

international relations

CONICYT



- > 2013 accomplishments review
- > CONICYT-ANR research building sustainable scientific collaboration
- > 2013 Abate Molina Prize on Chile's strengths for environmental research
- > CONICYT-USA project on scientific mission aboard Nathaniel B. Palmer

issue 21 /January 2014

at-a-glance
news clips
european connection
interview
projects
call for proposals
agenda

Welcome to issue 21 of CONICYT's International Relations quarterly bulletin, with news and information for all stakeholders interested in international cooperation in science and technology with Chile.

CONICYT's International Relations Department has just finished a busy year, marked by a wide range of accomplishments. At the front of this issue we review 2013's highlights - from new alliances and new projects to high-level missions and new funding opportunities.

In this issue we also show how international joint research supported by CONICYT is helping to establish sustainable scientific collaboration - looking at the case of the KEOpS project developed between Chilean and French researchers, breaking new ground in our understanding of the science of human vision.

Elsewhere in our European Connection section, Prof. Jost Heintzenberg, winner of the 2013 Abate Molina Prize for Excellence in Science, provides an insight of his personal and scientific experience conducting environmental research in Chile.

In Interviews, we profile two major new cooperation opportunities, one between researchers in Chile and Japan, and another between researchers in Chile and Korea - both of which will be opened for applications in the first quarter of 2014.

Finally, in Projects, we highlight the example of a research project in oceanography supported by the CONICYT-USA call, which shows the significant impact that international collaboration can have on scientific research, and the benefits it brings for all the teams involved.

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.

Department of International Relations
CONICYT

The Department of International Relations welcomes all comments and suggestions from readers. Please email us at relacionesinternacionales@conicyt.cl

Cover photo: RVIB Nathaniel B. Palmer in Valparaíso, Chile.
CONICYT-USA project led by Dr. Peter von Dassow.

CONICYT's 2013 international relations accomplishments

Launch of new project to enhance cooperation in STI between Chile and the EU

The Chile-European Union Science, Technology and Innovation Initiative ([CEST+I](#)) is a three year project funded by the Seventh Framework Programme (FP7) of the EU that aims at contributing to strengthening cooperation in STI between Chile and the EU. CONICYT's partner institutions in this project are DLR (Germany), IDOM (Spain) and IRD (France).



Chile: First in Latin America to integrate GROW

Chile became part of the select group of [GROW](#) (Graduate Research Opportunities Worldwide) participants. As a result of this, from 2014 National Science Foundation graduate fellows from the Science



Technology, Engineering and Mathematics (STEM) fields will collaborate with research institutions in Chile.

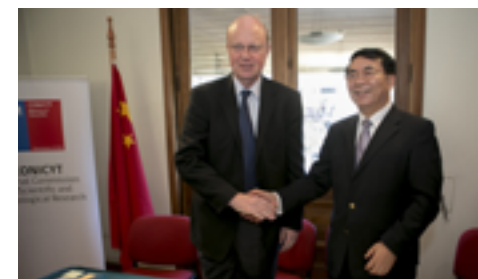
CONICYT on scientific mission to South Korea and Japan

During CONICYT's mission, important institutional links were established in both countries with the objective of implementing joint actions in science and technology. In South Korea, CONICYT signed a MoU with the National Research Foundation (NRF) which paved the way for a mobility programme to be introduced by CONICYT and NRF. In Japan, CONICYT agreed with the Japan Society for the Promotion of Science (JSPS) to launch a coordinated call for networking projects in order to foster cooperation between researchers in Chile and Japan. Both initiatives will be launched in the first quarter of 2014.



Launch of CAS-CONICYT Fund for joint astronomical research

The Chinese Academy of Sciences (CAS) will contribute through the CAS-CONICYT Fund, to the development of astronomical research in Chile. The Fund will be used for supporting bilateral collaboration activities in astronomical research, including a call in 2014 for post-doctoral fellowships in astronomy and astrophysics. This initiative will also allow the establishment of the China-Chile Joint Centre for Astronomy (CCJCA) in Santiago, the first scientific institution set up by CAS outside China.



Launch of two new international alliances of excellence with world's top universities

The launch of the UC Berkeley-Chile and Columbia University-Chile Seed Funds in 2013 followed the path initiated by the MIT-Chile Seed Fund and the Harvard Chile Innovation Initiative to strengthen collaboration between researchers in Chile and those working at prestigious U.S. universities. In 2013 within the frame of these alliances a total of 36 proposals were awarded around \$1 million USD for the development of collaborative projects.

CONICYT co-leads CELAC-EU Science and Technology SOM in Brussels

The CELAC-EU Senior Officials Meeting (SOM) was successfully led by CONICYT for the 33 CELAC countries for third consecutive year, consolidating the leadership of Chile in the bi-regional political dialogue in S&T.

Launch of new environmental cooperation project between the EU and Latin America

The Strategic, Sustainable R&I Cooperation with Latin America: Climate Action, Resource, Efficiency and Raw Materials



([ENSOCIO-LA](#)), is a two year project funded by the FP7 of the EU, aiming to establish sustainable and integrated research and innovation cooperation between the EU and Latin American countries in the environmental field. CONICYT is one of 14 Latin American and European partners participating in this project.

Fourth Chile-U.S. Joint Committee Meeting on Science and Technology

Delegates from Chile and the U.S. met to examine the progress of the cooperation projects and establish collaboration actions in the areas of basic research, cancer and natural disasters mitigation. Following the meeting two important initiatives took place: the CONICYT - U.S. Tri-Service Science Agencies and International Clinical Trials workshops, both in Santiago



Launch of new collaborative project between EU-CELAC on research and innovation

The ERANet-LAC project, a Network of the European Union (EU), Latin America and the Caribbean Countries (LAC) on Joint Innovation and Research Activities is a three year project funded by the FP7 of the EU that will strengthen the bi-regional partnership in STI by planning and implementing joint activities and creating a sustainable framework for future bi-regional joint activities. CONICYT is one of 17 Latin American, Caribbean, and European partners participating in this project.

Launch of new project to enhance EU-Latin America cooperation in ICT research and innovation

The Latin America-Europe Advanced Dialogues to Enhance ICT Research and Innovation partnership project (LEADERSHIP) is a two year project funded by the FP7 of the EU, aiming to create a LAC-ICT Expert Group to support cooperation in ICT policies between Latin America and Europe. LEADERSHIP will also facilitate LAC participation in Horizon 2020 by promoting ICT enabling technologies through capacity-building events, and promote the network of ICT 'Living Labs' across Latin America and the Caribbean. CONICYT is one of 10 Latin American and European partners participating in this project.

Major international events fostered scientific collaboration between researchers in Chile and abroad

CONICYT organised in collaboration with key partners, important scientific events that included the participation of experts from Chile, Latin America, Europe, Asia, and the U.S., who presented the results of their research and discussed future possibilities for cooperation. The events focused on the areas of polar science, climate change, biotechnology, astronomy, renewable energy, mathematics, bio-science, information systems, materials science, modeling, simulation, and patenting and licensing. A total of 400 people attended these events.



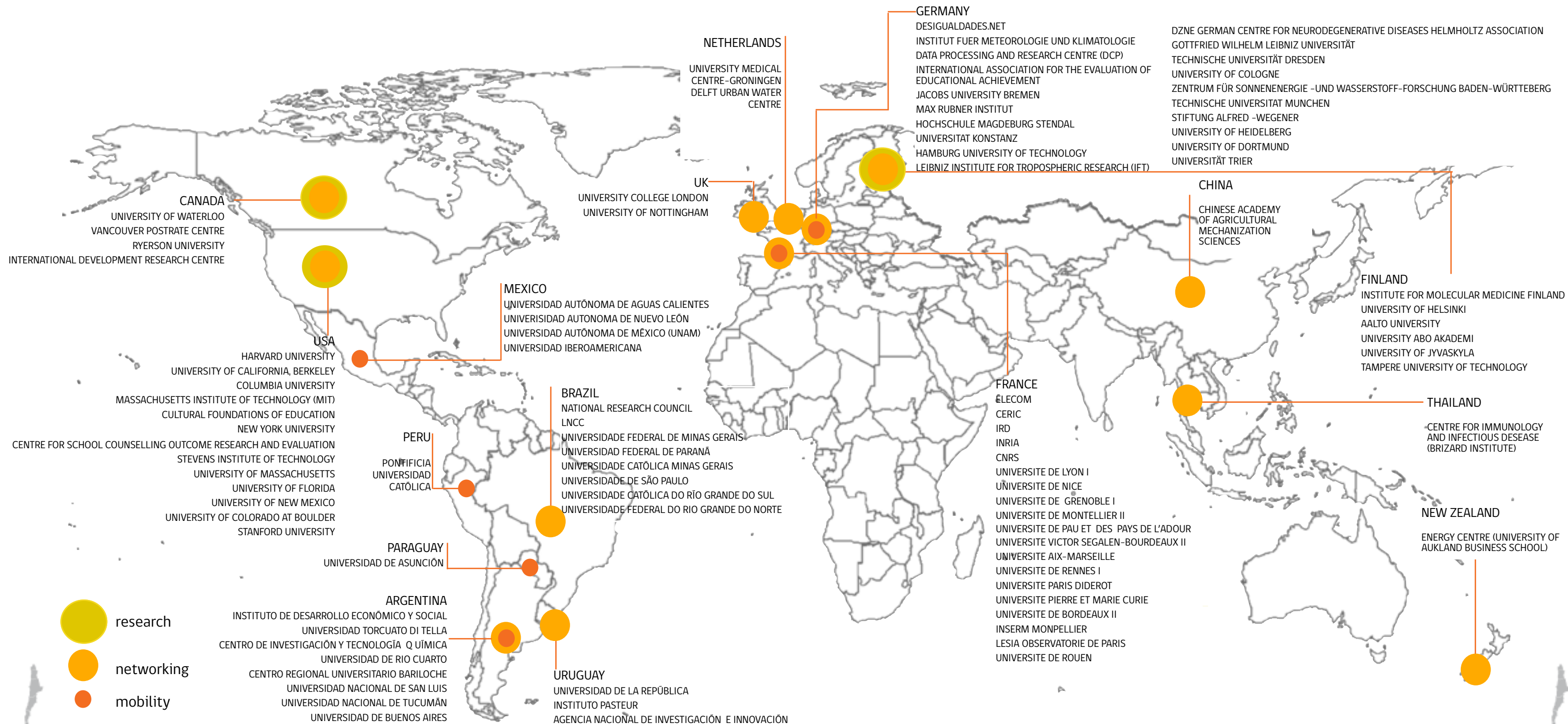
New brochure presents wide selection of Opportunities for international cooperation in STI

The instruments are either open for application to Chilean and foreign individuals, research groups and institutions. Most of the opportunities included in the publication are executed by various CONICYT programmes, but it also incorporates two close to market instruments executed by the Chilean Economic Development Agency (CORFO).

[Download the brochure.](#)



2013 new international scientific collaboration projects



46 mobility

71 networking

15 research

new international collaboration projects funded

132

5%

25,3%

69,7% of total budget

\$US awarded 7,930,205

UPDATES



Workshop on Polar and Climate Change Research

The *Future of Antarctic Research: Priorities, Collaboration Possibilities and Funding Opportunities Workshop*, organised by CONICYT and the Chilean Antarctic Institute (INACH), took place on the 28th and 29th of November in Punta Arenas, Chile.

The workshop included the participation of experts from Chile, Latin America and Europe who presented the results of their research in polar science and climate change, and discussed future opportunities for scientific and technological cooperation.

The workshop was the first of three scientific workshops to be organised within the frame of the CEST+I project with the aim of promoting synergies between the cooperation programmes of the European Union, Latin American and Chile.

Among the experts who participated in the workshop were Peter Convey, ecologist from the British Antarctic Survey (BAS), and Sergio Marensi, vice-president of the Scientific Committee on Antarctic Research (SCAR), as well as researchers and funding agencies from Germany, Finland, France, among others.



Patents and Licenses: Benefits for researchers in Chile Workshop

The *Patents and Licenses: Benefits for researchers in Chile Workshop*, organised by CONICYT and the Chilean National Institute for Intellectual Property (INAPI), took place on the 25th and 26th of November in Santiago, Chile.

The objectives of the workshop were to present the results of a comparative analysis of Chilean, European and international regulation on intellectual property rights, patenting and licensing; provide guidelines for IP protection; and exchange good practices in the field of patenting and licensing.

The study, developed within the frame of the CEST+I project, includes an analysis on the legal, social, economic and cultural factors affecting positively or negatively the patenting and licensing activity in Chile, and an action plan identifying short, medium and long term activities in order to improve patenting and licensing levels in Chile.

UPDATES



Horizon2020 first calls for proposals open

The first calls for proposals of Horizon2020, the new EU framework programme for research and innovation, opened on the 11th of December. The new programme replaces the Seventh Framework Programme (FP7) and will run from 2014 to 2020 with a €69.000 million budget.

Horizon 2020 combines all of the research and innovation funding currently provided by the EU: The FP7, innovation aspects of Competitiveness and Innovation Framework Programme (CIP), and EU contribution to the European Institute of Innovation and Technology (EIT).

The new programme is based on three pillars: societal challenges, excellent science, and industrial leadership, and will finance all types of activities, from frontier research to close-to-market innovation. The programme is open for applications from research centres, universities or private companies, as well as researchers, both individually and through a consortium from Europe or Third Countries.

In Chile, CONICYT acts as a point of contact for Horizon 2020, and have been supporting researchers on how to participate in the programme through its International Relations Department, where there is a team with experience in the implementation of over 10 projects funded by the Framework Programme.

Launch of new project to enhance EU-Latin America cooperation in ICT research and innovation

The Latin America-Europe Advanced Dialogues to Enhance ICT Research and Innovation partnership (LEADERSHIP) project kick-off meeting took place on the 4th and 5th of December in Madrid.

The main objective of the project, funded by the European Commission's Seventh Framework Programme (FP7), is to create a LAC-ICT Expert Group as a permanent mechanism to support cooperation in ICT policies between Latin America and Europe. LEADERSHIP will also facilitate LAC participation in Horizon2020 by promoting ICT enabling technologies through capacity-building events, and promote the network of ICT 'Living Labs' across the region.

CONICYT is one of 10 Latin American and European partners participating in LEADERSHIP and is in charge of coordinating the establishment of the new LAC ICT Expert Group, to support policy dialogue in the two regions in the field of ICT.

Another bi-regional initiative in the ICT area, the AMERICAS project, also focused on promoting cooperation in key areas of ICT policy, held its final consortium and review meeting on the 2nd and 3rd of December also in Madrid.

CONICYT as one of the partners of AMERICAS led the tasks related to supporting the ICT political dialogue between LA and the EU, organizing in March 2012 an international ICT Forum in Santiago and coordinating a second ICT Forum held in July 2013 in Brasilia.



CASE STUDY

Building strong scientific collaborations for the long term

KEOpS is a joint research project that combines the expertise of researchers in Chile and France in sensory biology, mathematical modeling, computational neuroscience and computing vision to build workable and useful models of vision. Developed as part of the collaboration programme between CONICYT and the French National Research Agency (ANR), this project stands out not only for its novel and multidisciplinary approach, but also for developing effective collaboration practices. As the project enters its closing phase we review key aspects of this success story.

The beginning of the collaboration between the Chilean and French researchers involved in the KEOpS project dates back to 2008, when Dr. Adrian Palacios from the Valparaíso Interdisciplinary Centre of Neuroscience (CINV) of Universidad de Valparaíso, spent his sabbatical leave at INRIA (National Institute for Research in Computer Science and Control) in France. "We had been developing a pilot on the same topics, exchanging ideas and primary results when we thought the CONICYT-ANR programme is an excellent tool to build a bridge between the mere exchange of ideas to the implementation of a proper joint research project and the establishment of a long term collaboration", says Dr. Palacios, who coordinates the Chilean team of this project.

The backdrop against which KEOpS is developed, explains Dr. Palacios, relates to the process of transformation experimented by modern biology, which has gone from generating very partial results, with very few records of neuronal activity, to being able, through the use of new technologies, to ask questions of hundred of neurons simultaneously, generating a massive amount of data.

The ultimate goal explains Dr. Palacios, is "to understand the dialogue between the eye and the brain, how signals are codified by the eye, and to determine what exactly the brain perceives." According to Dr. Thierry Viéville, who coordinates the French team of this project, the project offers "the chance to address amazing questions, likely yielding some sniff in the way we understand vision, but also the neural coding in the brain; the retina which is a "peripheral piece of brain" is definitely a subject of huge interest".



The Chilean KEOpS team works remotely with their French colleagues

The KEOpS project also points to generate an artificial visual system inspired by the understanding of the neural encoding mechanisms that can be applied for example to restore sensory capacities of visually impaired people. "It is already well known how the eye reacts to very simple stimuli, such as a passing colour bar, but not to real world situations. Signals during motor activity are totally different to how experiments have been conceived in recent years. The natural variable has just been incorporated and represents a huge field to be developed", explains Dr. Palacios. In that sense, developments carried out within the project have resulted in significant improvements to the existing models.

One of the most remarkable features of this joint research project has been the complementarity

CASE STUDY

between the collaborating teams. In fact, according to Dr. Palacios, KEOpS involves the merging of two worlds – the world of biology and the world of applied informatics.

In Chile, researchers from CINV provide the data generated during biological experiments. Additionally, Dr. Juan Cristóbal Zagal from the Department of Mechanical Engineering of the Universidad de Chile has conducted robotics experiments in order to study the applicability of a bio-inspired model of virtual retina to embedded vision. Moreover, the Universidad Federico Santa María (USM), has contributed with students (see page

"...THE CONICYT-ANR PROGRAMME IS AN EXCELLENT TOOL TO BUILD A BRIDGE BETWEEN THE MERE EXCHANGE OF IDEAS TO THE IMPLEMENTATION OF A PROPER JOINT RESEARCH PROJECT AND THE ESTABLISHMENT OF A LONG TERM COLLABORATION"

12) interested in the interface between engineering and biology.

The expertise provided by the Chilean research scientists of this project is highly valued by their French counterpart. Dr. Viéville, explains that their Chilean colleagues from CINV "are the very few in the world able to observe via multi-electrodes arrays tens of retinal cells' output at the same time. This is



Dr. María José Escobar, one of the researchers of the Chilean team of the KEOpS project from USM.

a crucial tool since retinal processing doesn't need to be observed at the level of one or two cells but at the neural network level". Furthermore, they also see a real opportunity in the chance to collaborate with their Chilean colleagues because this ambitious project requires knowledge and competences in several domains, namely: applied mathematics and computer science, neuro-science, but also including connected fields such as robotics, signal processing, theoretical physics, and cognitive science, among others. "It is clear that both the Chilean senior researchers and the students involved in this project have or are quickly able to develop these miscellaneous skills. This is a real opportunity for us especially because in France, multi-disciplinarity is less developed than in Chile", says Dr. Viéville.

The French side involves the participation of two INRIA research teams, one with expertise in applied mathematics and computer science, and the other strong in neuroscience. These teams carry out the analysis of the biological data made available thanks to the Chilean KEOpS groups. According to Dr. Palacios, as a result of the collaboration with the French team, the Chilean counterpart has acquired an incredible amount of knowledge not only in applied computing, but also in project planning. "It has been a huge learning experience for us in terms of developing a project since the level of detail our French counterpart is required to go into is much greater than we are used to".

Another distinctive aspect of this project has been the level of mutual commitment developed between both sides. Dr. Palacios explains that the joint implementation of the project demands a strong level of commitment in order to meet the requirements established by both funding agencies. "As opposed to other types of projects that include international collaboration, which only consider travel support, this project offers funding for basic research and demands both part to regularly account for the progress made. I think the French counterpart's administrative involvement, including the commitment of a number of hours per week, which makes them ineligible to participate in other projects, requires from them a level of commitment that is much stronger than that established within other types of collaborative projects. I think that the

CASE STUDY

A student's point of view: A handful of opportunities

Carlos Carvajal is an engineer from Universidad Técnica Federico Santa María (USM) and a PhD researcher at INRIA in France, who has been strongly involved in the KEOpS project since its beginning. Here he tells of his contribution to the project and how his experience in France has impacted on his career.

I joined KEOpS in December 2010. At that time I helped mostly with topics related to receptive field estimation. Today, and throughout my PhD thesis at INRIA, my contribution to KEOpS and its objective of "modeling the retina and beyond" is a computational model of the early visual system. My models include standard and non-standard pathways, and my approach is "functional systemic". This means that my models study and develop the system as a whole, and in natural behavioral situations. They aim at providing a better understanding of how emotional stimuli is processed in early stages, specially thanks to the non-standard pathway starting at the retina, and going to the cortex through, and regulated by, the thalamus.

In the first place curiosity drove me to become interested in applying my knowledge in engineering in a different area. Vision is such an important system for us in our daily lives – can you believe it uses around 50% of our brain resources? –, that to think that my work will help people see, either from scratch or in a better way, makes me feel really proud of it, and also gives me extra motivation.

On top of this, I really liked the working environment, the self-organizational freedom, and the way we worked and communicated with our colleagues, through facts and respectful intellectual debates, which is very enriching for the mind as well. In addition, a very important factor was the synergy with my colleagues, and to realize that we were all pushing in the same direction. Also, the fact that one does not know the answer, so the work is new and challenging all the time, really interests me.

Considering that my scientific career started in Chile, INRIA has been my second major step. It has given me amazing opportunities – besides providing an outstanding working environment – like experiencing two new cities (Nancy and Bordeaux)



and lifestyles, and to be able to participate in many other activities at several levels, specially in Bordeaux, where I am part of the Monitoring Committee of Young Researchers, the Editorial Board of SO News (our internal magazine), and a regular participant in science outreach initiatives, among others. Moreover, it did surprise me that so many varied and interesting subjects are being studied at the institute... not for nothing its motto is "Inventors for the digital world". Also, it astonished me to realize how good working conditions are here. There are several benefits and reductions for those working at INRIA; for example access to: cultural events, like ballet or opera. These privileges motivate people to grow in other aspects of their lives, rather than to focus solely on their work.

As for the future, I really like what I do at the moment, so continuing it would be ideal, either in a postdoc or permanent position, though I am also open to new, complementary opportunities.

CASE STUDY

constant positive stress makes the project work", says Dr. Palacios.

This strong level of commitment has come hand-in-hand with the use of technological tools that ensure a permanent communication between both teams. Dr. Viéville explains that instead of organizing short-term trips, they have favoured long co-working stays and remote work through "the co-development of good work remote practices: from visio-conferencing to digital collaborative tools, we have been able to really work together as a team with a minimal environment impact and a parsimonious use of financial resources."

Dr. Palacios, says that through this computational platform both teams have been able to exchange experimental results, data, and papers that team members can access from their personal computers making the process of completing progress reports much more simple. "As each project task progresses, each one of us updates the information related to that task, making the process of compiling progress reports very easy for project coordinators."

Promising future

Computational neuroscience is an area scarcely developed in Chile. However, according to Dr. Palacios, this situation might change in the future. "Our French partners are contributing to the development of computational neuroscience in Chile. The good news is that this is an inexpensive area, the only infrastructure required are computers. Chile has the potential capacity in the area of software engineering that can have applications in biology, mining, and other areas".

A real step forward in the development of computational neuroscience in Chile has been the organization of the Latin-American Summer School in Computational Neuroscience (LACONEU). The scientific summer school, that takes place in Valparaíso, gathers some of the most outstanding



scientists in the field to foster collaborative exchange of ideas between students and researchers helping to establish strong long term collaborations. "We organised the first school in computational neuroscience in Chile jointly with the French group, right at the beginning of the collaboration in the KEOpS project. The school is already in its third edition and has generated a massive interest. We have had students from Chile, Brazil, Mexico, Peru, United States, Cuba, Uruguay, Argentina, Germany, Spain, Poland and France", explains Dr. Palacios.

Students play a key role in the development of sustainable scientific collaborations. For instance, says Dr. Viéville, the contact between Dr. Palacios and INRIA, is due to Dr. María José Escobar, a major collaborator within the KEOpS project, when she was a PhD student in France. Moreover, says Dr. Palacios, the possibility of establishing a sustainable scientific collaboration is part of the "DNA" of a joint research project. "It is the only way to obtain commitment to do science. In mobility projects the commitment is to come here, but there is no knowledge transfer such as there is in development of a joint research project."

What is the value of conducting environmental research in Chile?

On the 2nd of December, as a result of a MoU with the Alexander von Humboldt Foundation in Germany, CONICYT awarded the 2013 Abate Molina Prize for Excellence in Science to Jost Heintzenberg, Professor Emeritus of the Leibniz-Institute for Tropospheric Research (IfT). Prof. Heintzenberg used the award to spend three months in Chile carrying out research at the Centre for Environmental Technologies (CETAM) of the Universidad Técnica Federico Santa María (USM). Prof. Heintzenberg, tells of his personal and scientific experience, including the reasons why Chile is an interesting location for conducting environmental research.

In the late nineties a young Chilean atmospheric scientist called me up in Leipzig, where at the time I was leading the Leibniz Institute for Tropospheric Research (IfT). His name was Dr. Francisco Cereceda-Balic. He had just obtained his Ph.D. in Germany and was interested in visiting me. The subject of his thesis sounded interesting to me because it dealt with the chemical content of atmospheric hydrometeors, which I had been studying in clouds and fogs myself. He and his wife turned out to be very pleasant people and they kindly invited me to visit them whenever I had a chance to do so.

This chance came some years later when the German Ministry for Science and Education organised an exploratory mission of German scientists to Chile in order to stimulate collaboration. I chose the Universidad Técnica Federico Santa María (USM) as one of my destinations and was heartily welcomed by Francisco. We discussed a number of potential collaborative studies amongst which investigating chemical processes in the frequent fogs in the Valparaíso region ranked very high. Our plans were shelved, however, because no funding could be found to realize our ideas. However, we kept up our friendship by his visiting IfT again some years later and by my giving a short course on atmospheric aerosols at USM.

When I finally retired from my duties at IfT and from my chair in atmospheric physics at the University of Leipzig in 2010 I was free to follow up on scientific interests that I had to leave aside earlier because of high administrative and teaching loads. When I contacted Francisco in early 2013 asking him if he was still interested



Fig. 1 Fog sampling set up in the front yard of David Botha's restaurant near Casablanca close to Ruta 68.

in studying fogs he was just as enthusiastic as ever and eventually came up with the idea of me applying for the prestigious Abate Juan Ignacio Molina grant. We were successful and here I am!

Why did I choose Chile for environmental research?

There are three main factors that influenced my decision. One, its marine and continental environment and certain topographic particularities cause frequent coastal fogs and heavy radiation fogs inland. Two, the processing of both marine aerosol particles and pollution aerosols, such as those from traffic emissions, through fogs and clouds is still not well understood. Chilean fogs and low clouds provide ample opportunities to study this aerosol processing under varying conditions. Three, the group at USM

is one of the few research groups worldwide who maintain their interest in fog studies, thus providing a solid scientific, infrastructural and logistic base for successful field experiments directed towards fogs and clouds.

To date I have been living and working together with my wife Konstanze in Valparaíso for nearly two months. The strongest impression that we both share is related to the many Chilean people that we have had the pleasure of meeting both in official and private circumstances. Their openness, helpfulness and friendliness were striking. We have not met a single grumpy person! Most striking were the ways we were welcomed by complete strangers when searching for suitable sites for our fog studies. Without questions we were welcomed to set up our instruments in people's backyards or on the roofs of their houses, to draw from their electrical power and get unrestricted access to their property in order to maintain our experiment around the clock.

Figure 1 illustrates our first fog sampling setup in the front yard of David Botha's restaurant Casabotha near Casablanca, within 20 metres of the heavily trafficked Ruta 68. The picture shows David himself kindly helping me to connect our instruments. At Casabotha we experienced the most impressive occurrence of a highly contaminated fog. With a laser-optical instrument we measured visibility. Meteorologically, visibilities lower than 1000 meters indicate fog and relative humidities in fogs must be close

to 100%. On October 25 these conditions were experienced between 5 a.m. and 6 a.m., shortly before sunrise (as displayed in Fig. 2). Visibility went down from upper instrumental limits to a few hundred metres. At the same time, however, the mass concentration of aerosol particles smaller than 10 micrometer (PM10) in size went up to nearly 1000 $\mu\text{g m}^{-3}$, which is 20 to 50 times the regulated public health limits. We suspect that these excessively high PM10 values were caused by farmers igniting smoke pods in their nearby vineyards because the air temperature got close to freezing.

For weeks then we went to Casabotha once or twice a day to change sampling filters and download data from the instruments, and hoped for nightly fogs to have occurred.

Alas, there are fewer and fewer radiative fogs in late spring and summer in the Casablanca region and no more extended fog periods were recorded. Konstanze found another sampling site of a point 400 m above sea level in Valparaíso. There higher up and near the sea, we have more chances of fog or passing cloud, while being close to the strong air pollution sources of the truck traffic to and from the harbour. At the same time we have started planning for the first Chilean long-term fog/cloud research station in a coastal national park, which hopefully will be realized in the near future.



Prof. Jost Heintzenberg

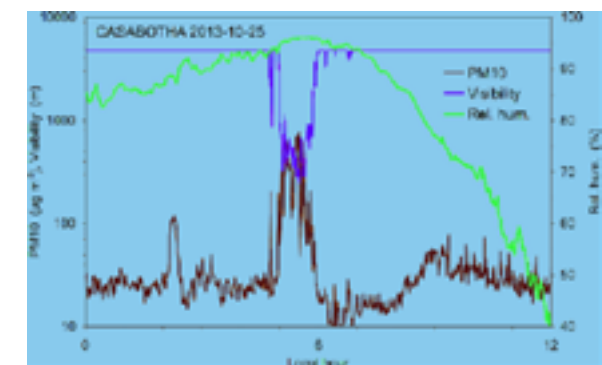


Fig. 2 Visibility, relative humidity (Rel. hum., %), and PM10 in $\mu\text{g m}^{-3}$ during the first 12 hours of October 25, 2013 at Casabotha, Casablanca near Ruta 68.



Maki Tsuchida

Head of the Bilateral Cooperation Division, International Programme Department, of the Japan Society for the Promotion of Science (JSPS) participated in the UTokio Forum held in Santiago in October. We asked her about what new opportunities for scientific and technological cooperation between researchers in Chile and Japan will be available in 2014.

What motivates JSPS partnership with CONICYT?

It is part of our five year strategy to enhance collaboration with South American Countries including Brazil and Chile. In the case of Chile, this strategy is based on its record of science and technology achievements and also on CONICYT's continuous interest in partner with JSPS.

How will the CONICYT-JSPS coordinated call operate?

This coordinated call is a flexible combination of two programmes. On the JSPS side, the programme is called Open Partnership Joint Projects/Seminars, and is open to Japanese researchers who can apply for support to cooperate with researchers from around the world, including Chile. We support bilateral joint projects and seminars. In the case of joint research projects the duration is up to two years. If researchers apply to conduct joint seminars, they can receive support for a one-off event of up to one

week. The call is open for all fields of science and closes for applications in February. On the side of CONICYT, the call closes for applications in around March.

What does JSPS expect from this partnership with Chile?

We want to promote joint research between Chile and Japan in a wide range of fields, not just in astronomy. Our fellowship programme is not well known to Chilean young researchers. So far we have supported zero fellow researchers from Chile, so we want to encourage Chilean young researchers to take advantage of our fellowship programme and to come to Japan.

What opportunities do you see for future cooperation between Chile and Japan?

If we receive a lot of applications to our coordinated call, we can consider scaling up collaboration by signing a formal MoU that considers annual joint calls for applications. A typical way of a bilateral MoU is that we support

allowance for Chilean researchers in Japan and international airfares for Japanese researchers to come to Chile and the other way around. The other way is that we support Japanese researchers' airfares and maintenance in Chile and then CONICYT supports Chilean researchers airfares and maintenance while in Japan.

Further information:
Japan: Ms. Matsuzaki/Ms. Toyoda
nikokukan@jps.go.jp
http://www.jps.go.jp/english/e-bilat/data/01_proposals_2602.pdf
Chile: María Mesonero
mmesonero@conicyt.cl



Dr. Jong-Hyun Rhie

Director of the Office of American & European Affairs at the Centre for International Affairs of the National Research Foundation of Korea (NRF), who participated in the Seminar "Chile-Korea: Building international Cooperation in Science, Technology and Innovation" held in November in Santiago, explains why 2014 will be an interesting year for scientific and technological cooperation between the two countries.

What is the potential for cooperation between Chile and Korea in science and technology?

Chile and Korea have cooperated in the areas of polar science and astronomical observation. However, I believe there are other potential areas for future cooperation where both countries may have common interests, namely: population and society, biodiversity, environment, and renewable energy, which are at the moment very hot topics for both the Chilean and Korean governments. While Chile has a long coastal line and abundant natural renewable energy resources, in Korea, less than 5% of our total energy consumed is renewable energy. The Korean government set up the 2nd Energy Master Plan last year as part of which 11% of total energy consumed by 2030 will be from renewable sources. Therefore, we are very interested in increasing cooperation with Chile in this area.

What steps are being taken to enhance cooperation with Chile?

Last August, the President of CONICYT exchanged a MoU with NRF in Korea. One of the first initiatives following this agreement will be a

mobility programme introduced in the first quarter of 2014. We will start with this mobility programme because networking between researchers is a prerequisite to carrying out joint research in the future. After establishing networks, both institutions will initiate medium and long term joint research programmes.

How will researchers benefit from these initiatives?

The Chilean National Innovation Strategy for Competitiveness presented in 2008 by the previous government had three pillars: the development of human capital, the strengthening of the science base to address socio-economic needs, and the improvement of business R&D and innovation activities. This strategy matches perfectly with the newly established Korean government policy of "Creative Economy". This policy integrates science, technology and ICT to boost national competitiveness and enhance national innovation. I hope the CONICYT-NRF mobility programme will develop in the future so that Chilean researchers can benefit from this drive for innovation.

What opportunities has the Chile-Korea Seminar opened for future cooperation?

All information from this forum, such as technology levels, possible research areas, and terms of cooperation, will be shared with Korean researchers, and NRF will encourage and promote international cooperation with Chile in addition to the 2014 joint programme. Both countries understand the need for international cooperation in S&T and emphasize the need for enhancing innovation capability through mutual understanding. However, it is inadequate to launch programmes without sharing information on possible research areas, relevant researchers and terms of cooperation. In this regard, this S&T forum will act as a foothold from which to promote the CONICYT-NRF joint programme and will contribute to the development of a general features-based roadmap for the joint programme.

Further information:
Korea: Taehee Kim
thkim@nrf.re.kr
Chile: María Mesonero
mmesonero@conicyt.cl



Smooth sailing international scientific cooperation

The Chilean team led by Dr. Peter von Dassow, saw in the CONICYT-USA call an opportunity to couple their ideas of studying the phenomena of diversity of marine organisms, with someone who was very strong in biogeochemistry, thus developing a project that otherwise they would not have been able to pursue. What they did not envisage was that during the first year of the project, their USA counterpart would invite them to participate in a scientific mission aboard the Nathaniel B. Palmer ice-capable research ship to explore the ocean waters off the coast of Chile and Peru, greatly amplifying their study area. We learned how this experience has impacted on their research.

The CONICYT-USA project led by Dr. von Dassow from Pontificia Universidad Católica (PUC), with the participation of Prof. Bess Ward, from Princeton University, involves studying how diversity responds to different marine conditions. "We were very interested in the natural anoxic zones, the upwelling zones with a naturally low pH, and the fact that in Chile you can get waters that are very off shore too. We had been thinking for a while we could use all those oceanographic bases to look at the very different marine conditions and as water passes by, look up how communities respond to this. We had no idea as to how we were going to make that into a coherent proposal, but then we saw the call and said: look this is what we need.

We need to couple what we do with the projects of somebody like Prof. Ward, who can help especially with the nitrogen cycles", says Dr. von Dassow.

The help provided by Prof. Ward, who has a large range of projects funded by the National Science Foundation (NSF) that potentially complement the scientific interests of the Chilean team, is a key factor in the development of this project. Dr. von Dassow explains that, "with the technique that we have in Chile we can look at the surface to measure nitrate concentrations, but Prof. Ward has developed specific tools to use gene expression to look at the actual status of the organisms related to nitrogen. That is a new tool we have been able to access thanks to this collaboration, that we would not otherwise have".

For Prof. Ward, the motivation to collaborate in this project lies on the special characteristics that the ocean in Chile has that are really important to oceanographers around the world. "In terms of the productivity of the ocean, the coast of Chile and Peru is one of those mythic places for oceanographers, it is the most productive piece of ocean in the world, that is why I came here", says Prof. Ward.

Another aspect of the collaboration that Dr. Ward is very interested in is the genome sequencing, the process by which the DNA of microbial species is determined, that is under way and that her lab has not done before. "The Chilean team has made a lot of progress analyzing the samples we collected not just on the research cruise, but in other sampling schemes. We realized that there are a couple of synergies we can take advantage of to look at things that have not been looked at before; the complement is really strong", explains Prof. Ward.

According to Dr. von Dassow, collaboration is strongly encouraged by a project such as this. Dr. Nicole Trefault, from Universidad Mayor, another member of the Chilean team, agrees. "The structure of the funding reinforces collaboration since we can allocate funds to send students to the USA, and also receive students from the USA, while in other projects that involve international collaboration the money you can spend on international travel is very limited". Dr. Trefault adds that "the possibility to really interact and work together is crucial, we can exchange different views on the same questions, to conduct experiments together, complementing different techniques and really work in a multidisciplinary way".

January 2014



A city that never sleeps

The Chilean participation in this research cruise, although not envisioned in the original proposal, but had been planned as part of Dr. Ward's project in the USA, became a big aspect of the collaboration. In Dr. Ward's words it was "like multiplying two by two and getting two hundred".

The Nathaniel B. Palmer research cruise departed from Valparaíso on the 23rd of June 2013 with over 20 scientists from five countries including Chile. This ice-capable research ship funded by the NSF with a cost that ranges between 50 to 100 thousand dollars per day, took three members of this CONICYT-USA Chilean team to an expedition to oceanic and coastal waters in front of Chile and Peru. "Dr. Ulloa and I were on the cruise for 21 days and Dr. Trefault for another 10 days. Without being part of this collaborative project we would have never had this opportunity", explains Dr. von Dassow.

The purpose of the Chilean team aboard the ship was to study

Loading portable labs onto the research vessel in Valparaíso.

... "THE COAST OF CHILE AND PERU IS ONE OF THOSE MYTHIC PLACES FOR OCEANOGRAPHERS, IT IS THE MOST PRODUCTIVE PIECE OF OCEAN IN THE WORLD, THAT IS WHY I CAME HERE", SAYS PROF. WARD.



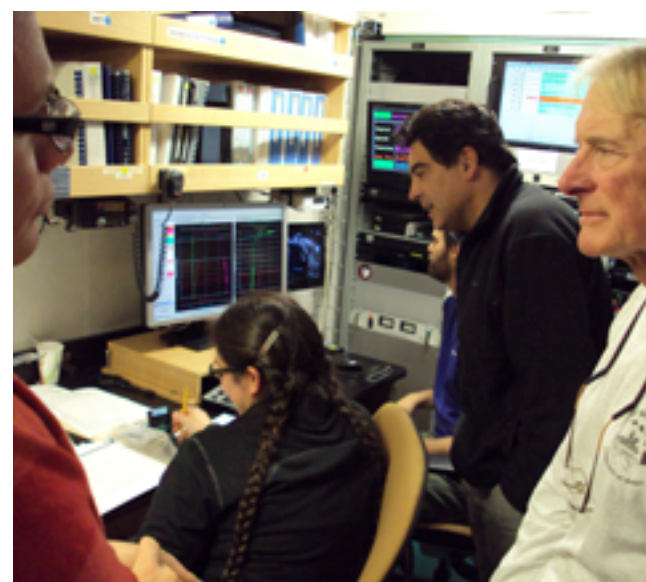
the microorganisms that live in waters low in oxygen and high in CO₂, conditions that are typical of the north of Chile and Peru. These "Oxygen Minimum Zones" also known as "dead zones", because many fish and shellfish suffocate in them, are nevertheless rich in diversity and could be important in global ocean productivity and climate regulation and also represent natural laboratories for predicting how the ocean will function in the future. According to Dr. von Dassow "Chilean waters effectively create a bunch of natural laboratories, all of which represent conditions that will effectively occur in the rest of the ocean in 100 or 200 years time".

Participating in a scientific expedition at sea demands a large amount of work from the participants who are immersed in their research processes day and night. Aboard the ship, Dr. von Dassow posted on his blog during the expedition: "both the crew and the scientists must work in shifts, and we the scientists many times have to work very long hours, going to bed at 5 or 6 in the morning and getting up only a few hours later if necessary. The ship's external lights are on all night for the security of scientists and crew working outside: It is a city that never sleeps!"

The multiplying effect

For the Chilean team of this CONICYT-USA project, the hard work onboard the Nathaniel B. Palmer was more than compensated. It enabled them to scale up the sampling to 27 stations, much more than they had originally anticipated within the frame of this project. "Before we had the opportunity to be aboard an oceanographic ship, we would have flew to Juan Fernández, hired a fishing boat, took some samples and sent them back from one station to get access to oceanic waters. Instead, we had a whole cruise to go not just to one station but many, and a chance to get to many locations with profiles of samples at different depths, instead of struggling to get a few chemical measurements, we could sample continuously the concentration of CO₂ and oxygen." Furthermore, the opportunity to participate in the research cruise "changed our ability to tackle the basic questions of this project", explains Dr. von Dassow.

Onboard the ship, the Chilean team also implemented a new methodology along with Dr. Ger van de Engh, vice-president of BD Biosciences and inventor of the world's most advanced influx citometres, machines used for marine microbiology research,



Gadiel Alarcón
(left) training young oceanographers on the use of CDT equipment Above: observing CDT data in real time

who collaborates regularly with Dr. Osvaldo Ulloa another member of this project from Universidad de Concepción, and Dr. von Dassow. This methodology, which is very relevant to this CONICYT-USA project, uses different lasers simultaneously that allow better discriminating between the different phytoplankton groups (aquatic microorganisms that photosynthesize) based on the fluorescence spectrum. Dr. van den Engh and Dr. von Dassow also implemented in the research cruise a new citometry methodology, that they previously developed together, to isolate two types of coccolithophores (microscopic unicellular algae), one of those, the *Reticulofenestra parvula*, is very common in oceanic waters, but had never been cultivated before.

The experience participating in this expedition also helped the Chilean team to synthesize their ideas on experimental oceanography, which became one of the central themes of the newly established Institute Milenio of Oceanography, led by Dr. Ulloa. "We are hoping that in the future, now that Chile has an oceanography research vessel of world-class quality (the new R/V Cabo de Hornos), we are able to do this kind

of work and repeat a cruise of this characteristics with colleagues from other countries", says Dr. von Dassow.

The plan for 2014, the second of this three year project, is to complete the oceanographic data analysis. "We all have more samples than we are able to process, though this is a good place to be. What we need to do in order to be productive is to plan the best way to exploit the results we have", says Dr. Ward. That planning process, according to Dr. von Dassow, requires a coordinated effort from both parts as well as making decisions together that consider for example which samples to prioritize or how fast technology evolves.

Further information:
<http://www.conicyt.cl/dri/2013/04/02/apoyo-al-desarrollo-de-proyectos-de-investigacion-chile-eeuu-2013/>



CONICYT-USA project team with other researchers after a hard day's work on board the vessel. Emilio García (left), Peter von Dassow, Bess Ward, Osvaldo Ulloa, Al Devol, Gadiel Alarcón and Ger van den Engh

2014 Calls for Proposals

The first calls for proposals of the year will open between March and April 2014.
Details will be available on:
www.conicyt.cl/dri

agenda

January



13-17

Global Biomedicine scientific mission,
(Santiago, Concepción and Valparaíso, Chile)

February



25-27

ALCUENET Biodiversity and Climate Change Workshop
(Bogotá, Colombia)

March



TBC

Alcuenet Twining Workshop on ICT
(Santiago, Chile)

the IR team

- Director
Gonzalo Arenas
- Director's Secretary
Ingrid Tapia
- Deputy Director
María Mesonero Kromand
- International Cooperation Unit Coordinator
Rodrigo Monsalve
- International Cooperation Programme Coordinator
Cecilia Velit
- International Cooperation Programme Coordinator
Marlene Vargas Neira
- International Cooperation Programme Coordinator
Catalina Palma
- International Cooperation Programme Coordinator
Natalya Molina
- ALMA - GEMINI - QUIMAL Funds Coordinator
Javier Martínez
- Astronomy Budgeting and Management Officer
Andrea Zuñiga
- Executive Secretary to the Astronomy Programme
Paola Jarpa
- Head of Budgeting and Management for International Cooperation
Ricardo Contador
- Projects Monitoring Coordinator
Adrien Quisefit
- International Relations Unit Coordinator
Trinidad García
- EU Projects Coordinator
Matt Sheldon
- Multilateral Projects Coordinator
Ivar Vargas Rivas
- Projects Executive
Pedro Figueroa
- Dissemination and Events Executive
Ana María Abraham
- French Embassy Delegate
Héloïse Verweyen

visit

www.conicyt.cl
www.sti-cooperation.cl
issuu.com/dri-conicyt

contact us

relacionesinternacionales@conicyt.cl