July 2012

ENLIGHT

HIGHLIGHTS

10 years on

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A Special Thank you to Marina Giampietro.

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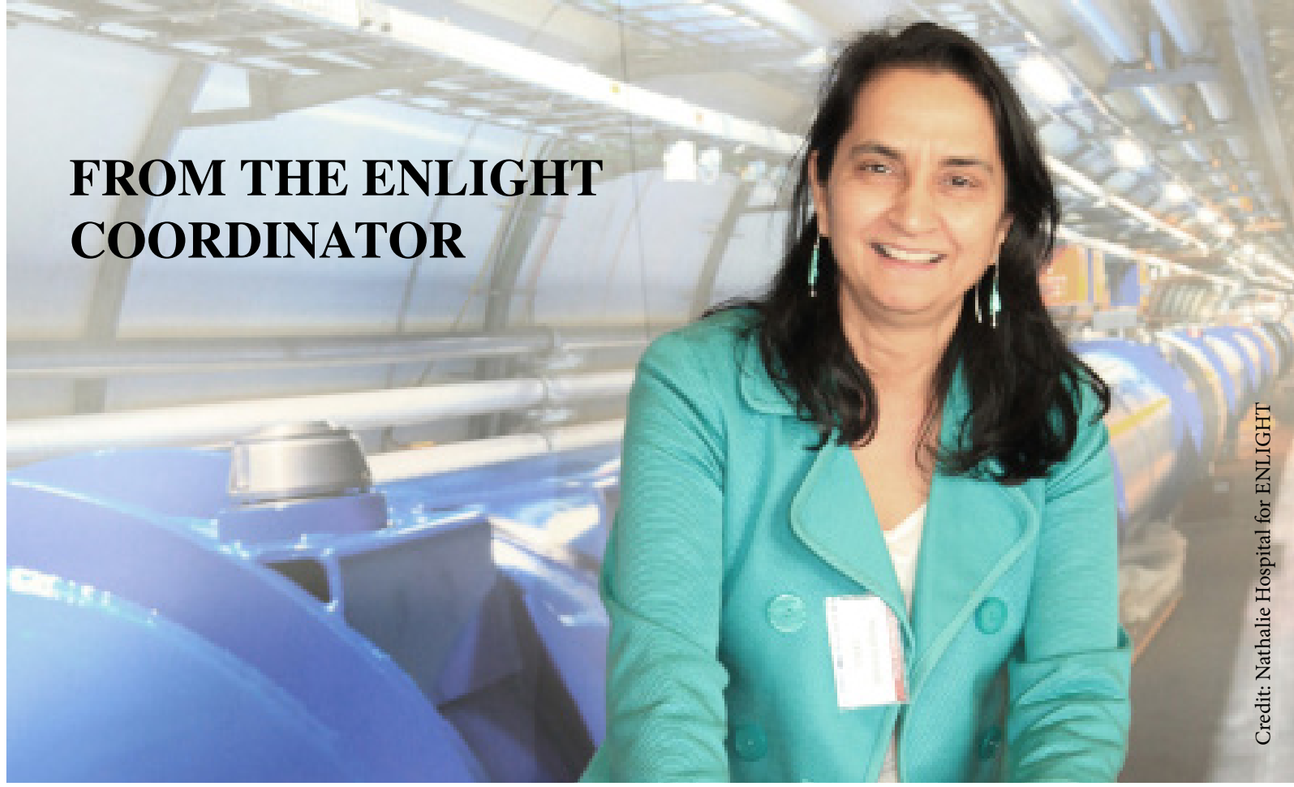
For more information and contact details please visit the ENLIGHT website



Credit: Nathalie Hospital for ENLIGHT

FROM THE ENLIGHT COORDINATOR

IT SEEMS LIKE YESTERDAY, AND YET TEN YEARS HAVE PASSED SINCE OUR NETWORK WAS LAUNCHED.

At the time, the establishment of a multidisciplinary platform which would gather clinicians, physicists, biologists, computer experts and engineers with experience in proton and carbon ion therapy seemed like a dream. And indeed, it has not always been easy; but looking at the size, cohesion, and scientific impact of ENLIGHT today, it was definitely worth it.

In 2002, ENLIGHT was created to foster effective collaborations. In 2012, we can affirm that ENLIGHT has fulfilled that need, acting as an essential catalyst for partnerships among different disciplines, research institutes, and countries. New challenges lie ahead of us: we started planning for the future at the meeting in Marburg last year, and we will refine our strategy in Pavia in September.

Scientific potential was turned into reality by the enthusiasm and energy of the people involved. From senior researchers to young PhD students, each one of us has been contributing to the success of the network. This same collaborative spirit inspired us to create HIGHLIGHTS. This publication is our new platform for keeping us all connected as the network expands and the young researchers from our first Marie Curie project pursue their careers around the world. We are a community on the move.

A warm thank you goes to all the contributors to our first issue.

Now the opportunity is yours to get your news and views across to the rest of the community.

Manjit Dosanjh

YEARS ON

Ten years ago, in February 2002, the ENLIGHT network had its inaugural meeting. About 70 specialists from different disciplines, including radiation biology, oncology, physics and engineering, attended this first gathering: this was a considerable achievement, in a time when "multidisciplinarity" was not yet a buzz word.

This success was the result of years of work aimed towards a unified approach to hadron therapy in Europe. Some of the key players in the birth of ENLIGHT have accepted to share their personal recollections of those years for this first issue of HIGHLIGHTS.

The agenda of the first meeting shows that all major institutions and projects involved in particle therapy, not only those within Europe, took part in the initiative and provided their input.

Part of the ENLIGHT community was also involved in the EU-funded project with the same name, which kicked off in September 2002 under the coordination of ESTRO.

The project came to an end in June 2005, with the final meeting in Oropa, an ancient sanctuary in the Italian Alps, held in conjunction with the annual ENLIGHT network meeting.

There were presentations and discussions on the key areas outlined in the EU project: epidemiology and patient selection; clinical trials; radiation biology; beam delivery and dosimetry of ion beams; imaging; and the economics of hadron therapy treatment.

Credit: GSI/HIT/Siemens

Treatment room at the Heidelberg Ion Therapy Centre

It was unanimously acknowledged that ENLIGHT had been a key catalyst in building a European platform and pushing hadron therapy forward. The encouraging results motivated the community to discuss on how to maintain and broaden the network.

Less than a year later, in March 2006, more than 100 scientists from 20 European countries arrived at CERN for the preparatory meeting of ENLIGHT++, where the two plus signs refer to more countries and more hadrons with respect to the previous project.

The participants agreed that the goals of the network could be best met by two complementary approaches: research in areas needed for highly effective hadron therapy, and networking, to establish and implement common standards and protocols for treating patients. The primary mandate of ENLIGHT++ is therefore to develop strategies for securing the funding necessary to continue the initiative in these two fundamental aspects, mostly through dedicated EU projects, while the network itself carries on without specific funding.

Today, there are four EC funded projects under the umbrella of ENLIGHT; PARTNER, ULICE, ENVISION and ENTERVISION, with total funding of 24 million Euros.

All these projects are directed towards the different aspects of developing, establishing and optimising hadron therapy. The network has been steadily growing, and it now counts about 400 participants from more than 20 European countries.

The annual meeting which will take place in September in Pavia will not only mark the 10th anniversary of ENLIGHT, but also the end of the first training project sponsored by the network, PARTNER.

It will be a time to celebrate the accomplishments of this decade, but also to look at the future, develop new strategies along the ideas outlined last year in Marburg, update the committees and list of members, and find ways to keep the community always connected.

10 YEARS ON

JEAN-PIERRE GÉRARD

ENLIGHT was launched in 2002, as a result of several years of European activity in the field of hadron therapy.
Indeed, as early as the 1970s, particle beam therapy was already considered an attractive field of research (Gérard JP et al., Experimental study of RBE of fast neutron, J Radiol. 1978; 60:691). In the 1980s the EULIMA project, established in collaboration with CERN, was the first European attempt to design a cyclotron to produce carbon-12 ions. The Honoris Causa awarding to Ugo Amaldi by Lyon University 1, in 1997, marked the origin of the ETOILE project for a carbon ion facility in Lyon, which today is included in "France Hadron".

At that time, radiation oncologists in Germany, Italy, Switzerland and Austria were actively engaged in the design of accelerators to produce protons and carbon ions beams (PIMMS). During my presidency of ESTRO between 1991 and 2001, the European Framework Programme offered a good opportunity to initiate a European cooperative action bringing together all the teams interested in the field.

It was thanks to the energy and vision of Germaine Heeren, the general secretary of ESTRO, that it was possible to create the ENLIGHT group: the European Network for Light Ion Hadron Therapy.

In collaboration with CERN, a memorandum of understanding was signed in 2001, and this was the basis of a call for grant from the EU 5th Framework Programme.

This grant was of a modest amount, but represented a strong incentive to create, with the intrinsic support of CERN, a dynamic collaboration between all the radiation oncologists and physicists involved in this great hadron adventure. It is a real pleasure to see 10 years later that the dreams of these pioneers are becoming reality in Heidelberg, Pavia and in other European centres, for the benefit of paediatric and

RICHARD PÖTTER

The European Network for Light Ion Therapy was founded on the basis of various developments in the field of particle therapy during the 1990s.

Specific projects in different European countries had been conceived, but there was the common vision that these initiatives had to come together, in order to globally strengthen the efforts in order to successfully establish light ion radiotherapy. Within ESTRO, a working group had already been initiated by prominent members of various European projects. This group prepared a comprehensive programme that included a range of topics, such as patient selection modalities, preparation of clinical trials, technology, biology, imaging, and health economics.

An essential step forward was the decision to apply for an EC grant under the 5th Framework Programme, in order to fund the development of ENLIGHT with regard to the various subjects mentioned above. The application was successful, so this European network got a unique opportunity to enhance its activity throughout the different working groups and regular meetings, over a period of three years.

The synchrotron at the CNAO facility in Pavia

At the end of this grant project, which produced promising results in various fields and created a comprehensive network structure, there was the strong belief and desire to continue the ENLIGHT initiative even without direct funding. It was felt that ENLIGHT, which had taken some years to be born, should survive and mature. In this second phase new leaders of the network became operational and could create a strong "informal" ENLIGHT collaboration structure.

UGO AMALDI

For me, the ENLIGHT project started with an email received on Saturday October 6, 2001 from Germaine Heeren, Secretary General of ESTRO. The title was "ESTRO Hadrons project – VERY URGENT" and it was addressed to many European radiation oncologists and physicists. The purpose - defined in a meeting chaired by Richard Pötter in December 2000, and better focused in a second meeting called by Jean-Pierre Gérard, at the time ESTRO President - was to submit a proposal by October 18 to the European Framework Programme 5. In the email, I was asked to coordinate the "theoretical physics and engineering part" of the proposal. Hans Svensson and Jean-Pierre Gérard had already been given the responsibilities respectively of the "physics part" and "the clinical tasks".

Since there were less than two weeks to the deadline, I exchanged the first emails with Germaine Heeren on Sunday, and as of Monday morning I contacted all the European groups I knew. Most of them were informed of the fact that something was on the move, and everybody said that in principle they agreed, but very few people were ready to contribute to the write-up. Thus I had to do a lot of the work myself, helped by Hans Svensson, but I still remember those hectic days with pleasure, because for me an European project initiated by ESTRO was the completion of ten years of activity.
In fact, TERA had been conceived already in 1991, the Proton Ion Medical Machine Study (initiated at CERN by Meinhard Regler and myself in 1995, and led by Phil Bryant) had completed the design of an optimized proton-carbon synchrotron, and, last but not least, the Italian Health Minister Umberto Veronesi was drafting the law financing CNAO, which was based on a modified version of PIMMS. A European project would have been the best framework for the next steps. Towards the end of the writing, there were also some difficult moments: on that occasion, the intervention of Jürgen Debus was instrumental.

I sent the text - for which Walter Henning had written a preface and Gerard Kraft had contributed the radiobiology part - to Germaine Heeren around noon of October 18. The approval of ENLIGHT arrived on February 6, 2002, just one week before the opening of the inaugural meeting of the network. It was held at CERN, following our request, supported by Hans Hoffmann, CERN's Director for Technology transfer and scientific computing, and Luciano Maiani, CERN's Director General.

A global strategy for better healthcare

Medical doctors, biologists and physicists do not often have the opportunity to discuss common and future strategies for health care. The ICTR-PHE 2012 Conference provided a much-needed venue to present the state of the art of the research in various domains and identify the best way forward.

A broad community of experts involved in diagnosis, treatment, and cure gathered to share and discuss their latest results in the ICTR-PHE 2012 Conference, which took place in Geneva from February 27 to March 2.

This large event resulted from the merging of two – formerly independent - successful gatherings: the International Conference in Translational Research in Radio-Oncology, which had been held every two years since 2000, and CERN's Physics for Heath, whose first edition took place in 2010.

ICTR-PHE 2012 was co-chaired by Manjit Dosanjh, CERN's Life Sciences Advisor, and Jacques Bernier, Head of the Radiotherapy Department at the Genolier Clinic (Switzerland).

With more than 600 participants, submission of 400 abstracts, and presentation of 150 posters, the conference was an important opportunity for researchers coming from different backgrounds, however all working towards better healthcare, to meet, to debate scientific and medical issues, and to establish or reinforce collaborations.

"This turns out to be an important meeting in order to get medical doctors, physicists, and engineers to collaborate together", pointed out Steve Myers, CERN's Accelerators and Technology Department Director. "In such occasions we - physicists and engineers - can find out what clinicians and biologists need and they can discover what we can give them in terms of technologies".

"Health research must be a driving force for the renewal of science policy" - José Mariano Gago

The need to establish a solid network between different scientific communities is strongly felt by most of the researchers and practitioners involved in life sciences. It is also becoming more and more evident that new synergies must be initiated in order to apply new findings from science and technology directly to clinical practice.

A continuous and constant interaction is necessary to develop a common strategy, which would integrate the various perspectives.

An even farther step should and can be taken in this direction: "Collaboration is not enough, we need union between the physics and clinical worlds", claimed Jean Pierre Gérard, professor of Oncology and Radiotherapy, member of the Centre Antoine Lacassagne (Nice, France).

Credit: Laurent Egli, CERN

The conference is opened by Rolf Heuer (CERN Director General), Ruxandra Draghia-Akli (Director for Health in DG Research and Innovation of the European Commission), Pierre-François Unger (Président du Conseil d'État de Genève), together with the conference chairs.

This concept was strongly reiterated by Soren Bentzen, oncologist with a background in medical physics, who gave a public lecture on "Treatment of cancer in the XXI century: biology, physics, and genomics".

He highlighted that when it comes to oncology and development of new treatments for cancer, researchers expert in different fields necessarily end up working in the same playing field.

Bentzen explained that, in the past, medical physics used to lie at the interface between physics and engineering on one side, and medicine on the other. Medical physicists had a background that gave them the ability to understand the languages of the two communities and they used to play the role of intermediaries between the two worlds, with the goal to implement a device or a treatment to be used in clinical practice.

However, the situation has evolved, and nowadays the boundaries between different disciplines are fading away, so that physics, engineering, information technology, biology, medicine, and genomics are merging into a unique new science: clinical biophysics.

Even though the ICTR-PHE 2012 Conference aimed at discussing a range of health issues, most of the talks over the five days of workshop focused on strategies and technologies for fighting cancer.

Ranging from new technologies in radiation therapy, detectors, and medical imaging, to radiobiology, radioisotopes for diagnostic, to molecular biology, and use of drugs and markers, the presentations gave an extensive overview of the state of the art and demonstrated that common efforts in this field can lead to important results.

Even though surgery and chemotherapy are commonly used for treating cancer, radiotherapy has become a major weapon in the fight against this disease. Usually, it is performed by applying high-energy photons (X-rays) to target and destroy tumour cells: often referred to as conventional radiotherapy.

"Tomorrow I will be back treating patients, but I will carry with me lots of dreams and ideas" - Alejandro Mazal

Recently the exploitation of charged particles, such us proton, and carbon ions, has been explored, and the results are very encouraging. The main advantage of this technique, which is called hadron-therapy (charged particle therapy), is that the specific dose delivery profiles of such particles allow to better target the lesion and spare the surrounding healthy tissues to a greater degree.

As Jean-Pierre Gérard explained, radiotherapy counts on three important characteristics (the 3 C's) that make it an appealing treatment. First of all, it is curative in several cases: 45-50% of tumours are defeated, half of which by using radiotherapy (the other half by surgery).

Second, it is conservative, because it does not lead to the removal of organs and mutilation of the body. Last, it is cost-effective: "only 5-10% of the actual medical expenses for cancer treatment are due to radiotherapy, the rest is connected to surgery, chemotherapy, and other medical procedures".

Therapies with charged particles are more expensive, but still cheaper or costly comparable to other combined modalities.

An interesting concept that emerged from the discussions during the conference is that the competition between the different treatments is actually a non-issue: research and clinical practice are showing how, in most cases, a combination of various treatment options is preferable and even mandatory.

Modern cancer treatment is taking one step further from the "one size fits all" philosophy: Bentzen explained that cancer patients used to be classified in boxes, according to their age, the organ in question, and other basic characteristics. People in each box used to go through exactly the same series of treatments.

Credit: Laurent Egli, CERN

The new frontier is a highly personalized approach, where the treatment is tailored to the patient, in order to increase the success rate and when possible to be more cost-effective. This is much more feasible nowadays because of new results of research in engineering and biology. For example, novel sophisticated imaging techniques offer the opportunity to monitor the effect of the therapy almost in real time, and a deeper understanding of the physiology of the cancerous tissues gives new insights for a better treatment.

Indeed the conference programme devoted a large amount of time to imaging. This research field is progressing quickly thanks to the development of new detectors for better resolution, the exploitation of powerful computers and fast electronics, as well as the combination of different imaging modalities.

Medical imaging is useful not only for diagnostics, but also for guiding surgeons when operating on patients. In addition, it can be employed to monitor the position of the tumour during radiotherapy and to see how it responds to treatment.

"Collaboration is not enough, we need union between physics and clinical worlds" - Jean-Pierre Gérard

SAVE THE DATE

ICTR-PHE 2014

10 – 14 February 2014

CICG - Centre International
Conférences Genève
Geneva, Switzerland

Søren M. Bentzen, professor of Human Oncology and member of the Imaging and Radiation Science program of the Carbone Comprehensive Cancer Center at the University of Wisconsin School of Medicine and Public Health.

Credit: Laurent Egli, CERN

The Conference chairs Jacques Bernier, Head of the Radiotherapy Department at the Genolier Clinic (Switzerland), and Manjit Dosanjh, CERN's Life Sciences Advisor.

Meetings such as the ICTR-PHE 2012 conference are important occasions for researchers to share their experiences and establish collaborations, but they also offer the opportunity to be involved in the discussion with decision-makers, who are called to establish research guidelines for the future and decide funding policies and directions.

Political issues were discussed by José Mariano Gago, professor of Particle Physics and former Minister of Science and Technology in Portugal: "Health research must be a driving force for the renewal of science policy", Gago stated in his talk, "a European Council for Health Research is urgently needed and its establishment is being already discussed".

The large participation and the request for a follow up to the ICTR-PHE 2012 conference showed that the interest around the defined research themes is high, as well as the will to foster collaborations between different scientific communities.

New bridges were being built during the workshop and some multidisciplinary projects will probably take their first steps from there. The participants went home with deeper knowledge on health issues and related technologies, and hopefully with new ideas. "I come here to dream", stated Alejandro Mazal, Head of Physics Institut Curie, Centre de Protonthérapie d'Orsay (France), and Chair of PTCOG, "tomorrow I will be back treating patients, but I will carry with me lots of dreams and ideas".

Follow-up from ICTR-PHE: a proposal for a European biomedical facility at CERN

The first Physics for Health workshop identified a set of critical important needs in the European landscape. One of the key issues was the necessity of a biomedical research facility, supported by a consortium of laboratories, to be hosted by CERN and made available to the international scientific community. Following the preliminary feasibility studies carried out on the LEIR accelerator, which were presented at ICTR-PHE, a brainstorming meeting was organised at CERN on 25th June 2012 to gather input from a large multidisciplinary community of experts. More than 200 people from 26 countries registered for the meeting, which was also webcast to reach a wider audience. From this one-day discussion, it was evident that there is a broad agreement on the usefulness and scope of such a facility. The major points are summarised in two articles being published on BJR and the Green Journal, and a strategy document is being addressed to the European Particle Physics Strategy Group. An in-depth article will be featured in the next issue of the ENLIGHT Highlights, so stay tuned.

Workshop agenda and presentations: https://indico.cern.ch/conferenceDisplay.py?confId=193910

ICTR-PHE's influence reaches as far as Senegal

Senegalese students in the remote village of N'Diago received a surprise shipment in May; the remaining ICTR-PHE 2012 conference bags, sponsored by VARIAN Medical Systems.

Credit: Ensemble pour Ndiago

It started with a brick. A bright red, lego knock-off brick. Although small, the bricks garnered attention from all the passers-by at CERN's main building.

But each brick symbolized a lot more than a nostalgic toy- they were the building blocks for an actual wall around a primary school in N'Diago, Senegal.

With the goal of providing development aid for the instructors and school-age students in the remote village, the Association Ensemble Pour N'Diago, a young non-profit organization headquartered in Geneva and founded on the 12th of February in 2011, has made great strides to meet the pedagogical needs of the students. Chantal Fournier and Laurence Greggio, both former CERN kindergarten instructors, head the association.

Their aim is to raise enough funds to build a wall around the school grounds, stocking a library, and supporting the school cafeteria needs.

The village lies 200km from Senegal's capital and largest city Dakar There are 5 hundred inhabitants in the village, the most important in an area where there are 12 other.

The children of these other villages go to school in N'Diago, usually carrying their supplies in plastic bags. So when Iulia Pascu, a fellow of the Knowledge Transfer group at CERN approached them with an offer, they were ecstatic.

VARIAN, a proud sponsor of the ICTR-PHE 2012, handed out over 800 messenger-style bags to conference participants. As with most conferences, there were a substantial number of bags left after the closing session.

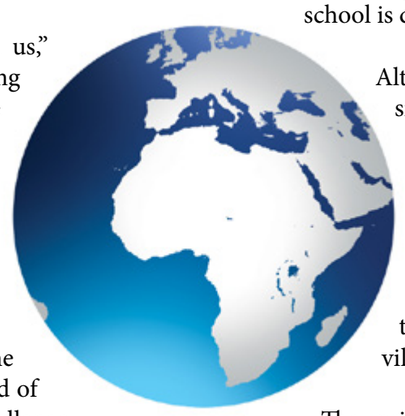
These remaining bags were given to the association and subsequently delivered to the school children.

The bags, blue in color, were distributed at the opening of the school's cultural day in front of the entire community. Varian couldn't be reached for a comment.

"It was awesome!" Greggio interjected. "Most students carry a plastic bag where their pens make holes and they start to lose their notebooks and other supplies. When we saw the bags, we couldn't say no to this!"

The principal of the school, Mr. Abdou Ngiago was also very appreciative for the bags that matched his students blue uniform shirts -a coincidence he commented in his last mail to Greggio. He is also the first person of contact for Greggio and Fournier who appreciate his and the teacher's dedication to the students.

"Seeing the teachers has touched us," Greggio said. "They are all young university graduates who have studied in Dakar. N'Diago is their first post and it is very hard for them".



The school lies at the entry of the village, where only 8 teachers are allocated for the nearly 3 hundred children. Although French is the lingua franca for the Senegalese and of course taught in school, it is also a challenge. Most children speak Wolof as the first language and speak it primarily at home. There is neither repetition nor reiteration of French at home, something that both Fournier and Greggio understand all too well.

"At CERN the children come from many different language backgrounds," Fournier says as she leans forward to take another sip of coffee. "French becomes their universal language to communicate with one another, for play. It becomes their universal language. That is why we incorporate sound to teach."

The 'sound' that Fournier refers to is a teaching method developed by Madame Borel-Maissony, a founder of speech therapy in France who also coauthored a book called "Bien lire et aimer lire."

Credit: Ensemble pour Ndiago

"This is for the kids, and they work. They work hard"

The method uses a variety of teaching tools, most notably phonetic and gestural signs to help with reading. In this case, the method helps the students get a grasp of a language they rarely use in their homes.

Point in fact, using these techniques to teach the children of N'Diago are important, as their time in school is quite limited.

Although the lessons are organized similarly to its French counterparts, the weather and seasons add another decisive factor of whether or not the children attend. Extreme heat can shorten school days and in the months of July though October, the children aid their parents in the fields and in the village.

The primary school is composed of 5 buildings, where four buildings are reserved for lessons, and the fifth for an eventual library. There is no encompassing wall around the school, an architectural element incredibly important in the villages. The secondary school is in no better shape.

"There is nothing. There is no electricity, so their needs are very basic" Greggio added. "We are of course surprised. The heart of this project is for the wellbeing of the students, unlike other places where teachers tell their students 'You learn or you don't'. This is all for the kids and they work. They work hard."

Even a small gift can make a world of a difference in these conditions.

Greggio and Fournier invite anyone that has old furniture or old computers to contact them. To financially support the association, you can make a contribution using the following bank details.

<<Ensemble pour Ndiago>>

Compte Postal 12-1-2
Bank: Banque Cantonale Geneve
Iban CH15 0078 8000 0502 6032 8

For more information on how to help, you can contact laurence.greggio@orange.fr

NEW WEBSITE

COMING SOON!

September 2012

IMPRESSIONS

im·pres·sion (ĭm-prĕsh’ən)

n.- An effect, a feeling, or an image retained as a consequence of experience.

Three researchers recount their impressions on past meetings and events. The ENTERVISION Kick-off and ENVISION Mid-Term Review are highlighted in this issue.

Robert Kieffer

This first Marie Curie training was a nice and rather complete introduction to the most recent hadron therapy techniques. The first day was held at the hadron therapy centre of Heidelberg (HIT). As Mondays are dedicated to machine maintenance, the doctors and physicists working at the facility were free to give us the lectures. They presented all the aspects of HIT, from the beam line to the treatment rooms, explaining in detail how the treatment is planned and delivered to the patient.

We were scheduled to have some hands-on beam control during the afternoon, but the timing was too short to have sufficiently good vacuum quality in the beam pipes. We made good use of this spare time, visiting the facility more extensively.

Starting from the ion sources, and first linac, we walked along the storage ring that feeds the delivery beam lines. The 600 tons gantry was in commissioning phase so we were able to see it rotating. That was really impressive, considering the precision constraints on the beam delivery, which are of the order of a millimetre at the isocentre point! We also spent some time in the treatment room, where doctors showed us how they validate the planned treatment using a water based phantom.

One of the most interesting aspects of this first day was to discover the interaction between physicists in charge of producing a stable beam and the doctors dealing with patients.

On the second day, we moved to the GSI research centre in Darmstadt. This facility pioneered carbon ion therapy, treating the first patients using the physicist’s ion beams as of 1997. We started with a series of radiobiological lectures on cell behaviour under ion beam irradiation. Then researchers gave us a status update on the hadron therapy studies being performed at GSI.

The afternoon was organised as a small workshop, where we had to propose a tracking device capable of following the organ motion in order to adapt the beam delivery. Most of the solutions we proposed turned out to be already under development, but it was nevertheless an interesting exercise. We concluded the training with a visit to the GSI facility. Even if the treatment room is no longer used for patient treatment, it is still operational for the development of new hadron therapy techniques.

Back from this training I think that every participant has a better understanding of hadron therapy and the critical issues to be solved in the forthcoming years. I hope everyone else enjoyed the training as much as I did. I personally thank again the speakers and organisers for their kindness and availability to answer our questions. –Robert Kieffer, TERA

Joakim Da Silva

As a freshly recruited Early Stage Researcher in the ENTERVISION project, the meetings in Ciudad Real provided my first contact with the other researchers in the two projects, as well as with the ENLIGHT network. Since I had started my PhD course only three days before the meeting, I was not sure what to expect – except maybe for warmer weather for a few days.

I was happy to learn that I am now part of a project involving cutting edge research in several areas related to radiotherapy, and not least of a group of friendly and cooperatively minded people.

The ENTERVISION meeting was opened with a short introduction to the project and to the ENLIGHT network, directly followed by researchers' presentations where we got to introduce both ourselves and our research plans. Like me, most researchers were quite new to their projects, and the presentations, rather than being dominated by scientific results, provided a nice overview of the different research topics within ENTERVISION, and an opportunity to learn about the background of the people behind them. To contrast this, the ENVISION meeting starting the same afternoon saw us newcomers thrown head first into technical talks on the progress of work packages in areas new to many of us. Though I cannot say I understood half of the details in these presentations, this baptism by fire, as Manjit put it, still gave me an idea of what is currently the state-of-the-art in these fields, and some knowledge of the platform that ENTERVISION will hopefully build on.

While the talks focused on the research, the real chance to get to know the other researchers was provided by the meals and coffee breaks generously scattered throughout the meeting agenda. Though these were all good and nicely organized by our hosts, the conference dinner, and in particular the starter with a selection of mouth-watering Spanish meats and cheeses, deserves a special mention.

Since a few of us were not flying home until the day after the last meeting, we profited to explore the city. Though seemingly very quiet and apparently hit by the recession, I found that Ciudad Real has a nice feel about it and houses a fair few sights and museums worth visiting for a city of its size; I particularly enjoyed the Museo Lopez-Villaseñor.

All in all, the weekend offered a pleasant mix of interesting talks, nice company and good food, all set in a quaint medieval city.

– Joakim da Silva, Cambridge

John Gillam

Recently, in April this year, my colleagues and I had the pleasure of attending the ENVISION Mid Term Review held in Ciudad Real. My role in the ENVISION project is as a researcher contributing to Work Packages 2 and 3, which deal with in-beam Time-of-Flight PET and single particle tomography. Specifically, I work on image reconstruction of data for both techniques, and it is from this perspective that I would like to provide an overview of the meeting.

While I tend to lean to the interesting rather than practical, the goals of ENVISION provide a balance in the trade-off between these two components of research. In a more scientific context, the Work Package 3 face-to-face meeting was held the day before the Mid Term Review. At the WP3 catch-up we heard very interesting results from everyone: but of particular note were those from CREATIS (INSA-Lyon) and IBA.

The contribution from CREATIS was fantastic, presenting a novel approach to system matrix estimation for Compton camera image reconstruction. IBA have developed a seemingly elegant and robust approach to beam monitoring that sidesteps many of the difficulties of other indirect imaging modalities, which was recently published in Physics in Medicine and Biology.

On the morning before the MTR meeting, the first annual ENTERVISION meeting took place, featuring interesting introductions from the Marie Curie researchers (both current and one future!). ENVISION Work Package updates were then delivered for the remainder of the first day and the morning of the next. Each WP seems to be producing some excellent research. While some of the developments were planned from the outset, less expected achievements (by me at least) were also reported.

The collimated gamma cameras, both multiple and single-slit devices, presented in WP3 and the excellent bio-mechanically modeled 4D phantom under development in WP4 were definite highlights. Both experimental and simulation results were presented from WP2 that will help quantify the advantages of Time of Flight PET in a monitoring application.

The WP5 presentation provided nice insight into post-reconstruction utility of the images acquired by monitoring devices, while the WP6 presentation outlined challenges of simulation in this field. Overall, the presentations managed to squeeze in some very interesting science between the reporting requirements of a review. Many researchers also provided poster presentations of their scientific developments, and it would have been nice to have time for a dedicated poster session for more detailed information.

ENVISION and ENTERVISION researchers gather at the Universidad de Castilla-Mancha in Ciudad Real .

The final work package presentation was perhaps the most important to the long-term outlook: WP7 communication, dissemination and outreach.

As researchers, we are generally competent in dissemination activities, yet we tend to overlook valorisation - one of the primary goals of WP7. In my opinion, valorisation is important in two aspects: it is difficult to get done correctly (particularly with scientists), and it needs to be done correctly to succeed.

A short presentation by Damien Prieels (IBA) addressed both points and in particular the fact that more needs to be done, particularly by individual researchers, in this regard.

From a personal perspective, my research being software-based, this can often be difficult to achieve as guidelines can be somewhat hazy. However, IP protection in the academic domain is a new and developing concern so that advice in such issues will be continuously updated. Advice, and perhaps assistance where institution-level facilities are insufficient, needs to be made readily available for success, and the presence of a Valorisation Committee within ENVISION is certainly beneficial.

The Project Officer rounded off the final day with some information on what to expect in the future from the European Commission.

While less scientifically compelling, this session did cover information regarding the means by which projects are funded within a European context and methods we can exploit to optimise ideas or applications of personal interest.

For Horizon 2020 much of the information pointed towards an emphasis on research towards innovation and exploitation for applications. The European overview was a helpful and necessary, although from my personal perspective, somewhat disheartening as a physicist who is very interested in fundamental research but it gave us a reality check as an end to a successful meeting.

– John Gillam, Valencia.

FOCUS ON... ENVISION

The project which started in 2010, is a 4-year collaborative research project funded by the European Commission. It aims at developing solutions for real-time non-invasive monitoring; quantitative imaging; precise determination of delivered dose; fast feedback for optimal treatment planning; real-time response to moving organs, and simulation studies. ENVISION brings together 16 leading European research centres and industrial partners.

The beginning of 2012 was particularly intense for the ENVISION community, both scientifically and in terms of reporting to the European Commission.

At the end of February, most of the ENVISIONers gathered in Geneva for the ICTR-PHE conference (see page 8). This was a good occasion to evaluate the scientific productivity of the consortium.

It turned out that in its first two years ENVISION had already published interesting results, as demonstrated by the large number of accepted contributions: a dozen talks in the sessions "Prospects in Detectors and Medical Imaging", "Novel Technologies in Radiation Therapy" and "Imaging and Treatment Planning", as well as a plenary talk on in-room imaging and a number of posters. In spite of the tight conference schedule, a couple of face-to-face work-package meetings were also organised in parallel. In addition, lots of informal discussions took place during coffee and lunch breaks.

With the end of the second year of the project, it was also time for ENVISION to formally report to the European Commission. The Mid Term Review was held on April 20-21, and hosted by our Spanish colleagues from Ciudad Real.

ENVISION Annual Meeting in Lyon 2011

The MTR was held in conjunction with the first ENTERVISION Annual Meeting (page 24), providing a great opportunity for the newly recruited Marie Curie researchers to become familiar with ENVISION, which serves as research platform for their training project. The EC Project Officer, Philippe Jehenson, was present throughout the meeting, and listened attentively to the progress reports from the different work-packages.

After a first year mainly devoted to recruiting and to the establishment of the communication network within the individual work-package, the consortium fully entered into the research phase. Hardware and software prototypes are being developed and tested, and important evaluation studies on Monte Carlo models and motion monitoring techniques have been performed.

Several collaborations across work-packages are also taking place, and it was decided that the best way to demonstrate the progress made so far and the collaborative spirit would be to publish a peer-reviewed article summarising the major achievements of ENVISION in all domains, and to have it co-signed by all participants.

With this wealth of results and publications, it is also essential to pay attention to the valorisation procedure established in February 2011 at the Annual Meeting in Lyon.

This point was stressed both by Damien Prieels from IBA and by the Project Officer.

There was also time to see a charming corner of Spain: our host Gloria Bueno and her team organised a visit to Almagro, the historic capital of the Ciudad Real province, including a guided tour of the Corral de Comedias, probably the only 16th-century open-pit theatre still in existence. The visit was followed by a social dinner in the beautiful Parador de Almagro, formerly the Santa Catalina convent.

ENVISION passed the Mid Term Review successfully, and this motivated the community even more to pursue future collaborations in the field of medical imaging.

In this context, Philippe Jehenson outlined the main features of Horizon 2020 as they stand now: it is evident that we will need to closely monitor the developments in the coming months. The consortium is discussing the possibility of submitting a follow-up project at the next (and last!) FP7 Health call with closing date in October 2012, and intensive brainstorming will take place during the summer months.

ENVISION is funded by the European Commission under the FP7 Grant Agreement 241851.

FOCUS ON... ENTERVISION

The project which started in 2011, is a 4 year training project funded by the European Commission. This is an interdisciplinary (physics, medicine, electronics, informatics, radiobiology, engineering) multinational initiative, which has the primary goal of training researchers who will help technical developments at a pan-European level, for the benefit of all of Europe. ENTERVISION brings together ten academic institutes and research centres of excellence and the two leading European companies in particle therapy.

Research Training in 3D Digital Imaging for cancer Radiation Therapy

Since the Kick-Off Meeting on 4 February 2010, the participating institutes have been busily recruiting researchers with a total of 10 ESRs and 3 ERs having already started their contracts.

At the meeting, the researchers were given an opportunity to introduce themselves to the community and to one another. They have very different academic backgrounds and come from all over Europe with a few coming from further afield (Brazil and China). Throughout the project they will be encouraged to build a multidisciplinary network which will not only help them in their future careers but ultimately improve the transfer of knowledge between the various disciplines of cancer treatment with particles - the common goal being early detection and more precise treatment of tumors.

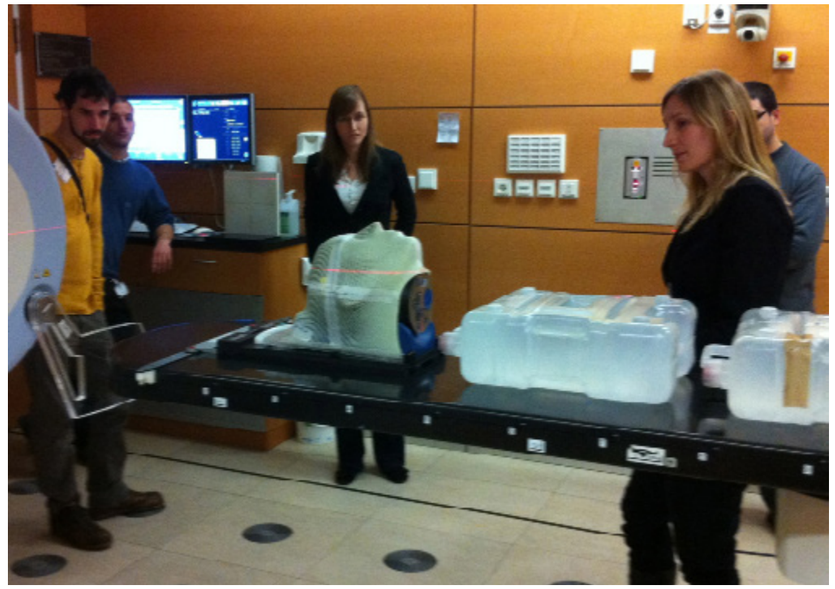
The main aim of the project is to provide a multi-disciplinary training programme which will enable the researchers to gain an insight into all aspects of the field. In March, they took part in their first training course 'Workshop on Treatment Delivery Systems and Dosimetry' organized by HIT and GSI. As well as attending lecture,s they were able to tour the HIT facility and gain an insight into how patients are actually treated.

The next course 'From physics to medical imaging through detectors' was held in Lyon 25-29 June. Since Lyon is the gastronomic capital of France, the course included a cookery lesson! In July, the researchers have the opportunity to join the PARTNER courses "Hadron therapy: one name many different techniques. The impact of Gantries and Imaging" and "Image guidance in hadron therapy" which will take place at CNAO, Pavia, Italy.

As well as scientific learning, the researchers are able to expand their knowledge in other areas. They are encouraged to take language courses to enable more effective communication within their host institutes. Courses covering complementary skills such as Management, Making Presentations, Business Planning and Marketing are also offered. Such a course is already planned for November at the University of Surrey, UK.

It is an amazing opportunity for these young researchers to meet and listen to lectures given by leading experts on many wide-ranging fields and in addition visit the facilities and gain first-hand experience of the latest advances in cancer treatment. It's clear that they will be kept very busy during their time in the project - attending all the courses, meetings and conferences and of course, carrying out their research work in their home institutes. We wish them all the best of luck!

ABOVE : ENLIGHT Project students and collaborators at the Marie-Curie building, at the Universidad de Castilla La Mancha, in Ciudad Real, Spain.



ABOVE : Dr. Ecker demonstrates to the students a water phantom.

ENTERVISION is funded by the European Commission under the FP7 Grant Agreement 264552.

FOCUS ON... ENTERVISION RESEARCHERS

Romain Brevet

Age: 23

Institute: GSI

Position: PhD Student

Hometown: Saint Brieuc, France

Project Description: it will change a bit soon. I finish my work about motion extracted from MV-fluoroscopy sequences (from patients treated with IMRT) for a correlation study with external surrogates.

On a desert island, I would bring: a wok

The first thing I do in the morning: hit an edge of the bed with my toe

Antonios Georgantzoglou

Age: 28

Institute: University of Cambridge, UK

Position: Marie Curie ITN

Hometown: Athens, Greece

Project Description: y project focuses on digital image processing techniques for application in a virtual computer microscope, which incorporates images from the real ion beam microscope facility. The project includes the development and integration of off-beam image processing routines that can enable real-time on-beam cells identification and image processing.

On a desert island, I would bring: my friends.

The first thing I do in the morning: is to make my favorite cappuccino.

Thiago Lima

Age: 28

Institute: CERN

Position: ER

Hometown: Rio de Janeiro, Brazil

Project Description: The goal of the project will be to build phantoms of increasing complexity, and to study the Bragg peak positioning and dose distribution at different therapeutic particle energies. Also work on comparing the measured distributions with those predicted by the most advanced simulation packages.

On a desert island, I would bring: A Football

The first thing I do in the morning: Check the football

Carlos Abellan

Age: 28

Institute: Centre de Physique des Particules de Marseille

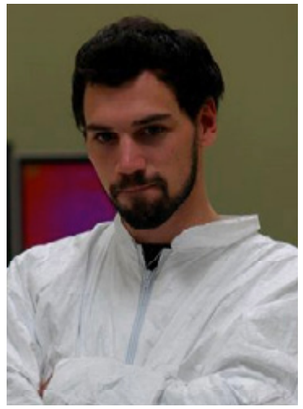
Position: Marie Curie Experienced Researcher

Hometown: Barcelona

Project Description: My project is a high speed data acquisition system based on FPGAs mounted on uTCA boards.It will be able to capture a large amount of data from nearly any detector and process it in real-time.

On a desert island, I would bring: A Hammock, a large straw hat and a solar powered fridge.

The first thing I do in the morning: Check the mail



Robert Kieffer

Age: 28

Institute: TERA

Hometown: Annonay, France

Project Description: Concerning my activities at TERA foundation, my main task is to develop high-speed data acquisition chain to readout multiple type of detectors: GEM, scintillators (SiPM), and MRPCs. There are two major issues for the next coming years. The first is a proton range telescope to complete. The second is to build a PET system based on MRPC (gaseous detectors).

On a desert island, I would bring: A boat to escape.

The first thing I do in the morning: Take a shower; otherwise my brain isn't awake enough.

Ben Liu

Age: 28

Institute: INFN Pisa

Position: Early Stage Researcher (ESR)

Hometown: Hubei, China

Project Description: I will participate in the development and validation of the interaction models contained in FLUKA as far as the prediction of secondary particles; fragments and residual nuclei production are concerned in view of analysis of in-beam PET.

On a desert island, I would bring: Food, shelter and clothing come to mind. Wouldn't hurt to have a pen and paper, but a fishhook and line would be handy too

The first thing I do in the morning: Brush teeth. Drink first cup of coffee.

Carlo Mancini Terracciano

Age: 30

Institute: CERN/ Università degli studi Roma Tre

Position: PhD

Hometown: Roma

Project Description: Monte Carlo simulation applied to Hadron-therapy

On a desert island, I would bring: a hammock

The first thing I do in the morning: Breakfast

FOCUS ON... ENTERVISION RESEARCHERS

Marco Pinto

Age: 25

Institute: Institut de Physique Nucléaire de Lyon

Position: PhD student

Hometown: Coimbra, Portugal

Project Description: The main goals of the PhD are (1) to improve the nuclear physics models in the Geant4 toolkit and (2) to accelerate the simulations to allow the introduction of such code as a viable option for the treatment planning in the context of hadron therapy monitoring.

On a desert island, I would bring: A Swiss pocket knife

The first thing I do in the morning: To have breakfast

Frauke Roellinghof

Age: 25

Institute: IBA

Position: PhD

Hometown: Biberach a.d. Riss, Germany

Project Description: I'm working on developing a camera that would allow imaging and controlling the range of protons in a patient in real time during proton therapy by detecting the gamma rays emitted by nuclear reactions along the ion path.

On a desert island, I would bring: If I'm being practical: a radio transponder to get help. If I'm not: a deckchair, a coconut opening instrument and a boatload of books.

The first thing I do in the morning: Turn off the alarm.

Marie Vanstalle

Age: 28

Institute: GSI

Position: Post doc

Hometown: Strasbourg

Project Description: This project aims at using the trajectory of secondary charged particles produced by ion fragmentation to reconstruct the ion range in the patient, using trackers in front of scintillators. This new technique should provide an online control of the delivered dose, resulting in an improvement of hadron therapy.

On a desert island, I would bring: a boat

The first thing I do in the morning: yell at the alarm clock

Marco Trovato

Age: 29

Institute: Instituto de fisica corpuscular (IFIC-CSIC)

Position: PhD Student

Hometown: Catania, Italy

Project Description: Development of a compton telescope based on continuous LaBr3 crystals and silicon photomultiplier arrays. Main tasks are: the detector development, testing and data analysis, both in the lab and in the accelerator facilities. This will be complemented with Geant4/GATE simulations.

On a desert island, I would bring: my music

The first thing I do in the morning: Listen to music.

Joakim da Silva

Age: 27

Institute: University of Cambridge

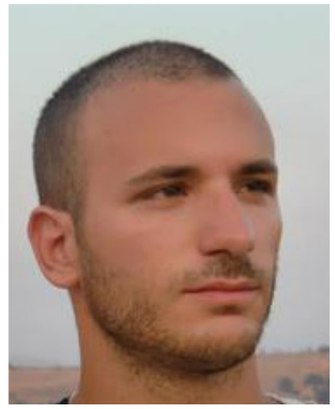
Position: PhD Student

Hometown: Stockholm

Project Description: Parallelise and port proton and/or ion dose calculation algorithms to GPU to (hopefully) enable "real time" use in adaptive hadron therapy.

On a desert island, I would bring: A decent toolbox

The first thing I do in the morning: Stumble to the kitchen for breakfast



Nicolas di Vara

Age: 25

Institute: CERN / University of Milano-Bicocca

Position: Marie Curie Fellow

Hometown: Cologno Monzese (Milano, Italia)

Project Description: my main commitment is in the field of TOF-PET devices, namely the improvement of timing resolution. With this respect my work focuses on the study of the main parameters connected to scintillating crystals and photo detectors, such as Photo Multiplier Tubes and Geiger Mode devices.

On a desert island, I would bring: my guitar, Moby Dick and The Waste Land, a rugby ball, a good stock of pasta and Terry O´Quinn

The first thing I do in the morning: call my dog!

Caption: Roberto Orecchia (CNAO), co-ordinator of ULICE.

FOCUS ON...ULICE

The project which started in 2009, is a 4 year infrastructure project funded by the European Commission. It brings together 20 leading European organisations. The project consists of 3 pillars: Joint Research Activities - focusing on the development of instruments and protocols; Networking Activities – increasing cooperation between facilities and research communities and Transnational access –allowing access to existing hadrontherapy facilities for researchers wanting to perform radiobiological and physics experiments as well as clinical studies.

Beamtime: From ULICE to ENLIGHT

The EU funded project ULICE (Union of Light Ion Centres in Europe) is ready to provide free beam time to researchers in hadron therapy inside and outside the consortium.

Two operational infrastructures are now open to researchers; the Heidelberg Ion-Beam Therapy Center HIT in Germany and the National Center for Oncological Hadrontherapy CNAO in Italy. In the framework of the Transnational Access activities of ULICE, the two facilities will provide a total of 131 hours of beam time at HIT and 35 at CNAO for physical and radiobiological research. In addition, 300 hours at HIT and 225 hours at CNAO will be available for clinical activity. Proposals are welcome not only from those involved in the project, but also from researchers outside the consortium. Details on how to apply can be found at the following link:

http://tinyurl.com/d9wefjb

The European Commission and the ULICE board established a set of rules for those wishing to submit a research proposal. The aim is to optimise opportunities for researchers, especially those in countries where such facilities do not exist.

A scientific selection committee, composed of experts not only from CNAO and HIT, but also from outside the ULICE consortium, has also been established. Its role is to evaluate clinical and pre-clinical research proposals, matching them to the facility best suited to that proposal.

Technical information about the two hadron therapy centres can be found on the ULICE website. Each research infrastructure will provide its own personnel, equipment and labs to support the selected research teams. In the case of clinical research, all ethical and bureaucratic issues will be duly addressed.

For pre-clinical studies, the cost of this beam time is completely borne by the European Commission, whereas for clinical research the costs are sustained by the facilities themselves.

For clinical research, clinicians can refer patients to HIT or CNAO. It is possible to combine different treatment approaches such as home-based photon therapy and boost-concept applied at the chosen particle therapy centre. Researchers visiting CNAO or HIT for clinical studies may or may not bring patients, but will of course act as observers if they are not entitled by national laws to perform medical activities. After the summer of 2012, four training courses will be organized, two of them at HIT and two at CNAO.

Each of these will last one month for medical doctors and medical physicists who are either working in one of the planned European hadron therapy facilities or who just want to update their knowledge in the field. Another four courses of one week each will take place at both facilities with the aim of promoting access to the sites. They are dedicated to medical doctors, medical physicists and biologists who are not working in HT facilities, but who are interested in beam time at HIT or CNAO to perform their experiments. These are introductory courses on access activities, aimed at helping researchers to prepare their proposals. Dates for these training courses will be published on the ULICE website and the ENLIGHT community will be informed in due course.

- ULICE Coordination Office

ULICE is funded by the European Commission under the FP7 Grant Agreement 228436.

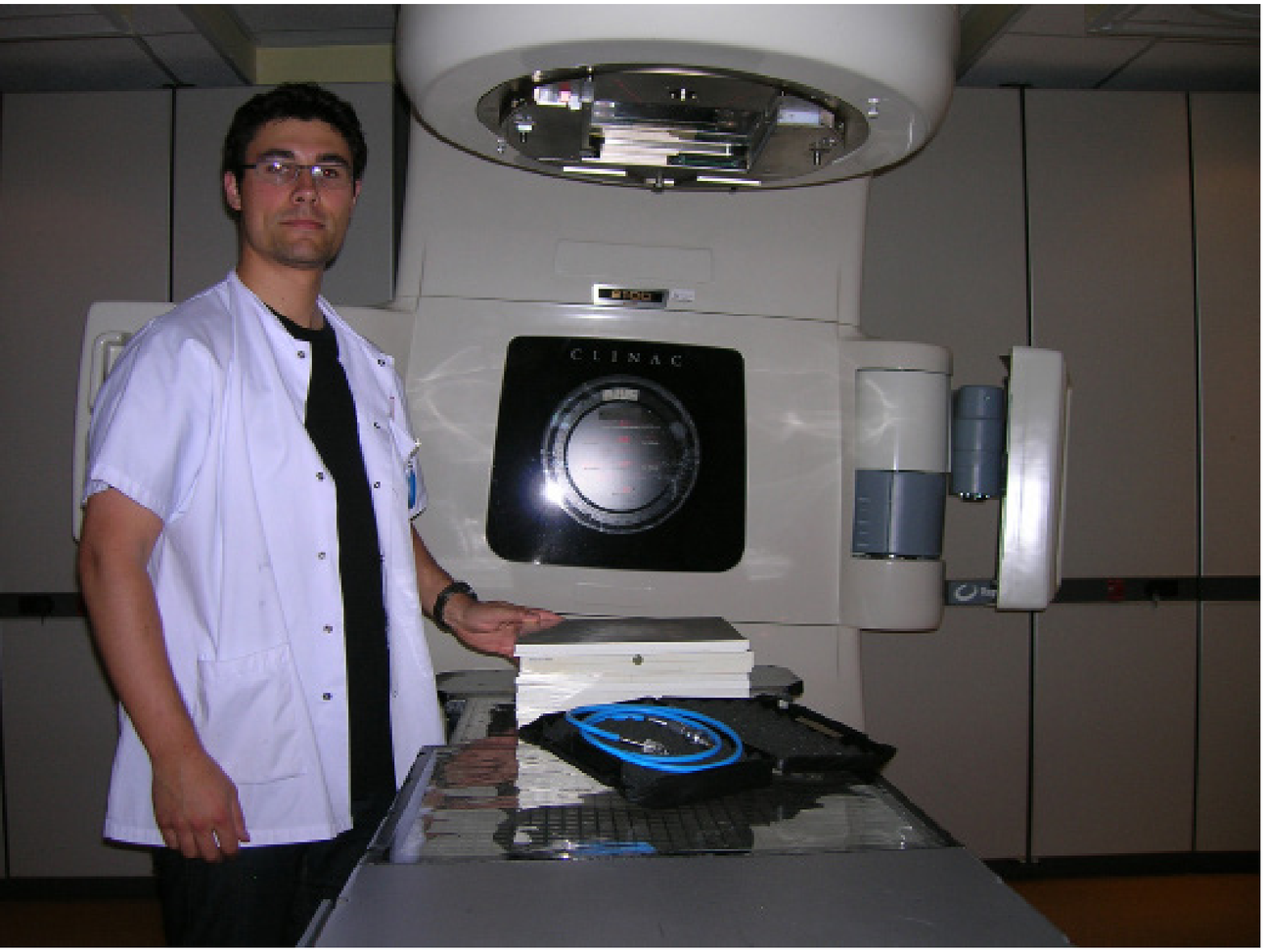
PARTNER

MARIE CURIE ACTIONS

FOCUS ON... PARTNER

The project which started in 2008, is a 4 year project funded by the European Commission. This is an interdisciplinary (physics, medicine, electronics, informatics, radiobiology, engineering) multinational initiative, which has the primary goal of training researchers who will help technical developments at a pan-European level, for the benefit of all of Europe. PARTNER brings together twelve academic institutes and research centres of excellence and the two leading European companies in particle therapy. The project will conclude in September 2012

PARTNER is funded by the European Commission under Grant Agreement Number 215840



ON THE LION'S TRACKS...

Loïc Grevillot

First of all, I wish to say that for many of us, the PARTNER project really started in Valencia in 2009, when we all (or almost all) first met. Suddenly, the project took its European dimension and we understood the chance we had to participate in this very interesting adventure. This group of people is amazing. We all shared our different cultures, way of life and we developed a beautiful network. That was really a unique adventure for me.

Before PARTNER, I obtained a master degree in medical physics. In PARTNER, I had the chance to deepen my knowledge in this new technique that is hadron therapy, especially in the fields of physics, treatment planning and Monte Carlo simulation.

I also had the opportunity to attend many events around the world, which was very pleasant and quite the eye-opener!

Today, I am a resident medical physicist in Lyon. This training position includes courses on radiation protection, nuclear imaging, radiology and of course radiation therapy. I have the chance to participate in the daily work of medical physicists: I perform dose measurements, treatment planning, patient treatment quality assurance, in vivo dosimetry, etc.

It is very interesting to move from a theoretical position as a PhD student to an applied position in a clinical environment.

In the future, I hope to evolve in an exciting environment and to interact with many people around the world as it was the case in PARTNER. I will gladly admit that the networking part is what I miss the most...

I wish to combine the clinical activities of a medical physicist with research activities and I hope to find a position in which I will have the opportunity to contribute to the establishment of hadron therapy in Europe. I will be looking forward to meeting you all again very soon! -LG

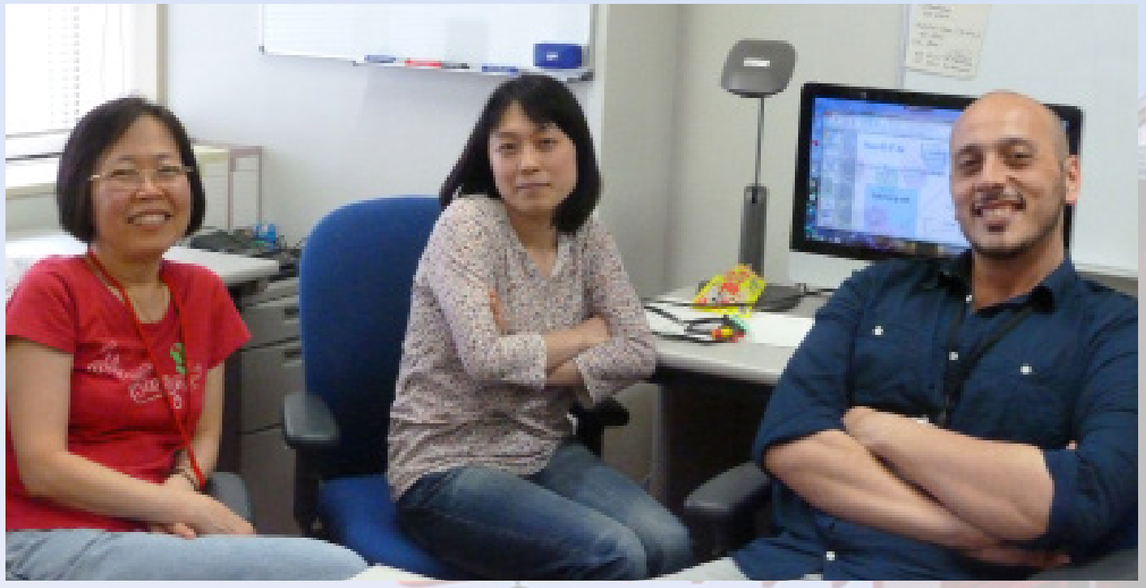
FOCUS ON... LYON

Country: France // Region: Rhône-Alpes // Department: Rhône // Population: 483, 181 -3rd in France Metro Pop. : 10, 023 // Lyon is the French capital of Gastronomy

GREETINGS FROM THE RISING SUN...

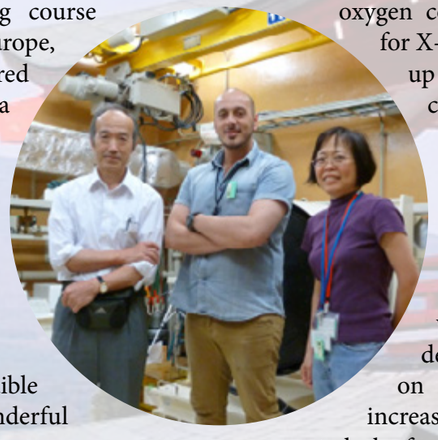
Walter Tinganelli takes on the Far East

I was really nervous at my first PARTNER project meeting, in 2009 in Valencia. My English was not so good, and I had to make my first speech in front of many people. And I knew no one.



But all the fear melted away as soon as I met the other Marie Curie researchers. Everybody was nice and kind, and everything was so simple and fun. I remember with nostalgia the time that we spent together.

PARTNER is an incredible project made of persons from different countries, cultures and backgrounds. At every meeting and training course held in a different place in Europe, particle therapy experts shared their knowledge with us. I am a biologist, but thanks to the many courses focused on different disciplines, I learned to look at particle therapy under all the different points of view: that of the medical doctor, the physicist, the mathematician.



PARTNER was an incredible experience, and above all, a wonderful school of life.

My experience within the PARTNER Project lasted about three years as Early Stage Researcher at GSI, Darmstadt, Germany.

For my research project I studied the "Influence of LET and oxygen status on cell survival and adhesion molecule expression", which is also the title of my PhD thesis. After this experience, and my PhD at TUD (Technische Universität Darmstadt), I was granted a researcher position at NIRS (National Institute Radiological Science) in Japan.

The main goal of my project here in Japan is to generate the first experimental dataset of ion beam irradiation of cells in different oxygenation conditions. In fact, literature data for irradiation of cells under different oxygen concentrations are only available for X-rays. Ion beam experiments were up to now only performed with cells in total anoxic conditions. A great, immediate benefit from my results, at least I hope, will be their direct application to the development and validation of a new adaptive treatment planning. Further benefits will concern the mechanism description and the understanding on a microscopic basis of the increased radio-resistivity effect related to lack of oxygen.

In the future I hope to keep working as a radiobiologist and to eventually join other global projects like PARTNER.

From my new office, in the Far East, today I would like to thank the PARTNER project, Manjit Dosanjh, and all the others for the great opportunity that they gave me and for the wonderful experience that they made possible. -WT

FOCUS ON... PARTICLE THERAPY IN FRANCE

New funding secures particle therapy in France

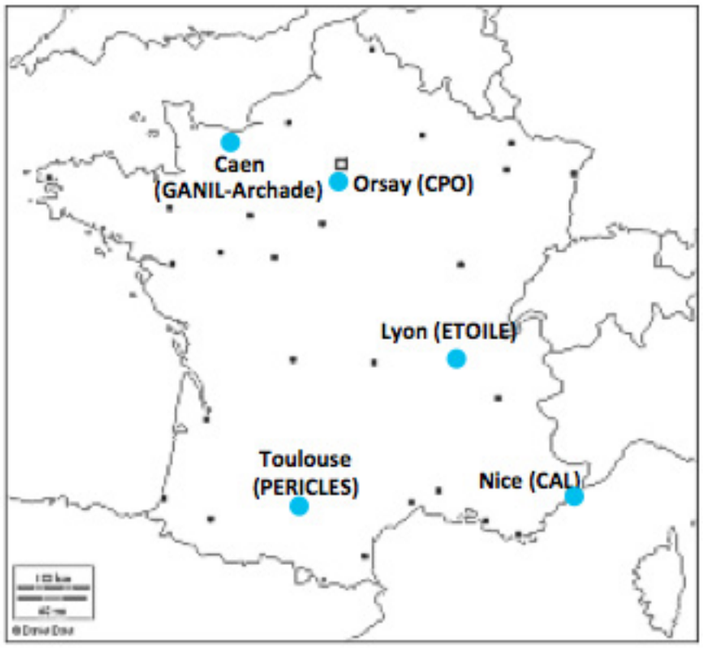
At the recent Meeting in Ciudad Real, Denis Dauvergne from UCBL had the pleasure to announce that 2 research projects have recently gained funding from the "Commissariat Général à l'Investissement" as part of the "Investissements d'Avenir" programme. France HADRON and PRIMES were granted 15 MEuros and 8MEuros, respectively, both over a period of 9 years.

France HADRON is led by CNRS and brings together ETOILE (Lyon), ARCHADE (Caen), ICPO (Paris-Orsay), IMPACT (Nice) and PERICLES (Toulouse).

The project will develop a national infrastructure for the organisation and coordination of particle therapy research in France, comprising 25 research teams in 8 different towns. This funding will allow the purchase of research equipment and access to beam time.

PRIMES (Physique, Radiobiologie, Imagerie Médicale et Simulation) aims to develop innovative medical imaging methods and equipment in order to improve patient diagnosis and treatment.

Recently awarded the label "Laboratoire d'Excellence", the project brings together experts in imaging, radiotherapy and radiobiology from Lyon, St Etienne, Grenoble and Clermont Ferrand (16 laboratories and 175 researchers and engineers).
-Denis Dauvergne, Lyon, France



France HADRON
- 5 nodes
- 2 operating proton centres
- 2 carbon projects + GANIL
- 1 proton project
- 25 research teams in 8 different towns = 102 FTE researchers

ANNOUNCEMENT

MAASTRO CLINIC OPPORTUNITY

Postdoc position in Modeling of Dose Distributions and Biological Outcome in Particle Therapy (M/F)

In this position you will carry out research in the field of radiotherapy with protons and carbon ions. This work is part of the European ENVISION project .

We are looking for a candidate with a PhD degree (or equivalent) in Physics, Biomedical Engineering or similar, with a strong interest in radiotherapy treatment planning studies and treatment outcome modeling. You ideally have several years of experience in treatment planning. You preferably have some clinical experience. You must have at least moderate programming skills, e.g. with MatLab. You will liaise with several other ENVISION partners in other countries. We expect you to have a GPA of at least 3.5/4 for your Masters degree. Experience with particle therapy is a plus. The enthusiastic and flexible candidate that we are looking for must be fluent in English. The position involves no or minimal teaching duties. You must provide two letters of reference upon selection.

We offer an exciting radiotherapy research project in the rapidly evolving particle therapy field, in a pleasant working environment in a multidisciplinary team, with many learning opportunities. Part of the project may be performed at the Gray Institute, University of Oxford, with a visiting contract there. Conditions of Employment and salary are based on the Dutch Collective Labour Agreement for Hospitals (CAO-Ziekenhuizen). You will receive a contract for an initial period of one year, with the intention for an extension up to 2 years. There is flexibility in the number of working hours per week and the contract can either be a full time contract or a part-time contract. The number of agreed working hours determines the total duration of the contract. Your salary will be according to the scale of scientific researcher level 3 of MAASTRO clinic (with a minimum of €3260,- gross/month and a maximum of €4458,- gross/month based on a full time contract, 36 hrs/week), and is depending on your relevant experience. Furthermore the Collective Labour Agreement offers an extended package of secondary conditions, among others an 8%-holiday bonus, a yearly bonus and excellent pension arrangements and health insurance arrangements.

Further information may be obtained from frank.verhaegen@maastro.nl, Head of Physics Research at MAASTRO CLINIC or by calling +31-(0)88-4455792. Please also visit www.maastro.nl and www.rob.ox.ac.uk.

Your application letter, Curriculum Vitae and listing of publications can be sent before the 23th of July 2012 to the attention of personeelszaken@maastro.nl

FOCUS ON... RADIOTHERAPY IN POLAND

From proton beam eye radiotherapy to a scanning proton gantry in Krakow, Poland

On February 18, 2011, the first two patients from the Department of Ophtalmology and Ophtalmic Oncology of the Jagiellonian University's Collegium Medicum (Prof. B. Romanowska-Dixon, MD) received ocular proton radiotherapy treatment at the Institute of Nuclear Physics of the Polish Academy of Sciences (IFJ PAN) in Kraków, Poland, in collaboration with the Centre of Oncology in Kraków (Prof. M. Reinfuss, MD).

Up to July 2012, a total of fifteen patients have been treated. For the first time, proton radiotherapy of the eyeball has been made available to patients in Central Europe. The eye melanoma patients undergo a four-fraction treatment by a 60 MeV proton beam from our in-house-designed AIC-144 isochronous cyclotron, beam delivery system and treatment room.

Our 60 MeV proton radiotherapy facility, supervised by Dr. Jan Swakoń (IFJ PAN), is the only one in Poland (a 40-million people country) and also the first to operate in Central-Eastern Europe. It should be able not only to treat all Polish patients affected by ocular melanoma (some 100 cases per year), but also patients in neighbouring European countries. From 2013 onwards, proton therapy will be considered standard treatment of eye-cancer patients, and costs are expected to be covered by the Polish National Health Fund.

The optical bench and patient treatment chair of the proton radiotherapy facility at IFJ PAN (the beam enters from the far right towards the viewer).

On March 17, 2011, the construction of the new cyclotron building (National Centre of Hadron Radiotherapy - Cyclotron Centre Bronowice - CCB) began, with an experimental hall and ocular treatment room. This 45 M€ project, led by Prof. Pawel Olko, is financed for 85% from EU structural funds and for the remaining 15% by the Polish government. A 230 MeV Proteus C-235 cyclotron produced by IBA has already been installed, and will be fully operational by December 2012.

Starting from January 2013, the installation of equipment for research in radiobiology, nuclear and medical physics will begin in the experimental hall. The construction of a medical extension to the present building in order to house an IBA-designed scanning gantry (1σ= 3 mm or 9 mm) has just began. The gantry will work with a robotic patient positioning system, a Vision RT optical positioning system and a PatLog motorized patient transport system. Virtual simulation will be performed using a dedicated CT unit. Treatment of children under full anaesthesia will be possible. We expect this CCB complex to begin treating patients in 2014.

- Pawel Olko, Krakow, Poland

May 11, 2012: Placement of the IBA Proteus 230 MeV proton cyclotron for nuclear research and proton radiotherapy at its site in IFJ PAN in Kraków, Poland.

AGENDA

JULY

24 — PARTNER COURSE
PAVIA, ITALY

SEPTEMBER

14-16 — ENLIGHT ANNUAL MEETING
PAVIA, ITALY

PARTNER	ENLIGHT	ULICE	ULICE
14	15	15	16
	MORNING	AFTERNOON	

NOVEMBER

12-16 — ENTERVISION LEADERSHIP COURSE
SURREY, UK

JANUARY

11 — ENTERVISION MID-TERM REVIEW
GENEVA, SWITZERLAND

JULY/ AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	2013	2014
Informal discussions between EC and different interest groups on propositions within the Horizon 2020 overarching framework: lobbying.					Program Definition	Launch 1st Project
Best opportunity to establish dialogue with EC					1st business case draft	
	SEPTEMBER... Decide on further actions depending on EC feedback.	**OCTOBER...** If EC is positive then: 1) Engage more industrial actors. 2) Elaboration of a Program Implementation Plan, ready latest mid-October			Adoption of legislative acts by Parliment and Council	

Visit the Horizon 2020 website : http://ec.europa.eu/research/horizon2020/index_en.cfm

ANNOUNCEMENT

In the framework of a research project on hadrontherapy "Tools and methods towards the exploitation of a cyclotron-based hadrontherapy facility", the research unit MIRO is looking for a full time post-doctoral fellow.

Hadrontherapy aims at treating cancer by irradiating tumor cells with protons or light ions (essentially carbon), offering increased precision and significant biological gain on specific tumor cases. Hadrontherapy is the topic of intense research efforts especially in Europe where a large number of institutions are independently or jointly conducting investigations in different directions: fundamental biological and clinical aspects, technological developments and instrumentation for treatment delivery, software development for accurate treatment planning, radiation measurements and quality assurance tools and methodology.

In this context, the Belgian company IBA is constantly designing and developing new solutions for accurate patient treatments with protons and carbon ions. While primarily centered on treatment equipment, IBA has initiated an international research programme towards the development of an innovative Treatment Planning System (TPS) computation kernel.

The programme includes one partnership with UCL-MIRO covering reference measurements in dosimetry and radiobiology. This part of the work has received financial support from Belgian regional authorities (WinTPS project) and includes two specific contributions:

1) The development of an absolute dosimeter, to be used as a primary reference for the conventional dosimetry tools to be used on any hadrontherapy center.

2) Radiobiology experiments that will accumulate sets of measured data to benchmark the radiobiological models implemented in the planning software.

Main purpose of job

Radiobiological research in the field of hadron radiationtherapy, aiming at measuring the Relative Biological Effectiveness (RBE) of different clinical hadron beams, for clinically relevant in vivo biological systems. This includes the design of the experimental protocols, the management of the experiments, the analysis and the interpretation of the results. Beside this radiobiological part, our collaborator will be involved in other radiation therapy related researches fitting with the general program of the lab.

Typical work activities (experimental radiobiology)

- Contacting hadron facilities
- Designing protocols and writing experimental proposals
- Discussing protocols with ethical committee
- Logistic organization (ordering animals, building of specific material, transport, etc.)
- Realization of the experiment and pre- /post-experimental manipulations
- Follow-up, analysis and interpretation of the results
- Writing grant application
- Preparation of poster and publications
- Attending scientific meetings and workshops
- Constitution of an international network for specific advises and discussions.

Work Conditions

- The activity is Brussels-based (Université catholique de Louvain, Medical school, Brussels, Belgium)
- The scientific environment comprises 25 persons (physicians, physicists, biologists, engineers, research assistants)
- Due to the nature of experimental work at hadron facilities, high flexibility in the working hoursis compulsory. Work at night and during week ends is not uncommon.
- 15-day stays abroad (e.g. Japan, Germany) will be compulsory on short notice (1 month)

Position offered

The position is open for 2 years with a possible extension of 1 year to a scientist bearing a Ph.D degree in Sciences (Physics, Biology, …). Some experience in the use of in-vivo biological systems is expected.
Use of computer software for analysis of data and/or modeling constitutes a definitive advantage.

The salary, depending on qualification, is in accordance with the European academic standards.

To apply :

Further information could be asked by E-mail to : John.gueulette@uclouvain.be

Formal application (motivation letter and CV) should be addressed to :
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