CONICYT
Ministerio de Educación

Gobierno de Chile

international relations
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> New Chile-Germany projects receive support from CONICYT and BMBF
> FP7 DISCO project exploiting Chile's strengths in plant science
> REUSE project promoting an integrated approach to the mining cycle
> Chilean PhD researcher among top scientists working at ESRF in France

issue 26 /April 2015

Welcome to issue 26 of CONICYT's International Relations quarterly bulletin, with news and information for all stakeholders interested in international cooperation in science and technology with Chile.

In this issue we are pleased to inform about the progress made by CONICYT and its partners in the UK, Germany and Finland to support collaboration in various scientific fields.

In our *European Connection* section we feature the case of the DISCO project, supported by the European Union's Seventh Framework Programme, which includes the participation of researchers in Chile. This project shows how academia and industry can work together to deliver not only scientific excellence but also viable products.

In *Voices*, Thomas Lagathu head of the Regional Delegation for Cooperation for the South Cone and Brazil of the French Embassy in Chile, shares his vision about the role of diplomacy in the promotion of STI collaboration between Chile and the EU.

In *Interview*, young researcher Victoria Lobos tell us of her experience at the Leaders for Innovation Programme, which is an initiative supported by the Newton-Picarte Fund.

In *Projects*, we profile the case of the REUSE project, supported by the Ibero-American Programme for Development of Science and Technology (CYTED), which is coordinated by the Universidad del Bio Bio in Chile and promotes an integrated approach to the mining cycle.

In *On the Move*, we learn how CONICYT-supported PhD researcher Cristian Fernández-Palomo is conducting cutting-edge experiments at the European Synchrotron Radiation Facility (ESRF) in France.

Finally, we list the calls that are open or about to open for applications from researchers in Chile and abroad to carry out collaborative projects.

We hope you find these articles - and the rest of the pieces in this issue - enjoyable and informative. Please do email us your feedback or ideas for content.

International Cooperation Programme
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The International Cooperation Programme welcomes all comments and suggestions from readers. Please email us at relacionesinternacionales@conicyt.cl

Cover photo: Humberstone, Chile. UNESCO / Andrés Pascoe .

CONICYT and British Council formalize collaboration to implement Newton-Picarte Fund

CONICYT and the British Council signed a Memorandum of Understanding (MoU) on March 9 in Santiago to collaborate in the implementation of the Newton-Picarte Fund, which will allow through the joint financing of Chile and the United Kingdom, to increase collaboration in science, technology and innovation between the two countries in the next three years.

(left) Gabriel Rodríguez, Director of Decyti, Ministry of Foreign Affairs of Chile, Francisco Brieva, President of CONICYT, Ciarán Devane, CEO of the British Council and Fiona Clouder, Ambassador of the UK to Chile.

Mr Ciarán Devane, CEO of the British Council, highlighted how rapidly both institutions managed to put the collaboration into action. "We are very happy to see that in such a short period of time we are supporting important initiatives that benefit both sides. In fact, we are already supporting interesting projects for the development of the scientific capacity in Chile and that will help opening the eyes of scientists in the UK to the strengths of Chilean science", said Mr. Devane.

Dr Francisco Brieva, the President of CONICYT, said that the Newton Fund is a decisive step towards incrementing the collaboration in science and technology between Chile and the UK. "We are working with the British Council to implement different initiatives to support the creation and development of links between scientists in both countries", explained Dr Brieva.

The calls involving the collaboration between CONICYT and the British Council are the Second call of IDeA in two stages, Newton Institutional Links and the Call for proposals to support new partnerships between regional centres and SMEs.

Newton-Picarte Fund supports young researchers to participate in training programme in the UK

The Royal Academy of Engineering (RAEng) selected 15 young Chilean researchers to receive support from the Newton-Picarte Fund to participate in the Leaders in Innovation Fellowhips (LiF) programme run between February 15-25 in London and Oxford.

The LiF programme is an intensive commercialisation training course designed for young entrepreneurs based on the methodology and best practices used by RAEng and Isis Innovation, the research and technology commercialisation company of the University of Oxford.

The Chilean researchers who participated in the programme were selected by the RAEng through a process of expressions of interest opened to leaders of valorization of university research (VIU) projects. (Read more on page 12).

Chilean researchers at the LiF programme in the UK

Results of the CONICYT-BMBF call for joint research projects

CONICYT in partnership with BMBF awarded around US$3 million to six joint projects between research teams in Chile and Germany.

The three-year research projects will focus on the areas of environment, non-conventional renewable energies and polar and marine research (3); biotechnology (2); and mining and the environment (1).

This is the first time that CONICYT and BMBF will be financing larger research projects following the support that both institutions have provided in the last 20 years for the exchange of researchers through the Programme for International Scientific Cooperation (PCCI).

Bilateral Chile-Germany meeting

CONICYT participated on March 17-18 in Santiago in the IV Bilateral Chile-Germany meeting organized by the Ministry of Education of Chile to review the cooperation between both countries in the areas of education, science and technology.

The meeting was focused on the educational reform in Chile and the German experience in higher education and vocational training, the modernization of the scientific cooperation between Chile and Germany, and sustainable mining.

IV Bilateral Chile-Germany meeting in Santiago.

CONICYT-AKA workshop on education

CONICYT and the Academy of Finland (AKA) held on March 24 the workshop "CONICYT-AKA research on education: impacting Chile and beyond" that included the participation of representatives of the main research institutions in Chile and Finland.

During the workshop, Mika-Markus Leinonen, Ambassador of Finland to Chile, pointed out that Finland has tried to contribute to the discussions about the reform of the education system in Chile without trying to impose themselves, but to serve as a referent.

Christian Nicolai, Executive Director of CONICYT, said that "education is a hot topic in Chile today, therefore, we are sure that the results of this new phase in the cooperation will be without doubt very useful for the country".

The next call that CONICYT and AKA are planning to implement will be the fourth for both institutions and the second in the area of education. So far, CONICYT and AKA have financed nine joint research projects on non-conventional renewable energy through public calls launched in 2007 and 2012, and four joint research projects on education through a public call launched in 2009.

Mika Markus Leinonen, Ambassador of Finland to Chile

Closing ENSOCIO-LAC wokshop in Berlin

The partners of ENSOCIO-LAC, a consortium to establish a sustainable and integrated research and innovation cooperation between the EU and Latin American countries in the environmental field, held the project closing workshop in Berlin on March 26-27.

The meeting included working sessions to produce concrete outputs following the workshop organized by the consortium in Cancun, Mexico in July 2014. During this meeting, the partners identified priorities, gaps and needs for bi-regional collaboration on resource efficiency, including the development of customized technology for wastewater treatment. In fact, the ENSOCIO-LAC partners plan to use the links created within the project to develop innovative solutions tailored to the Latin American context.

As one of the partners of the ENSOCIO-LAC project, CONICYT contributed to the implementation of a programme of networking activities to increase links between researchers in Europe and Latin America and the Caribbean, informing about national research priorities and identifying opportunities for funding. CONICYT also contributed to elaborate a series of recommendations for future actions on resource efficiency which will be presented to the 2015 Senior Officals Meeting (SOM) in science and technology to be held in October 2015 in Brussels..

Workshop on ICT International Cooperation EU-LAC

The LEADERSHIP project held a workshop on March 11 in Buenos Aires, Argentina, to enhance coordination and information-sharing on EU-LAC ICT cooperation, with special focus on lessons learnt from the Seventh Framework Programme (FP7) and ways to move forward taking into account future calls within Horizon 2020 and other research and innovation programmes.

The Workshop on ICT international cooperation, organized by the LEADERSHIP project, the EU-Argentina Liaison Office in Science, Technology and Innovation (ABEST III), and the Ministry of Science, Technology and Productive Innovation of Argentina (MINCYT), took place in the framework of the 10th anniversary of the cooperation in research and innovation between the EU and Argentina.

During the workshop, LEADERSHIP presented the project's input papers on digital agendas and benchmarking of good practices for EU-LAC cooperation. The event also offered the opportunity for the participants to share information on ICT regulations and funding mechanisms.

CONICYT, jointly with FinCEAL Latin America and the Caribbean from Finland, led discussions with the objective to provide recommendations on ICT issues for the 2015 Seniors Official Meeting (SOM) in science and technology.

CEST+I is a bilateral project financed by the Seventh Framework Programme of the EU to promote science, technology and innovation cooperation between Europe and Chile.

EU embassies meet to analyse Chile-EU cooperation in STI

The CEST+I project held a meeting on April 9 with ambassadors and delegates from European embassies in Chile to exchange views about the past and future science, technology and innovation cooperation between the EU and Chile.

The EU-Chile Liaison Office's mission is to establish a dialogue platform between research actors from Chile and Europe, as well as to increase the participation of Chile in European research projects. The EU-Chile Liaison Office is the focal point of the 2002 agreement on science and technology cooperation between Chile and the EU and is based at the International Cooperation Programme of CONICYT.

During the meeting, Rafael Dochao, Ambassador of the EU Delegation to Chile, stressed that "the European leaders have clearly decided to invest in research and innovation as an investment in the future". Ambassador Dochao also reviewed the most important milestones of the EU-Chile relationship in the area of science, technology and innovation, highlighting the importance of the framework programmes to implement the European strategy for research and innovation, where international cooperation plays a pivotal role in solving global challenges.

Workshop on Sustainable Mining in Chile

The CEST+I project will be holding on May 4-5 a workshop on sustainable mining in Chile to bring together academic and industry experts from Chile and the EU, for a discussion focused on applied research (the link between university research and market innovation) - and the application of sustainable mining technologies in the Chilean and European markets.

The workshop will enable leading stakeholders in the field to discuss the possibilities of sustainable mining in Chile and the EU. These stakeholders range from university researchers over small and medium-sized enterprises to big multinational companies. They will look especially at the relationship between university research and private-sector industry needs and the possibilities for joined collaboration.

The event will be focused on both energy in mining and water and waste management with a special emphasis on the current state of sustainable mining in Chile and Europe; the future possibilities for sustainable mining and sustainable factors in the mining industry.

The complete programme can be viewed on https://eventioz.cl/e/sustainable-mining-workshop

CASE STUDY

Sustainable technology for the production of bioactive compounds from plants

DISCO is an interdisciplinary and multinational consortium that involves the participation of academic and industrial European partners and the Fraunhofer Chile Research Foundation, to develop innovative bioactive compound extraction procedures. Supported by the Seventh Framework Programme (FP7) of the EU, the project shows how academia and industry can work together to deliver not only scientific excellence but also viable products.

Plants compounds have a variety of uses, from medicines and food to cosmetics, health supplements and feedstuffs. However, the process of extracting bioactive compounds from plant sources relies on chemical synthesis which has negative effects on the environment.

The DISCO project aims to understand plant biosynthetic pathways for the manufacturing of different compounds and develop improved ways to obtain novel products of pharmaceutical and industrial interest. In order to achieve this, it brings together the expertise of leading academic experts in plant genetics, molecular biology and metabolic engineering as well as small and medium enterprises and a large pharmaceutical company. The idea is to "enable leading international research groups to work together bringing fundamental scientific discoveries to real-life feasibility studies and translation to products", says Dr Paul Fraser of Royal Holloway and Bedford New College, the project coordinator.

The project builds upon the previous work of the consortium in high-value chemicals from plants and microorganisms. In fact, Dr. Fraser had previously worked in the UK with Dr Wolfgang Schuch, the General Manager of the Fraunhofer Chile Research Foundation (FCR), on a long-standing collaboration with the agriculture company Syngenta (Zeneca then) and Royal Holloway University of London. This collaboration, says Dr Fraser, "led the way in showing how academia and industry could successfully work together, adding value to the discovery and developmental pipeline".

Partners in Chile

The Fraunhofer subsidiary in Chile was set up in Santiago in 2010 through the initiative of the Chilean government to support the establishment of international centres of excellence to carry out R&D, technology transfer and commercialisation activities with high national and international economic impact.

The main drivers for the establishment of the FCR in Chile were the "very unique opportunities for biotechnology research that Chile offers with a huge diversity of biological organisms, and the opportunity to do different types of research, particularly in the area of nanotechnology, from those that Fraunhofer was carrying out in Germany. The Fraunhofer model relies on long term funding from governments and the Chilean government initiative provides funding for 10 years. This funding enabled us to make a start in a way that would not have happened in many other countries where we are operating on a project basis", says Dr Schuch.

At the time that discussions about establishing international centres of excellence in Chile were taking place, one of the big issues affecting aquaculture industry was the ISA virus and Fraunhofer is one of the leading institutes for the development of vaccines made in plants. "Plants have a number of different advantages to other production systems which are used for vaccines and Fraunhofer has pioneered that platform, so there was a very obvious opportunity to link the needs of the country to Fraunhofer's technological platform", explains Dr Schuch.

Fostering EU-Chile collaboration

Last year FCR hosted DISCO's first consortium meeting in Chile to discuss the project's scientific progress and further collaboration. On that occasion, the project partners discussed the progress in the different lines of work and results achieved so far.

In the case of FCR, they are actively involved in the evaluation of the use of biogas production from waste extraction processes which are developed in the network, as well as the trial of different carotenoids as feedstuff for salmon. The results achieved by FCR so far, include the development of a system for biogas production from waste derived from tomatoes which "is not only relevant in the context of the DISCO project, but also in other projects where industrial waste can be used to develop products for the local industry", says Dr Schuch.

According to Dr Schuch one of the main benefits of participating in large international projects such as DISCO has been "to be able to look over people shoulders and see how technology transfer is being developed. In fact, in this network several partners are working to meet the very specific requirements set by the big companies involved. So, it is very nice to see that the close collaboration between industry and research providers is actually working. I have been involved in many of these large gear projects in Europe and I think that they have always been set up with this in mind, to really bring the basic science into the actual research application field. The involvement of the companies in this network in particular guarantees that there will be very productive research outputs".

The collaboration between Europe and Chile fostered by the DISCO project is expected to be further reinforced in the future. "It is hoped that further funding will be secured with our Chilean partners and greater institutional links will be developed between the European based institutions and those in Chile. This will increase the global impact for all partners and extend our collaborative research portfolios. It is also an objective of the project that the opportunity to commercialise outputs via Chilean industrial involvement will occur", says Dr. Fraser.

Chile has significant strengths in the field of plant science that are attractive for the development of international collaborations. In fact, the DISCO project has discussed with the local partners of the EU-funded BacHBerry project, focused on the identification of bioactive compounds from a range of different berries, possible collaboration between the two consortiums. "One of the strengths that Chile has is its biodiversity, which is clearly something which we, as part of the Chilean research community, should be tempting to exploit more", says Dr Schuch.

More info:
disco-fp7.eu/

VOICES

How can diplomacy serve to promote EU-Chile STI collaboration?

As part of a series of activities organized in the framework of the 10th anniversary of the EU-Chile Liaison Office, ambassadors and delegates of science and technology of the European embassies in Chile met at CONICYT on April 9 to exchange ideas about the actual and potential contribution of diplomacy to EU-Chile STI collaboration. Thomas Lagathu, representative at the French Embassy in Chile of the Regional Delegation for Cooperation for the South Cone and Brazil and a member of the advisory board of the CEST+I project, shares his vision about this topical issue.

By Thomas Lagathu

For the past ten years the EU has been promoting science, technology and innovation with specific Latin American countries, including Chile, as a way to invest in the future. The EU has understood, thanks also to the Chilean diplomats, all the advantages that the country has to offer for research and innovation. Among the various EU instruments, the framework programmes have helped to establish a Liaison Office in Chile and other Latin American countries, to enhance collaboration with EU research institutions.

Figures from the last decade demonstrate quite clearly the impact of the work carried out by the Chile-EU liaison Office to promote synergies between the different European and Chilean actors in STI. Chile is the fourth country among the Latin American beneficiaries of the EU Seventh Framework Programme (FP7) with the larger number of EU-funded projects, just after Brazil, Argentina and Mexico, which are countries way bigger than Chile, and it is quite in front of Colombia which is the country after Chile with the larger number of EU-funded projects in the region.

A more detailed examination of the participation of Chile in FP7 projects shows that of the total number of projects with Chilean participants (119), a third of them involve the collaboration between French and Chilean partners from leading French institutions including the National Centre for Scientific Research (CNRS), the Institute for Research for Development (IRD), the French Agricultural Research Centre for International Development (CIRAD) and The National Institute for Research in Computer Science and Control (INRIA).

Diplomatic initiatives

France has always been among the top 10 countries in the world to invest in soft diplomacy as an influence tool, therefore, it does not come as a surprise to learn about the support it has provided for the development of research and innovation in Chile through various initiatives.

The Joint Initiative for Research and Innovation (JIRI), for example, where Chile is represented by CONICYT and France by the Ministry of Research and Higher Education, is a completely diplomatic approach on research and innovation and a very interesting place for research institutions to share their interests. The JIRI is clearly where diplomacy and research institutions complement each other in order to help building up tools like Horizon 2020, the new EU research and innovation programme, and other tools developed at other levels.

French diplomacy has also facilitated the inclusion of research operators such as the IRD in Chilean led projects. The IRD has collaborated with the EU-Chile Liaison Office through the bilateral projects supported by the EU framework programmes, CHIEP I and CHIEP II and through CEST+I. Additionally, French diplomats have taken part in the advisory board of EU-Chile bilateral projects trying to help and provide guidance on topics of mutual interest for the EU and Chile.

There have also been some specific science and technology diplomats of EU member States in specific countries like Chile, whose presence has been very useful in trying to find complementarities between the tools that are discussed at a higher level to enhance the possibility to participate at a lower level. In this sense, perhaps it would be interesting to see in the future, efforts at the EU delegation level in Chile to have more of a common voice rather than an addition to the various EU member States interests, especially when it comes to bilateral collaboration between EU and Chile. The EU and each member State have their own research and innovation tools and then Chile has also its own tools. Diplomacy should try to orientate discussions or use various tools to complement each other as a way to avoid competency.

At the regional level the specific programmes between France and South America in ICT and Mathematics have been developed quite successfully for the past ten years to support teams working on these specific areas. The idea is to try to encourage teams that use this France-South America tool to develop larger European projects in the future. Likewise, the Chile-France tools that exist, mostly for mobility, provide a basis for building up collaborations between France and Chile. On the Chilean side there are specific tools managed by CONICYT and CORFO that are quite useful. In fact, with the support of CORFO the French institute INRIA established in Chile in 2011 the Communications and Information Research and Innovation Centre (CIRIC) dedicated to research and innovation transfer in the ICT field.

In terms of my thoughts for the future, I believe that Latin American partners should take a bigger role in the investment share of EU projects and that Chile should try to take the lead showing a positive and voluntary orientation. As it is already the case on many projects, Chile should show the EU its ability to finance teams. The idea is to favour collaboration over just cooperation, that is to say, we need to share more all the investment to have a common interest.

Thomas Lagathu.

"I believe that Latin American partners should take a bigger role in the investment share of EU projects and that Chile should try to take the lead showing a positive and voluntary orientation"

Victoria Lobos

Agricultural Engineer from Universidad Católica de Temuco was awarded the first place in the Leaders for Innovation Programme (LiF) in London. The initiative is supported by the Newton-Picarte Fund.

How did your participation in the Leaders for Innovation Programme come about?
I developed a project to obtain the first yeast of Latin America and the Caribbean motivated by the fact that the whole region relies on importing yeast from the EU, United States, Canada and Australia to produce all its fermented drinks. This new type of yeast had never been isolated before in Latin America and it is the first to be used in the food industry. This yeast has already been validated and it is ready to be commersialised, it only needs to be patented. With this project I applied to the Valorization of University Research (VIU) call and received the support of CONICYT to elaborate a business plan. Then, CONICYT invited all those who had been selected in the VIU call to apply to the LiF programme. I was one of the fifteen young researchers who were granted a fellowship to take part in an intensive, two-week commercialisation training course at the Royal Academy of Engineering (RAEng) and the research and technology commercialisation company of the University of Oxford, Isis Innovation, in the UK.

What motivated you to participate in the LiF programme?
I had already been granted scholarships to conduct research in the Peruvian and Brazilian Amazon and to learn English for biotechnology at the University of California, Davis. Both experiences helped me a great deal in my career, so I found this a fantastic opportunity to gain further international experience. A lot can be learnt in the classroom, but having the opportunity to meet certain people that serve as an inspiration and motivate you to keep developing your ideas is priceless.

What was the most useful thing you learned in the programme?
The first part of the training at the RAEng in London covered the different aspects of tech enterprise strategy and administration, that is, how to create a business model canvas, how to distinguish a good from a bad business idea and how to develop a marketing strategy. This part of the training helped me to learn how to approach potential clients, and how to present the product to potential investors, so they get fascinated by your product as much as you are. It was also very rewarding that after the pitch presentation of my project I was awarded the first place in Leaders in Innovation by the RAEng.
During the second part of the training at the University of Oxford, we had the opportunity to meet innovators who shared their experiences and gave us tips on how to look for investors and how to negotiate issues such as percentages and others. This part of the training helped me to learn how despite having failed they have managed to take their ideas forward. It helped me to expand my horizons, in fact I identified four new clients that so far I had not considered and I made important contacts with people who want to test my yeast in London and Mexico.

What are your plans ahead?
My plan is to establish the first yeast laboratory in Latin America and the Caribbean to improve the use of microorganisms in fermented drinks. My yeast has some characteristics that make it better than some European yeasts and others that make it the same, so it generates a lot of international interest. In Chile, the diversity of our geography with the Patagonia, the desert, the ocean and the mountains offers huge possibilities to investigate different microorganisms for fermenting our drinks and to create poetic marketing that is totally sellable to foreign markets. I would also like to create a company to help students to take their innovative ideas forward. In Chile we need to create better business incubators to support new ideas. There are many people with the passion needed to come up with good ideas. New ideas do not come overnight, it takes a lot of sleepless nights and careful study to innovate. In Chile there are many young people with ideas but without the support to take them forward.
I have also plans to pursue a MBA and a PhD abroad and then come back to Chile and create new business models. I am interested in patenting in Argentina, the U.S, and Europe, so I am planning to establish contacts with companies and develop strategic alliances in these markets.

> "A LOT CAN BE LEARNT IN THE CLASSROOM, BUT HAVING THE OPPORTUNITY TO MEET CERTAIN PEOPLE THAT SERVE AS AN INSPIRATION AND MOTIVATE YOU TO KEEP DEVELOPING YOUR IDEAS IS PRICELESS"

Promoting the sustainable reuse of post-mining landscapes

Mine closure poses a series of challenges that are inadequately addressed by even the most developed regulatory systems worldwide. REUSE is an Ibero-American research network coordinated by Universidad del Bio Bio in Chile, which promotes an integrated approach to the mining cycle. The network is supported by the CYTED programme.

For decades mining has commonly been linked to the decline of the environment. However, after a mine closes a number of other serious issues also arise that affect communities long time after extractive companies have moved away from the territory and even no longer exist.

The aim of the REUSE project is to promote a paradigm change in mining planning. Dr María Isabel López from Universidad del Bio Bio in Chile and the project coordinator, explains that throughout history mining companies have moved away from territories that are no longer profitable leaving behind environmental, social and economic costs caused by the cease of their activities. "We look to change this paradigm for one that considers the process of mine closure as part of the mining cycle, so that mining companies assume the costs of re-converting post-mining territories, re-training local communities, repairing environmental damage, and avoid as much as possible mono-productivity", says Dr López.

According to Dr López legislation has historically failed to properly address the whole impact of mine closure on local communities. "Mine closure legislation has developed unevenly, and although nowadays some regulatory systems are better than others, there is no comprehensive piece of legislation that - aside from the environmental dimension - also considers the social and cultural aspects of post mining processes", explains Dr Lopez.


Lota, Chile

A novel perspective

The REUSE approach combines the expertise of researchers from different disciplines, including engineers and geologists, who have traditionally been involved in mining research, with researchers from disciplines that have recently begun to contribute to the area, such as architects, urbanists, and planners. All of whom focus on two main areas: environmental repair of mining territory including issues such as re-vegetation and the technical difficulties associated to mass removal processes, which need to be considered before recovering the value of former mining territories; and mining heritage that involves how to strategically add value to older mining landscapes.

The idea to establish the network originated after Dr Lopez finished her PhD in Spain, which focused on the recovery and reconversion of Lota, a former mining town in southern Chile. "Having been in contact with researchers, most of them engineers and geologists, who for years have been working on mining research in an European context, I found it interesting to add a different approach with a focus on Latin America; where also, with the exception of Brazil, the issue has been scarcely explored", says Dr Lopez.

Dr Agustín Hernandez from Universidad Politécnica de Madrid, who was Dr Lopez PhD supervisor, says that the diversity of research talent put together by the network is a major contribution to mining research. "So far mines have been managed in a dissociated way, not taking into account the mine surroundings and from the point of view of the territorial order this is an important gap to be filled if we are to have a more integral way of managing mines and the territory", says Dr Hernandez.

Cultural change

During the last two years the network has produced various research results that have been compiled in three books and disseminated at various public international meetings.

In 2014 the network held a symposium in La Paz, Bolivia, co-organized by Cumbre del Sajama, a consulting company, and the Universidad Mayor de San Andrés (UMSA), which helped to visibilize the mining heritage of different regions of Bolivia, in particular, the Pulacayo mining centre, located 30 kms from the Uyuni Salar, which is an important site for the mining history of Bolivia. According to Ana María Ananibar, General Manager of Cumbre del Sajama, the REUSE network has contributed significantly to identify mining heritage sites in the participating countries. "There is still a lot to be done to improve mining practices, but we can say that the network has served to identify adequate mechanisms for achieving socially and environmentally responsible mine closure processes", she highlights.

A further symposium held in 2014 took place in Guayaquil, Ecuador, organized by the Escuela Superior Politécnica del Litoral (ESPOL). During this meeting the network partners visited Ancón, which is the first oil town in Ecuador, also known for its beautiful cliffs. In this area, the network has developed a proposal to establish a Geopark as an alternative for the recovery of post-mining territories.


Pulacayo mining Town, Bolivia

The closing activity of the network is planned to be held in Chile this year. "Our challenge is to try to broaden the impact of the network beyond academic circles and influence the practice of mining getting the big mining companies in Chile involved in this event", says Dr Lopez.

S&T for development

According to Dr Lopez the network has helped the participants to expand their investigative horizons. "The network has allowed the members to have a more comprehensive overview of the problem of reconversion of mining territories. We have learned that mining reconversion presents similar challenges in the different countries, but also important nuances. For instance, in Brazil the massive power of big mining companies makes it very difficult for local communities to have their voice heard. Furthermore, in this country mining operates within urban areas, whereas in the Chilean case for instance, mining operates in more isolated areas. These differences are very interesting from the scientific point of view, since they allow us to have a better understanding of the complexity of the problem", explains Dr Lopez.

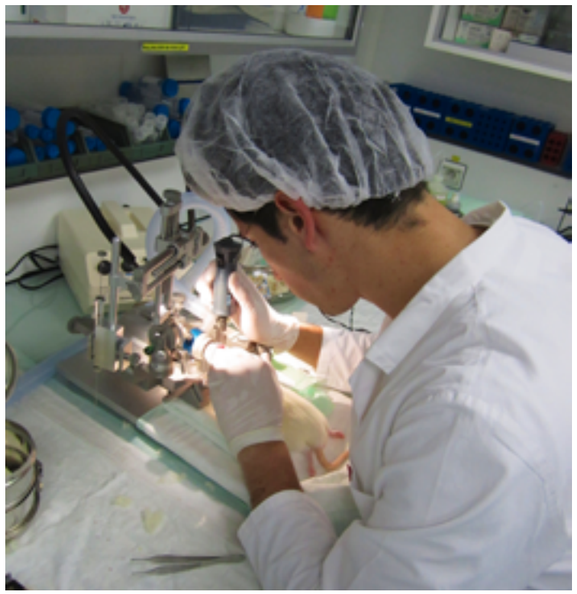
Equally, the network has been important for strengthening the links between the different partners. In fact, the consortium has participated in the postgraduate programme of architecture and urbanism at Universidad del Bio Bio, and various students are developing their theses on mining heritage. Future plans to continue the collaboration include the possibility to apply for support from CYTED to organize a mini forum with the participation of potential partners from the industry and public sector in order to influence the practice of mining.

More info
http://reuse-cyted.ubiobio.cl

Researcher Cristian Fernández-Palomo

on the move Lighting the hidden corners of nature

at The European Synchrotron Radiation Facility (ESRF) in France



The ESRF is the most powerful synchrotron radiation source in Europe that every year brings together first-class scientists to conduct exciting experiments at the cutting edge of modern science. CONICYT-supported PhD student Cristian Fernández-Palomo gives an insight into his research at the facility and plans ahead to increase awareness in Chile about the positive and negative effects of radiation.

By Cristian Fernández-Palomo

A Synchrotron is a circular particle accelerator of enormous dimensions, which accelerates electrons to nearly the speed of light. The word Synchrotron was chosen because the machine uses magnetic fields that need to be in-synch in order to keep the electrons circulating within the storage ring (a gigantic circular vacuum tube). Once the magnets change the direction of the electrons large amounts of X-rays are produced, which are directed to the beamlines and used for different experimental purposes.

The facility I use is the European Synchrotron Radiation Facility (ESRF) located in Grenoble, France. The storage ring of the ESRF has a circumference of 844.4 meters and it can produce electron beams 10,000 billion times brighter than a hospital X-ray machine.

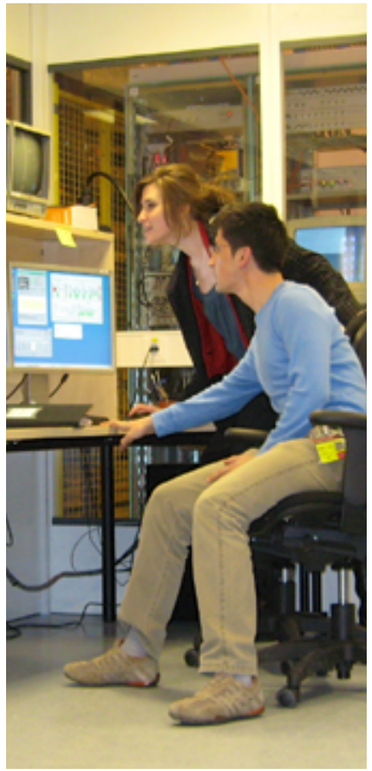
The high brilliance of the Synchrotron X-rays allows for spatial fractionation of the dose (geometric grid) instead of temporal fractionation (over days) given during conventional radiotherapy. For those who like the details, we can create an array of quasi-parallel rectangular microbeams of 25-50 microns width with intermediate gaps of 200-400 microns. This is extremely important because while the radiation dose is concentrated in the microbeams, the tissue in the gaps receive minimum dose, which increases the tolerance of normal tissue to radiation, allowing the delivery of higher doses to the tumor. Conventional radiotherapy for example, delivers a maximum of around 4-6 Gy to tumors whereas with the Synchrotron we can deliver up to 350 Gy without any negative effects; this is about 58 times more dose in just a fraction of a second!

Endless possibilities

I began working in the Synchrotron project invited by my PhD supervisor Prof. Carmel Mothershill, a world-renowned radiobiologist at McMaster University in Ontario, Canada. Prof. Mothershill had been invited to participate in the Synchrotron studies by Dr MD. Elisabeth Schültke, a German neurosurgeon and researcher, who has been actively working to treat brain cancer using Synchrotron radiation. The focus of my research is on the effects of X-rays and Gamma rays in two different areas: (1) the response to low-doses of radiation and their possible benefits and (2) the study of an experimental method of brain radiotherapy using Synchrotron radiation.

Participating in this project and having access to the ESRF facilities has been a hugely exciting experience for a number of reasons. On the one hand, Synchrotron X-rays have a wide range of uses, many of them highly relevant for Chile. Besides being used for improving cancer treatment, Synchrotron radiation is widely used in mining research, which could help to boost the Chilean mining sector; in structural studies of viruses such as HIV, which could be homologated to study the ISA virus affecting the Chilean salmon; and in the development of stronger materials, which could help to improve the resistance of buildings to major earthquakes, just to name a few applications.

On the other hand, to gain access to the ESRF is a very competitive process, and once you are accepted to work there you are able to meet scientists from all over the world and to share with them a true love for science. I had never experienced something like that ever before. In addition to the contacts I have made working in Canada, France and Germany, I have also established links with the Radiation Research Society (RRS) and the European Radiation Research Society. I am also a member of the Scholars in Training Committee of the RRS and one of the directors of the Network of Chilean Researchers in Canada (REDICEC), which brings together Chilean researchers in Canada to promote collaborations between Canada and Chile. Now that I am in the final year of my PhD, my plan is to continue working in the Synchrotron project and to develop my own line of research to work towards increasing the understanding of the beneficial and harmful effects of radiation, and with this to help encourage Chilean institutions to join this exciting area of research.



Call for proposals supporting the development of international research projects

who can apply?

Researchers sponsored by a public or private non-profit institution in Chile jointly with researchers in the United States, or Germany or the United Kingdom

disciplines

All areas of expertise. Polar science in the case of applications with researchers in the United Kingdom

funding

Internships, short working visits, consultancy and advice expenses, dissemination costs, equipments, administrative costs, operational costs, national and international travel

dates

May-July

OECD Cooperative Research Programme (CRP)

who can apply?

Research Fellowships: individual researchers willing to undertake their own research project in collaboration with host researchers and laboratories in a different CRP member country.

Conference sponsorship: organizers of international conferences, workshops, symposia, and congresses to be held in a CRP member country and focused on specific research priority areas of the CRP.

disciplines

Natural resources challenge, sustainability, and the food chain.

funding

Research Fellowships: travel and accommodation costs.

Conference sponsorship: travel, accommodation and subsistence costs of keynote speakers, plus a contribution towards the publication of the proceedings of the conference.

dates

April-September

CONICYT-ECOS Scientific Cooperation Programme Exchange Projects

who can apply?

Researchers from universities, non-profit research centres or institutes, public or private, in Chile and France.

disciplines

All areas of expertise

funding

Airfares and expenses for scientific missions and stays in Chile and France

dates

April-June

CONICYT-STIC Amsud Cooperation Regional Programme

who can apply?

Public or private research laboratories and units, linked to an institution of higher education, research organizations or private companies from one of the participant countries (Argentina, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela and France).

disciplines

Information and Communication Technologies

funding

Airfares and expenses

dates

December-May

CONICYT-MATH Amsud Cooperation Regional Programme

who can apply?

Public or private research laboratories and units, linked to an institution of higher education, research organizations or private companies from one of the participant countries (Argentina, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela and France)

disciplines

Mathematics

funding

Airfares and expenses

dates

December-May

Abate Molina Prize 2015

who can apply?

Nominations may be made by a university, institute or a public or private research centre in Chile

disciplines

All areas of expertise

funding

Research visit of the awarded researcher to Chile

dates

May-July

International Networking between Research Centres 2015

who can apply?

National science and technology research centres formally established in Chile

disciplines

All areas of expertise

funding

Short-length training internships, research visits, bilateral workshops or seminars, and access to scientific and technological equipment

dates

May-July

CONICYT-BMBF International Scientific Research Projects

who can apply?

Researchers sponsored by a public or private non-profit institution in Chile jointly with researchers in Germany

disciplines

Sustainable mining and raw materials, biotechnology and environment

funding

Internships, short working visits, consultancy and advice expenses, dissemination costs, equipments, administrative costs, operational costs, national and international travel.

dates

May-July

Terms of reference and application at:
www.conicyt.cl/pci

agenda

April

22 — Signing of MoU with Korea Astronomy and Space Science Institute (Santiago, Chile)

27-30 — ERANET LAC consortium and final funding decision meeting (Bonn, Germany)

May

4-5 — Workshop on sustainable mining (Santiago, Chile)

5 — CEST+I Advisory Board Meeting (Santiago, Chile)

6 — CEST+I consortium meeting (Santiago, Chile)

7 — Knowledge Transfer Experiences in Chile and Europe: solutions for common challenges (Santiago, Chile)

8 — Chile-Europe exchange on Solar Technology Platforms and Roadmapping (Santiago, Chile)

13 — 2014 Abate Molina Prize Award Ceremony (Santiago, Chile)

26 — Fourth Annual Meeting of the Global Research Council (Tokyo, Japan)

25-27 — ALCUE NET yearly LAC NCP meeting (Barbados)

June

1-3 — Trans-Atlantic Platform for Social Science & Humanities Meeting (London, UK)

10-11 — EU-CELAC Summit 2015, Brussels, Belgium

23-24 — ERANET LAC consortium meeting (Buenos Aires, Argentina)

the IR team

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