Project Partners

The oPAC Network presently comprises of 12 beneficiary partners and 11 associated partners. Each beneficiary partner will host between one and five early stage researchers (ESRs) who will be employed as Marie Curie Fellows to work on their own specific research project. Associated partners will play a key role in the network-wide training, providing secondment places for ESRs in relevant scientific areas. Partners come from academia, research facilities and industry, thus providing a mix of environments for the researchers and creating multi-sector research and training experiences.

Beneficiary Partners

Associated and Adjunct Partners

Project Management

During the project kickoff meeting a Steering Committee was elected. This important body has representatives from the academic and industry sectors, as well as from international research centers.

The Steering Committee presently consists of the following members and will be responsible for the overall management and execution of the project:

Prof. Dr. Grahame Blair *(Royal Holloway University of London and John Adams Institute, UK)*, Prof. Dr. Erich Griesmeyer *(CIVIDEC, Austria)*, Dr. Andreas Jansson *(ESS, Sweden)*, Dr. Rhodri Jones *(CERN, Switzerland)*, Dr. Nika Vodopivec *(Instrumentation Technologies, Slovenia)* and Prof. Dr. Carsten P. Welsch *(Cockcroft Institute and University of Liverpool, UK)*. It is supported by a dedicated EU Project T.E.A.M. at the Cockcroft Institute/University of Liverpool, UK. A trainee representative will join the Steering Committee in due time.

Contact

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Optimizing the Performance of Particle Accelerators

A Marie Curie Initial Training Network

Project Overview

The optimization of the performance of any particle accelerator (oPAC) critically depends on an in-depth understanding of the beam dynamics in the machine and the availability of simulation tools to study and continuously improve all accelerator components.

It also requires a complete set of beam diagnostics methods to monitor all important machine and beam parameters with high precision and a powerful control and data acquisition system. Within the oPAC project all these aspects will be closely linked with the aim to optimize the performance of present and future accelerators that lie at the heart of many research infrastructures.

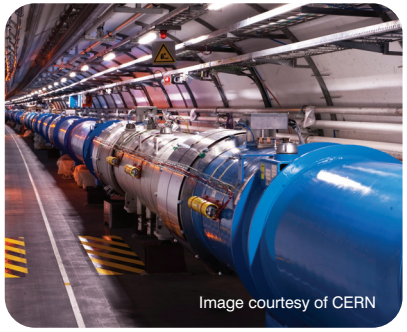
Image courtesy of CERN

The project presently brings together 23 institutions from around the world, including major research centres such as CERN (Switzerland) and Soleil (France), universities including Royal Holloway University of London (UK) and the University of Seville (Spain), as well a large number of industry partners, such as CIVIDEC (Austria), CST (Germany) and COSYLAB (Slovenia). It was initiated and is coordinated by the Cockcroft Institute/University of Liverpool, UK.

This network will jointly train 22 early stage researcher (ESRs) and started on 1.12. 2011 with a project duration of 48 months. It was selected for funding by the EU under extreme competition: From 919 submitted proposals, only 84 were recommended for funding, with only 9 in the physics domain.

With a project budget of 6 M€, oPAC is one of the largest projects ever funded by the EU within the Marie Curie ITN scheme.

Research Projects

The following projects are being undertaken within the oPAC network:

Cockcroft Institute/University of Liverpool
- Development of designs for possible LHC upgrade options
- Beam monitor for halo propagation mechanisms
- Development of a simulation suite based on the multilevel fast multipole method

ALBA
- Advanced beam physics problems at light sources
- Optimization of beam instrumentation for light sources

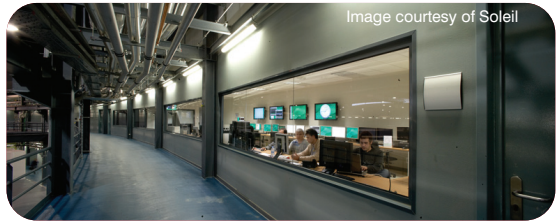
Image courtesy of Soleil

CERN
- Optics and lattice design studies for the interaction region design of the LHC experimental insertions
- LHeC as a future upgrade option of the LHC
- Simulation studies into halo generation in high brightness hadron beams
- Studies into an H^T-SQUID based beam current monitor
- Beam Loss Monitors for use in Cryogenic Environments

CIVIDEC
- Development of a versatile beam loss monitor

COSYLAB
- Adaptation of existing open-source control systems from compact accelerators to large scale facilities

CST
- Development of a GPU-based PIC solver

ESS
- Studies into beam loss patterns at ESS
- Methods for measuring the beam profile in high intensity beams

GSI
- Design and development of resonant structures as Schottky noise detectors for various frequencies

Instrumentation Technologies
- Design and development of common applications for different particle Accelerators

Royal Holloway University of London
- Optimization of the layout of the LHC collimation system
- Laser-wire beam profile monitor for measuring the transverse beam profile of an H^- beam

SOLEIL
- Improvement of the understanding of non-linear beam dynamics effects in light sources

University of Seville / Centro Nacional de Aceleradores
- Optimization of ^{10}Be detection
- Design a detection system for verifying a 3D method of image reconstruction for Intensity Modulated Radiotherapy Treatment

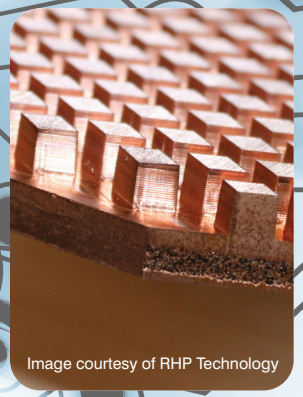
Image courtesy of RHP Technology


Image courtesy of GSI

Training Events

All oPAC fellows will be embedded into a structured course program at their host university or, in case their work contract is with an industry partner or a research centre, with a collaborating university.

In addition, the network will organize a large number of training events that will also be open for participants from outside the network. This includes a variety of Topical Workshops, International Schools and Conferences.