



FuSuMaTech



**Future Superconducting Magnet Technology**

## **FuSuMaTech phase 2**

**Ziad Melhem**

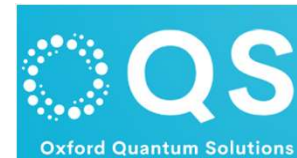
6 Mth Meeting of FuSuMaTech

14<sup>th</sup> Dec 2021, video conference Hosted by PSI

# Agenda



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• Opening , welcome, status of the FuSuMaTech initiative All partners et al.	Stephane Sanfilippo	
	Ziad Melhem	13:00 - 13:10
• FuSuMaTech MOU update	Sylvain ROUX	13:10 - 13:15
• Update from the current partners and new partners	Sylvain Roux	13:15 - 14:15
• Fundings calls and opportunities update	Ziad Melhem	14:15 - 14:30
• Potential new consortia within FuSuMaTech	Ziad Melhem	14:30 - 14:35
• A. Superconducting magnet for the proton therapy- PSI proposal	Ciro Calzolaio	14:35 - 15:05
• BREAK	All	15:05 - 15:15
• B. Advanced superconductive magnet designs for clinical MRI	Denis Le Bihan	15:15 - 15:45
• C. Materials database and characterisation platform and testing facilities	Ziad Melhem	15:45 - 16:15
• Proposed strategic road map for superconducting applications	Ziad Melhem	16:15 - 16:30
• Proposed strategic superconductivity challenge	Ziad Melhem	16:30 - 16:45
• Conclusion and final address	Ziad Melhem	16:45 - 17:0



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# Opening and Welcome

Stephane Sanfilippo

Ziad Melhem

# Meeting Objectives



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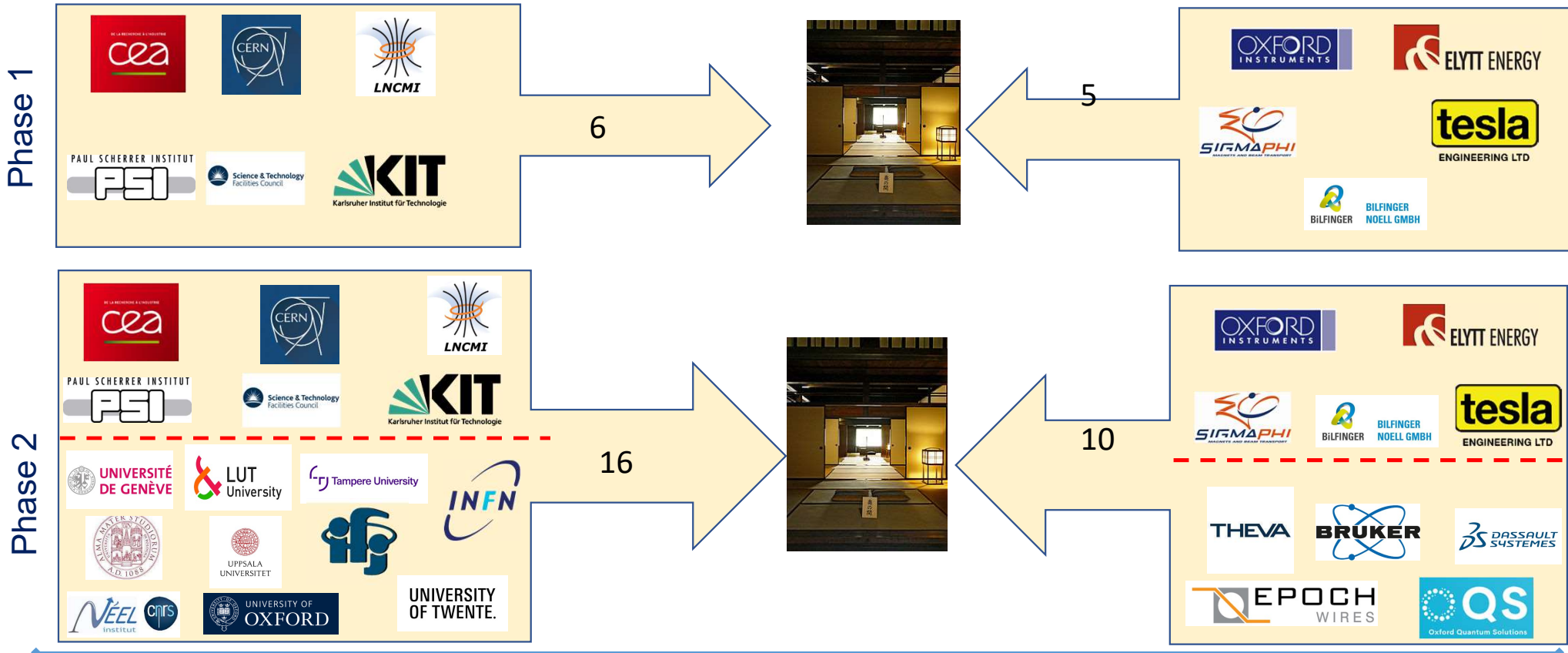
- Update on FuSuMaTech status
  - Phase 2 Objectives
  - New members
- Review status of Phase 2
- Review proposals for going forward:
  - Develop a Strategic Roadmap for Applied Superconductivity to guide potential funding routes
    - Individual calls
    - European challenge for Applied Superconductivity for 2 years (100-200 M Euro) – For Discussion

# FuSuMaTech From Phase 1 to Phase 2

Synergy with Industry and the Impact on the Future Superconducting Magnet Technology



✓ Obj. 1: Moving towards a FuSuMaTech European cluster

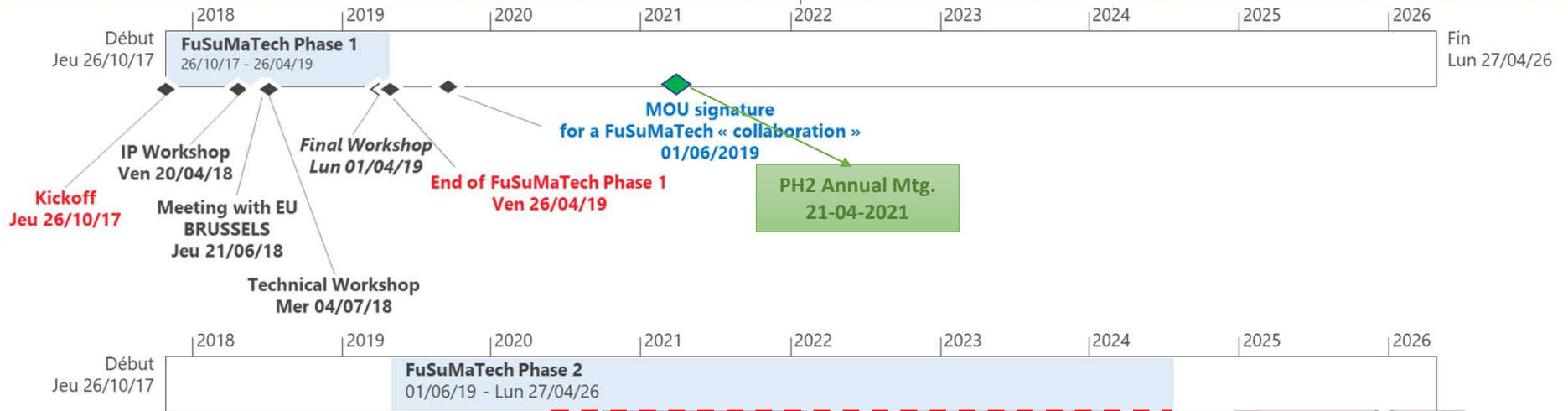


## FuSuMaTech attendance today



- 49 registrations
  - 20 From Companies
  - 27 From National Facilities
  - 2 From International Facility
- 7 countries
  - Finland, France, Germany, Italy, Poland, Switzerland, UK
    - *There is scope for enlargement to include other countries active in SC!*
- 21 speakers
- 3 potential project consortia for discussion

# FuSuMaTech from Phase 1 to Phase 2



- Sustaining a European cluster on novel superconducting magnet technologies
- Implementing the FuSuMaTech roadmap for generic R&D
- Developing and implementing technology demonstrators





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# Fundings calls and opportunities update



# Funding – Route 1



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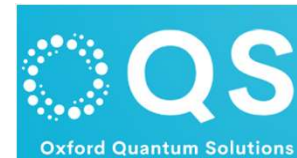
- Route 1 – Available now
  - EU calls (TBC)
    - Cluster 5 “Energy, Climate and mobility”,
    - Cluster 1 “Health”,
    - Cluster 4 “Industry, Digital and Space”
  - SWISS Calls – TBC
  - UK calls –(RIUK) TBC
- Not different from Phase 1
  - Will not sustain FuSuMaTech cluster

# Funding – Route 2

## EIC Applied Superconductivity Challenge



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### • Route 2 – For Discussion

- EIC Pathfinder challenges
  - **EIC Pathfinder Challenges** aim to **build on new, cutting-edge directions in science and technology** to disrupt a field and a market or create new opportunities **by realising innovative technological solutions** grounded in high-risk/high-gain research and development.
- 5 Pathfinder Challenges selected for 2021-2022
  1. Awareness inside
  2. Tools to measure & stimulate activity in brain tissue
  3. Emerging Technologies in Cell & Gene Therapy
  4. Novel routes to green hydrogen production
  5. Engineered living materials

### • Proposal – For Discussion and approval

- Develop an Applied Superconductivity Challenge for 2023-2024
- Need a **Strategic Road map for Superconductivity**
  - Now local roadmaps with no strategic Roadmap linking various interests/topics
- Need FuSuMaTech to work with ESA and CONECTUS
  - FuSuMaTech only body linking Research and academia with Industrial partners
- **Propose to have a Subcommittee from FuSuMaTech and representative from ESA and CONECTUS (plus other bodies TBC) to develop an EIC Pathfinder Challenge**
- **Need to engage with EU on requirements for a SC challenge**

<b>EIC Pathfinder funding schemes</b>	European Innovation Council (EIC) aims to identify and support breakthrough technologies and game changing innovations to create new markets and scale up internationally
<b>EIC Pathfinder Open</b>	bottom-up approach with no predefined topic
<b>EIC Pathfinder Challenges</b>	top-down challenge-driven calls for tackling specific technology breakthroughs by portfolios of projects

	Pathfinder Open	Pathfinder Challenges
<b>Total budget</b>	€168 million	€132 million
<b>Proposals (indicative)</b>	Up to €3 Mio	Up to €4 million
<b>Funding rate</b>	100% of eligible costs	100% of eligible costs
<b>Opening</b>	9 April 2021	15 June 2021
<b>Deadline</b>	19 May 2021 at 17:00 CET	27 October 2021 at 17.00 CET
<b>Length of proposal</b>	17-page proposal – Section 1 to 3	25-page proposal
<b>Applicants</b>	Consortia: Min. 3 partners from 3 different MS/AC (of which at least 1 partner in a MS)  Legal entities: all types are eligible	1. Single legal entities in a MS/AC (conditions apply) 2. Consortia: - If 2 partners: from different MS/AC, otherwise - Min. 3 partners from 3 different MS/AC (of which at least 1 partner in a MS) (unless differently stated in the Challenge chapter)

Courtesy of Gaëlle DECROIX



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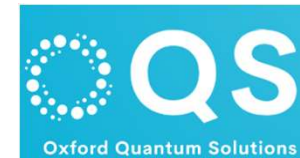
# EIC pathfinder slides

# Funding – Route 2 (Medium term Funding ~ 5 years)

## European Innovation Council (EIC) Applied Superconductivity Challenge !



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### • Route 2 – In Progress

- EIC Pathfinder challenges
  - **EIC Pathfinder Challenges** aim to **build on new, cutting-edge directions in science and technology** to disrupt a field and a market or create new opportunities **by realising innovative technological solutions** grounded in high-risk/high-gain research and development.

EIC Pathfinder funding schemes	European Innovation Council (EIC) aims to identify and support breakthrough technologies and game changing innovations to create new markets and scale up internationally
EIC Pathfinder <b>Open</b>	bottom-up approach with no predefined topic
EIC Pathfinder <b>Challenges</b>	top-down challenge-driven calls for tackling specific technology breakthroughs by portfolios of projects

*Courtesy of Gaëlle DECROIX*

### • Proposal – For Discussion

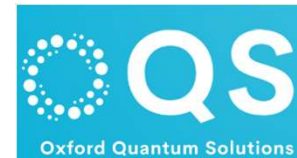
- Develop an Applied Superconductivity Challenge for 2023-2024 (**~150-200 M Euro**)
- Need a **Strategic Road map for Superconductivity**
  - Now local roadmaps with no strategic Roadmap linking various interests/topics
- Need FuSuMaTech to work with ESAS and CONECTUS
  - FuSUMaTech only body linking Research and academia with Industrial partners
- **Propose to have a Subcommittee from FuSuMaTech and representative from ESAS and CONECTUS (plus other bodies TBC) to develop an EIC Pathfinder Challenge**
- **Need to engage with EU on requirements for a SC challenge**

# Funding – Route 3 (Long term funding ~ 10 Year Initiative) **not today**

## Applied Superconductivity “Flagship”



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### • Route 3 – For Discussion

- Superconductivity “Flagship”
  - Equivalent to GRAPHENE Flagship, Quantum Flagship,
  - Need to engage with EU in the near term
  - Funding ~ **1 Billion Euro**
- ESA submitted a Flagship proposal (2017?)
  - PV has more details

### • Proposal – For Discussion

- Develop a Superconductivity Flagship from 2023 or 2025 ?
- Need a **Strategic Roadmap for Superconductivity**
- Need FuSuMaTech to work with ESAS and CONECTUS
- **Propose to have a Subcommittee from FuSuMaTech and representative from ESAS and CONECTUS (plus other bodies TBC) to develop a Flagship proposal**

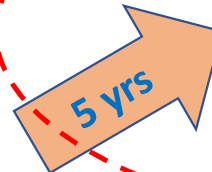
FET Flagships	Future Emerging Technologies (FET) programme
<ul style="list-style-type: none"> <li>• FET invests in transformative frontier research and innovation with a high potential impact on technology,</li> <li>• FET Flagships can only be realised through a long-term and sustained effort at European level by:</li> </ul>	Benefit EU economy & society. <ul style="list-style-type: none"> <li>• building on large scale research cooperation across academia, industry &amp; national research programmes</li> <li>• Mobilising Europe's best researchers around an <b>ambitious R&amp;D roadmap.</b></li> </ul>
The FET Flagships run typically for a period of <b>10 years</b>	<ul style="list-style-type: none"> <li>• Mobilise hundreds of researchers across Europe with an overall support of around <b>EUR 1 billion.</b></li> </ul>
Graphene/Brain/Quantum	

### Both; Route 1 (SC Challenge) and Route 2 (SC flagship) will require

- A Strategic Roadmap for SC
- Dedicated effort from the SC community to develop the roadmap
- Clear objective and targets to exploit the potential from SC on various sectors

# Summary

- Need a **Strategic Road map for Superconductivity**
- Need FuSuMaTech to work with ESAS and CONECTUS and others including end-users and Gov funding agencies and Private funders
- Need to engage with EU on requirements for a SC challenge and **EIC SC Challenge FET SC Flagship**
- Propose to have a Subcommittee from FuSuMaTech and representative from ESAS and CONECTUS (*plus other bodies TBC*) to develop Routes for Partnerships and Funding



## Funding Route 2 – For Discussion

### Proposal – For Development

- Develop an Applied Superconductivity EIC Challenge for 2023-2024
- **(~150-200 M Euro)**



## Funding Route 3 – For Discussion

### Proposal – For Discussion

- Develop a proposal for a Superconductivity Flagship from 2023 or 2025 ?
- **~ 1 Billion Euro**

# EIC Pathfinder Potential Deadline for 2022



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## • **Potential Deadline**

### • **EIC Pathfinder**

- Open 2/03/2022
- Challenge : 26/10/2022

### • **EIC Transition** (cut-off dates)

- Open : 6/04/2022 – 15/06/2022, 5/10/2022
- Challenge : 6/04/2022 – 15/06/2022, 5/10/2022

•

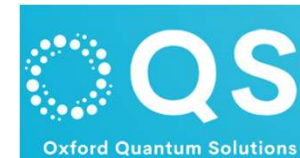
## • **Potential EIC Pathfinder Challenge**

- Carbon and Nitrogen management valorisation
- Mid to long term and systems integrated energy storage
- Cardio genomics
- Towards the Healthcare Continuum: technologies to support a radical shift from episodic to continuous healthcare
- Regenerative medicine and tissue engineering
- DNA-based digital data storage
- Alternative approaches to Quantum Information Processing and Communication

# EIC Pathfinder dates for 2022



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## • Potential EIC Transition Challenge

- Green digital devices for the future
- Process and system integration of clean energy technologies
- RNA-based therapies and diagnostics for complex, rare and severe genetic diseases

## • Research infrastructure concept development : if pertinent ?

- <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-infra-2022-dev-01-01>
  - Planned opening date : 19 January 2022
  - Deadline date : 20 April 2022 17:00:00 Brussels time

## • R&D for the next generation of scientific instrumentation, tools and methods

- <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-infra-2022-tech-01-01>
  - Planned opening date : 19 January 2022
  - Deadline date : 20 April 2022 17:00:00 Brussels time
- Consortia must be built around a leading core of at least 3 world-class research infrastructures, being ESFRI infrastructures, European Research Infrastructures Consortia (ERICs) and/or other world-class research infrastructures of European interest[1] and can include a wider set of RIs. Other technological partners, including industry and SMEs, should also be involved, thus promoting innovation and knowledge sharing through co-development of new technical solutions for research infrastructures.
  - ESFRI : <https://www.esfri.eu/>





## Potential new consortia within FuSuMaTech

- |  |                |               |
|--|----------------|---------------|
| • A. Superconducting magnet for the proton therapy- PSI proposal             | Ciro Calzolaio | 14:35 - 15:0  |
| • B. Advanced superconductive magnet designs for clinical MRI                | Denis Le Bihan | 15:15 - 15:45 |
| • C. Materials database and characterisation platform and testing facilities | Simon Canfer   | 15:45 - 16:15 |



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# Strategic Roadmap



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# Strategic Roadmap

## Status of Route 2 – Towards a Superconductivity challenge



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- Establish a subcommittee from FuSuMaTech to develop EIC challenges to include in a proposal to be submitted to as an EIC Strategic Challenge using Superconducting Technologies
  - If you are interested in being part of the subcommittee for the EIC challenge send in the chat your name and affiliation (Silvia and Sylvain will compile the list)
- For the EIC challenge, need to develop a Strategic Roadmap for Superconducting applications in Europe
  - Establish a sub-committee from
    - FuSuMaTech
    - ESAS
    - Conectus
    - IEEE-CSC (Europe) (PV)
  - ESAS and CONECTUS will provide a shortlist for the subcommittee by 15<sup>th</sup> Jan 2022
    - If you are interested in being part of the subcommittee for the strategic roadmap please send in the chat your name and affiliation (Silvia and Sylvain will compile the list)
  - PV and ZM will contact the EIC Officer in the New year to start planning for the proposal

# Consortia summary



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- A. Superconducting magnet for the proton therapy- PSI proposal
- Coordinator: Stephane Sanfilippo and Ciro Calzolaio - PSI
  1. Sigmaphi, F. Forest, is happy to be part of the consortium (design, construction)
  2. KIT, KP Weiss, is interested and will forward this information to his colleague Bernhard Holzapfel
  3. Uni of Bologna, M. Breschi, is potentially interested (feasibility and design)
  4. M&I Materials, D. Coll, could contribute for quench protection on a possible CCT magnet design and could guard against the fast ramp issue.
  5. Epoch Wire, S. Adamart, potentially interested
  6. Bilfinger, M. Gehring, potentially interested and will check internally
  7. ENEA, A. Della Corte, is interested in joining as ICAS
  8. Elytt, A. Garcia, potentially interested
  9. Bruker EAS, A. Aubele, interested as a supplier and help with the feasibility part
  10. Tesla, Ben Leigh, potentially interested as a supplier
  11. Oxford Quantum Solutions, Ziad Melhem
- Dates
  - Membership interest 14<sup>th</sup> Jan 2022
    - Any clarifications from the coordinator
    - Confirm membership interest to Coordinator, Sylvain Roux and Ziad Melhem
      - Emails: stephane.sanfilippo@psi.ch; ROUX Sylvain <s.roux@cea.fr>; Ziad Melhem <ziad.melhem@oxqsol.com>
  - First consortium meeting by 4<sup>th</sup> Feb 2022

## Consortia summary



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- B. Advanced superconductive magnet designs for clinical MRI
- Coordinator Denis Le Bihan, CEA
  - Tesla, Ben Leigh, depending on which of the 3 proposal is chosen, interested as a supplier
  - Bilfinger, M. Gehringer, potential consortium member
  - Uni Bologna, M. Breschi, has colleagues within the university, who could be involved in discussions.
  - Epoch Wires, S. Adamart, if option with low costs, he is interested in joining.
  - Oxford Quantum Solutions, Ziad Melhem
- Dates
  - **Membership interest 14<sup>th</sup> Jan 2022**
    - Any clarifications from the coordinator
    - Confirm membership interest to Coordinator, Sylvain Roux and Ziad Melhem
      - Emails : Denis Le Bihan <denis.lebihan@gmail.com>; ROUX Sylvain <s.roux@cea.fr>; Ziad Melhem <ziad.melhem@oxqsol.com>
  - **First consortium meeting by 4<sup>th</sup> Feb 2022**

# Consortia summary

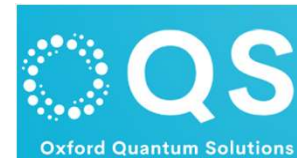


- C. Materials database and characterisation platform and testing facilities
- Coordinator Simon Canfer, STFC
  1. LUT, Bernardo Barbiellini
  2. Dassault, Chris Riley
  3. KIT, Klaus-Peter Weiss
  4. Oxford Quantum Solutions, Ziad Melhem
- Dates
  - Membership interest 14<sup>th</sup> Jan 2022
    - Any clarifications from the coordinator
    - Confirm membership interest to Coordinator, Sylvain Roux and Ziad Melhem
      - Emails : CANFER Simon [simon.canfer@stfc.ac.uk](mailto:simon.canfer@stfc.ac.uk); ROUX Sylvain <s.roux@cea.fr>; Ziad Melhem <ziad.melhem@oxqsol.com>
  - First consortium meeting by 4<sup>th</sup> Feb 2022

# Closing remarks



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- Priorities
  - Develop consortia and apply for funding
    - Within 2022
    - Subcommittee from FuSuMaTech to shortlist challenges
      - [Nomination/volunteers 14<sup>th</sup> Jan 2022](#)
      - [Subcommittee first meeting by 4<sup>th</sup> Feb 2022](#)
  - Strategic RoadMap for Eu Superconducting Technologies
    - Develop a proposal for an EIC SC Challenge to submit if possible by April 2022
    - In partnership with ESAS, CONECTUS, IEEE-CSC, IOP – Superconductivity Group,
      - [Nomination/volunteers 14<sup>th</sup> Jan 2022](#)
      - [Subcommittee first meeting by 4<sup>th</sup> Feb 2022](#)
- Proposed Future FuSuMaTech meetings - 2022
  - 3 months meeting – Virtual – 2 hours
    - [April 2022 \(date TBC\)](#)
    - [Dec 2022 \(date TBC\)](#)
  - 6 months meeting – Virtual – 4 hours
    - [Date TBC Oct 2022](#)
  - Annual meeting – In person (If possible) 1 day meeting
    - [Next one at CEA Saclay – TBC Jun 2022 ?](#)

## Priorities for 2022 are for

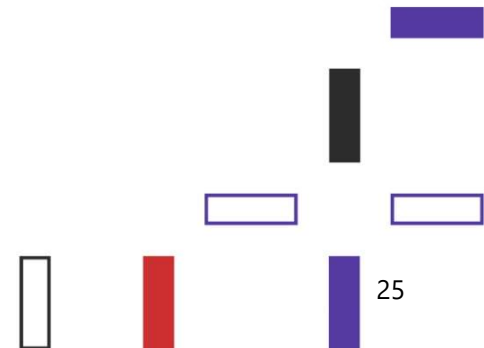
1. Consortia setup and applications submissions
2. Develop Strategic EU Roadmap for SC (*is March 2022 feasible?*)
3. First attempt on a strategic SC Challenge (*is April 2022 Feasible?*)





## Introduction to EIC Pathfinder

- Slides courtesy of Gaëlle Decroix, CEA who can't join us today





# European Innovation Council main instruments

## Pathfinder

- **Early stage research** on breakthrough technologies
- Grants up to €3/4 million
- Successor of FET (Open & Proactive)

## Transition

- **Technology maturation** from proof of concept to validation
- **Business & market readiness**
- Grants up to €2.5 million

## Accelerator

- **Development & scale up** of deep-tech/ disruptive innovations by startups/ SMEs
- Blended finance (grants up to €2.5 million; equity investment up to €15 million)
- Successor of SME instrument

- Mission to **identify, develop and deploy high risk innovations** of all kinds
  - Focus on **breakthrough, market-creating, deep-tech**
- 1. Steered by EIC Board** of leading innovators (entrepreneurs, investors, researchers, ecosystem)
  - 2. Business Acceleration Services** (coaches/ mentors, corporates, investors, ecosystem)
  - 3. Pro-active management** (roadmaps, reviews, re-orientations, etc) with EIC Programme Managers
  - 4. Follow up funding for results from Horizon** (ERC, EIT, collaborative) & national programmes





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What is the EIC Pathfinder?

The EIC Pathfinder programme funds **research to develop the scientific basis** to underpin **breakthrough technologies.**

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## EIC Pathfinder funding schemes

- **EIC Pathfinder Open**



bottom-up approach with no predefined topics

- **EIC Pathfinder Challenges**



top-down challenge-driven calls for tackling specific technology breakthroughs by portfolios of projects

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# EIC Pathfinder Open



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## Why should you apply?

You apply for an EIC Pathfinder Open grant:

- for support to realise **an ambitious vision for radically new technology**, with **potential to create new markets** and/or to **address global challenges**.
  - for **early stage development** of such future technologies (e.g. various activities at low Technology Readiness Levels 1-4),
  - to provide the **foundations of the technology** you are envisioning.
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## EIC Pathfinder Open : Gatekeepers

Collaborative, interdisciplinary research, meeting the following Gatekeepers:

- **convincing, long-term vision of a radically new technology** that has the potential to have a transformative positive effect to our economy and society;
  - **concrete, novel and ambitious science-towards-technology breakthrough**, providing advancement towards the envisioned technology;
  - **high-risk & high-gain research approach & methodology**, with concrete and plausible objectives.
-

# Expected outcomes of EIC Pathfinder Open project



- the expected outcome of a EIC Pathfinder project is the **proof of principle** that the **main ideas of the envisioned future technology are feasible**, thus validating its scientific and technological basis;
- projects are expected to take the necessary measures to **allow future uptake to take place**, for instance through an **adequate formal protection of the generated Intellectual Property (IP)**;
- projects are encouraged to involve and empower in their teams **key actors** that have the potential to **become future leaders** in their field such as excellent early-career researchers or promising high-tech SMEs, including start-ups.

All the above will **strengthen Europe's capacity for exploiting the scientific discoveries made in Europe** throughout the steps to market success or for solving global challenges.





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# EIC Pathfinder Challenges



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# EIC Pathfinder Challenges

**EIC Pathfinder Challenges** aim to **build on new, cutting-edge directions in science and technology** to disrupt a field and a market or create new opportunities **by realising innovative technological solutions** grounded in high-risk/high-gain research and development.

Top-down, based on given vision for each Challenge

Indicative: TRL 2-4.

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# Pathfinder Challenges for 2021

## Pathfinder Challenges

1. Awareness inside
2. Tools to measure & stimulate activity in brain tissue
3. Emerging Technologies in Cell & Gene Therapy
4. Novel routes to green hydrogen production
5. Engineered living materials

Call opening:  
**15 June 2021**

Deadline:  
**27 October 2021 at 17.00.00 CET**



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# Portfolio approach

Challenge portfolio approach:

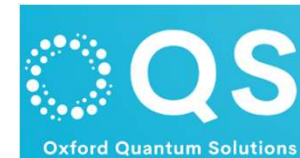
- a coherent set of projects exploring different perspectives, competing approaches or complementary aspects of the Challenge;
- multidisciplinary interactions and exchanges for synergies and serendipity;
- contributing to an overarching medium to long-term business goal and technology-based strategic plan, under the supervision of an **EIC Programme Manager**.

Projects will participate in relevant portfolio activities.

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# Calls 2021 – Summary table for all funding opportunities

	Pathfinder Open	Pathfinder Challenges	Ad hoc grant
<b>Total budget</b>	€168 million	€132 million	Max. 1% of Pathfinder call budget
<b>Proposals (indicative)</b>	Up to €3 Mio	Up to €4 million	Up to €50000
<b>Funding rate</b>	100% of eligible costs	100% of eligible costs	100% of eligible costs
<b>Opening</b>	9 April 2021	15 June 2021	-
<b>Deadline</b>	19 May 2021 at 17:00 CET	27 October 2021 at 17.00 CET	Not applicable
<b>Length of proposal</b>	17-page proposal – Section 1 to 3	25-page proposal	Not applicable
<b>Applicants</b>	<p>Consortia: Min. 3 partners from 3 different MS/AC (of which at least 1 partner in a MS)</p> <p>Legal entities: all types are eligible</p>	<p>1. Single legal entities in a MS/AC (conditions apply)</p> <p>2. Consortia: - If 2 partners: from different MS/AC, otherwise - Min. 3 partners from 3 different MS/AC (of which at least 1 partner in a MS) (unless differently stated in the Challenge chapter)</p>	No specific requirement: either an individual grant holder or a group of grant holders.



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# Support slides

# Strategic EIC Pathfinder Challenges

available for specific challenges that are typically steered by an [EIC Programme Manager](#). In 2021 these Challenges are:



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## **Challenge: Awareness inside**

For projects to: to develop new concepts of awareness that are applicable to systems other than human; to demonstrate and validate the role and added-value of such an awareness in an aware technology, class of artefacts or services; and to define an integrative approach for awareness engineering, its technological toolbox, the needs and implications and its limits, including ethical and regulatory requirements.

## **Challenge: Tools to measure & stimulate activity in brain tissue**

For projects to develop novel neurotechnologies to diagnose or treat brain, spinal cord or peripheral nerve-related disorders and which can be rapidly accepted by clinicians and patients.

## **Challenge: Emerging technologies in cell & gene therapy**

For breakthrough projects that propose novel concept-based technological solutions or technological platforms far beyond the current state-of-the-art with aim to tackling current bottlenecks from discovery to the manufacturing step towards clinical grade and thus, reinforce critical components of the European cell and gene therapy innovation-driven community.

## **Challenge: Novel routes to green hydrogen production**

For projects to develop novel processes and technologies to produce Green H<sub>2</sub>, at different scales (from small to large) and with higher flexibility, entirely based on renewable sources and on the use of toxic free, non-critical raw materials.

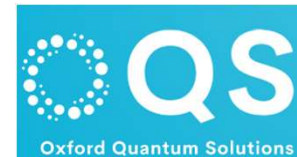
## **Challenge: Engineered living material**

For projects to develop new technologies and platforms for the controlled and made-on-demand production of engineered living materials with multiple functionalities, shapes and scales.

# EIC pathfinder calls in 2021



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	Who can apply	What for	Open calls (Section II)		Challenge driven calls (Section III)		
			Call deadline(s)	Indicative Budget (EUR million)	Challenges	Call deadline(s)	Indicative Budget(EUR million)
<b>EIC Pathfinder</b>	Consortia of at least three different independent legal entities (e.g. research organisations, universities, SMEs, industry) established in at least 3 different eligible countries. Single applicants or small consortia (two partners) may be able to apply for Pathfinder Challenges according to the call specifications.	Grants of up to EUR 3 million (open) or EUR 4 million (challenge driven) (or more if properly justified) to achieve the proof of principle and validate the scientific basis of breakthrough technology (TRL 1-4)	19 May 2021	168.00	<ol style="list-style-type: none"> <li>1. Awareness inside</li> <li>2. Tools to measure &amp; stimulate activity in brain tissue</li> <li>3. Emerging Technologies in Cell &amp; Gene Therapy</li> <li>4. Novel routes to green hydrogen production</li> <li>5. Engineered living materials</li> </ol>	27 October 2021	132.00
<b>EIC Transition</b>	Single applicants (SMEs, spin-offs, start-ups, research organisations, universities) or small consortia (two to 5 partners). Applications must build on results from eligible Pathfinder, FET or ERC Proof of Concept projects	Grants of up to EUR 2.5 million (or more if properly justified) to validate and demonstrate technology in application-relevant environment (TRL 4 to 5/6) and develop market readiness	22 September 2021	59.60	<ol style="list-style-type: none"> <li>1. Medical devices</li> <li>2. Energy harvesting and storage technologies</li> </ol>	22 September 2021	40.50
<b>EIC Accelerator</b>	Single Start-ups and SMEs (including spin-outs), individuals (intending to launch a start-up/SME) and in exceptional cases small mid-caps (fewer than 500 employees)	Blended finance: up to EUR 2.5 million grant component for technology development and validation (TRL 5/6 to 8); EUR 0.5 - 15 million investment component for scaling up and other activities. Grant only/grant first under certain conditions. Investment component only for small mid-caps or as follow up to grant only (i.e. for SMEs, including start-ups)	Any time (short applications) Full applications by 9 June 2021 and 6 October 2021	592.50	<ol style="list-style-type: none"> <li>1. Strategic Health and Digital Technologies</li> <li>2. Green Deal innovations for the economic recovery</li> </ol>	Any time (short applications) Full applications by 9 June 2021 and 6 October 2021	495.10