



Final event

Johannes Gutleber

CERN

September 21, 2021



EASITrain – European Advanced Superconductivity Innovation and Training. This Marie Skłodowska Curie Action (MSCA) Innovative Training Networks (ITN) receives funding from the European Union's H2020 Framework Programme under grant agreement No. 764879.

An experience to build on

- This first MSCA project for the FCC collaboration was also a learning experience for ESRs, scientists, project managers
 - Actual needs and goals of training Europe's next generation excellence in R&D&I had to be better understood and a process in the minds of the people was triggered
 - Challenges occurred, needed to be identified as challenges and were mastered (I dare to say!)
- EASITrain helped us all to gain experience and to grow together
 - This experience is now engraved in the minds of those who participated and hopefully will be used to propose further MSCAs with wider and even longer lasting impacts

What MSCA is about

- A learning curve for cooperation and strategic long-term planning for ESRs, project and university supervisors
- Still much focus on “hard science and engineering”
- The value of excellent persons in R&D&I includes intersectoral skills, willingness to move, openness to non technical competencies, unconditional acceptance of their colleagues in a project that is geographically dispersed and not defined by them and their supervisors in quite diverse administrative and cultural contexts
 - This is an extraordinary challenge for everyone!
 - Alone the fact that all ESRs, researchers and university teachers were holding on until the end of the project to overcome all those differences and constraints is a remarkable success!
 - We all go out of this project with a much better understanding of how to make Europe a better place to live and work in and what each of us can do to make that road to the end together!



**A big hand to those who helped creating the awareness!
Even more applause to those, who grew with us together and
made it happen!**

The value of training



The most direct benefit of international Research Infrastructures for each individual and for the entire society is the value of training through project activities like MSCA Easitrain

Salary Premium Effect

Conservative mapping to monetary value including 3% yearly discounting until the end of the active period indicates > 150,000 Euro per person* (economic value generated by a person is a factor higher than the salary)

Dr. + 11-15 %



BSc and MSc
degrees

+ 5 %



Local university
Dr. degree
premium



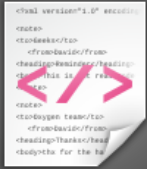
CERN international
project induced
additional premium

** Preliminary value from projects in 2010 to 2015 time.
Ongoing salary premium validation survey started in 2019*

What is the origin of the premium?

- **2 drivers** lead to increased professional opportunities
 - **Intersectoral and transferrable technical skills**
 - **Learning-by-practical experience**
- **Reasons** for lifetime-salary premium
 - Higher salary entry level due to **broader skill portfolio (versatility = higher value of the person for the employer)**
 - Positions with **more responsibilities and managerial activities at lower age**

Skills Acquisition



Programming



Data Analysis



International Environment



Structured thinking



Dialogue



Work under pressure



Adapt to constraints



Effectiveness and persistency



Approaching conflicts



Reaction to failure

Collaborative Doctorate Programs

- EASITrain included the creation of a curriculum and university information package for an international, collaborative doctorage programme in applied superconductivity
- The work revealed how diverse programs are still today in different EU countries, how different the conditions for recognition of courses and exams are despite the “Bologna declaration” signed in 1999.
 - *Third cycle (doctoral degree): There is no concrete ECTS range, since the disciplines vary in length and comprehensiveness. However, some countries have minimum credit weight requirements on doctoral degrees. Those country-level requirements typically require 120-420 ECTS of study.*
- There is still a long way to go. We learned this. We accept this. We decided to stay on the road and contribute to improve
 - Can this project become a seed? Can it serve documenting and highlighting the need for improved administrative frameworks to help implementing international doctorates? Question and suggestion to the EC project officers to help spreading the message upstream.
- Evidence that CERN is an ideal platform for such undertakings, connecting universities, research centres, companies and students to advance this process. This MSCA is working evidence by having added a modest additional brick in that fundament.

Sustainability “Built in”

- The **program is sustainable**, investments pay back
 - Cost for taxpayers per ESR is ca. 250'000 euro
 - Expected lifetime benefit per ESR in this range
- Creation of common assets that will be used for several year beyond the project duration through collaborative R&D
 - Example: turbo compressor test stand
- In addition, **research outputs** are generated also after the end of the project period
- **Knowledge is transferred** from scientific research to industry, becomes part of the university body of knowledge and ultimately reaches society
 - Example: studies on the needs of thin film coating technologies for use in healthcare, consumer electronics and the need of specialized companies for skilled experts to expand their fields of activity and to bring the technology to the society.
- **Cultural goods** are created
 - Numerous examples in this project ranging from ESRs engaging laypeople at many events, travelling exhibition and Terra Mater's video productions about the “diary” of the ESRs.
 - The materials collected are already flowing into the new FCCIS H2020 project
- **Networks are built** up that last beyond the project period
 - **Networks of universities, research centres and companies are networks of individual people!**
 - New links have now been created by people in an “age class” who can continue to work together for a lifetime period (e.g. in the domain of cryogenic refrigeration USTUTT, TUDRESDEN, test stand suppliers)
 - Existing links have been re-inforced and the existence of skilled people who know each other better presents now opportunities to forge in-depth technology R&D activities (e.g. in the area of superconducting thin films)

Project goals

- ✓ •This ITN has been established to **provide additional resources to ongoing R&D activities** on technologies relating to superconductors in the scope of the **Future Circular Collider Study**.
- ✓ •Train future experts in the key technologies that FCC needs
 - Develop a durable curriculum at doctoral level to continue the training and R&D activities after 2021. **(intent has been agreed)**
- ✓ •Create lasting links between academia and industry, in view of follow up projects (e.g. model magnets).
 - Communicate clearly a superconducting technology roadmap that emerges from HL-LHC and FCC activities. **(time horizon is very long, too long to engage industries in high risk activities immediately)**
- ✓ •Engage the public, funding agencies and decision takers in academic, industrial and administrative sector to raise awareness of the potentials that superconducting technology can bring and R&D and training needs until the 2030ies.

EASITrain as a career platform

- 9 out of 15 ESRs have received a regular employment contract
- 6 ESRs are finishing the doctorate without employment
 - Information will be updated to keep track of the career evolution
- Non-European ESRs
 - 1 out of 7 ESRs left Europe since the end of the contract

Impacts of EASITrain

A woman in a red athletic outfit is climbing a large, grey concrete structure in a factory setting. The structure is composed of several large, rectangular blocks. The background shows a complex industrial environment with metal beams, pipes, and overhead lighting.

Effective training in international project environment

Economic and societal benefits through training

Increased competitiveness of our people

An example of “brain gain” for Europe