I.FAST Annual meeting
17th April 2024

What is the I.FAST Challenge based innovation?

- During 10 days 4 teams of 6 students try to suggest innovative solutions based on accelerators technologies to address a challenge.
- The challenge takes place at the European Scientific Institute in Archamps near Geneva.
- Participants attend high level seminars from academic and industrial experts.
- On the last day they present their work in person in front of a jury at CERN.
- The target audience is students (and young professionals) sufficiently advanced in their studies but not yet too specialized.
  - Students in their 2nd cycle of studies (typically 3rd to 5th year of University), before the start of doctoral studies.

The I. FAST CBI 2023

- After the success of the 1st edition in 2022, the Challenge 2023 was the second edition.
- Same topic than in 2022: **Accelerators for the Environment**
- 115 applications received in 2023 against 187 in 2022.
- About 85% of applicants were studying in I.FAST participant countries.
- Good gender balance in the applications.
- 12 male and 12 female selected studying in 11 different European countries.

The I. FAST CBI 2023 outcome

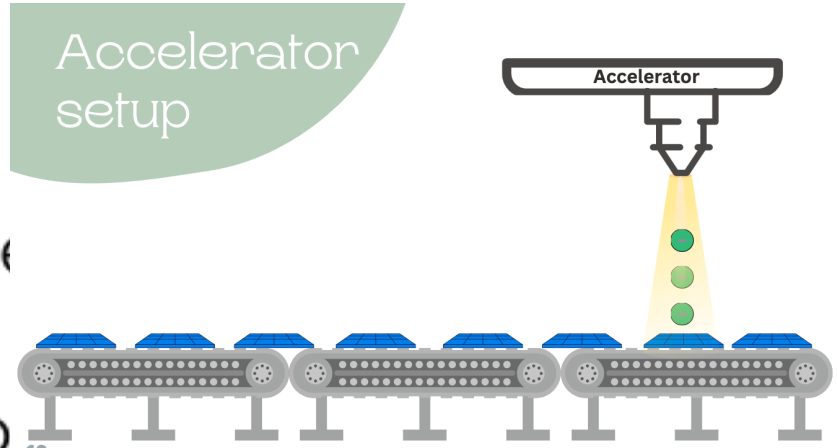
I.FAST Challenge Based Innovation

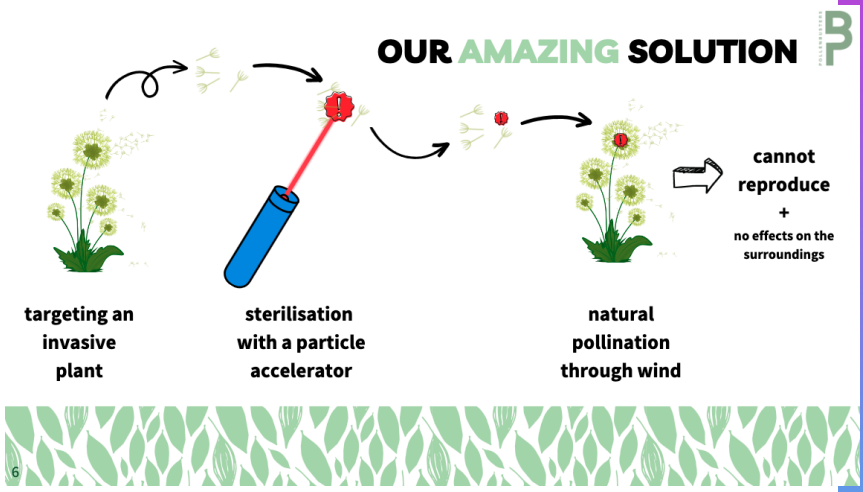
- Went very well!
- Students dynamics was different.
- Very interesting idea proposed once again.
- Projects more oriented on irradiation applications.
- Much fewer students who had been accepted withdrew : fewer applicants but of better quality!

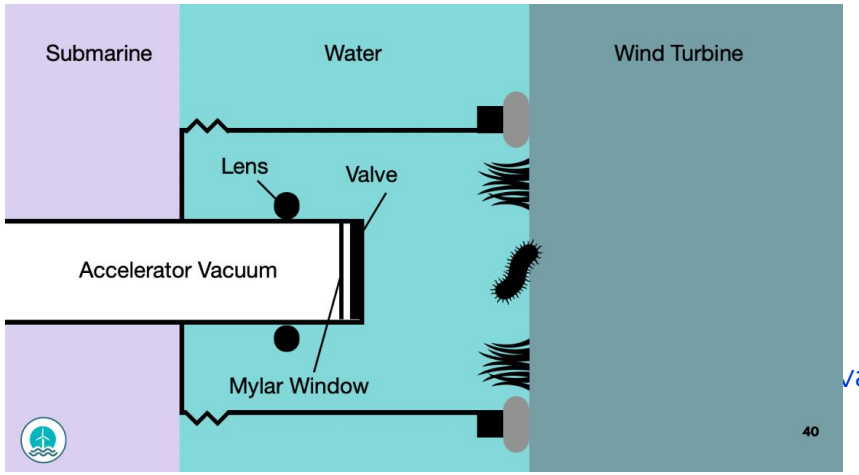
The I. FAST CBI 2023 projects

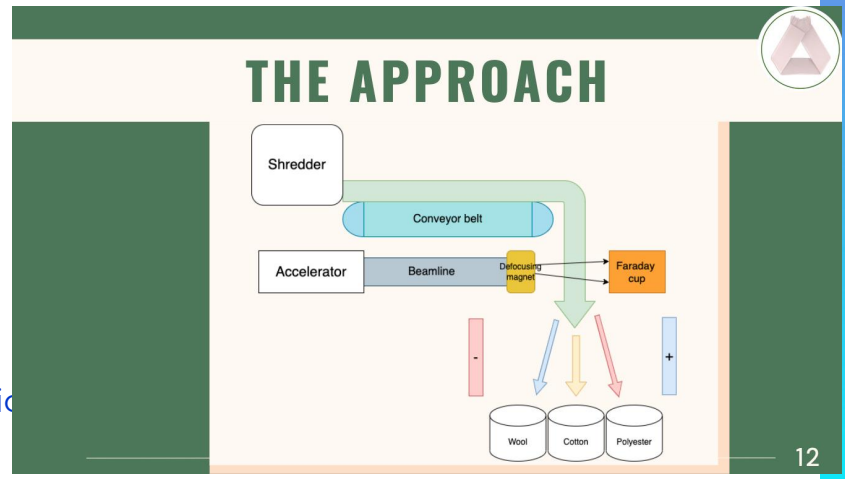
- Recycling solar panel by irradiating the glue that links the glass with the substrate.
- Sterilizing the pollens of invasive plant species.
- Using ion implantation to fight corrosion on off-shore windmills.
- Ionising cloth shreds from fast fashion to separate and recycle them.

I.FAST Challenge Based Innovatio



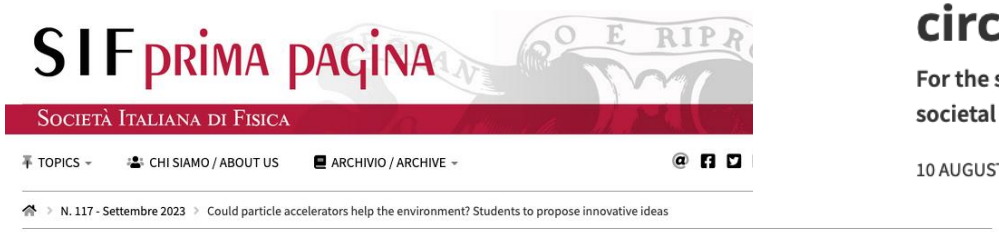


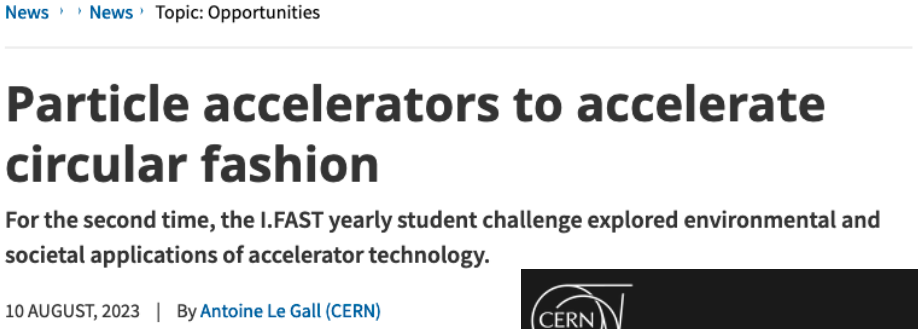


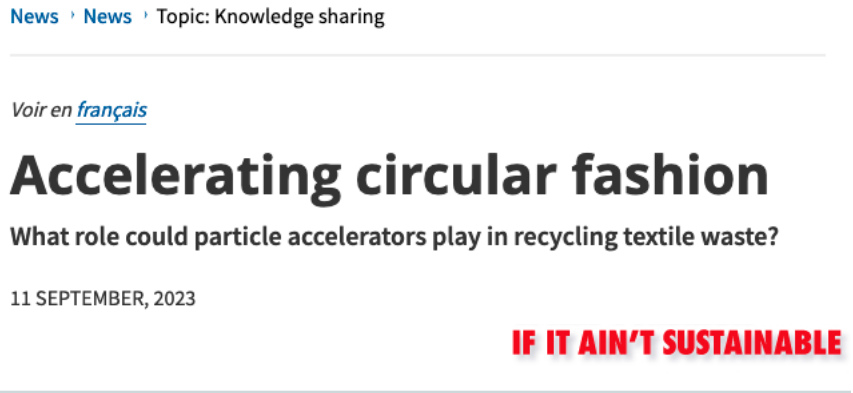


iFAST

In the news







- Articles written by Antoine Le Gall on the I.FAST and CERN websiteled to a story in Textfash (Textile Fashion magazine)!

The projects after the CBI…

- Two big players from the clothing industry contacted CERN to see if they could license the fast fashion recycling idea! [Too early]
- After the CBI we stayed in contact with the teams.
- Groups from 3 teams from 2023 decided to continue working on their project.
  - The solar panels recycling team has already conducted beam tests that were positive and decided to create a start-up to market their idea (jointly with an institute member of I. FAST). To my last enquiry they replied that they now have a non disclosure agreement and can't tell me more.
  - The fast fashion recycling team has made test experiments with a small Van de Graaff generator and is working on improving their process.
  - The pollen sterilization team is waiting for plants to grow to test their idea.

The I. FAST CBI 2024

- At the end of the CBI 2023, our deliverable was achieved but there were 15k€ left over.
- Decision to contact sponsors and partners to raise sufficient funds for a 3rd edition of the CBI.
- Many positive replies: TIARA, EPS-AG, Hitriplus, CERN ATS, GSI, SEIIST, Baltic countries, Archparc, Eddy Offermann, EMMI…
- New topic: “Accelerators to tackle healthcare challenges: How can particle accelerators help improving human health?”
- 174 applications received, including 134 from geographical Europe, good gender balance. Significant number of applications from the Baltic countries and the Balkans.
- 24 applicants selected (12 males, 12 females, studying in 14 different countries).
- Currently working on the program.
- The 2024 CBI will take place from July 23rd until August 1st 2024.

About participants diversity (addressing the SAC Feedback)

- The selection committee takes care in maximising the diversity of the participants on 3 axis (Gender, Academic, Geography):
  - Gender diversity: aim for parity (Goal always achieved so far)
  - Academic diversity: student come from several fields of studies.
    - 2022/2023: Physics, Engineering, Environmental Sciences, Law, Business, Communication
    - 2024: Physics, Engineering, Chemistry/Pharmacy, Life science/biotechnology, Medicine
    - More difficult to reach students further away from our core disciplines (Physics, Engineering) despite our efforts (emails to colleagues in other faculties, marketing campaign,…)
- …

About participants diversity (addressing the SAC Feedback)

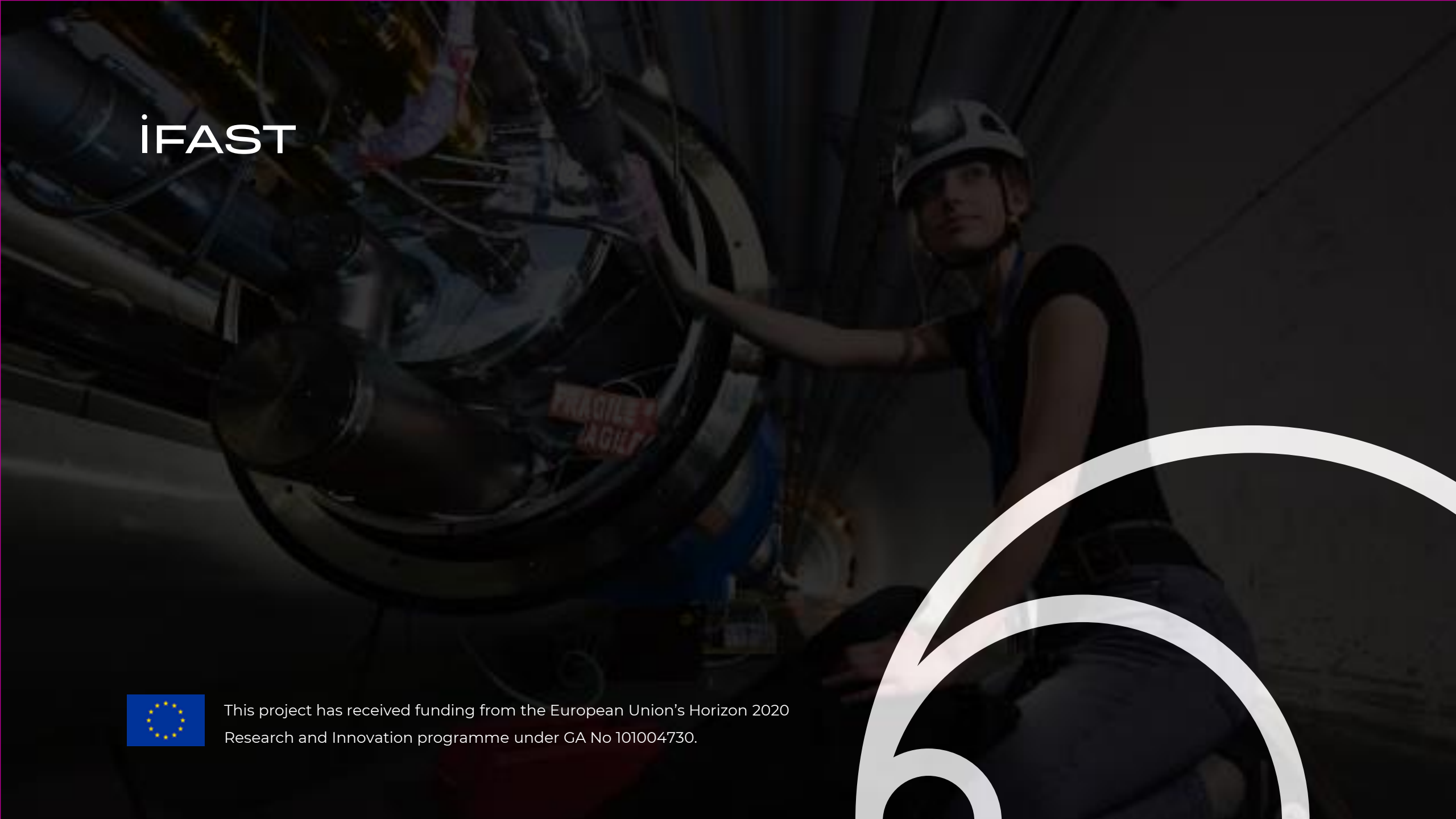
- The selection committee takes care in maximising the diversity of the participants on 3 axis:
  - …
  - Geographical diversity:
    - Citizenship is not a criteria for selection
    - We look at the country of affiliation to ensure the there are not more than 4 students studying in the same country
    - The call for application is circulated widely.
    - This year's selected participants study in 14 different countries but, by citizenship, they come from 19 different countries, including some countries far away: Japan, Kazakhstan, Iran,…
    - However:
      - We limit travel costs reimbursement to 300€, this would not cover travel from outside Europe.
      - The carbon footprint of flying participants from far away may not be justified.
      - We do not have the human and financial resources to petition for visa (although we did help some participants to get their visa in the past).

Milestones and deliverables

- Milestone MS6: Report submitted on time (Month 12).
- Deliverable D2.2: Report submitted on time (Month 24).

Beyond 2024?

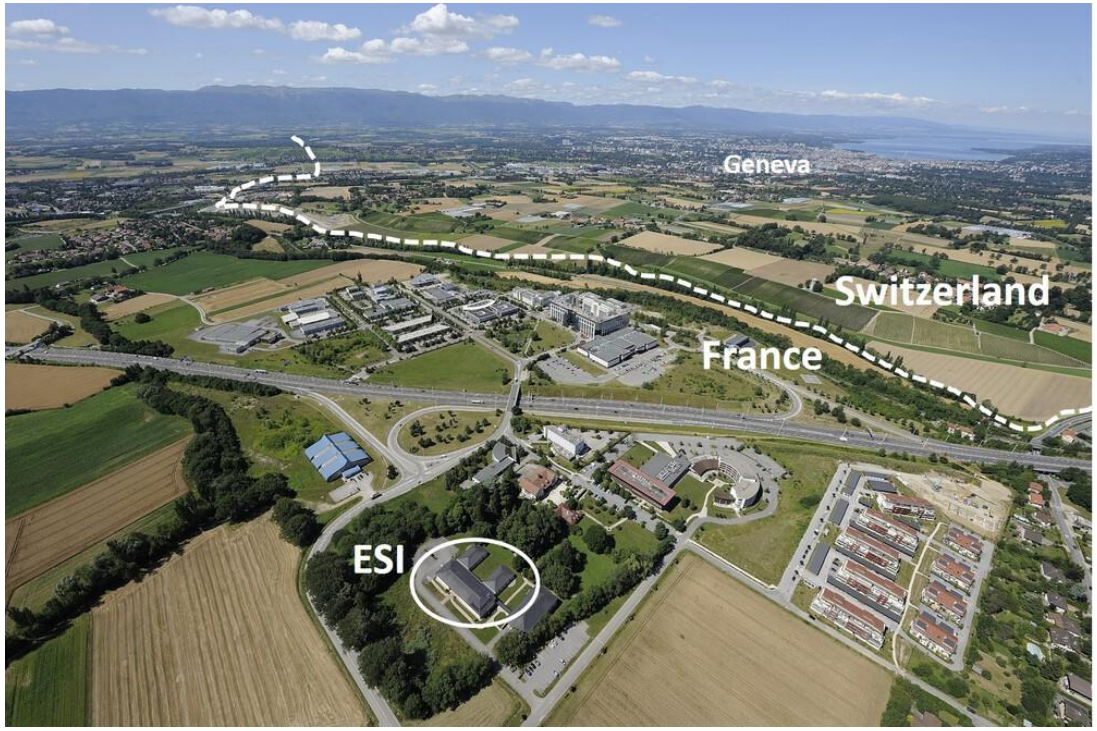
- Strong response from partners and sponsors when approached for funding for the 2024 CBI.
- Considering organising a 2025 CBI but no decision taken yet.
- To be decided in fall 2024.



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

Hosting

- The challenge takes place at the European Scientific Institute (ESI) in Archamps near Geneva: https://www.esi-archamps.eu/
- ESI has strong experience in hosting scientific schools, including JUAS.
- The ESI team is taking care of the logistics, full board accommodation and travel arrangements for the participants.



The program

- The program is aimed at giving the students the opportunity to learn about accelerators and their applications
- 4 online seminars before the challenge + video session to get to know each other (all together and by team)
- 8 in person seminars with experts of accelerators and/or their environmental applications
- 2 days at CERN
- 2 “conferences”

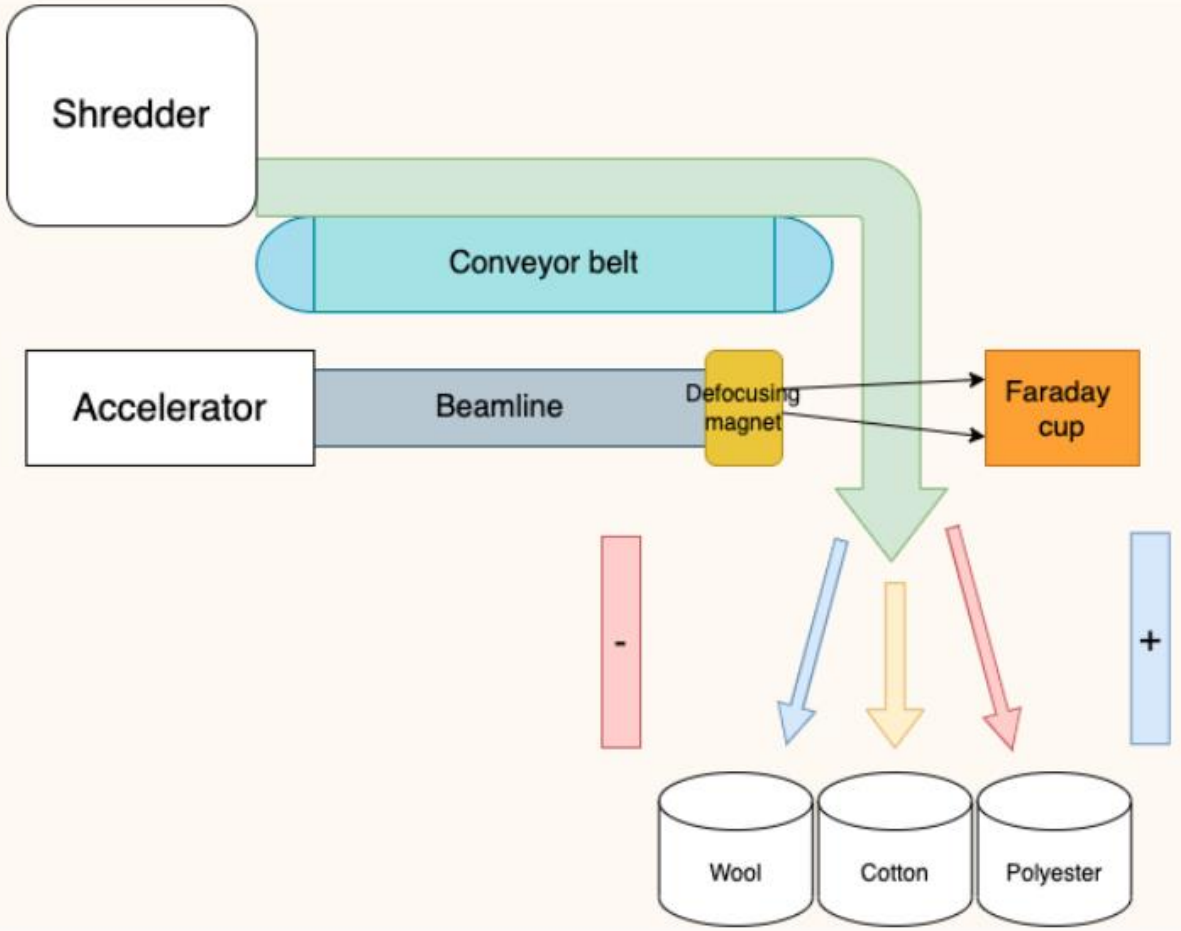
mardi 26 juillet 2022	mercredi 27 juillet 2022	jeudi 28 juillet 2022	vendredi 29 juillet 2022	samedi 30 juillet 2022	dimanche 31 juillet 2022
	09:30 Transport to CERN	09:30 Seminar	09:30 Prepare 1st conference	09:30 Private studies	
	10:30 Seminar	10:30 Team work		10:00 Feedback to teams 1 and 2	
	11:30 Team work			11:00 Feedback to teams 3 and 4	
12:00 Buffet Lunch	12:00 Lunch at CERN	12:30 Lunch	12:30 Lunch	12:00 Team work	10:45 Visit Annecy - Meet at ESI at 10:45 am to pick up your picnic bag. The bus will leave at 11.00am sharp! Departure from Annecy at 20:30. Remember that there is NO evening meal at ESI !
	13:00 Team work	13:30 Private studies	13:30 1st conference - individual presentations	12:30 Lunch	
14:00 Opening of the CBI	14:00 CERN Visit	14:00 Seminar		13:30 Private studies	
14:30 Break			16:30 Break	14:00 Seminar	
14:40 Seminar		15:00 Team work	16:40 Team work	15:00 Team work	
			17:30 1st conference - team presentations		
17:00 Introduction to the I.FAST CBI and Ice breaking activities			18:20 Free time	18:00 Free time	
	18:00 Return from CERN	18:00 Free time	18:30 Conference feedback		
18:30 Free time				19:00 After work / Dinner	19:00 Dinner
19:00 Welcome Dinner	19:15 Dinner	19:00 Dinner	19:30 Dinner		
20:00 Free time	20:15 Private studies	20:00 Private studies	20:15 Private studies	20:00 Social evening	20:00 Free time

lundi 1 août 2022		mardi 2 août 2022		mercredi 3 août 2022		jeudi 4 août 2022	
						08:30	Transport to CERN
09:30	Seminar	09:30	2nd conference (15' presention + 15'question / team)	09:30	Prepare final report (due at noon)	09:30	Lunch at CERN + Free time
10:30	Team work			12:00	Free time	11:00	Final presentations
12:30	Lunch	13:00	Lunch	12:30	Lunch		
13:30	Private studies			13:30	Private studies	14:30	Award ceremony
14:00	Seminar	14:00	2nd conference feedback	14:00	Seminar	16:00	Return from CERN (optionnal)
15:00	Prepare 2nd conference	15:00	Team work	15:00	Prepare presentations		
17:35	Determine speaking order for			17:45	Fill feedback forms		
18:00	Free time			18:15	Free time		
19:00	Dinner	19:00	After work / Dinner	19:00	Dinner		
20:00	Private studies	20:00	Private studies	20:00	Finalize presentations		

Past projects 2023

Fast fashion recycling with a particle accelerator

THE APPROACH



Invasive plant pollen sterilisation

OUR AMAZING SOLUTION

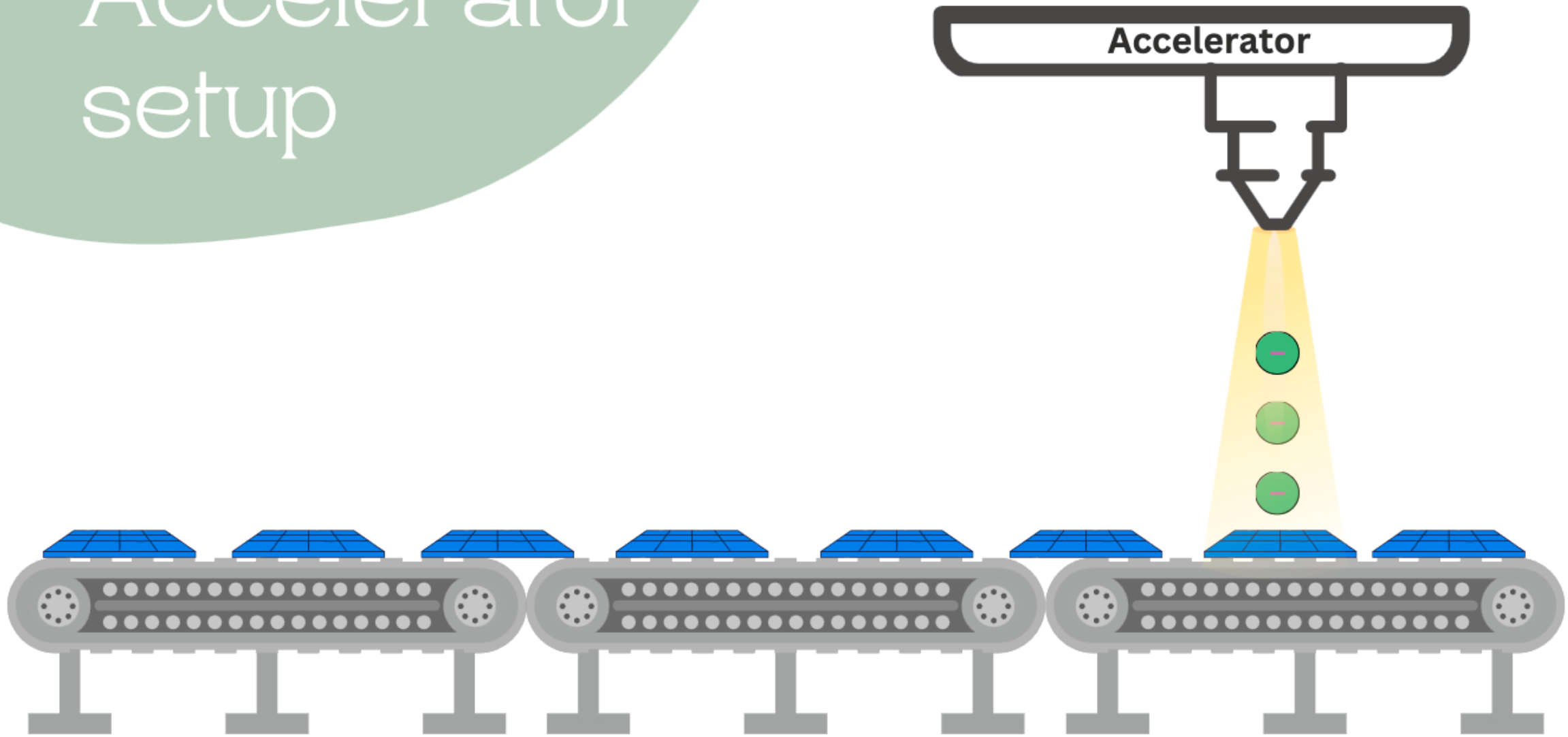
targeting an invasive plant

sterilisation with a particle accelerator

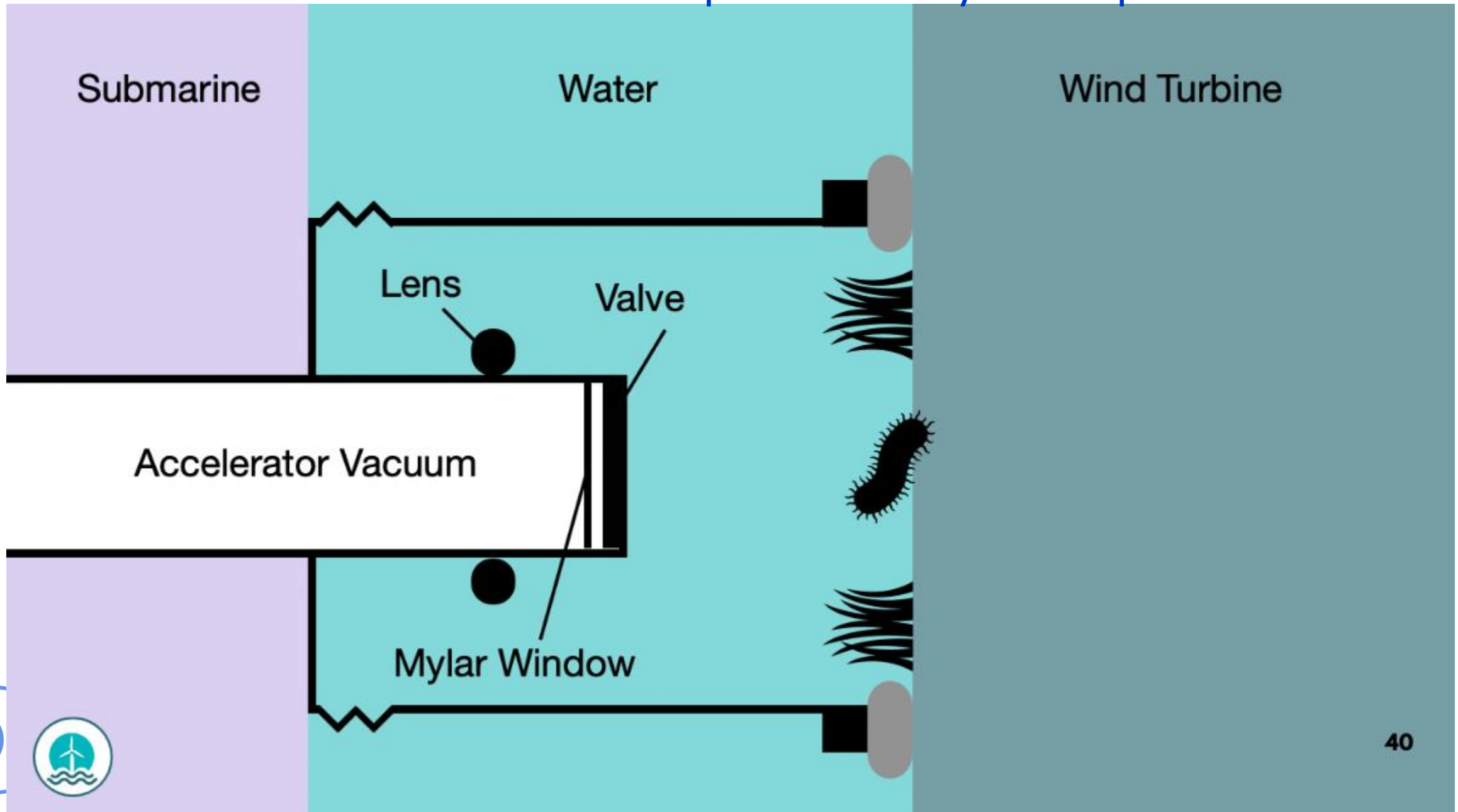
natural pollination through wind

Glue removal and solar panel recycling

Accelerator setup

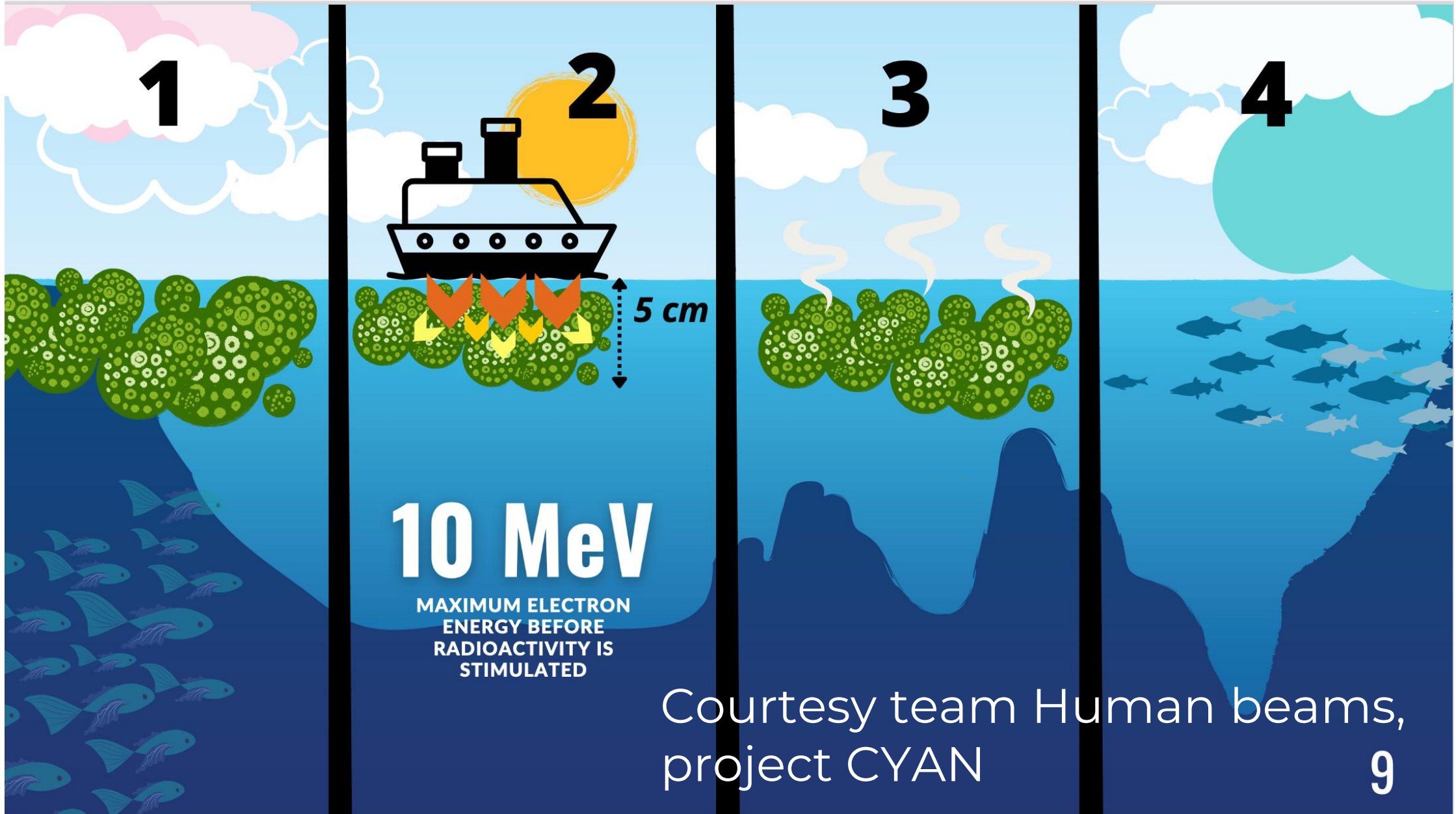


Off-shore wind mills corrosion protection by ion implantation



Past projects 2022

Algal bloom treatment by surface water sterilisation



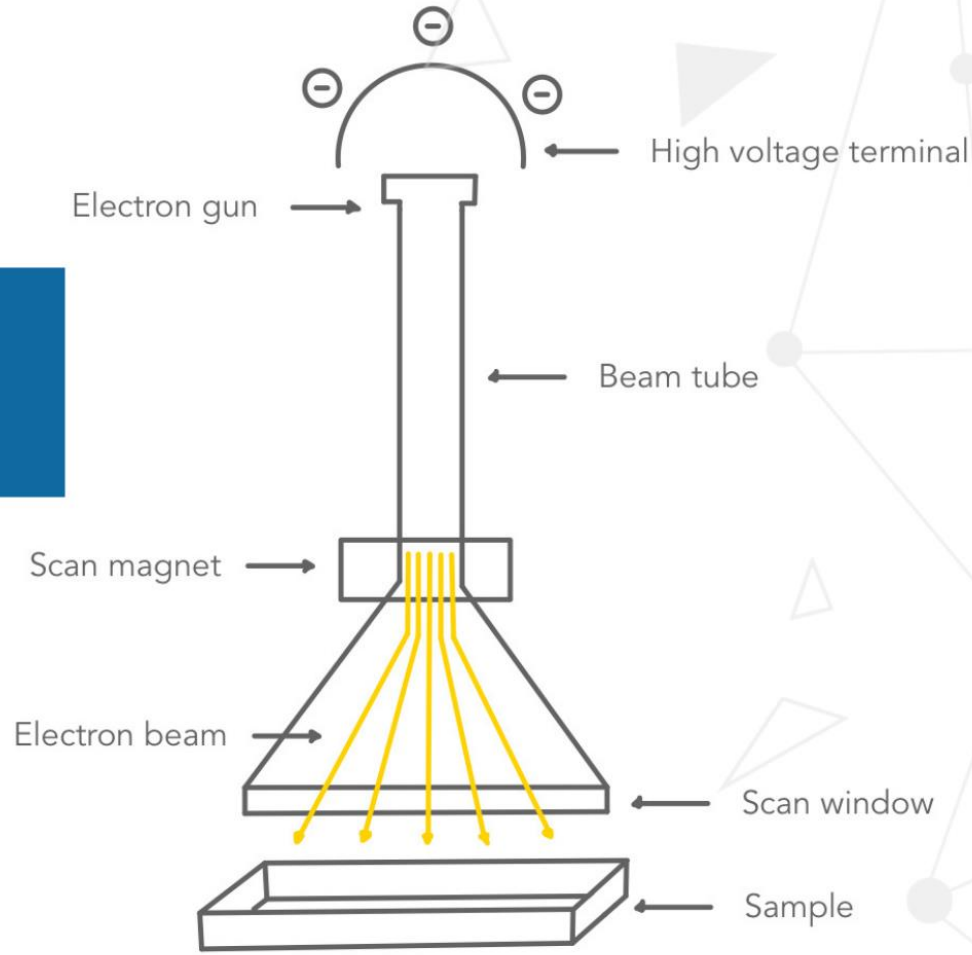
Courtesy team Human beams, project CYAN

Wind mill blades strengthening

Goal: Functionalisation of CNF with e-beam irradiation

BEAM PARAMETERS Energy: 3 MeV, Dose: 1000 kGy

SAMPLE 1.245 kg of CNF powder in aluminium pans



Linear accelerator commercially available through IONISOS (France)

Courtesy Team Fellowship of the accelerator ring - Durablade - Accelerating the Green Transition

Microplastic studies in oceanic gyres with a compact Compton source on a boat

Courtesy **Teams White Light - A.M.M.I.R.A : Accelerators for Marine Microplastics Investigation and Research Agency.**

Polluted soils clean up

DEVELOPING TECHNOLOGY - THE SOIL SAVIOUR 2.0 & A PORTABLE PARTICLE ACCELERATOR

SOIL SAVIOUR 2.0