC |
| ALBA |
| UH-HIP |
| UNIGE |
| Wigner RCP |
| MIT |
| CNAO |
| MedAustron |
| SEEIIST |
| PICCOLI |
| Biopolinex |
| CTDI |
| INDUCENCIA |
| CU |
| Covesion |

## Industrial Partners:

RHP Technologies
Bergoz Instrumentation
Sigmaphi (magnets)
Thales
BNG (magnets)
Barthel HF-Technik
ILK
XILNIX
COMEB
KYMA
VDL-ETG
CYCLOMED
Elytt (magnets)
NNK
GE
Scanditronix
TMD

48 beneficiaries (16 industry, 33%)
20 Partner Organisations
>20 collaborating institutes

# Use of resources – EC requested funding

**Deviations on requested EU contribution compared to flat-spending profile.**

| Benef. No. | Under-claiming (<20%) or Over-claiming (>60%) | Justification |
|---|---|---|
| 3. RHP<br><br>41. PSI | PM RHP: 65%<br>PM PSI: 77%<br>Personnel costs PSI: 72% | The Financial Statement includes full costs in effort and personnel costs, which was not foreseen in Annex 2. But only a fraction of the full costs is requested for EU funding on the Financial Statement (Requested EU contribution < Maximum EU contribution) |
| 4. TalTech<br>5. BI<br>42. DLS | 19-20% | Slight under-claiming due to slow start of the project (covid and/or slight delays) |
| 9. THALES<br>19. WWU<br>44. RHUL | <br>0%<br>10% | The use of resources is not linear during the project, and not limited to EU contribution as outlined above. They will claim EU contribution (mostly) as of Reporting Period No. 2. |
| 15. HZB | 6% | Delays due to major maintenance of the HZB cryo plant |
| 47. ULANC | 8% | Delays due to recruitment issues |
| 11. BT<br>36. Elytt<br>39. Scand.<br>45. TMD | 9%<br>3%<br>2%<br>10% | The activities are not linear during the project, and are mostly planned for the 2nd half of the project.<br><br>NB: Scanditronix will step out of the project and keep only but an observer role. |
| 14. HIT<br>26. PICCOLI | 90%<br>111% | The activities are not linear during the project, and are mostly planned for the 1st half of the project. |
| 29. UT | 163% | The use of resources is not linear during the project, and not limited to EU contribution as outlined above. They will not claim EU contribution after Reporting Period No. 1. |

# Use of resources – EC requested funding

**Deviations on average personnel cost (€/PM) compared to GA and annexes.**

| Benef. No. | Higher APC (> 120%) or Lower APC (< 80%) | Justification |
|---|---|---|
| 3. RHP<br>4. TalTech<br>11. BT<br>14. HIT<br>26. PICCOLI<br>35. CYCLOMED<br>43. HUD | 69%<br>30%<br>66%<br>78%<br>79%<br>57%<br>37% | Less experienced staff are working more than planned, under the supervision of senior researchers/engineers. In addition, senior staff personnel costs are not claimed to the EC for some cases, such as TalTech. |
| 25. KYMA | 79% | More labor hours from staff at the Linked Third Party (LTP) are used than planned, and the LTP has a lower average personnel cost. |
| 31. INCT<br>33. STU<br>36. Elytt<br>39. Scanditronix<br>40. UU<br>48. uu | 73%<br>77%<br>47%<br>64%<br>75%<br>57% | The use of resources is not linear during the project, and for this first period, they involved more junior staff than initially planned.<br>*NB for STU: in addition to this, a valorisation of personnel costs, planned at proposal stage, could not happen due to political situation in Slovakia also connected to global situation in Europe and war in Ukraine.*<br>*NB for Scanditronix: more senior staff was planned to work later in the project, but as outline above Scanditronix will step out of the project.* |
| 5. BI | 129% | Salary increases and incentive plan related to the R&D were not part of the budget estimation |
| 12. DESY<br>20. Wigner RCP | 159%<br>204% | The work for I.FAST in P1 was performed by senior scientists<br>NB for WIGNER, this is also due to exchange rate and unforeseen increased personnel costs |