European Advanced Superconductivity Innovation and Training

A Marie Skłodowska-Curie Actions Innovative Training Network coordinated by CERN

easitrain.web.cern.ch
@EasiTrain
Beneficiaries and Partners

Beneficiaries

- Bruker
- CEA
- Columbus Superconductors
- HZB Helmholtz Zentrum Berlin
- I-CUBE
- Technische Universität Dresden
- TU Wien
- Universität Siegen
- WU

Other Associates

- Fraunhofer VENTURE
- Hilumi H2-HEC Project
- ARIES
- Idea8

Partners

- Bmax Superconductors
- ASG
- Bilfinger Babcock Noell GmbH
- CEMCON TEC The Tool Coating
- IEEE Advancing Technology for Humanity
- iv Supra
- THEVA

- MAN Diesel & Turbo
- Red Bull MEDIA HOUSE
- research instruments
- Sigma Phi
- Universita degli Studi di Genova

 Hopefully more over the project period to create a strong and durable network!
### Work Packages

<table>
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<tr>
<th>WP</th>
<th>Name</th>
<th>Lead</th>
<th>Co-Lead</th>
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<td>1</td>
<td>Management</td>
<td>CERN</td>
<td>A. Ballarino</td>
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<td>TUW</td>
<td>M. Eisterer</td>
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<td>3</td>
<td>Manufacturing</td>
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<td>V. Palmieri</td>
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<td>M. Putti</td>
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<td>Communications</td>
<td>CERN</td>
<td>P. Charitos</td>
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Materials

• Assess the quality, superconducting properties of wires and thin-films under cryogenic operation conditions

• Identify, analyse and describe the impacts of manufacturing processes on the material properties

• For magnets: Nb₃Sn wires, MgB₂ wires, HTS wires at low temperatures

• For RF cavities: Nb₃Sn, NbN

• For beam screen: Thallium Tl-1223/1212
Manufacturing

• Optimise production processes for superconductors for quality and to pave the way for cost effective production at large scale
• Assess the impacts of production processes on the superconducting properties
• MgB$_2$ wire production
• Coating for RF cavities (e.g. interface substrate/coating)
• Thin-film production recipe for Thallium
• Electro-hydraulic forming with metals
Cryogenics

- Develop the **Nelium cycle** for refrigeration down to 40-60 K
- Develop a suitable **turbocompressor** design for Nelium and gain practical experience at a test stand
- Develop a **catalogue of SC magnet cooling architectures**
- Optimise **SC magnet heat extraction schemes**
Valorisation

• **Identify and assess** the **potentials of superconductor applications** using economics approaches with **focus on downstream users**
  - Enlargement of existing relevant markets with cost/performance improvements, e.g. medical imaging, chemical analysis, particle therapy
  - Identification of new markets (e.g. fruit sorting, loudspeakers, cargo scanning) and development of market entry strategies
  - Assessment of the “industrial” scientific market, e.g. XFELs, NMRs

• **Creation of a reference curriculum for an interdisciplinary PhD program** on superconductivity applications
  - Understand how it can be implemented (e.g. EJD)

• **Technology roadmap for EU and national decision bodies** encompassing upstream and downstream industries

30 May 2017
J. Gutleber
3 teams / 18 students
Conceive concepts for new industrial applications
Preparation work since Feb. 2017
Satellite event of EUCAS 2017 (GVA)
Hosted by IdeaSquare
With support from industry experts, leading technology professors and economists

http://inn2.mynews.de/cern-superconductor-hackathon-2017/
Training

- Interdisciplinary and intersectoral training
  - Three 2-weeks long summer schools, 2 weeks intro training at CERN
  - Lectures, courses to obtain ECTS points

- Transferrable skills
  - Work health and safety, Project management, presentation techniques, job search and application, intellectual property management and protection, writing grant proposals, how to engage the public in scientific projects, personality development

- Career Development Plan & Secondments
  - Personalised training plan and meaningful exposure to industry
Communications

- Planned **scientific and non-scientific dissemination** of results
- Develop a **plan and actions to engage the public** in matters related to superconductivity and cryogenics
- With the **help of media companies**, develop **key messages** for different audiences that work, accompany the early stage researchers and gather material (the value of training in an international science project for the ESRs, for the scientific domain, the European industry, for the entire society)
- **Work with industry** to identify **opportunities for** engagement in common **future projects**, create **support from interest groups**
Next Steps

• Start: 1 October 2017, Duration: 48 months
• Timeline:
  • HIRING HAS STARTED!
  • Grant Agreement information and text: 19 May 2017
  • Declaration of Honour: 30 May 2017
  • All signatures for GA: < 2 August 2017
  • Consortium Agreement ready for GA deadline
  • Kick-off meeting: 5/6 September at CERN
  • All job applications until 1.10.2017
  • All job contracts signed before < 31.12.2017
  • All ESRs ready to start in January 2018
Upcoming Events

• **Superconductivity Hackaton at IdeaSquare**
  • September 22-24, 2017 (EUCAS satellite event)

• **Introduction Workshop** at CERN
  • March 11 – 23, 2018 (2 weeks)

• **EASISchool 1** in Vienna, Austria
  • August 19 – 31, 2018 (2 weeks)
Hiring

- Work **contracts are given out by the beneficiaries** and the work place is at the beneficiary site. Among them are 3 companies: Bruker (Germany), Columbus (Italy) and I-CUBE (France)

- Assignments are **for 36 months**

- All **applications must be done through the CERN HR site**
  - **APPLY NOW:** [https://jobs.web.cern.ch/job/12523](https://jobs.web.cern.ch/job/12523)
  - Preliminary job page: [http://easitrain.web.cern.ch](http://easitrain.web.cern.ch)
  - Follow us on **Twitter @EASITrain**!
## Employers

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<th>Employer</th>
<th>Location</th>
<th>Topic</th>
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<tr>
<td>CERN</td>
<td>Geneva (CH)</td>
<td>Interface thin film/substrate at cryogenic temperatures</td>
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<tr>
<td>Bruker</td>
<td>Hanau (DE)</td>
<td>Wires at low temperatures</td>
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<tr>
<td>CEA</td>
<td>Grenoble (FR)</td>
<td>Cooling architectures</td>
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<tr>
<td>CEA</td>
<td>Paris (FR)</td>
<td>Thermal properties of coils</td>
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<tr>
<td>WUW</td>
<td>Vienna (AT)</td>
<td>Transfer of knowledge from science to market</td>
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<tr>
<td>TUW</td>
<td>Vienna (AT)</td>
<td>SC wire and thin film characteristics</td>
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<td>Microstructure of SC materials</td>
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<tr>
<td>CNR-SPIN</td>
<td>Genoa (IT)</td>
<td>Thallium thin films and MgB2 wires</td>
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<tr>
<td>Columbus</td>
<td>Genoa (IT)</td>
<td>MgB2 wire production techniques</td>
</tr>
<tr>
<td>HZB</td>
<td>Berlin (DE)</td>
<td>SC thin film production and characterization</td>
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<tr>
<td>I-CUBE</td>
<td>Toulouse (FR)</td>
<td>Electro hydraulic forming for metals</td>
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<tr>
<td>INFN-LNL</td>
<td>Legnaro (IT)</td>
<td>Thin film coating (cavities)</td>
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<tr>
<td>University Siegen</td>
<td>Siegen (DE)</td>
<td>RF properties of SC thin films</td>
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<tr>
<td>University Stuttgart</td>
<td>Stuttgart (DE)</td>
<td>Turbocompressor for light gases</td>
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<tr>
<td>TU Dresden</td>
<td>Dresden (DE)</td>
<td>Nelium refrigeration and test stand</td>
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Eligibility Criteria

• In addition to the technical competences:
  • **Have a university degree**
  • **Not have a PhD degree at the start of work date**
  • **Have less than 4 years of full-time researcher contract experience**
  • **Have not resided or worked/studied in the country of assignment for more than 12 months during the last 3 years before start of contract**
  • **Proficiency in English, knowledge of the language in the assignment country an asset**
  • **This project strongly encourages the participation of female researchers.** Particular attention will be given during the selection process to achieve a well-balanced team of researchers in terms of gender representation.
Contract Conditions

- Different employment contracts from employer to employer
- Salary is fixed by the Marie Curie EC program
  - 3110 Euro/month gross salary per month x country adjustment coefficient
  - 600 Euro/month mobility allowance
  - 500 Euro/month family allowance if eligible
  - ~ ca. 3700 - 4200 Euro/month gross salary, subject to national applicable tax and pension fund rules
- Training costs are covered by a training budget

- Important references

30 May 2017
30 May 2017

CSC Video:
We are pleased to announce that the CSC Video Library has been updated with videos from the International Superconductor Electronics Conference 2013 (ISEC 2013) and the Applied Superconductivity Conference 2014 (ASC 2014). These videos include the Awards Ceremony, Plenary, Keynote, Invited, and Contributed Papers. 

Announcements:
1. Training Opportunities: EASITrain Marie Curie Project
2. EUCAS 2017 Newsletter: Financial Support Deadline, Short Courses, Ancillary Meetings
3. Short Courses in Applied Superconductivity

Search IEEE CSC

Notable Notes:
- Read a message from our President
- Affiliates with the Council
- Council on Superconductivity Young Professionals
- Student Support
- View our IEEE Member Societies

Upcoming Events
Click here for the full list of events. Note in particular the upcoming workshop on sensors and detectors.
Project Organisation at CERN

• Project Leader: Amalia Ballarino
• Deputy: Michael Benedikt
• Project Office: Johannes Gutleber
• Communications: Panagiotis Charitos
• Administration: *position to be filled*
Meet Some of the Team at FCC Week 2017

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<td>CEA</td>
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