

# international relations

## CONICYT

- ForEAdapt project adapting forest management to climate change
- Chile-U.S. collaborations at the forefront of global science
- GROW-Chile laying the foundations for future collaborations
- Chilean PhD fellow breaking ground in oceanographic research in Spain

issue 23 /July 2014

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**W**elcome to issue 23 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 inform about the active role that CONICYT is taking in the international arena to boost international scientific and technological cooperation with Chile, including important initiatives in the field of particle physics and the bilateral cooperation with India and the UK.

We also feature the case of the ForEAdapt project to show one of the exchange and networking opportunities that Chilean researchers can access through European research and innovation programmes.

In preparation for the coming workshop on solar research hosted by CONICYT and its partners in the CEST+I project in Spain, in our European Connection section energy expert Dr. José Miguel Cardemil provides a glimpse of some of the potential opportunities for cooperation between Chile and the EU on solar research.

In Interviews, we learn from the two sides of the coin how the US-Chile partnership, through the GROW programme, can significantly contribute to establishing collaborations between research groups.

In Projects, we look at collaborations between researchers in Chile and researchers working at the world's top universities that are set to produce high-impact results with the support of our Global Alliances for Excellence programme.

Finally, in On the Move, Antonio Canepa, a Chilean PhD researcher working at the Institute of Marine Science in Barcelona tells of his international research experience and his role in an innovative international research project in the area of oceanography.

We hope you find the content we have prepared for this issue enjoyable and informative.

Please do email us your feedback or ideas for content.

International Cooperation Programme  
CONICYT

The International Cooperation Programme welcomes all comments and suggestions from readers. Please email us at [relacionesinternacionales@conicyt.cl](mailto:relacionesinternacionales@conicyt.cl)

## Chile to collaborate in the ATLAS upgrade programme

CONICYT and the European Organisation for Nuclear Research (CERN) signed in June a Memorandum of Understanding (MoU) for the construction of the Muon New Small Wheel by the Pontificia Universidad Católica de Chile and the Scientific and Technological Centre of Valparaíso (CCTVal) at Universidad Federico Santa María. The project is part of the upgrade programme for ATLAS, the world's largest particle detector.

CONICYT will contribute with around US\$400,000 to finance the equipment needed for the construction of part of the Muon New Small Wheel, a project considered to be of the upmost priority in the ATLAS upgrade programme, to increase the efficiency in the detection of particles.

Another CONICYT initiative announced recently that supports Chile's participation in CERN's experiments involves the financing of Universidad de Talca's full membership of the ALICE experiment. This university has collaborated in ALICE since December 2011 as one of CERN's high performance computing laboratories.

In 2014 CONICYT's support will also allow the Pontificia Universidad Católica de Chile and the Universidad Federico Santa María to increase from four to five the number of researchers participating in ATLAS.



ATLAS Small Wheel

CERN is the world's largest particle physics laboratory. It gathers in Switzerland over 7,500 scientists, engineers, students and technicians from 60 countries, including Chile, to collaborate in the search for new phenomena and the particles that make up dark matter.

In 2007, CONICYT and CERN signed a Protocol for the long-term participation of students, scientists and technical staff from Chile's universities and research institutions in CERN's experiments.

## First India-Chile Workshop on Big Data



2014 India-Chile Workshop on Big Data in Goa, India.

A scientific delegation led by CONICYT participated on June 4-6 in the first India-Chile Workshop on Big Data in the Birla Institute of Technology & Science, Pilani, in India. The initiative aimed at bringing together experts from India and Chile to explore opportunities for collaboration in the area of Big Data.

Dr. Eduardo Vera, Director of the National Laboratory for High Performance Computing (NLHPC) at Universidad de Chile and scientific coordinator of the Chilean delegation, highlighted the importance of moving forward in the area of Big Data. "Nowadays we have the capacity to collect large amounts of data, therefore, it is extraordinarily important to be able to analyse all that data and develop mathematical and computational tools that allow using the results to generate knowledge".

The scientific delegation brought together leading experts in different areas of Big Data, including bioinformatics, biomedicine and computational biology, all of which are set to have a strong impact in the development of personalised medicine. Another area of growing importance worldwide, and where Chile has a comparative advantage, is astrophysics, a discipline related to the management of large amounts of data obtained through astronomical observations.

The workshop is part of the 2012-2015 Action Plan between the Department of Science & Technology (DST) of India and CONICYT to boost scientific collaboration in areas of common interest. In this context, similar events, in the areas of astronomy and food processing, are planned for this year.



## CONICYT endorses international initiative in support of future researchers



3rd GRC Annual Meeting in Beijing, China

The 3rd Annual Meeting of the Global Research Council (GRC), an organisation that brings together science and technology funding agencies from around the world, was held on May 26-28 in Beijing, China.

The objective of the meeting was to continue the work undertaken by this international organisation and take forward its commitment to removing

barriers to international research collaboration.

CONICYT was among the more than 70 research funding agencies from around the world that endorsed the Statement of Principles and Actions for Shaping the Future - Supporting the Next Generation of Researchers. During the meeting the participating agencies also reviewed the status of the implementation

of the GRC Action Plan on Open Access to Publications. The meeting was hosted jointly by the Chinese Academy of Sciences (CAS), the National Natural Science Foundation of China (NSFC) and the Natural Sciences and Engineering Research Council of Canada (NSERC).

The GRC will meet again in 2015 in Tokyo.

## CONICYT reinforces ties with Great Britain

A Chilean delegation including representatives from CONICYT and the Innovation Division of the Ministry for the Economy, Development and Tourism, visited the UK on June 23-27 to reinforce their ties with key actors in the collaboration in science and innovation between the two countries.

During the visit the Chilean delegation met with senior figures from the Department for Business, Innovation and Skills, responsible for executing the Newton Fund, and representatives of Research Councils UK, the Technology Strategy Board and the British Council, Chile's delivery partners in this new initiative,

which involves a UK investment of £12m/US\$20m, over three years to strengthen collaboration in science and innovation between Chile and the UK.

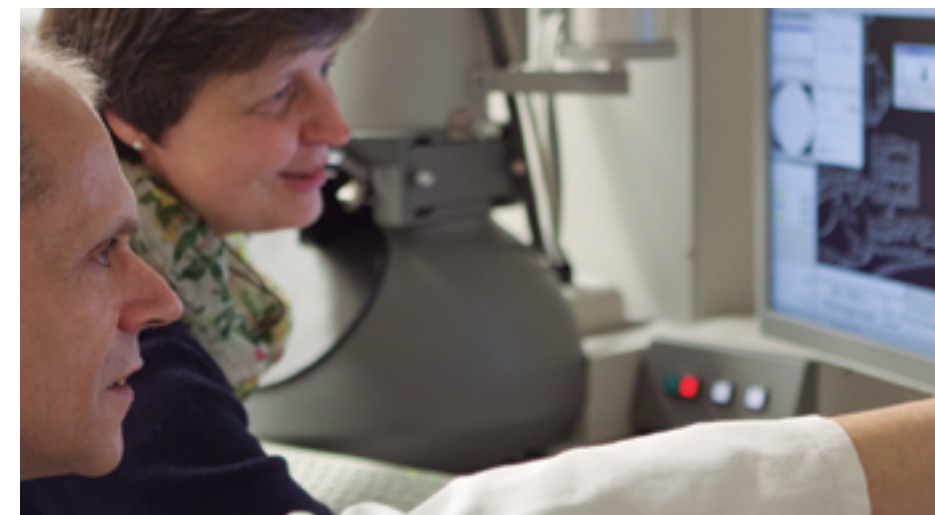
Chile is the first of the 15 countries working under the Newton Fund to implement this initiative. Last month two CONICYT calls for applications that involve cooperation under this scheme closed with 138 applications received from Chilean and UK research groups. Further Newton Fund initiatives are expected to be announced later this year by CONICYT, including skills training for researchers, and funding for innovation projects.



## Calls for international cooperation close with record number of applications

The International Cooperation Programme of CONICYT received 235 applications for the 2014 Call for Proposals in support of International Networking between Research Centres, nearly a hundred more applications than last year. Meanwhile the 2014 Call for Proposals Supporting the Development of International Research Projects received 119 applications, more than double the number of applications received last year.

The 2014 Call for Proposals in support of International Networking between Research Centres funds one and a half year networking projects including short visits, seminars and other joint activities. The 235 applications received for this call involve the participation of foreign institutional partners from 30 countries. Similarly to last year the most represented countries are the United States (30%) and the United Kingdom



(23%). Most applications received are from the natural sciences area (47%), followed by social sciences (20%) and engineering and technology (18%).

The 2014 Call for Proposals Supporting the Development of International Research Projects funds three year research projects between Chilean researchers and researchers either supported by the US National Science Foundation (NSF) or the British Research Councils (RCUK). The most represented thematic areas

of the applications received for this call are natural sciences (55%), engineering and technology (17%), medical and health science, and social sciences (12% each).

The first CONICYT-BMBF Call for Joint Research Projects also attracted high interest, with 52 applications received.

The estimated date for the publication of the results for these calls is September-October 2014.

## Results of GROW-Chile 2014 announced

CONICYT announced in June the projects selected in the 2014 Call of the GROW-Chile programme. The first call of the GROW-Chile programme will allow five National Science Foundation (NSF) PhD research fellows to establish research collaborations with leading researchers in Chile at an early stage of their scientific careers.

In 2013 Chile became the first country in Latin America to join the select group of GROW participants, which includes

Denmark, Spain, Finland, France, Japan, Norway, Singapore, Sweden, Switzerland and South Korea. The next call of the GROW-Chile programme will open in October-November 2014.

More information can be found on pages 16-17 of this issue.





## UPDATES



## Chile H2020 NCPs nominations

The newly nominated [National Contact Points](#) (NCPs) for Horizon 2020 (H2020) in Chile held their first meeting on May 28 in CONICYT. They will be responsible for providing information and advice to the scientific community in Chile about how to participate in the new research and innovation programme of the EU.

The objective of the meeting was to inform the recently nominated NCPs about their roles and the activities planned for 2014.

The first calls of H2020 for the period 2014-2015 opened in December 2013 and are focused on twelve areas, including food security, seas and oceans, and smart cities, as well as a number of cross-cutting topics.

## Report analyses S&amp;T cooperation between Chile and Europe

The CEST+I project has produced a new analytical [report](#) that looks at the current state of bilateral S&T instruments between Chile and institutions in different member states of the EU.

The report identifies good practices and challenges, explores how these cooperation instruments interact with other multilateral and national initiatives, and provides recommendations for the consolidation, expansion and improvement of bilateral cooperation on R&D in the future.

## CEST+I supports working visits in Europe and Chile

CONICYT and the French Institut de Recherche pour le Développement (IRD) announced the projects selected to receive support for working visits in Europe and Chile through an invitation for expressions of interest financed by CEST+I.

The [four](#) projects selected were chosen from a total of 54 by two parallel groups of evaluators appointed by CONICYT and IRD, based on their quality, the relevance of the proposed visit and the researchers' previous experience.

The projects selected will receive funding to cover the travel costs of researchers from the EU to Chile and vice versa, with the aim of developing new proposals for joint research projects and establishing new twinning mechanisms between institutions in Chile and the EU.

As an integral part of its work plan, CEST+I is committed to foster the establishment of networks between Chilean and European researchers.



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.

## UPDATES



## ALCUENET capacity building and networking event in Montevideo

The capacity building and networking event organised by [ALCUENET](#), INCONTACT 2020 and INNOVA, took place on May 5-6 in Montevideo, Uruguay.

The first day of the event included a workshop to inform country representatives, researchers, SMEs, National Contact Points (NCPs), and other stakeholders about the opportunities for Latin America and the Caribbean (LAC) in the new innovation and research programme of the European Union, Horizon 2020. This workshop highlighted the importance of reinforcing existing links between research institutions in the region and Europe in order to take part in collaborative research projects funded by the European Commission.

The event also included a meeting of NCPs aimed at creating a platform for international cooperation, which allows networking, generates synergies and creates regional capabilities that strengthen cooperation between LAC and Europe. During the activity CONICYT made a presentation about the Chilean experience promoting cooperation in science and technology with Europe through the Chile-Europe Liaison Office, established within CONICYT in 2005 to support and enhance the Chilean participation in the EU's Framework Programme.

## ENSOCIO-LAC Workshop in Cancun

The [ENSOCIO-LAC](#) project held a workshop in Cancun, Mexico on 30 June-1st July to promote EU-LAC collaboration and joint research initiatives across selected areas within the fields of Climate Action, Resource Efficiency and Raw Materials.

The event brought together the partners of ENSOCIO, including CONICYT, and other stakeholders to review the results of research projects in the environmental field from across LAC and the EU. Among the projects that participated in the event, two involve the participation of Chilean researchers from Universidad de Magallanes ([Ice2Sea](#)) and Pontificia Universidad Católica ([Coroado](#)).

One of the main results of the workshop was the identification of priority topics, networks as well as research gaps, which serve as a base for the establishment of future collaborations. In addition to that, the workshop's participants exchanged views on the progress of the ENSOCIO Knowledge Platform, which will allow all stakeholders from the environmental field to access information on relevant EU-LA projects, programmes, initiatives and networks.





## CASE STUDY

# Adapting forest management to climate change

ForEAdapt is a four-year networking and exchange project coordinated by the Instituto Superior de Agronomia (ISA) in Portugal that involves more than 40 researchers from organisations in Europe, Brazil, USA and Chile. We learned how the Chilean participants of this project have benefited from taking part in this large exchange programme for researchers. The project is supported by the EU Marie Curie Actions International Research Staff Exchange Scheme (IRSES).

Changing climate conditions can have a strong impact on forestry. While variations in temperature and rainfall rates may result in increased forestry growth rates in some regions, in other areas similar climate conditions can make forests suffer even up to the point of extinction. Uncertainty in climate change is based in the difficulty in predicting which of these scenarios will actually occur and what their impact will be in forest production. Depending on how conditions evolve, there is also uncertainty regarding which species could be grown in a particular place in the future.

ForEAdapt, explains Dr. Jordi Garcia-Gonzalo, the project's coordinator, looks to create an international research network to exchange knowledge on the impact of climate change on forest growth and on how decision making could be improved to address climate change uncertainty

in forest management and planning. The ultimate goal of this exchange, says Dr. Garcia-Gonzalo is "to develop adaptive forest management rules to cope with climate change, including new tools and techniques to predict forest growth under uncertainty and to optimise forest management".

In order to achieve this goal, ForEAdapt gathers experts from many fields, including environmental science, forest modelling, forest management, socio-economic analysis, operations research and software engineering, working in Portugal, Finland, Spain, Sweden, Brazil, the US, and Chile. These countries, explains Dr. Garcia-Gonzalo, "share key tree species of common interest and a range of similar biogeographic conditions relevant in the context of climate change. Besides, the strategic importance of managed and planted forests for multiple purposes is also common to the countries involved".



## CASE STUDY

## The Chilean chapter

The Chilean partners of this initiative have excelled in key research areas related to the project. The Department of Industrial Engineering (DII) of Universidad de Chile is globally recognised for developing optimisation models for forest management.

Dr. Andrés Weintraub, Professor at DII and National Prize Winner for Applied Sciences (2000), has collaborated for many years in this area with Dr. Carlos Romero, at the Universidad Politécnica de Madrid (UPM). The ForEAdapt project has reinforced this collaboration and allowed the establishment of new collaborations with the universities involved in the project. In fact, Dr. Garcia-Gonzalo has carried out a number of working visits to Dr. Weintraub's laboratory with the purpose of "exchanging ideas on forest management in the context of climate change uncertainty, particularly regarding how climate change affects forest growth and decision making", explains Dr. Weintraub. Furthermore, "the exchange of interesting problems and methodologies has helped to develop a significant degree of synergy between all participants. We have involved young people in global research and reinforced our international networks, which are very important to generating knowledge", says Dr. Weintraub.

The Department of Ecosystems and Environment of the Pontificia Universidad Católica de Chile, also takes part in the project. Dr. Paulina Fernández, an expert in modelling tree structure and dynamics, says that as soon as Dr. Garcia-Gonzalo contacted them they found the idea of joining the consortium very attractive. "Forest modeling has become a very strong area of study and we found the idea of working with international partners hugely interesting to continue developing the work we do in this area", says Dr. Fernández.

As opposed to Dr. Weintraub, Dr. Fernández has no previous working experience with the partners in the consortium, so joining the project has allowed her team to set up new collaborations. "We have established a very productive research collaboration. The project's spirit has been one of true openness



## funding instrument

The ForEAdapt project has the support of the Marie Curie Actions-IRSES scheme of the Seventh Framework Programme of the European Union (FP7). In the new European research and innovation programme, Horizon 2020, this instrument has been renamed International and Inter-Sectoral Cooperation through the Research and Innovation Staff Exchanges (RISE). It supports short-term mobility of research and innovation staff at all career levels, from the most junior (post-graduate) to the most senior (management). It is open to partnerships of universities, research institutions, and non-academic organisations both within and beyond Europe.



## CASE STUDY



in the sense that when a researcher from another institution makes contact, doors are immediately opened and links are generated no matter whether previous collaborations are in place", explains Dr. Fernández. As a result of the exchanges within the ForEAdapt

**"THE EXCHANGE OF INTERESTING PROBLEMS AND METHODOLOGIES HAS HELPED TO DEVELOP A SIGNIFICANT DEGREE OF SYNERGY BETWEEN ALL PARTICIPANTS. WE HAVE INVOLVED YOUNG PEOPLE IN GLOBAL RESEARCH AND REINFORCED OUR INTERNATIONAL NETWORKS, WHICH ARE VERY IMPORTANT TO GENERATING KNOWLEDGE".**

project, Dr. Fernández has established a fruitful collaboration with Dr. Ane Zubizarreta of the University of Eastern Finland (UEF). Dr. Zubizarreta's work with Dr. Fernández has focused on one of the most important commercial forest trees in Chile (*Pinus Radiatae*). "We use the extensive data collected by Dr. Fernández in Chile to model the dynamics of the branches within a whorl of a tree following the Markov chain process, which is a probability function, in our case following the rule that the characteristic of the following forming branch is dependent only on the characteristics of the present branch", explains Dr. Zubizarreta.

According to Dr. Fernández, the work developed jointly with her colleague at UEF supports models that simulate forest growth under different climate scenarios. In a few months, Dr. Fernández will be visiting UEF "to open new investigation areas, this time with a focus on climate change impacts on Chilean species growth applying and testing some Finnish models. The idea is that these visits (from and to Chile) will be frequent, now that PUC and UEF have started collaborating with very positive results", says Dr. Zubizarreta.

#### A platform to go global

An important aspect of the Chilean participation in the ForEAdapt project has been the exchange of young researchers who have benefited from collaborating with world-class researchers in Europe. One Chilean PhD student from PUC who visited UPM to collaborate with Dr. Juan Oliet Pala, is Juan Francisco Ovalle. His PhD research evaluates the impact of nursery fertilization on deep-rooted development, and its ecophysiological implications during the establishment of native species in environments with extreme drought, such as, the Mediterranean region of central Chile. This area will be, according to climate change projections, one of the most affected by the increase in temperatures and decrease in rainfall (of up to 20% in 2050) which leads to high levels of uncertainty about the success of restoration projects using native species, he explains.

## CASE STUDY

According to Juan Francisco Ovalle, the experience gained in Spain gave him the opportunity to exchange ideas about forest restoration and forestal ecophysiology with Dr. Oliet's research group, which helped him to improve the methodological approach of his current and future research. Furthermore, he had the opportunity to visit the National Centre for Forest Improvement "El Serranillo", a flagship in plant quality research. All these activities "opened new avenues for my future research career, including the development of a post-doctorate research programme at UPM in the near future", he says.

The exchanges have also involved young European researchers who have come to Chile to collaborate with local scientists. Joanna Bachmatiuk from the ISA in Portugal, who has a background in applied mathematics, recently visited Dr. Weintraub's laboratory. According to Joanna Bachmatiuk, during her research visit she "learned, under the supervision of some of the best experts, cutting-edge optimisation techniques to solve forest management problems under different climate change scenarios, as well as strengthening her international networks." Further visits from European researchers to Chile are expected to take place within the project. These visits, explains Dr. Garcia-Gonzalez, will be focused on the development of models to predict the growth of some Chilean species under climate change, which he thinks could potentially be very useful for the forest sector in Chile.

Chile, highlights Dr. Fernández, offers interesting advantages in relation to Europe. "On the one hand, it has intensive forest plantations with genetic improvements that allow for the studying of the growth and development of the same genetic material under different environments. And on the other hand, it has an interesting distribution of native forest under different climate conditions. From Mediterranean forest in the central valley, to rain and evergreen forest, through to the Patagonian forests, Chile is a hugely interesting natural laboratory to collect data and analyse how forests behave under the different changes in climate".

More information:

<http://www.isa.utl.pt/cef/pub/ForEAdapt>



**"...CHILE IS A HUGE INTERESTING NATURAL LABORATORY TO COLLECT DATA AND ANALYSE HOW FORESTS BEHAVE UNDER THE DIFFERENT CHANGES IN CLIMATE".**



## VOICES

# What is the potential for EU-Chile cooperation in solar energy research?

*As part of its series of workshops on key areas of EU-Chile cooperation, the CEST+I project is organising an event on solar power in Seville, on November 10th and 11th. . The workshop will bring together academic and industry experts from Chile and the EU to discuss the potential for developing new solar technologies in Chile. We asked Dr. José Miguel Cardemil, researcher at the Energy and Sustainable Development Centre of Universidad Diego Portales and H2020 NCP in Chile for energy, to describe the potential for bilateral research cooperation in the area.*

By José Miguel Cardemil

Solar energy is definitely taking off in Chile. In the last five years, alongside the deployment of a number of large solar photovoltaic (PV) and concentrating solar power (CSP) electricity generation projects, two new research clusters have received significant support for developing scientific investigation in the field.

One of them, the Chilean Solar Energy Research Centre ([SERC-Chile](#)), was established in 2012 by the Universidad de Chile in collaboration with other Chilean universities and research institutions with a contribution from CONICYT's Fund for Research Centres of Excellence ([FONDAP](#)) of over US\$7 million. SERC-Chile is focused on developing the solar energy potential of the Atacama Desert in northern Chile and maintains close links with international partners, including four leading research centres in Europe (Plataforma Solar de Almería, Universidad de Sevilla, Universidad Politécnica de Valencia, and the ISC Konstanz Solar Energy Research Centre).

The other group that is leading solar research in Chile is the Fraunhofer Institute for Solar Energy Systems ([ISE](#)) that has a budget of nearly US\$31 million, of which 40 per cent comes from CORFO and the Ministry of Energy. This institute, established in 2013 is the result of a partnership between Pontificia Universidad Católica (PUC) and the Fraunhofer Foundation of Germany. It looks to replicate in Chile similar projects



undertaken by the ISE in the EU – transferring applied science to technological solutions that help develop the solar industry in Chile. The project builds upon the work undertaken by PUC through CONICYT's Scientific and Technological Development Support Fund ([FONDEF](#)).

## Research challenges and opportunities

University research on solar power has played a pivotal role in revealing the massive potential for generating solar energy in Chile, both through solar PV and thermal technologies. Thanks to the efforts undertaken by researchers at a number of institutions in recent years we have verified that solar irradiance conditions in northern

## VOICES

Chile are some of the best in the world for generating solar power. Moreover, this potential is not limited to the northern region of Chile, but extends to the central valley region and further south in the country.

Chile's excellent natural conditions for generating solar power, along with rising energy demand and a move away from dependence on imported fossil fuels, have made Chile the leading solar market in Latin America. The interesting thing is that solar power plants cannot only help meet rising electricity demand, but also have considerable potential in meeting other energy needs, such as for heating and air conditioning needed for industry and domestic use.

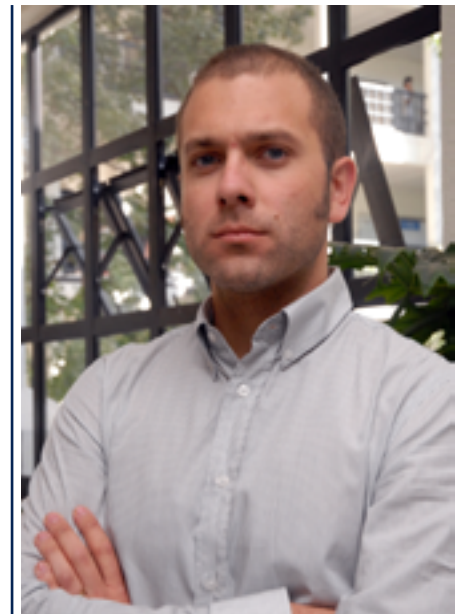
In this context, there is huge potential for Chilean research centres, working with industry, to develop research in integrating solar energy systems into industrial production processes. In mining and agriculture for example, there is a clear need for developing new technological solutions to satisfy these sectors' demand for energy for water supply and heating. Additionally, in the field of materials science, the development of new materials for solar PV and thermal systems, using for instance copper and organic compounds, which are abundant in Chile, also stands out as a potentially interesting opportunity.

## Support available in Chile

In terms of the funding available for solar research, a number of different initiatives are now available in Chile, particularly from public sources. CONICYT (fundamental and applied research), and CORFO (applied research in / for industry) represent the main sources of financing. There are also funds that support certain sectors, such as those from the (also public) Foundation for Agrarian Innovation (FIA), and innovation funds for specific regions.

In contrast, however, private investment on solar research in Chile has been lacking. But this too could be about to change given the ever more competitive and practical solution that solar energy is proving to be, compared to conventional energy sources. In addition, the environmental (and marketing) benefits, as well as the tax incentives that companies in Chile receive to invest on R&D, provide for a very favourable scenario for solar research in Chile at the moment. Hopefully, the EU-Chile Solar Energy Workshop next November in Spain should be an opportunity to examine all these opportunities and to discuss how EU research centres and companies can get involved in the growing Chilean market.

For more information about the workshop, and how to participate contact: Matt Sheldon  
[msheldon@conicyt.cl](mailto:msheldon@conicyt.cl)



Dr. José Miguel Cardemil.

**“UNIVERSITY RESEARCH ON SOLAR POWER HAS PLAYED A PIVOTAL ROLE IN REVEALING THE MASSIVE POTENTIAL FOR GENERATING SOLAR ENERGY IN CHILE, BOTH THROUGH SOLAR PV AND THERMAL TECHNOLOGIES.”**





## Alia Khan

The first NSF graduate research fellow to visit Chile with the support of the Graduate Research Opportunities Worldwide (GROW) programme is to arrive later this month to work with Dr. James McPhee. We asked her about what she expects to gain from this unique opportunity.

### What motivated you to apply for the GROW-Chile programme?

I first met Dr. McPhee during a field excursion for an Advanced Snow Methods course at the University of Colorado - Boulder. During this time, he gave a talk about the Chilean snow hydrology research they are conducting, and the interest that local mining companies have in their research. He informed us of the plethora of mining activities being conducted in these high elevation areas. Several months later I met Dr. McPhee at a Snow Remote Sensing workshop and we began discussing the possibility of me coming to help with field work and to collect samples for my dissertation on black carbon in snow and melt water. When the GROW proposals were announced, this seemed like the perfect fit!

### Why did you choose Dr. McPhee's laboratory to carry out your research visit?

Black carbon deposition on snow and ice reduces surface reflectivity or albedo, and therefore has major impacts on the climate system. Additionally, enhanced absorption of the dark particles by snow

and ice, heats the matter around it, affecting melt processes. In mountainous regions such as the Andes, this feedback is of particular importance where water resources are dominated by snow and glacial melt. Dr. McPhee's group studies snow and glacier fed water resources across 1000km of the Chilean Andes, many of which are vulnerable to these kinds of impacts caused by human activity from mining and other sources of pollution.

### What are your plans for your research stay in Chile?

The aim of my field stay will be to collect snow and water samples for biogeochemical analysis to include in my dissertation, as well as to build international collaborations with Dr. McPhee and his scientific group. I will have the opportunity to participate in three rounds of fieldwork. One snow survey in the northern Chilean Andes in August, and a second snow survey in the southern Andes in September. The aim of both surveys is to collect information on snow distribution. They will also facilitate collection of snow samples for my dissertation. In October a glacier mass-balance

survey will enable me to learn new glaciological field skills, as well as to collect ice and melt-water samples.

### What impact do you expect this international research experience will have on your career?

This will be an unparalleled opportunity to participate, collaborate, and learn about Dr. McPhee's existing snow and glacier field and research methods. Furthermore, the samples collected will provide supplemental and complimentary data to be incorporated in my dissertation. Dr. McPhee is leading one of the first Chilean groups to conduct annual monitoring of snow-pack and glacier mass-balance; thus I will have the opportunity to begin forming long-term collaborative ties for future work. I hope to pursue a career in academia; therefore this will be highly beneficial.

## Dr. James McPhee

Leader of the scientific team in the field of snow hydrology and high Andean watershed studies at the Department of Civil Engineering of the University of Chile, explains how collaborating in Chile with NSF graduate research fellow Alia Khan will benefit his research group.



### How does Alia Khan's project fit into your current work?

One of the lines of research I have developed for some years now consists in characterising the hydric resources found in the cryosphere in the Andes Mountains, that is, in seasonal snow cover and glaciers. This characterisation includes understanding the volume of accumulated water; the timing of the accumulation, the snow and the ice melting; linking this timing to the availability of river water for human, irrigational and industrial use; and understanding the potential impact of climate change on snow and glacier fed water resources. One aspect that we have not developed in depth is the local anthropogenic impact on cryospheric water resources, which is closely related to particles deposition on snow and ice. Particles deposition can accelerate snow and ice melting, which influences the availability of water downstream or at basins exits. Alia's work relates to the characterisation of that effect using black carbon as an indicator of atmospheric pollution and its impact on snow and ice. In a

nutshell, Alia's project adds a new dimension to our work that relates to the local human impact on the availability of snow and glacier fed water resources.

### How do you expect your team to benefit from this collaboration?

Based on the information this collaboration generates we will be able to build more efficient mathematical models of snow and ice melting processes that take into account the local effects of pollution and atmospheric deposition. With those mathematical models we could make more accurate short and long term predictions of water availability at the exits of basins that consider the impact of climate change and how these impacts overlapped.

### How do you think this exchange visit will impact on other students at your laboratory?

I think the impact is massive. By interacting with foreign students from top universities, our students gain in confidence since they realised they are equally well prepared. Then, these exchanges

contribute in some way to our students personal growth, and to become more confident about their own capacities. At the same time many of them get motivated to continue postgraduate studies and start a PhD, and it also allows them to learn cutting edge methodologies and specific techniques.

### What is the potential for future collaboration?

An opportunity such as this offers a lot of potential for future collaboration. If you think about it, the exchange of students is one of the most effective means to consolidate international collaborations between research groups. Very often researchers have too many commitments and little capacity to personally interact or start up new topics. So, students, especially postgraduate students are those who create and reinforce those links. I think exchange students play a key role in establishing international collaborations between research groups.

For more info on GROW-Chile contact  
Trinidad García [mgarcia@conicyt.cl](mailto:mgarcia@conicyt.cl)



# Searching new potential cancer medicines in Chile's native flora

**Every year an estimate 66,000 people die from skin cancer worldwide, approximately 80% are from melanoma. New potential melanoma treatments would depend on the ability to control the production of an enzyme called melanin.**

A group of researchers from UC Berkeley and the Universidad del Bio are searching in Chile's flowering plants potential cancer-fighting agents that can block certain enzymes key to the production of melanin.

The US-Chile collaboration will search for molecules in Chilean terrestrial and marine flora that can inhibit the activity of tyrosinase, an enzyme that relates to melanin production.

Melanin acts as a pigment that provides protection against UV radiation. However, when a person has been overexposed to UV radiation, via sunlight, melanin production rapidly increases leading to malignant melanoma.

The research will focus on the study of a Chilean plant commonly known as *zapatitos de doncellas* (*maiden's slippers*) and related species. "Indigenous ancestral knowledge and previous scientific studies lead us to believe that these plants could be potential cancer-fighting agents", says Dr. Carlos Céspedes, head of the team of researchers in Chile.

Dr. Céspedes collaborates in this project with Dr. Isao Kubo, an expert in biological activity in natural plant-derived products at UC Berkeley. They first met during a scientific conference in Concepción, Chile, while Dr. Céspedes was completing his PhD in chemistry in the early 1990's. According to Dr. Céspedes,

## Global Alliances for Excellence

The projects featured in this section are funded by CONICYT's Global Alliances of Excellence Programme.

This funding instrument provides grants of up to US\$30,000 per project to strengthen connections and facilitate the creation of long-term relations between researchers working at [Harvard University](#), [Columbia University](#), [UC Berkeley](#) and [MIT](#), and those working at Chilean research institutions, through research visits and exchange activities around varied areas of research. The next call for applications will open in October 2014.

this project will reinforce the collaboration they began during his post-doctoral fellowship at Dr. Kubo's laboratory in early 2000s.

So far, the Chilean team of this project has collected the plants and performed compound extractions and identification. The next task, led by Dr. Kubo's laboratory, will be to measure the inhibitory activity of melanin. The results of the study will be presented at the 248th American Chemical Society National Meeting & Exposition on August 10-14 in San Francisco, and at the 62nd International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research in late August in Portugal.

# Developing educational video games for blind children

**Technology and innovation developed jointly by researchers in the U.S and Chile promises to help change blind children's lives through the use of video games.**

Researchers from Harvard University and the Universidad de Chile have successfully collaborated during recent years in the development of novel education and rehabilitation strategies for the blind, particularly children, using computer-based gaming software and virtual environments.

effort and expertise of the two groups involved. On the one hand, Dr. Jaime Sanchez, a computer scientist, and his group at the Universidad de Chile, have developed the software. On the other hand, the group at Harvard has contributed with the clinical and testing expertise to evaluate the software in the rehabilitation setting.

**"...WE FIND THAT USERS ARE ABLE TO FIND THEIR WAY (I.E. NAVIGATE) IN ACTUAL PHYSICAL BUILDING MODELED IN THE SOFTWARE".**

The focus of their research has been on the application of gaming software called AbES (Audio-based Environment Simulator), which "allows blind users to explore virtually the indoor environment of a complex building. Once the spatial layout of the building is learned, we find that users are able to find their way (i.e. navigate) in actual physical building modelled in the software", explains neuroscientist Dr. Lotfi Merabet, head of the Harvard's team.

According to Dr. Merabet, these encouraging results are a consequence of the combined

In order to continue this collaboration, the U.S-Chile team is currently developing a scientific and cultural exchange project involving faculty and students from both institutions.

Their latest project will allow for the first time all researchers, blind educators and rehabilitation specialists involved in this study to gather together and plan future research. "We have completed a series of preliminary studies that have demonstrated the feasibility of our training approach. We now hope to expand upon this work to include larger environments (e.g. school campuses, museums, etc.) in order to improve the accessibility of these spaces for the blind", explains Dr. Merabet.

For more info on the Global Alliances for Excellence Programme contact Trinidad García [mgarcia@conicyt.cl](mailto:mgarcia@conicyt.cl)



A student using the AbES software.





PhD researcher Antonio Canepa

on the move Advancing the knowledge of jellyfish blooms

at the Institute of Marine Science in Barcelona



Med-Jellyrisk is a ground-breaking international collaborative research project about the socio-economic impacts of jellyfish blooms in the Mediterranean Sea that involves the participation of Antonio Canepa, CONICYT-supported PhD researcher at the Institute of Marine Science in Barcelona.

By Antonio Canepa

I joined the Institute of Marine Science in Barcelona (ICM-CSIC) in 2011 to carry out my PhD thesis and later in 2014 I became part of the Med-Jellyrisk project research team. This is the first cooperation project between neighbouring countries (Italy, Malta, Spain and Tunisia) assessing the socio-economic impacts of jellyfish blooms and the implementation of mitigation countermeasures. Med-Jellyrisk is focused on 10 Marine Coastal Zones in the western and central Mediterranean Sea basins faced with increased jellyfish proliferations. In these areas, jellyfish outbreaks represent a growing threat for humans and coastal activities (including leisure and aquaculture).

The strategic objective of the

project is the promotion of joint planning methodologies for the implementation of risk assessment, prevention and mitigation of negative impacts resulting from jellyfish proliferations in the research focus areas. The ultimate goal is to promote socio-economic development based on innovation and research outputs, favouring synergies between Mediterranean countries and strengthening regional planning strategies.

As part of the Med-Jellyrisk project team I collect and analyse data on jellyfish populations and environmental variables relevant to the ecology of a variety of species. The idea is to understand the role that certain environmental variables play in

the distribution of species to be able to predict where they may appear. In order to achieve this, we create distribution models of the most relevant species, in terms of their interaction with humans, to then create predictive maps. The aim is to generate effective tools for coastal management and decision making (e.g. risks mapping for bathers or aquaculture installations).

#### A platform for scientific exchange

In ICM I work mainly in the Cnidarians' Ecology Group led by Prof. Josep-Maria Gili and Dr. Verónica Fuentes. This group has given me all the support and confidence necessary to develop my doctoral thesis: "Jellyfish of the Spanish Mediterranean coast:



effects of environmental factors on their spatio-temporal dynamics and economic impacts". ICM has also provided me with an excellent platform for exchanging information with world-class researchers from different disciplines, and to access key training opportunities for my research career. While working in ICM I have been trained on species distribution modelling and plankton oceanography, both in Spain and France with leading scientific groups working in collaboration with people such as Dr. Jennifer Purcell, who is at the forefront of research on jellyfish proliferation worldwide.

My research group has also been influential in my career path, driving my research towards oceanography, where the study of jellyfish blooms is not only strongly linked to ecology, but also to applied sciences. The study of jellyfish populations in the Mediterranean Sea enables us to understand not only the causes of jellyfish proliferations, but also its impact on marine ecosystems and to generate useful management and decision making tools. A fine example of this is the mobile application [iMedJelly](#) developed by our group and other collaborators, to provide citizens with real-time information about the presence of jellyfish in Barcelona's beaches.



*Pelagia noctiluca* is the most common jellyfish in the Mediterranean. Photo Credit: E. Orbis.

#### Transferring knowledge

My future research plans are to continue studying the human impact on coastal ecosystems using gelatinous organisms as a model of study. The idea is to use the information obtained in the last 15 years in the fjords and canals of southern Chile to evaluate trends of the gelatinous organisms, such as jellyfish. These areas, for their latitude, oceanographic characteristics, and the human impact they have been subject to in the last period, make for an extremely interesting location for this kind of study. In fact, the south Pacific coast (Chile and Peru) is commonly identified as a very important area from all perspectives (ecological, economic and social), but with scarce spatio-temporal biological information. In the case of planktonic cnidarians (group that includes the most common jellyfish) in the south of Chile, this apparent lack of information is partly due to the fact that standardised data is not publicly available, since researchers have been collecting data for at least the last 10 years. I aim therefore to look to make these data available in an attempt to shed some light on the trends of gelatinous organisms over time and the impact of human activity on the environment.

More information:  
<http://jellyrisk.eu/>



**Graduate Research Opportunities Worldwide–Chile  
(GROW–Chile)**

**who can apply?**

National Science Foundation Graduate Research Fellows from Science, Technology, Engineering and Mathematics (STEM) fields who have completed at least one year of their PhD programme at the time of application.

**support**

NSF provides an allowance to travel to Chile and CONICYT provides a monthly per diem allowance of \$600.000 CLP to cover living expenses during the period of the study visit.

**dates**

November

**more info**

[www.nsf.gov](http://www.nsf.gov)

Trinidad García [mgarcia@conicyt.cl](mailto:mgarcia@conicyt.cl)

**Global Alliances for Excellence**

**who can apply?**

Researchers with a permanent affiliation with one of the participating foreign universities (Harvard University, Columbia University, UC Berkeley and MIT). In the case of Chilean partners, those eligible to support the project locally are researchers with a permanent affiliation with a Chilean accredited university or research institution.

**support**

Up to US\$30,000 per project

**dates**

October–November

**more info**

[www.conicyt/pci](http://www.conicyt/pci)

Trinidad García [mgarcia@conicyt.cl](mailto:mgarcia@conicyt.cl)

**GEMINI South Telescope Observing Time 2015–A**

**who can apply?**

Chilean or foreign researchers based at Chilean institutions who are actively engaged in teaching and research within the field of astronomy.

**support**

Gemeni South telescope observing time during the period February–July 2015

**dates**

1–30 September

**contact**

Edgardo Costa [ecosta@conicyt.cl](mailto:ecosta@conicyt.cl)

**APEX Telescope Observing Time 2015–A**

**who can apply?**

Astronomers working at Chilean universities.

**support**

Apex telescope observing time during the period January–July 2015

**dates**

September–October

**contact**

Luis Chavarria [lchavarria@conicyt.cl](mailto:lchavarria@conicyt.cl)

**Terms of reference and application at:**

[www.conicyt.cl/astronomia](http://www.conicyt.cl/astronomia)



July



17-18

CYTED Network on TICs in Agriculture Kick-off Meeting and Workshop (Santiago, Chile)

21

Programme Management for Science and Technology Training Sessions (Santiago, Chile)

August



25

Signature of MoU between CONICYT and the National Natural Science Foundation of China (NSFC) (Santiago, Chile)

27

Science and Diplomacy: A Pre-Conference Symposium (Auckland, New Zealand)

28-29

Science Advice to Governments Meeting (Auckland, New Zealand)

30

Second Meeting of the APEC Chief Science Advisors (Auckland, New Zealand)

10

Smart Cities: Smart Transport and Smart Energy - Seminar to strengthen EU-CELAC biregional cooperation on science, technology and innovation (Santiago, Chile)

September



28

Leadership Project Regional ICT Experts Meeting (Guadalajara, Mexico)

## the IR team

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