Newsletter
October 2015
Issue 12

Onwards to Great Things…

All oPAC Fellows are now about to complete their research projects within the network. An exciting journey lies behind us: Most of our trainees started without a background in accelerator science. During the three years of the Fellowship they have received an interdisciplinary training that allowed them to carry out cutting edge research and shall now provide them with an excellent basis for their future careers. I was very impressed by the high quality of their research work as it was presented at our international conference on accelerator optimization last month in Seville, Spain and that will soon be presented as part of a Special Edition of Physical Review STAB. It was also fantastic to see the manifold links that have been established between the Fellows, the oPAC partner institutions and collaborating scientists since the project started in 2011. It is a pity that the unique framework that oPAC has provided us and the wider accelerator community has to end now, but I am sure that we will see many projects emerge on the basis of the foundations laid by the network.

Earlier in 2015 I have highlighted the need of more trained experts in accelerator science and technology. This was expressed for example in articles that appeared in physics world, Laboratory News and science business. I am absolutely thrilled that the Optimization of Medical Accelerators (OMA) network was now accepted for funding as a new Marie Curie network within the H2020 framework. With a dream evaluation result of 100% OMA shall train 15 early stage researchers between 2016 and 2020. It joins a number of oPAC partner institutions and will directly build up on the training concepts and vision that we have established during the last 4 years. I am optimistic that OMA will make an important contribution to plugging the skills gap.

Whilst OMA is an extremely welcome and timely initiative **many more training programs in other accelerator-related areas will be required** to ensure that the full research potential of Europe's most advanced research infrastructures can be exploited. In particular the areas of **antimatter research** and **novel accelerators** would benefit enormously from more trained researchers. On the one hand the new ELENA facility at CERN will be commissioned in 2016 and will provide highest quality low energy antiproton beams. On the other hand dielectric laser accelerators, the AWAKE experiment at CERN, as well as laser and electron-driven wakefield accelerators are a promising way towards ultra-compact versatile accelerators for many fundamental research and industry applications. These fields show immense promise for major scientific discoveries and technological advancement. The community needs to work closely together and find ways to make training programs in these areas happen.

Finally, I would like to thank all oPAC partners for making the network such a fantastic experience. I would also like to wish all our Fellows the very best for the next career move. It has been a pleasure and privilege to work with you lot !

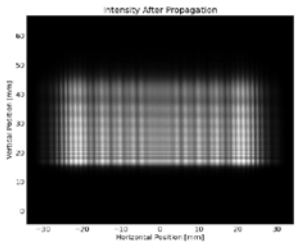
Prof. Dr. Carsten P. Welsch, Coordinator

Research News

Measuring the beam size at ALBA via interferometry

– Laura Torino

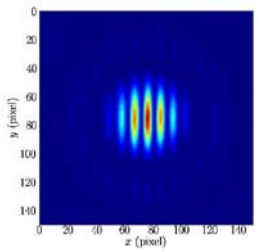
After two years of intensive work at ALBA, oPAC Fellow Laura Torino has managed to make reliable measurements of the beam size at the storage ring by interferometry. In the process, she has upgraded and optimized the diagnostic beamline Xanadu [1,2] in order to achieve good horizontal and vertical results using the interferometric technique.



SRW simulation of the footprint reaching the Xanadu diagnostic beamline.

The ALBA diagnostic beamline Xanadu, takes the synchrotron radiation from a bending magnet. The light is selected by a photon shutter where a mirror extracts only the upper lobe of the visible radiation. The radiation is extracted through a vacuum window and transported outside the tunnel in the experimental hutch through an optical path of seven mirrors located "in-air".

This beamline layout presented two mayor limitations that had to be overcome theoretically and practically, namely, diffraction and vibrations.



Horizontal interferogram.

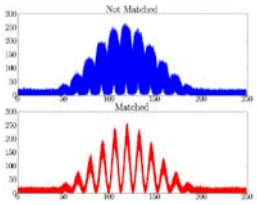
Diffraction

This limitation was due to a horizontal cut on the light caused by the photon shutter (causing vertical strips in the interferogram), and a vertical one due to the extraction mirror (causing horizontal strips). A solution to this problem was found by using pinholes instead of slits, and adapting the theoretical formula describing the interferogram for this setup.

The use of pinholes instead of slits makes the alignment easier, and allows to select more uniform zones of the footprint. As a consequence, less Fraunhofer fringes are selected, and the contrast of the interferometry results improves.

Vibrations

The second limitation was due to the fact that almost the whole beamline is in-air, and therefore exposed to air turbulences. This effect provokes changes in the interferogram characteristics and a rigid displacement of the centroid of the image.



Plot of the 3000 projections without (blue) and with (red) the application of the matching algorithm.

The effect of vibrations can be reduced by lowering the exposure time of the CCD camera during the image acquisition. However, this decreases the quantity of light reaching the CCD sensor reducing the quality of the interferogram. To overcome this problem, a dedicated algorithm was implemented to match more images together to improve the dynamic range of the measurement.

The algorithm takes the first interferogram acquired as reference, computes the correlations between this and the others, and shifts them according to the resulting quantity. The images are shifted until the interferograms can all be superimposed with the proper centroid match.

Conclusion

After a period of commissioning, the interferometric beam size measurements are finally fully reliable at ALBA. The use of pinholes instead of slits reduced the loss of contrast due to the Fraunhofer diffraction. Measurements showed that it is possible to balance the loss of contrast due to vibrations and the low dynamic range of the camera, by reducing the exposure time of the image acquisition accordingly.

The results of this work were presented by Laura Torino and Ubaldo Iriso at the IBIC-2015 conference held in Melbourne: L. Torino and U. Iriso, "Limitations and solutions of beam size measurements via interferometry at ALBA", IBIC-2015, Melbourne, September 2015, TUPB049 (2015)

[1] U. Iriso *et al.*, "Diagnostics during the ALBA SR commissioning", DIPAC-2011, Hamburg, May 2011, TUOA02 (2011)
[2] L. Torino *et al.*, "Beam Size Measurements using Synchrotron Radiation Interferometry at ALBA", IBIC-2014, Monterey, September 2014, TUPF23 (2014)

Beam Loss Monitors for the cryogenic LHC magnets

– Marcin Bartosik

The Beam Loss Monitoring (BLM) system of the LHC close to the interaction points contains mostly gas ionization chambers working at room temperature, located far from the superconducting coils of the magnets. The system records particles lost from circulating proton beams, but is also sensitive to particles coming from the experimental collisions. In the future, with beams of higher brightness, distinguishing between these interaction products and dangerous quench-provoking beam losses from the circulating beams will be difficult. Therefore, in the high luminosity LHC upgrade, BLMs are foreseen to be located near the superconducting coils inside the cold mass of the magnets in the superfluid helium at a temperature of 1.9 K [1]. The dose then measured by such cryogenic beam loss monitors would more precisely correspond to the real dose deposited in the coil [2].

The specifications for cryogenic BLMs represents a completely new and demanding set of criteria that have never been investigated together before. The main unknown is the combination of the superfluid helium environment with a total ionizing radiation dose of 2 MGy.

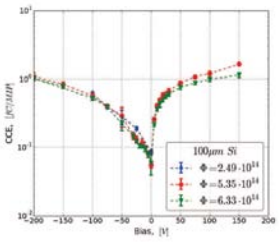
oPAC Fellow Marcin Bartosik together with colleagues at CERN, the Ioffe Institute (Russia), and Cividec (Austria), has been conducting radiation hardness tests of p^+–n–n^+ silicon detectors [3] which, together with single crystal Chemical Vapour Deposition (scCVD) diamond [4], are the main candidates for these future cryogenic beam loss monitors.

Cryogenic radiation tests

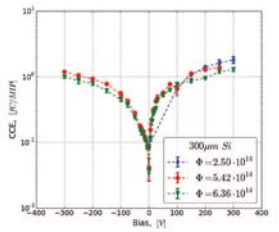
The main aim of the cryogenic irradiation test was to investigate the radiation hardness of 100 µm thick p^+–n–n^+ silicon wafers in a liquid helium environment at 4.2 K, and evaluate their advantages compared with more common 300 µm thick diodes.

The dependence of the collected charge on voltage (voltage scans) for the 100 µm Si and 300 µm Si detectors at different fluences are depicted in the images to the right respectively. A positive voltage corresponds to the forward bias operation mode.

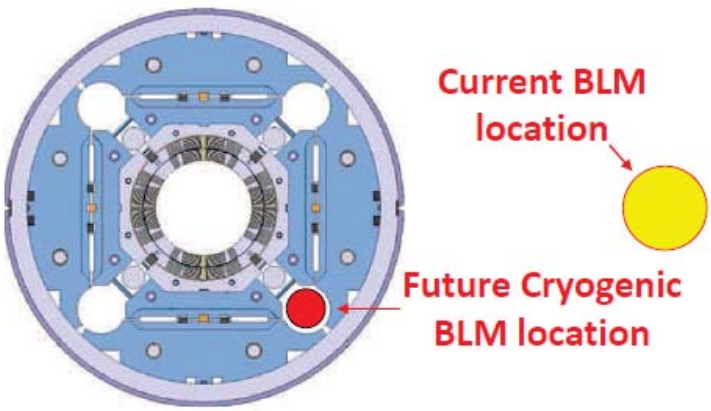
The collected charge increases with increasing voltage and shows a slight tendency to saturate. In detectors operated as Current Injection Detector (CID), i.e. at forward bias, the increase was more apparent and the collected charge was larger than that at reverse bias. This is caused by the reduction of the effective trap concentration due to filling via carrier injection. This implies an effective operation at low voltages which is the main advantage of a CID.



Voltage scan of a 100 µm Si detector for different integrated proton fluences.



Voltage scan of a 300 µm Si detector for different integrated proton fluences.



Cross section of a large aperture superconducting insertion magnet (MQXF) foreseen for HL-LHC with the current BLM and the future Cryogenic BLM locations shown.

Conclusions

The main results are that the tested Si detectors survive under irradiation to 2.8×10^{15} protons/cm^2 in a liquid helium environment, and charge carrier transport properties are strongly influenced by the electric field in irradiated detectors.

In order to minimize trapping, current injection into the detector sensitive region CID was tested. It has been shown that current injection developed as a tool for increasing the tolerance of silicon detectors to irradiation at moderate cooling, is still effective in liquid helium environment.

The results of this work were presented by Marcin Bartosik at the IBIC-2015 conference held in Melbourne: M. R. Bartosik *et al.*, "Beam Loss Monitors for the cryogenic LHC magnets", IBIC-2015, Melbourne, September 2015, MOPB042 (2015)

[1] C. Kurfuerst et al.: Investigation of the use of Silicon, Diamond and liquid Helium detectors for Beam Loss Measurements at 2K, Proceedings of IPAC 2012, New Orleans, USA.
[2] C. Kurfuerst, Cryogenic Beam Loss Monitoring for the LHC, PhD thesis.
[3] M. R. Bartosik, et al.: Characterisation of SI detectors for the use at 2 K, proc. of IPAC 2013, Shanghai, China.
[4] C. Kurfuerst, et al., Radiation tolerance of cryogenic beam loss monitor detectors, proc. of IPAC 2013, Shanghai, China.

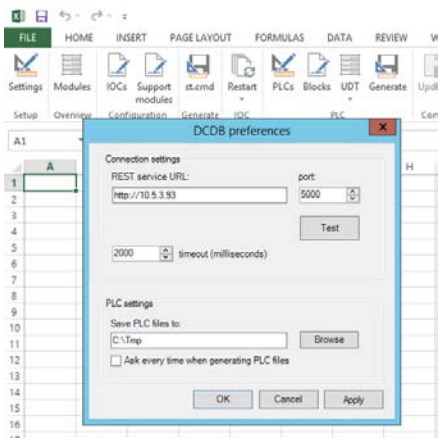
Power is nothing without control: the DCDB – Pavel Maslov

COSYLAB
CONTROL SYSTEM LABORATORY

Changing the configuration of the control system in a large experimental facility, like a particle accelerator that contains numerous instruments, can be an extremely cumbersome task. Therefore, it is essential to reduce the amount of effort and repetitive work needed for adding new devices, moving instruments from beamline to beamline, etc.

The oPAC Fellow Pavel Maslov, working for Cosylab in Slovenia, has developed a control system configuration tool, which provides an easy-to-use interface to quickly configure an entire facility.

DCDB architecture



The Device Control Database tool (DCDB) uses an Excel-like front-end application and allows the user to quickly generate and deploy different configurations (EPICS start-up scripts, alarms and archive configurations) onto the system's Input/Output Controllers (IOC).

The tool uses a relational database to store information about all the elements of the accelerator. It is compatible with the CODAC control system suite (used at facilities like ITER, ESS and ELI-NP), but can also be used in any other EPICS environment.

Pavel has created project web-page (http://users.cosylab.com/~pmaslov/dcdb/) with a detailed description, tutorial and a demo.

Network News

Forschungszentrum Jülich becomes adjunct partner of oPAC

In spite of having a mere month left of funding the oPAC family continues to grow. The latest addition to this 35-member partnership is the Forschungszentrum Jülich in Germany. Forschungszentrum Jülich is one of the largest interdisciplinary research institutions in Europe, comprising nine research institutes in the areas of energy, environmental science, information technology, brain research, etc. Within the Forschungszentrum Jülich, the institute for nuclear physics (IKP) operates and designs particle accelerators. It main activity is the operation of the 2.88 GeV Cooler Synchrotron COSY – Jülich. In addition the IKP is also responsible for the design, construction, and commissioning of the High Energy Storage Ring (HESR) of FAIR.

Some key activities carried in in the field of accelerator optimization are:

- Non-invasive beam profile measurement based on luminescence for high-intensity beams or on ionization for high- and for low intensity beams.
- 2-MeV and 100 keV electron coolers
- Development of a SQUID BPM
- Modelling of Linear Beam Optics for Accelerator Operation and Development
- Modelling of Nonlinear Beam Dynamics for existing and future accelerators
- Development of techniques for diagnostics of polarized beams
- Stochastic cooling for COSY and the HESR
- Activities for proposed future projects are:
- Search for permanent Electric Dipole Moments (EDM) of light ions (p, d, ^{3}He) in storage rings. In order to measure the EDM, the feasibility of a purely electrostatic storage ring with a 30m radius is under investigation.
- Evaluation of the Jülich Short-Pulsed Particle and Radiation Center (JuSPARC), which will be an interdisciplinary center for collaborative research with ultra-short pulsed photons as well as neutrons and polarized ion beams.

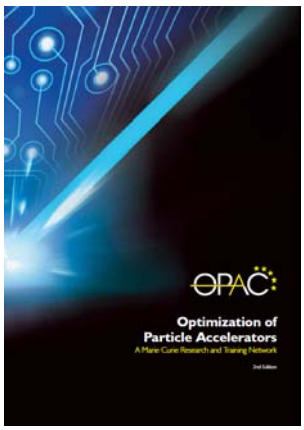
Staring 2015 the COSY accelerator is dedicated to deliver beams for studying future accelerator and detector techniques. Although mainly reserved for the FAIR and EDM project, this gives a unique possibility of having a large scale accelerator available for the evaluation of new accelerator based methods and devices.

oPAC's new brochure is out

oPAC has produced a second edition of the network's promotional brochure, featuring an updated description of all projects and the Fellows' personal profiles, highlighting their research results.

This new edition of the brochure is intended to be a showcase of the project's achievements, and it is bound to raise the international profile of the Fellows at a time when they are building up their careers. The brochure will be distributed in international conferences and exhibitions, and can be downloaded here.

Many thanks to our Fellows for their contribution to the text !



oPAC featured in the Cockcroft Institute

Everyone visiting the Cockcroft Institute has now a chance to see a presentation about oPAC and its achievements. All the Fellows are presented in the video, which emphasizes their research achievements and the training events carried out by the network. The video will be displayed in the main hall of the Cockcroft Institute until the end of the year and it is already attracting attention of visitors and staff.

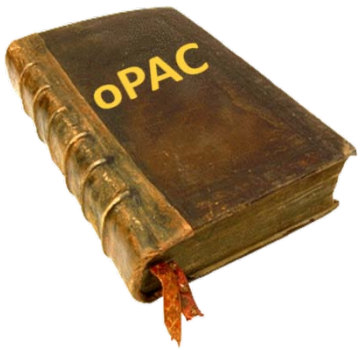
Display in the Atrium of the Cockcroft Institute

A lasting memory

oPAC Steering Committee member Dr. Nika Vodopivec is compiling a special book of memories for the Fellows to enjoy at the end of their oPAC journey.
The Fellows are invited to send Nika a short description of their impressions and experiences of their involvement in the oPAC network: How they learnt about oPAC; how they found the recruitment process; how were the first days at the hosting institutions; which experiences, people, events, etc. did they enjoy most and why; and what they consider to be the most valuable experience gained from the three-year oPAC project. They are also invited to include the pictures that reflect the experiences described in the text and that they would like to remember forever.

The objective of this collection of texts is to create a real life memory of the Fellows' experiences during the project. Therefore it will be more personal than the official descriptions of the oPAC materials (like the oPAC Brochure).

Fellows who want to contribute are asked to send their contributions to Dr. Nika Vodopivec: nika.vodopivec@i-tech.si



oPAC Events

Fellows shine brighter than the Spanish sun in oPAC's grand finale

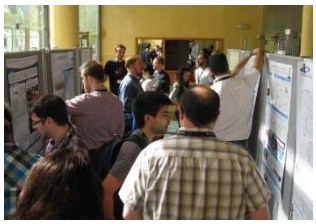
The Centro Nacional de Aceleradores (CNA) in Seville, has proven once again to be a superb conference venue by hosting the International Conference on Accelerator Optimization, October 7th – 9th , oPAC's final official event.

For two and a half days the CNA was home of a significant delegation of the international community of accelerator science, among which the oPAC Fellows had a notorious presence.
The blue skies of Seville offered a splendid background for the conference, which started on Wednesday 7th October with a review of the current status of the Large Hadron Collider and its future upgrades. The following session featured next generation machines, like the Facility for Antiproton and Ion Research (Germany) and the European Spallation Source (Sweden). Novel acceleration schemes using high-power lasers were also presented in one of the talks.

On Thursday there was a whole session dedicated to light sources, with representatives from Solaris (Poland), Soleil (France), ALBA-CELLS (Spain), and ESRF (France). This was followed by several talks on applications of accelerators, in which private companies like IBA group and Med Austron made a prominent contribution.
The Friday session focused on next generation detector technologies and computing, and the conference ended with a visit to the facilities of CNA. The works presented at the conference will be published in a special issue of Physical Review Special Topics: Accelerators and Beams.

The conference also sponsored an outreach talk, especially addressed to the Spanish public, about the treatment of cancer with particle accelerators. The talk, given by Prof. María Isabel Gallardo, from the University of Seville, reviewed the history of radiotherapy, the physical principles of their efficacy in diagnosing and treating cancer, and the future prospects of radiological techniques. Professor Gallardo highlighted the hope offered by accelerators of a definitive cure for the disease, if only the necessary investments where made in facilities for ion therapy. The talk was attended by a large group of people, mainly students, who showed their interest in the topic by actively engaging in many questions.
In addition to the talks, the delegates could enjoy an excellent social program, thanks to the efforts of the local organising committee, the magnificent environment offered by Seville, and the succulent Spanish cuisine.

All presentations can be found on the conference Indico page. The network is much obliged to CNA for hosting the conference and to all the Fellows who contributed to the success of the event.



The poster session provided a forum for intense discussions

Left to right: Prof. Carsten Welsch (oPAC Coordinator), Prof. Maria Isabel Gallardo, and Prof. Joaquín Gómez (Director of CNA)

Upcoming Events

Joint Universities Accelerator School

The next edition of JUAS will be held at the European Scientific Institute in Archamps (France) from January to March 2016 and is open to 2nd year Master, PhD students and professionals.

Founded in 1994, JUAS delivers an academically accredited training programme in accelerator science collaboration with CERN and a cluster of 15 European universities.

The 2016 programme was finalised following the meeting of the JUAS International Advisory Board, hosted by the University of Liverpool at the end of April. The school comprises two five-week sessions: 1) Sciences and physics, and 2) Technologies and applications of particle accelerators.

Classes are taught by leading specialists in their fields, and each session is concluded by an examination which enables students to earn ECTS credits recognised by their home university.

The school is organised by European Scientific Institute with the support of 15 major European Universities and CERN.

PRE-REGISTRATION FOR JUAS 2016 IS NOW OPEN. For information please go to: http://www.esi-archamps.eu/Thematic-Schools/JUAS

Students and faculty in front of the ESI building

Fellows News/Activity

Interview with Michał Jarosz

Michał Jarosz, was born in 1987 in Warsaw, Poland (the birth-place of this EU action patron, Marie Skłodowska-Curie). He studied electronics and informatics in medicine at the Warsaw University of Technology where he obtained his bachelor's and master's degree. During his undergraduate studies, he joined the Polish-Swedish cooperation program for the future European Spallation Source (ESS) and he got involved in the Linac4 project at CERN.

Michał spent two summers at ESS helping in the design of the proton accelerator's tunnel layout, and in March 2012 he successfully defended a master's thesis based on this research. In addition, he worked at the National Centre for Nuclear Studies in Świerk, Poland, where he took part in smaller accelerator projects for medicine and industry.

Michał joined the oPAC network at ESS in August 2012.

What did attract you to the oPAC network?

What attracted me to the oPAC network was, very generally, the opportunities. First of all, the opportunities of working in the accelerator environment – the real accelerator world – then, the opportunities for personal development, the funding for the schools, workshops, trips… Usually it is quite difficult to get that much funding. Then I learned even more, but these two things were what attracted me in the first place.

Why did you choose to go to the European Spallation Source?

Mostly because of my previous experience with them, I had already worked with them before and whenever there was an opportunity of staying I just applied. The ESS was a green field at that moment so it was very exciting to see how the accelerator facility started from scratch, so that was something most exciting, and then of course, Sweden as a place to live is quite tempting.

Did you find it difficult to live in a foreign country and work in a different language?

Not really, as in Sweden everybody speaks English so I had absolutely no problems communicating. I think it would be much more difficult if I had to learn Swedish from scratch. That would make things much worse. In the beginning I didn't expect any downsides on moving abroad, then I found it a little bit more difficult being away from family and friends, in a different environment… but the idea of moving abroad was quite clear for me.

Can you explain in a few words what your project was about and what have you achieved?

My project revolves around the wide area of beam loss monitoring at ESS so I started with some general topics like radiation protection simulations, the loss simulations themselves, and then I switched more to the analysis of the simulation results. In the end the project should result in the final layout for the ESS beam loss monitors all along the cold part of the linac.

What has oPAC provided you apart from a three-year contract?

Again, the funding for all the schools and workshops I could ever imagine, but then also the events organized by oPAC itself were pretty precious for me. Starting from the one in Liverpool which really improved my skills… these were called secondary skills but apparently these secondary skills are sometimes primary if you really want to forward your ideas to other people. Also the last workshop in Liverpool, the technology transfer and the follow up to the career development training might be really useful in the future career.

Did it fulfill your expectations?

It has fulfilled them and even more. I'm very happy about oPAC in the end!

Michał Jarosz

Beam Diagnostics – Down Under

Between 13th-17th September 2015 beam diagnostics experts from around the world gathered in Melbourne, Australia for the International Beam Instrumentation Conference IBIC. IBIC is an established annual conference series that gathers the world's beam instrumentation community. It is dedicated to exploring the physics and engineering challenges of beam diagnostic and measurement techniques for charged particle accelerators and light sources worldwide.

oPAC Fellows Marcin Bartosik, Laura Torino and Manuel Cargnelutti, together with network coordinator Prof. Carsten P. Welsch all contributed to this conference and presented recent research results. Marcin presented results from studies into cryogenic beam loss monitors and Laura attracted a lot of interest with her poster on optimization studies using advanced diagnostics at the ALBA synchrotron in Barcelona, Spain.

Manuel was busy throughout the week at the Instrumentation Technologies booth. His company was one of the main sponsors of IBIC this year and brought several staff members, including CEO Rok Ursic to Melbourne. Prof. Welsch gave overview presentations about Fellow achievements to disseminate their R&D results and help them secure future positions.

The conference was attended by 180 delegates from around the world and considered as a big success by the participants. There was ample opportunity for collaboration meetings and detailed discussion of ongoing research. The conference dinner, held in the Melbourne Cricket Ground – the world-famous 'G' - was one of many highlights during a research-packed week. IBIC16 will be held in Barcelona, Spain and hosted by oPAC partner ALBA.

Greetings from Australia

There is life beyond oPAC

And not only life, but bright professional careers in the accelerator industry. Thus it has been demonstrated by oPAC Fellows Manuel Cargnelutti and Pavel Kavrigin, both of whom have secured a permanent job contract with their host institutions, Instrumentation Technologies (Slovenia), and CIVIDEC (Austria) respectively.

This also demonstrates that oPAC's mission of training researchers to meet the increasing demand for qualified personnel from particle accelerator facilities and suppliers is being accomplished.

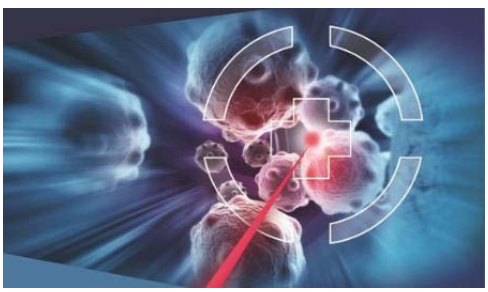
Congratulations Pavel and Manuel!

Partner News

New ITN awarded to train the next generation of medical accelerator experts

Building on the success of the oPAC, LA³NET, and DITANET projects, a new 4M€ Marie Curie Initial Training Network has been granted to a consortium led by University of Liverpool, to train the next generation of medical accelerator experts.

The new network coordinated by Prof. Carsten P. Welsch from the Cockcroft Institute / University of Liverpool, is called Optimization of Medical Accelerators - OMA and it comprises a total of 24 universities, research facilities and private companies from across Europe. It will train 15 early stage researchers to carry out research in the development particle beam therapy for treating cancer, including treatment facility design, numerical simulations for the development of advanced therapies and novel imaging techniques.



Although significant progress has been made in the use of particle beams for cancer treatment, extensive research is still needed to maximize healthcare benefits. Prof. Welsch said: "The field of particle therapy has steadily developed over the last six decades, first in physics laboratories, and starting in the late 90's in dedicated clinical installations."
"By March 2013 about 110,000 people had received treatment with particle beams, the vast majority having been treated with protons and around 15,000 patients with heavier ions such as helium, carbon, neon, and argon."

"OMA will push the limits in treatment facility design, imaging techniques and treatment optimization through advanced numerical studies.

"A network of European universities, research centers, clinical facilities and industry partners with outstanding expertise in this area will jointly develop advanced schemes to assure the best possible cancer care for patients."

Professor Welsch added: "I am absolutely delighted that this collaboration has been funded. In close collaboration with our project partners we will provide a broad and interdisciplinary training program to our Fellows to develop them into outstanding researchers.

"We will also organize many events for the wider research community to stimulate knowledge exchange and generate a lasting impact."

The project is currently recruiting for its Fellowship positions that will be based at institutions across Europe. Researchers from around the world are invited to submit their application by 28th February 2016. Further information on the vacancies available through the project can be found at here

To find out more about OMA, visit: www.oma-project.eu.

This project has received funding from the European Union's Horizon 2020 research and innovation program under the Marie Skłodowska-Curie grant agreement No 675265.

The T.E.A.M. - A European 'success story'

The oPAC network – and its sister projects LA^{3}NET and OMA – is managed by the EU Project T.E.A.M. (Training, Enterprise, Administration, Management) based at the Cockcroft Institute / University of Liverpool. Their hard work allows making the most out of these large scale research projects and is vital for maintaining excellent links to project partners from around the world.

To date, we have organized numerous events around the world, trained a large number of researchers and continuously highlight the importance of accelerators for science and society. We have now produced a short video that summarizes some of the many T.E.A.M. activities:

https://youtu.be/UUs_M5WOAu8

Enjoy!

"If you have a problem, if no one else can help, and if you can find them, maybe you can hire **The EU – T.E.A.M**"

Crowd sourcing effort – The Secrets of the Universe

In order to reach a wider audience a 3D IMAX film about the scientific discoveries at CERN and their relevance to fundamental questions about the universe is planned for distribution via science centres and museums. The film is being funded through crowd sourcing to match a grant with a large proportion of the budget already pledged. The film is "The Secrets of the Universe" to be launched by the creators of "Particle Fever". www.indiegogo.com/projects/explore-the-secrets-of-the-universe-at-the-lhc#/story

EU funding for Open Access journals

The European Commission has recently launched a pilot action to fund open access peer-reviewed publications from finalized FP7 projects. This initiative is implemented by the project OpenAIRE2020.

If any of the oPAC partners is planning to publish peer-reviewed articles in Open Access journals after the end of the project they might be able to use the funds made available through this pilot to cover the publication fees (Article Processing Charges or APCs). Also open access monographs, book chapters or conference proceedings can be funded if these are occurring after the end of the grant (and not eligible for reimbursement from the project budget).

You can find more information on the post-grant pilot here:
https://postgrantoapilot.openaire.eu/#home

D-Beam: Commercialization of Beam Diagnostics

Ms Alexandra Alexandrova, a Marie Curie Fellow from the LA3NET project, based at the Cockcroft Institute/University of Liverpool has been awarded a Royal Society/STFC Enterprise Fellowship in summer 2015. These Fellowships are awarded on a highly competitive basis and enable promising science and technology researchers to grow into successful entrepreneurs. Ms Alexandrova is aiming at establishing the highly specialized company D-Beam.

The idea of *D-Beam* is the provision of optical diagnostics for enhanced characterization of charged particle beams in accelerators, light sources and reactors. Of the thirty thousand accelerators in operation, only 1% is used for fundamental research purposes, whilst the vast majority finds application in healthcare, security, environment, material treatment and production.

Accelerators are a flourishing and expanding industry, underpinning important sectors worth several billions of pounds. Key to the successful operation and optimization of these machines is a powerful diagnostics system that provides comprehensive information about the beam at any moment in time including its profile, position and intensity.

If you have specific instrumentation requirements or simply would like to find out more about D-Beam, please get in touch:

alexandra.alexandrova@cockcroft.ac.uk

Vacancies

Marie Curie Early Stage Career Fellowship – OMA project
Several locations around Europe

Research Associate - Electromagnetic mode profile shaping
The Cockcroft institute, UK

Fellowship in Accelerator Physics
Paul Scherrer Institute (PSI), Switzerland

Scientist (f/m) Collider Phenomenology
DESY, Germany

Post-Doctoral Fellowships in Experimental Physics
INFN - Istituto Nazionale di Fisica Nucleare, Italy

Experimental Scientist (IRC202977)
Science & Technology Facilities Council (STFC), UK

Post-doctoral Fellow for the soft interfaces and coherent scattering beamline ID10
European Synchrotron Radiation Facility, France

Insertion Device Physicist/Senior Insertion Device Physicist
Diamond Light Source Ltd, UK

Senior and Junior Researchers, Postdoctoral research assistants, PhD students, Engineers, Physicists and Technicians
ELI-NP National Institute for Physics and Nuclear Engineering, Romania

Postdoc Physicist for Laser-driven Electron Acceleration and Plasma Diagnostics
ELI Beamlines, Czech Republic

Technical Engineer (Radiation Protection)
CERN, Switzerland

Associate Laboratory Director, Accelerator Division
TRIUMF, Canada

PhD Scientist
Helmholtz Zentrum Berlin für Materialien und Energie, Germany

Selected Publications

L. Torino and U. Iriso, “Limitations and solutions of beam size measurements via interferometry at ALBA”, IBIC-2015, Melbourne, September 2015, TUPB049 (2015)

M. R. Bartosik *et al.*, “Beam Loss Monitors for the cryogenic LHC magnets”, IBIC-2015, Melbourne, September 2015, MOPB042 (2015)

Project Coordinator
Prof. Carsten P. Welsch
Cockcroft Institute
Sci-Tech Daresbury
Keckwick Lane
Warrington, WA4 4AD
United Kingdom

PHONE:
+44 (0) 1925 86 4352

FAX:
+44 (0) 1925 60 3192

E-MAIL:
carsten.welsch@cockcroft.ac.uk

Project Manager
Dr. Ricardo Torres

PHONE:
+44 (0) 1925 86 40 46

FAX:
+44 (0) 1925 86 4206

E-MAIL:
ricardo.torres@cockcroft.ac.uk

Newsletter Editor
Alexandra Welsch

PHONE:
+44 (0) 1925 86 4050

FAX:
+44 (0) 1925 86 4206

E-MAIL:
alexandra.welsch@cockcroft.ac.uk

Find us on Facebook

www.opac-project.eu

Events	
Nov 16th – 19th 2015	International Workshop on Antiproton Physics and Technology at FAIR, Novosibirsk, Russia
Nov 19th – 21st 2015	ALPA 2015, Venice, Italy
Jan – March 2016	JUAS 2016, Archamps, France
March 6th – 11th 2016	Leap 2016, Kanazawa, Japan
May 8th – 19th 2016	IPAC 16, Busan, Korea
Sept 11th – 15th 2016	IBIC 16, Barcelona, Spain
Sept 25th – 30th 2016	LINAC 16, East Lansing, MI, USA
Oct 25th – 28th 2016	PCAPAC 2016, Campinas, Brazil

NOTICE BOARD

Deadline for submission of the full application form for Joint Universities Accelerator School **30th October 2015**

Please send your contributions to the oPAC Book of Memories to Dr. Nika Vodopivec: Nika.Vodopivec@i-tech.si

Contributions to the special issue of Phys. Rev. STAB for the International Conference on Accelerator Optimization still welcome!

DEADLINE FOR CONTRIBUTIONS TO THE NEXT NEWSLETTER **15th January 2016.**

About oPAC

The optimization of the performance of any Particle ACcelerator (oPAC) is the goal of this new network within the FP7 Marie Curie Initial Training Network (ITN) scheme. oPAC aims at developing long term collaboration and links between the involved teams across sectors and disciplinary boundaries and to thus help defining improved research and training standards.

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 289485.