

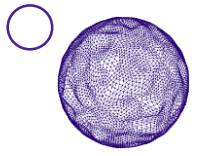
Bringing European Science Closer to Market - ATTRACT

John Wood

Chair, ATTRACT Project Advisory Committee(PAC)

CERN-Visit
January 31, 2023



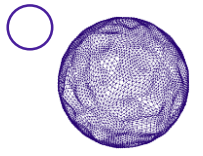


Why ATTRACT?

We believe that the potential of European Research Infrastructures as Innovation Engines is not yet fully exploited.

- The European Commission defines Research Infrastructures (RI) as facilities providing resources and services for research communities to conduct research **and foster innovation***.
- But is this really the case? Could pushing the limits of Fundamental Science, which is the mission of RIs, *in some new way* translate research faster and in a more streamlined fashion into industrial applications, new business and social wealth?
- The ATTRACT initiative was created in 2018 to address the above question, in a dialogue with the EC.
- It became apparent that this new approach would need to deviate from the traditional role of considering RI as access facilities for industry.
- Moreover, the communities behind RIs would also need to tap into industrial know-how in a better way (e.g. advanced and high scale manufacturing capacity) for pushing their own research-driven mission.

* https://ec.europa.eu/info/research-and-innovation/strategy/european-research-infrastructures_en



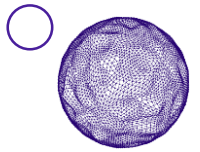
Basic Philosophy of ATTRACT:

To create a novel Ecosystem focusing on breakthrough detection and imaging (D&I) technologies in Europe.

The dialogue between the ATTRACT Consortium and the EC, as well with several influential thinkers, led to the following key insights*:

1. A new action framework beyond the existing RI-industry frameworks and practices was needed for enabling the opportunities identified in the paradigm of “Open Science, Open Innovation, Open to the World”, to harness *both* value creation and value capturing, and *share* it
 - see Henry W. Chesbrough and Melissa M. Appleyard, Open Innovation and Strategy, California Management Review Vol. 50, No. 1, 2007.
2. Focus on bottom-up, low TRL initiatives in D&I with industry (SME)-RI co-innovation potential innovation (but do not assume all scientists wish to turn into entrepreneurs themselves). But the (young) entrepreneurs should be on board!
3. Aim at a *sustainable* cycle, in phases (cascade funding approach). Try to engage private investors ...
4. Create a framework that can be dynamically tested by generating, gathering and analyzing related data. This is needed to validate the concept and see whether it can be significantly scaled-up, also outside D&I.

• Many of them have been reflected in the EC policy paper, *Sustainable Research Infrastructures*,
https://ec.europa.eu/info/sites/default/files/research_and_innovation/research_by_area/documents/swd-infrastructures_323-2017.pdf

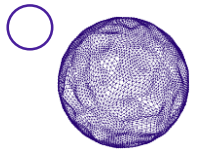


ATTRACT: Why Detection and Imaging (D&I)?

What in the picture has nothing to do with D&I?

- The scientific mission of European RIs as well as their R&D associated communities is strongly coupled with detection and imaging technology instrumentation (including computing).
- Detection and Imaging technologies are and will be at the core of future industrial developments applications and business (e.g. IoT, Smart Cities, Autonomous Transport, Sustainable Agriculture, etc).

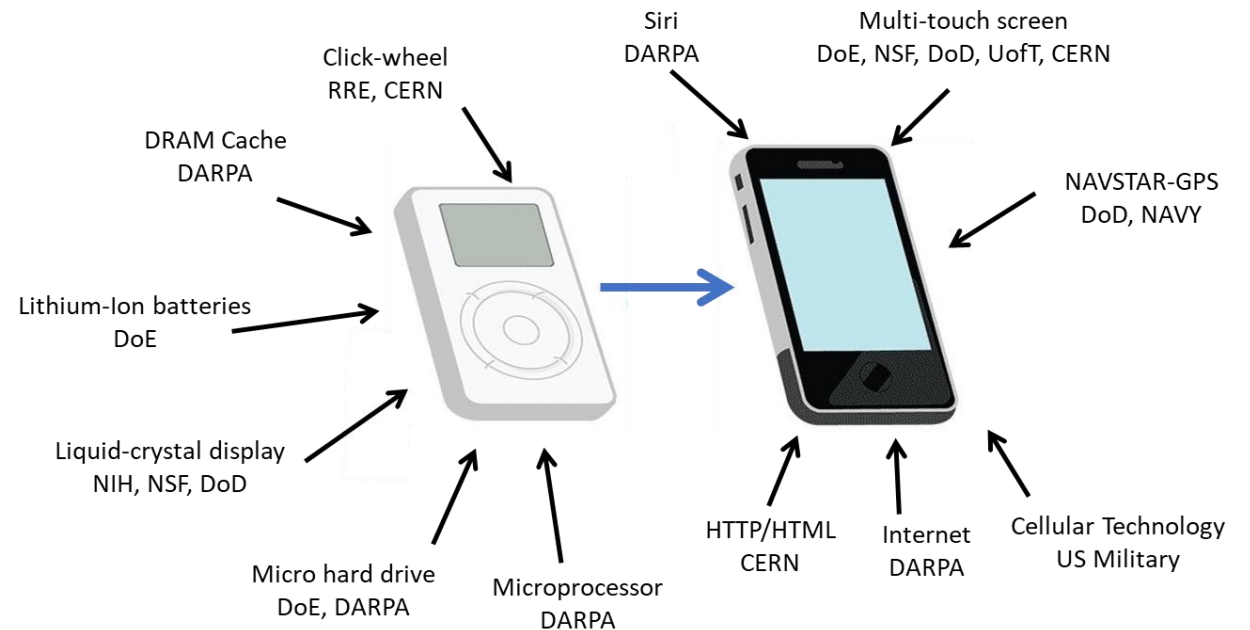




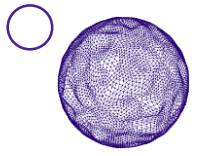
ATTRACT: Key pillars (1)

“So where does breakthrough Innovation come from?”

Public Funding: Key for helping nascent breakthrough technologies, many of them even at the conceptual level, mature for raising the interest of private capital .



DARPA: Defense Advance Research Project Agency
 RRE: Royal Radar Establishment
 CERN: European Organization for Nuclear Research
 DoE: Department of Energy
 NIH: National Institute of Health
 NSF: National Science Foundation
 DoD: Department of Defence
 UofT: University of Toronto



ATTRACT: Key pillars (2)

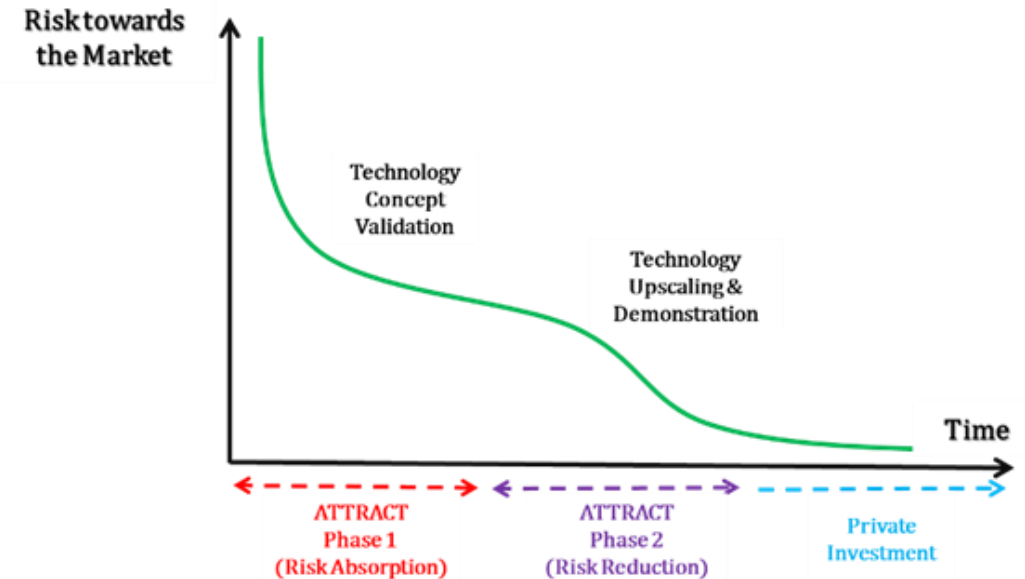
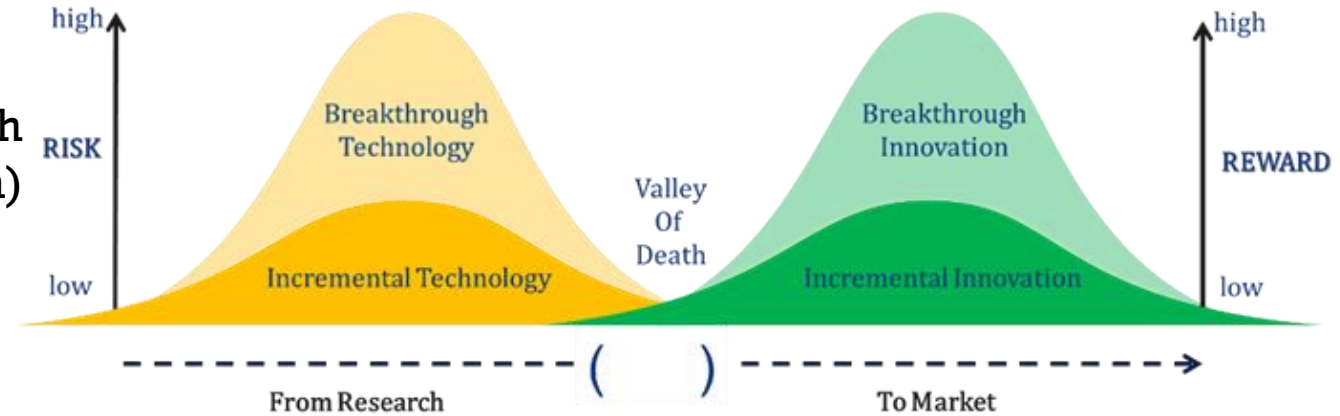
“Not two Valleys of Death look the same”

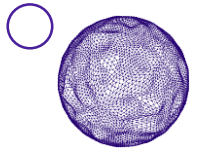
Phased approach to funding: Breakthrough Technologies (coming from Fundamental Research) are very risky for private capital.

De-risking them needs public funding:

First, a **risk-absorption stage**, where ideas and concepts could reach a prototype level and technology concept validation (Phase-1).

Second, a **risk-mitigation stage**, where the most promising concepts are further helped raising towards a pre-market product (Phase-2).



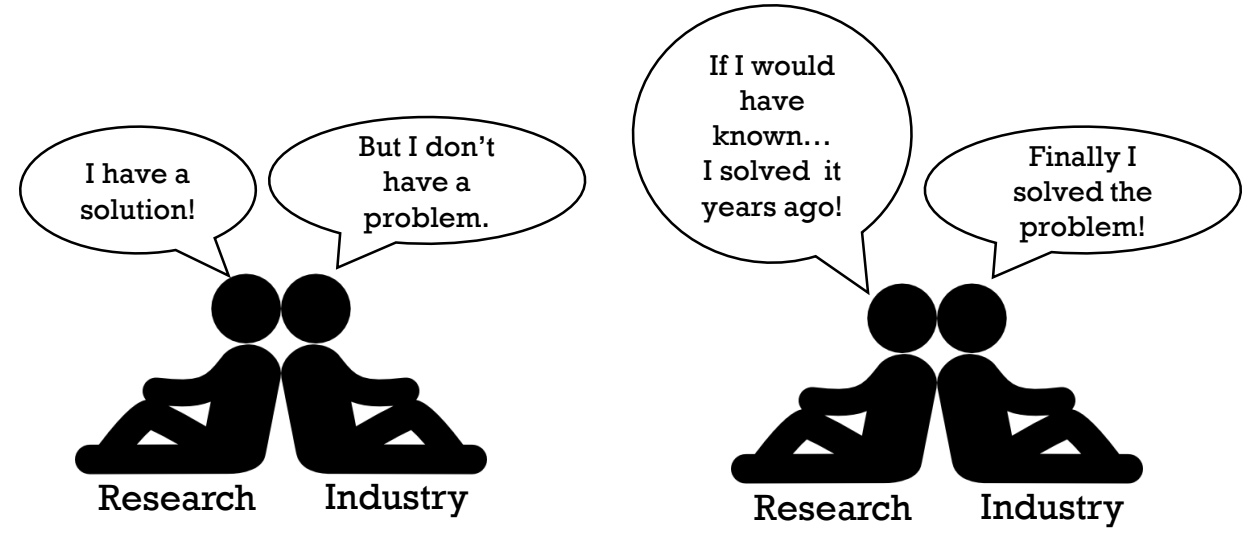


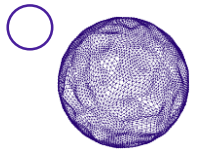
ATTRACT: Key pillars (3)

“Trust and shared know-how is not built in one day”

Co-Innovation:

- Bridge between two communities (research and industry) that in principle have different motivations and goals for undertaking R&D&I (capital and/or resource intensive) efforts .
- Entails the identification and collaboratively pursuing of win-win outcomes, starting already at the conceptual stages of a technology development and enduring them until the later stages of the innovation value chain (e.g. commercialization).
- This model differs from established research-industry customer-supplier relationships.





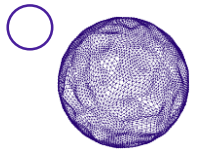
ATTRACT: Key pillars (4)

“Young people want to change the world”

Young Innovators Projects:

- ATTRACT is facilitating the integration of interdisciplinary MSc level students working side by side with professional researchers from academia and industry developing the R&D&I funded projects.
- These Young Innovators' goal is prototyping technology solutions specifically addressing the United Nations Sustainable Development Goals,
- They use a Design Thinking approach inspired by the technology developed by the projects.

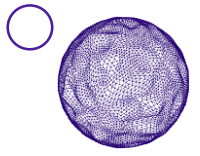




Example of what we wish to see ...

Enabling potential projects where, for example...

-a biologist realizes that her ideas for a new sensor,
-are solving the issues faced by an astrophysicist friend,
-and when both get in contact with a company developing solutions for plastic recycling,
-the three of them think it is worthwhile working together, and even more,
- ... relying on some young folks for prototyping their ideas and get inspired by new ones.



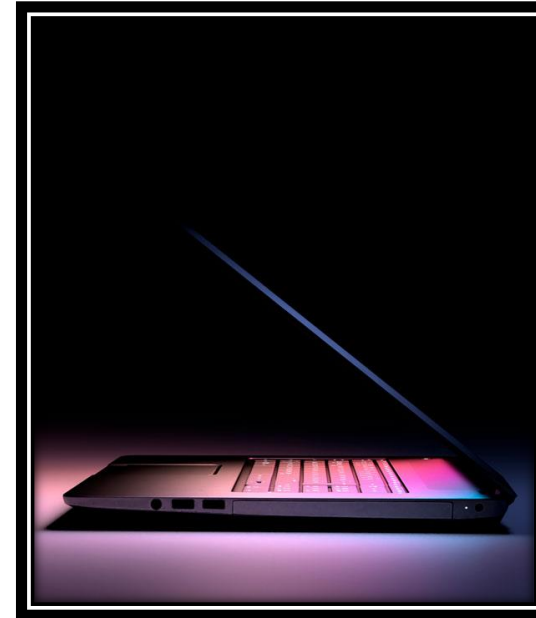
ATTRACT Phase-1: Technology Examples



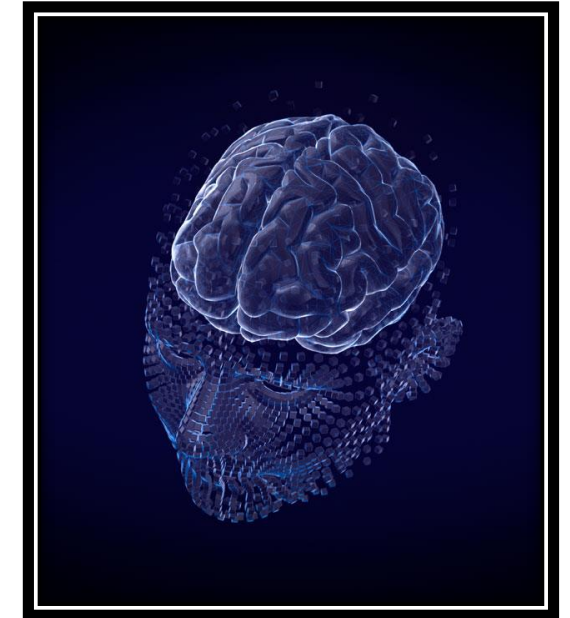
Portable Eco-Batteries



Pollution Detecting Drones



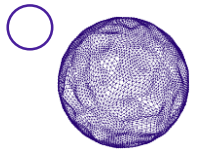
Advanced IoT Technologies



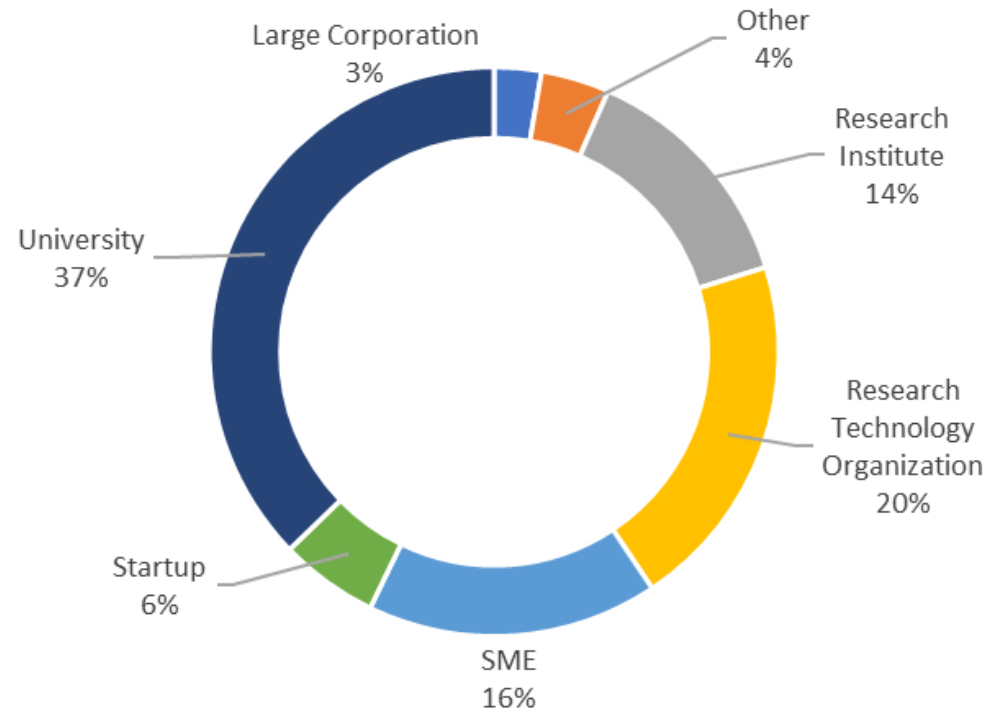
Virtual Reality for Healthcare

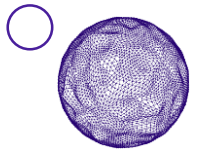
ATTRACT SHOWROOM: 170 examples of breakthrough technologies

<https://phase1.attract-eu.com/showroom/>



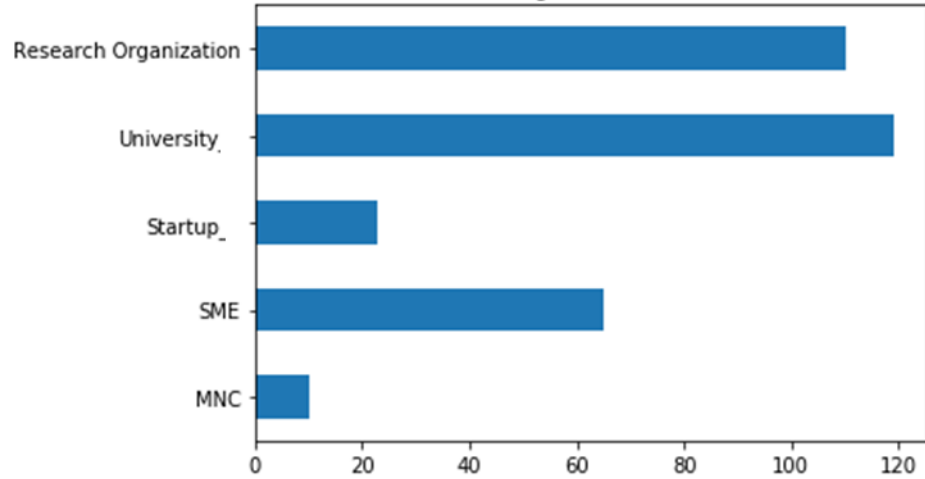
ATTRACT Phase-1: Type of Organizations Involved



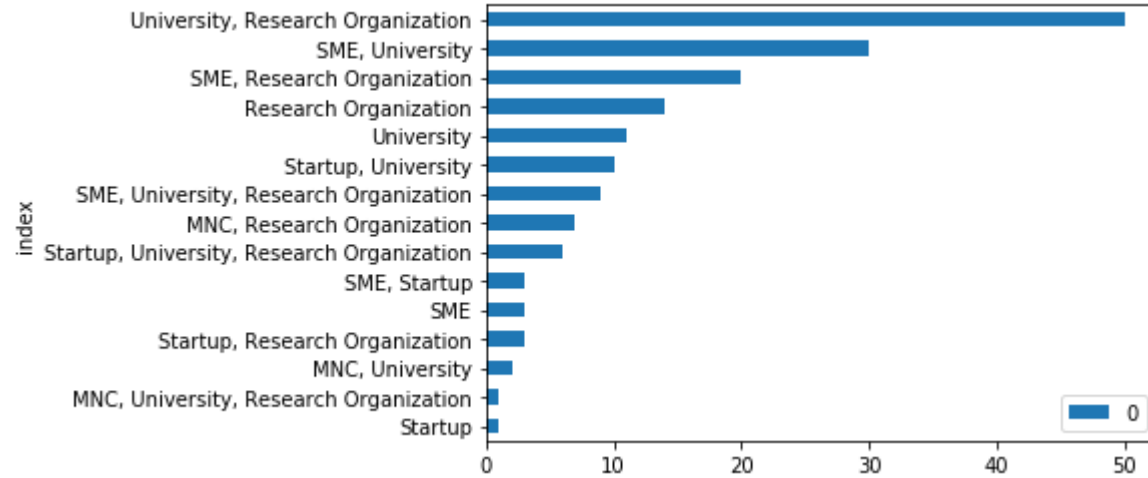


ATTRACT Phase-1: Summary Statistics

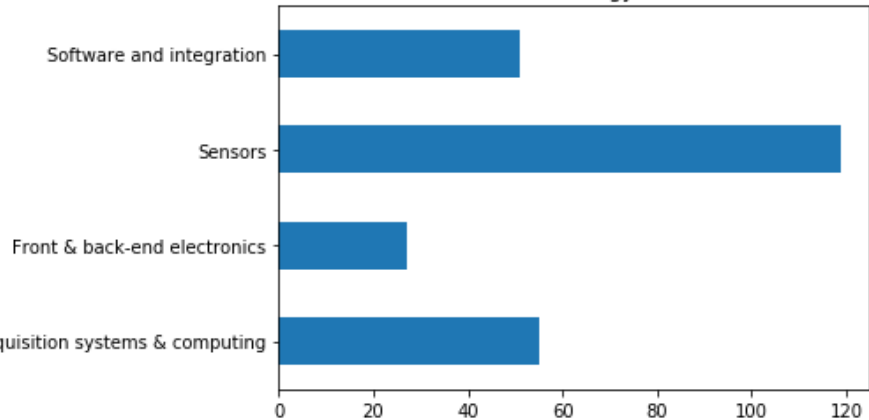
Organizations

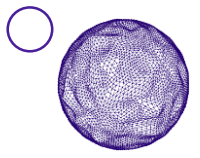


Collaborations



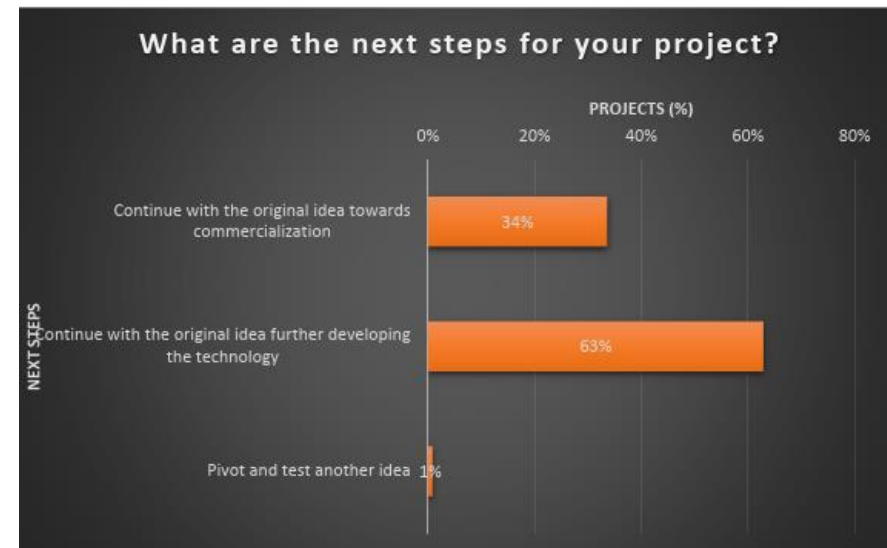
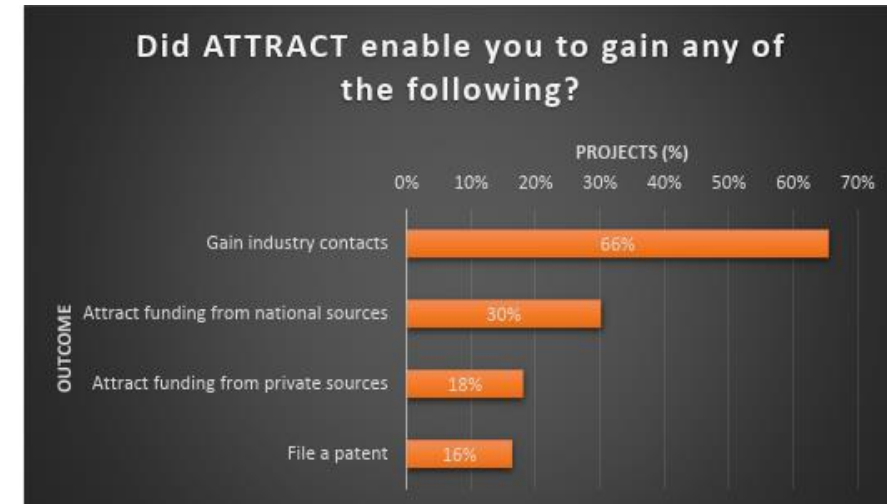
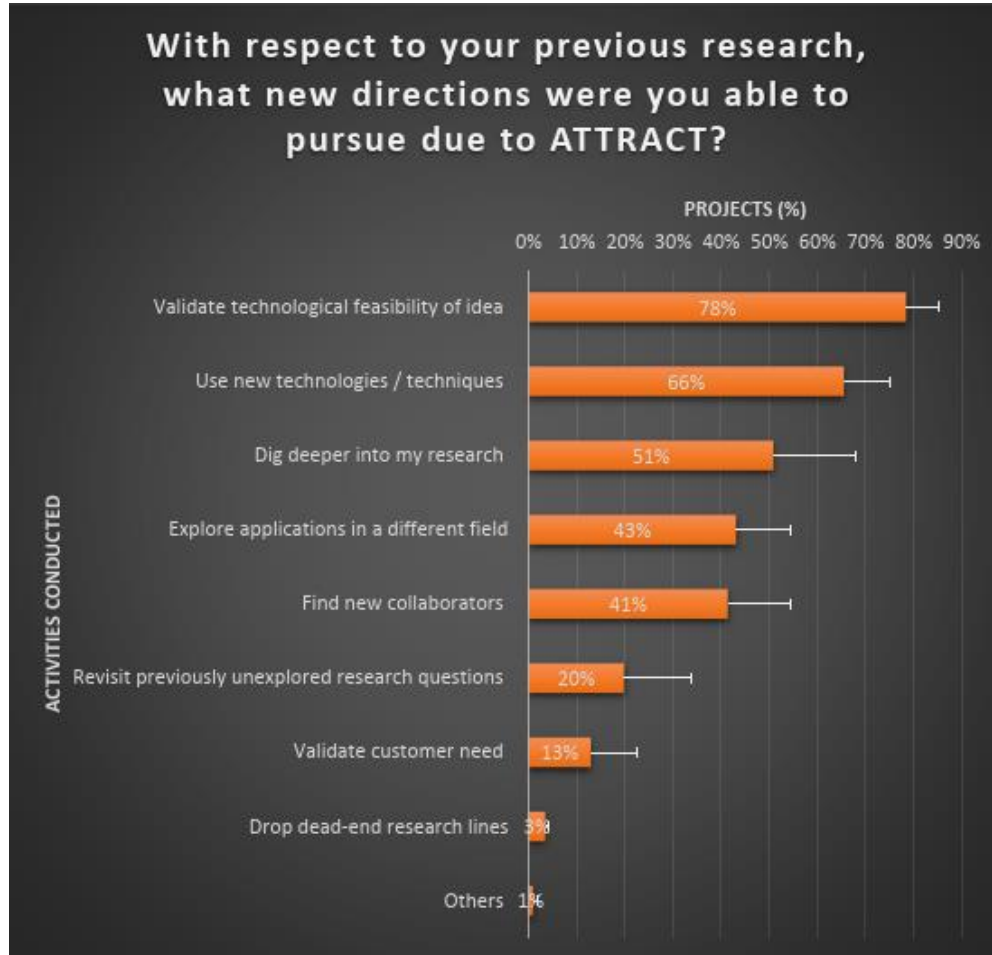
Technology

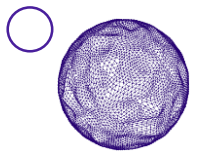




ATTRACT Phase-1: Some figures of merit (1)

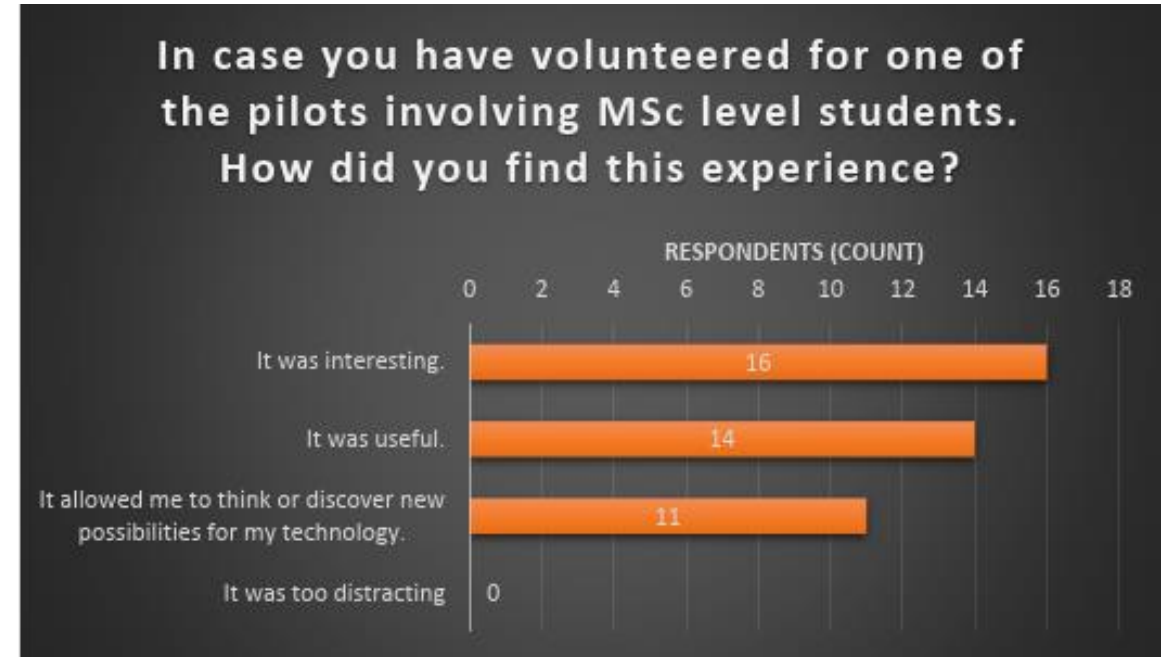
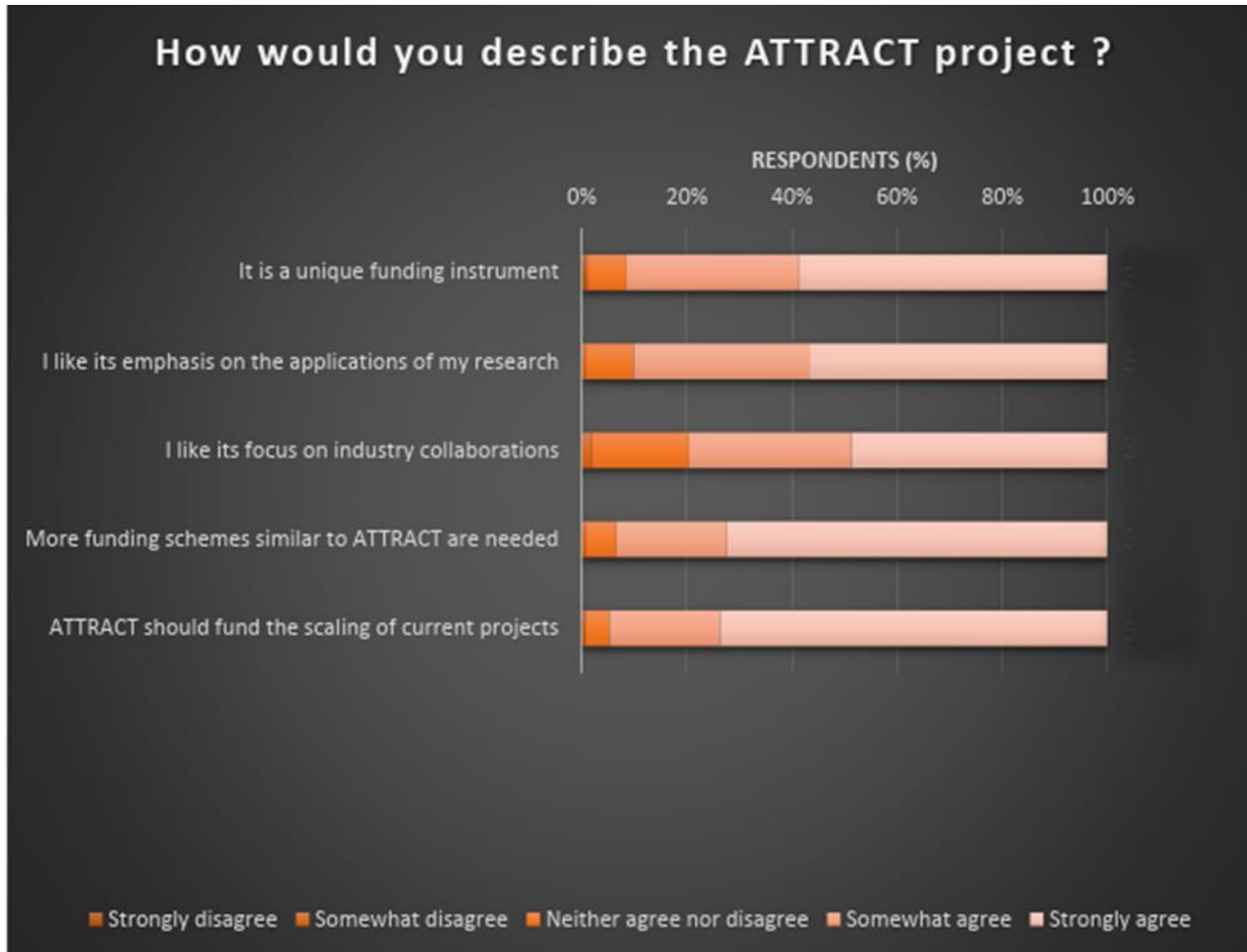
“How are we doing after Phase 1?”

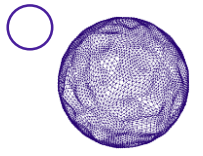




ATTRACT Phase-1: Some figures of merit (2)

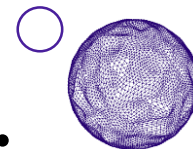
“How are we doing after Phase 1?”





Identified Challenges (so far...)

- Awareness among researchers of the different technologies being developed in the other funded projects
- Disruptive effects of COVID-19 (lack of access to labs, testing of new ideas ...)
- Projects to find and engage with the right (industrial) partners to scale up the TRL
- Provide the right type of (IP) help for the researchers interested in commercializing their ideas
- Engaging the right type of (C) VCs at the right moment (PAC is working on this!!)



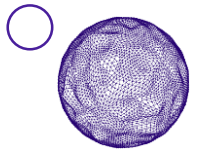
Side Note: ATTRACT Phase-1 and the COVID-19 Pandemic

Funded Project	How the developed technology found new applications to fight COVID-19
FUSCLEAN	Optical technology enabling a fast and contactless analysis of surfaces contaminated by SARS-CoV-2.
SMILE	Disposable device able to stabilise, preserve and prepare saliva samples for COVID-19 detection.
VL4BD and DetectION projects	Covid-19 outbreak tracking and epidemic simulation tools.
H3D-VisionAir	Smart-eye technology offering remote support for doctors and nurses in intensive care units during the Covid-19 crisis
BioPIC	Nanoscopy techniques enabling quick and accurate Covid-19 diagnostics.
TEFPLASNOM	Raman spectroscopy based technology for real-time detection and identification of the SARS-CoV-2 virions.
PHIL	Non-invasively image technology for studying the effects of SARS-CoV-2 on organs in vivo, based on endogenous contrast.

More detailed Information:

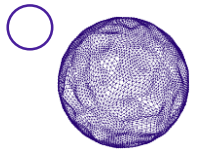
<https://phase1.attract-eu.com/attract-technologies-help-fight-covid-19/>

<https://phase1.attract-eu.com/attract-awardee-launches-new-travel-assistance-website-to-help-fight-covid-19/>

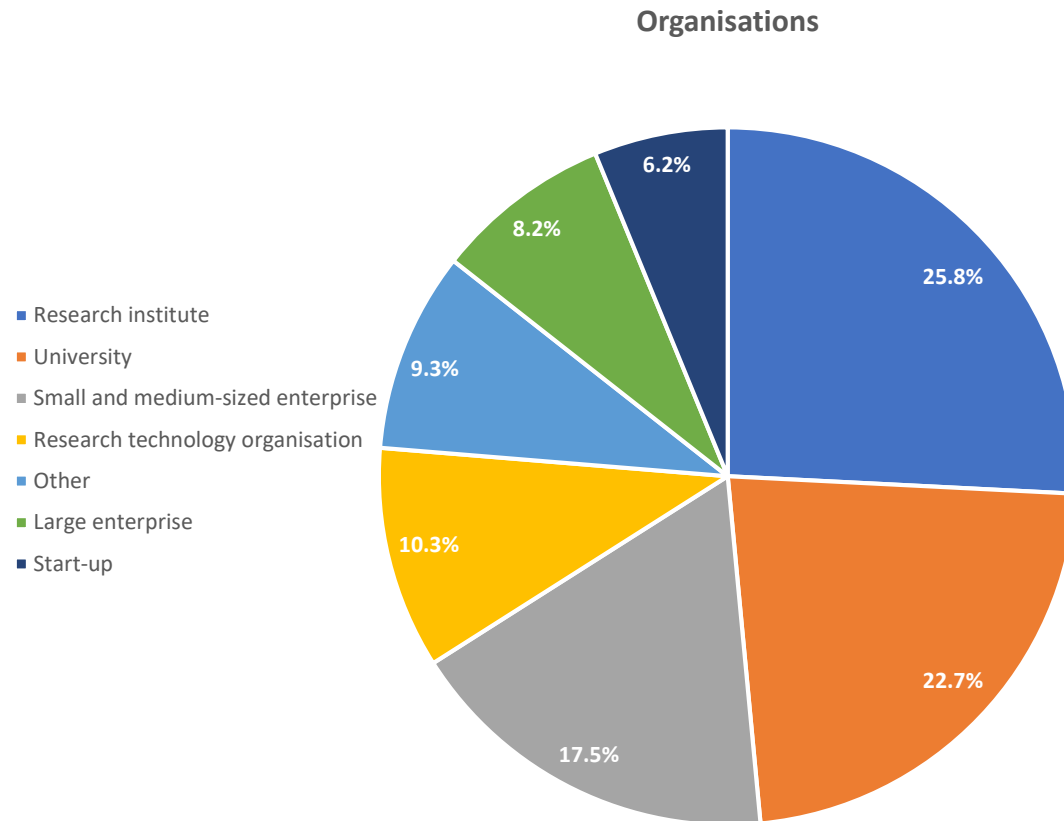


ATTRACT Phase 2 is now in progress

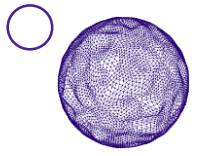
- Three open calls were handled for a total funding of €28 M for funding in accordance with the EC call text:
 - The most promising opportunities arising from ATTRACT Phase 1, for their transition from the lab to the market;
 - Young innovators from universities developing ideas and prototypes for social innovation in collaboration with professional researchers within the ATTRACT ecosystem based on Design Thinking methodologies.
 - Professional scholars undertaking a socio-economic study of the ATTRACT initiative.
- The evaluation process of the calls, by three different and call-related Independent Committees, has concluded and all the projects have started.
- The different Independent Committees have selected for being funded:
 - 18 R&D&I projects.
 - 8 projects contributing to the overall Socioeconomic study of the ATTRACT initiative.
 - 10 projects financing ideas and prototypes of Young Innovators.



Update on ATTRACT Phase 2: Some preliminary statistics (18 R&D&I funded projects)

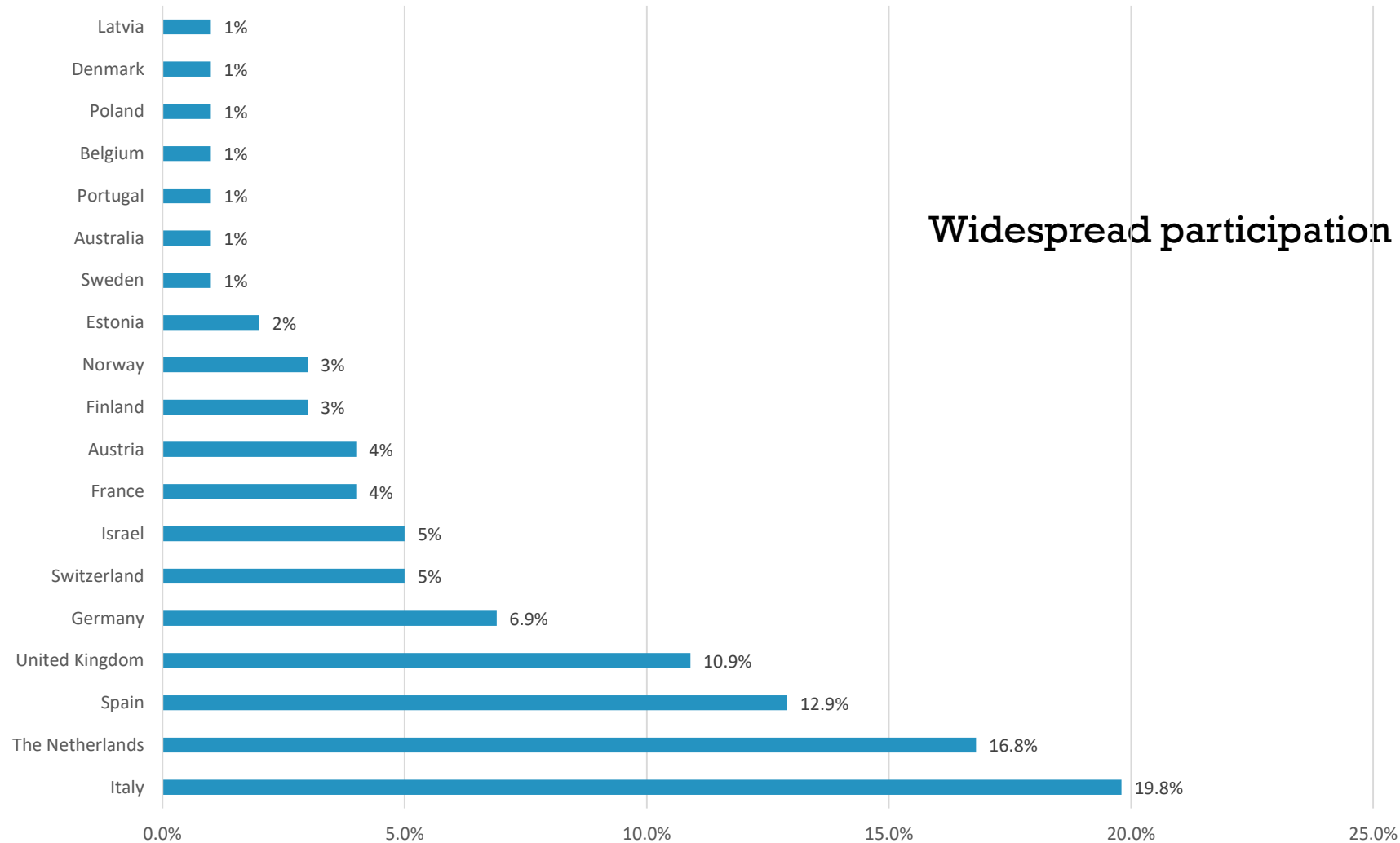


Strong Industrial participation (32%).

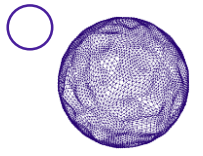


Update on ATTRACT Phase 2: Some preliminary statistics (18 R&D&I funded projects)

Distribution by country

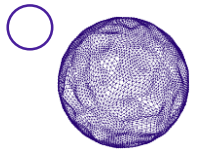


Widespread participation among EU MS and AC



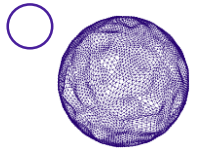
A new round of Phase 1(B): ATTRACT EIC Innovation Ecosystems

- The ATTRACT Consortium responded to the 5M€ call launched by the EIC Innovation Ecosystems: *HORIZON-EIE-2021-SCALEUP-01-02: Scaling up deep tech ecosystems.*
- It was approved by the EC and the Grant Agreement is now for signing.
- This new development of the ATTRACT initiative will specially focus on:
 - Breakthrough technologies from fundamental science applied to Sustainability Challenges, thus in connection with EC's key strategic initiatives such as the Green Deal.



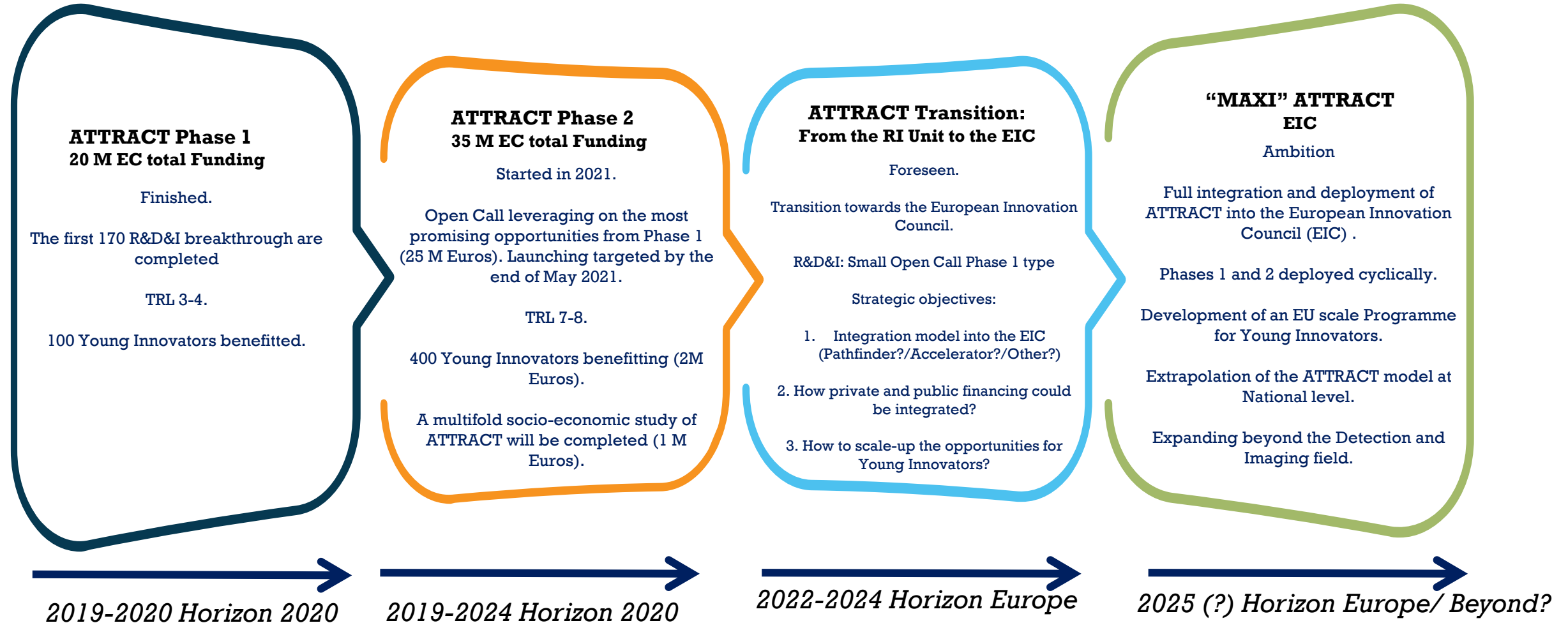
Some reflections

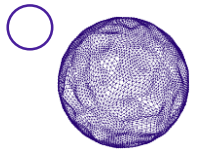
- The ATTRACT initiative is consolidated as a framework for deploying an Innovation Ecosystem in Europe in the field of breakthrough detection and imaging technologies.
- The first quantitative and qualitative evidence indicates that ATTRACT is contributing to accelerate the translation of science-driven technologies to the market.
- The continuous support of the EC, both through the Framework Programmes, but as well with expertise, is key.
- As the EC very well knows, it takes a great effort to build an innovation ecosystem, but very little one to let it die if the nurturing and willingness disappears.



ATTRACT: How we are deploying it? What's next?

“From R&D&I communities to brimming Ecosystems”

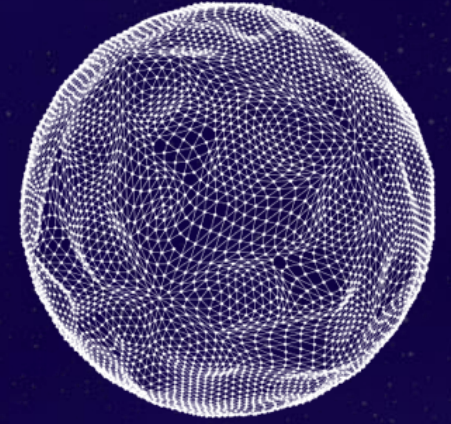




ATTRACT Phases 1 & 2: More Information

<https://attract-eu.com/>

- ATTRACT Phase 1 Facts and Figures: <https://attract-eu.com/facts-and-figures/>
- Phase 1 Funded Projects: <https://phase1.attract-eu.com/showroom/projects/>
- Phase 1 Young Innovators' Projects: <https://phase1.attract-eu.com/showroom/student-projects/>
- Phase 2 Funded R&D&I Projects: <https://attract-eu.com/attract-calls/rdi-projects-thematic-call/>



Thanks!



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