



▶ HOW STRONG ARE THE LINKS RESEARCH & DEVELOPMENT SCIENCES BETWEEN ITALY AND AUSTRALIA..... 3



▶ CAN A LARGE EUROPEAN CONSORTIUM BE A MODEL FOR AUSTRALIAN PARTICIPATION?.....7



▶ A MARIE CURIE FELLOWSHIP SUCCESS STORY TOWARD LONG TERM CO-OPERATION..... 10

FEAST *focus*

BUILDING THE EUROPEAN-AUSTRALIAN RESEARCH COMMUNITY.
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Over the past few months I have visited and spoken at more universities and research institutes, attended more conferences, and talked to more researchers than many people do in a lifetime....

Funding the Internationalisation of Your Research

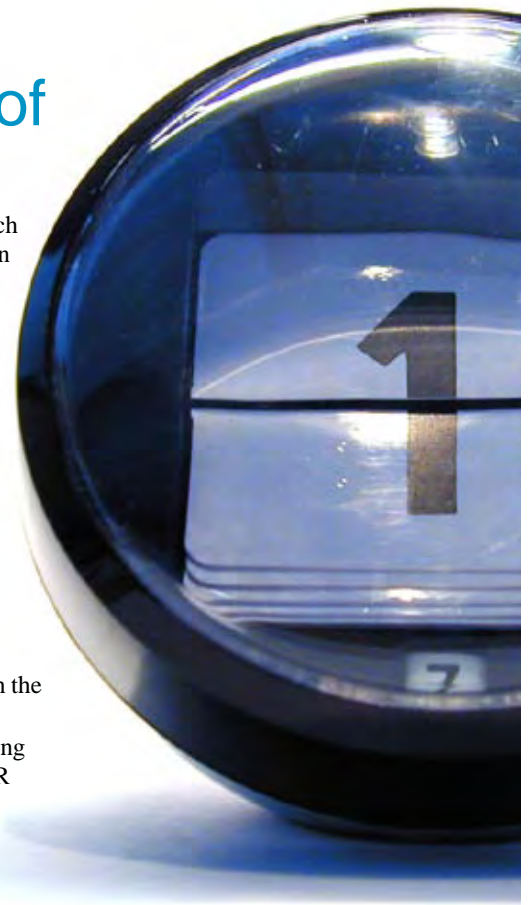
All of this activity raises the level of awareness of Australian researchers of the benefits of international collaboration (hopefully with Europe!) and in particular to help them understand how they may build relationships and fund long term activity in partnership with their European counterparts. My audiences usually contained a smattering of PhD students, Post docs, researchers for Australia and Europe, university and institute administrators and senior staff, as well as Federal and State bureaucrats.

In almost every case many of the questions I fielded were, perhaps not surprisingly, directed toward trying to access funds for research, travel, workshops, scholarships, or positions. This is usually the single most prominent area of inquiry to an organisation like FEAST. However, I was surprised that very few people or institutions approached me with concrete ideas or proposals for collaboration that they wanted to turn into reality. The most startling aspect is that many Australian researchers (even experienced and well-published ones!) and research administrators apparently lack knowledge of many sources

of funding for research and research support activities. This is, at least in my mind, one of the fundamental building blocks of normal research practice. It is also critical in the planning of a longer term research agenda. None of this information is difficult to find, in 15 min surfing the web today I found:

- More than 100 postdoc positions and PhD scholarships on the Marie Curie Research Training Networks site;
- A dozen entire programmes (hundreds of positions, workshops etc) of fellowships available to Australians on the German "Researcher Mobility" site;
- An enormous list of European funding sources on the British Council SISTER website, many of which are of value to Australian researchers ...

*Neil Hamilton,
FEAST Executive Director*



RESEARCH WATCH

Regularly we will highlight work with a particular country. This issue of FEAST focus shows the flavors of *Italia*. We illustrate a range of collaborations between Europe and Australia with examples of bilateral exchanges, bilateral projects and also mature or new Framework projects. The vast field of Agriculture, Land & Water gives us good landmarks from deep in the soil within the entangled roots to the no less complex pathways of Chemistry, via lakes and greens.....4

SMARTER COMMUNITY: stepping stones to success



FEAST is the only organization having an official mandate from the Australian government and the European Commission to foster co-operation in Science and Technology, including Humanities and Social Sciences
www.feast.org

FEAST Team Vol. 1

Dr Neil Hamilton planned and organised the second phase of FEAST and has run the project since May 2005.

Neil was appointed as executive director of FEAST in May 2005 although he has been involved with FEAST activities since the earliest days in 2001. His interests in and commitment to international collaborative research stem from early postdoctoral experiences with several groups in Europe and his ongoing participation in large-scale international global change research networks.

Previous career highlights include his appointment as Deputy Executive Director of the International Human Dimensions Programme on Global Environmental Change (www.ihdp.org) in Bonn, working for the International Geosphere-Biosphere Programme (IGBP) in Stockholm and Washington DC, establishing a CRC, and some very formative years at CSIRO Wildlife and Ecology.

Since returning to Australia he has held several positions in the ANU Chancery focussing on research and internationalization planning, and commercialisation of intellectual property.

A geographer by training and inclination, Neil has a PhD from the University of Sydney and an incurable travel bug. His research interests focus on global scale human – environment interactions, sustainable futures, and international relations. Or as he puts it, “how the world works”. Given that his first scientific publication was on beach sands he seems to have come a long way!

Neil has developed an ener-

getic programme for the next 3 years at FEAST, seeking to engage the Australian and European research communities and to create some outstanding examples of collaborative research. He strongly believes that, important as it is, providing information is not enough to facilitate many international relationships.



Working with the bureaucratic, academic, and diplomatic communities in Australia and Europe to break down barriers and create new opportunities is also critical, as is guiding researchers through the

maze of funding schemes, rules, and other pitfalls.

Neil’s other interests include motorcycles, beautiful gardens, wine, thinking, building things, and racing vintage sports cars. Oh yes, and travelling.....

Smart Demo 2005

The largest contingent of “intelligent” vehicles to be assembled in the Southern Hemisphere converged late September on Adelaide as it plays host to key international industry forum, Smart Demo 2005.

More than 300 delegates and over 120 companies from Australia and around the world – including FEAST, the United States, Belgium, France, Korea, Japan and Germany – travelled to Adelaide to attend the two-day exhibition on 29 and 30 September at Victoria Park.

The Demo showcased live, on-track demonstrations of innovative operating Intelligent Transport Systems (ITS) technologies - some of which have never been seen before in this country.

Australian teams rank among the world leaders in the design and development of ITS technology, “but the rest of the world is leaving us in their wake with the implementation of such innovation,” said Mr Lauchlan McIntosh, Smart Demo 2005 organising committee chairman,

and Australian Automobile Association executive director. “As a community, we need to bring about pressure on Australia’s key decision-makers to legislate to make many of the road safety technologies available today, compulsory in vehicles in this country,” he said. “Other nations are introducing new ITS to save lives, and the improvement in their road trauma statistics support these policies”.

This international ITS forum brings together the technology developers, the transport policy makers and regulators, transport infrastructure and vehicle manufacturers, and transport users to address the key issues not only on the Future of vehicle safety, and security but also on efficient

cy and environment in Transport.

Organisations attended Smart Demo 2005 to demonstrate their ITS technology, with dozens more presenting seminars on key issues involving the implementation of these technologies in Australia including Bosch’s Electronic Stability Program (ESP), high-tech trucks with the latest generation of active safety systems, DriveCam – the latest in digital video recording of accidents, advanced infrastructure technologies for speed alert and traffic and weather warning, and also fleet telematics application.

■ ITS Australia

Intelligent Transport Systems Australia (ITS Australia) is the leading non-profit organisation which promotes transport safety technology. ITS Australia hosts local and international events designed to facilitate exchanges within the ITS Sector and to promote the competency of Australian ITS industry.

More information about ITS Australia:

www.its-australia.com.au

Australitalia

Nicola SASANELLI has been the Scientific attaché at the Embassy of Italy in Canberra since 2001. Here he gives us a snapshot of the Italian S&T presence in Australia, with a view on the near future.

Over the last few years, S&T cooperation between Italy and Australia has intensified. Since 2001, an integrated approach to the S&T cooperation has been undertaken or facilitated by the Scientific Office of the Italian Embassy. This approach is based on the interaction of four fundamental activities that, although independent, work in perfect synergy. The conduct of these activities has resulted in the development of a network of relationships which, in the mutual interest of the two countries, should be nurtured and exploited.

■ Conferences and workshops

About 45 workshops and conferences have already been organized on the main thematic areas of common interest allowing more than 500 academics, researchers, experts and entrepreneurs from Italy to come and visit their Australian counterparts.

■ Student Exchanges

About fifty student exchanges have been or are in the process of being organized with strong support from Italian Regions.

■ Bollettino della Comunità Scientifica in Australasia

An important element of the integrated approach is the Bulletin, a quarterly publication in Italian and English, distributed to the main Italian and Australian universities and Research Centres. Eighteen "Bulletins" have appeared since 2001 allowing a flow of information in S&T related to the two countries giving stimulus to and raising interest in new forms of cooperation.

In parallel to the Bulletin, a website was set up which includes access to all the Bulletin issues,

the proceedings of our conferences and workshops and news regarding S&T cooperation between the two countries. The website is visited monthly 4500 times (30% from Italy; 15% from USA; 13% from Australia etc..).

■ Associations for Research between Italy and Australasia

The concept which guided the creation of the ARIA Associations is encapsulated in the assertion that "in a globalised technological world it is no longer relevant to consider the geographical location of excellence but rather the network in which it operates". The Associations' aims are "to promote, encourage, facilitate and administer promotional activities pertaining to scientific research, technology and social science between Australia, with particular attention to universities and research centres of a specific Australian State, and Italy". The Associations are the ideal network for collecting and disseminating information related to basic research, to applied research and technology transfer from and to universities as well as public and private research centres of each Australian State, and Italy.

Independent associations have been established in each Australian State to facilitate the development of locally-oriented initiatives undertaken by universities and research centres in order to attracting State Government support in strengthening their research infrastructures. This is especially true if research objectives are seen to support State or local development plans.

Members of ARIA are both Italian and Australian researchers with interest in cooperation between the two countries. The first ARIA Association

was launched in Canberra in November 2002. We currently have incorporated one ARIA in each Australian State and have more than 150 members.

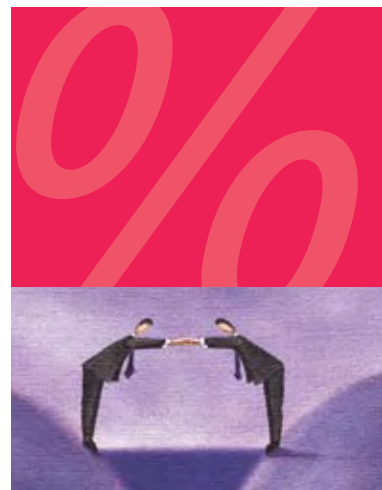
S&T collaboration between the two countries is benefiting from ARIA, which is very active but needs continuing encouragement. The new ARIA, the Bulletin, the workshops and the exchange of PhD students promoted by the Italian Embassy highlight the enthusiasm through the scientific community of both countries. In particular, the ARIA Associations should be seen as a new instrument of S&T cooperation between the two countries, unlike any other system currently operating in the world. While grounded in their respective territory, such as a given State, they represent a valuable network connecting Italian and Australian research centres.

We firmly believe that these networks need continuing attention and support and future strategies for bilateral cooperation should be targeted at two activities in particular: sustaining more efficient network between the Centres of Excellence in the two countries; and stimulating major involvement by local governments (Italian Region and Australian State) that are principally interested in the endogenous development of their local area.

Research and new knowledge represent an important part of our future, these activities are already changing the way we do business, providing new medical services, and generally accelerating economic growth. The process of globalisation is acknowledging the key role of international scientific cooperation in pushing back the frontiers.

Every one of us is engaged in responding quickly to the new challenges which are emerging day after day, however, we are not working alone, we are part of a larger family represented by the international network.

Dott. Ing Nicola Sasanelli



More information about countries in Europe at:
www.feast.org/?countries

For more information and regular news, please make sure to bookmark:

www.scientificambitalia.org

FEAST focus/18/November 2005/p 3

MILESTONE: commencing collaboration



In 2003 over 16,000 proposals were submitted to the 6th Framework Programme involving nearly 160,000 participants from more than 50 countries. Some 2600 of these proposals were retained for funding (involving over 27,000 participants). (2004 Report on RTD activities of the EU)

Green Chemistry in Campania

Dr. Tony Patti from the Centre for Green Chemistry at Monash, engaged with Prof. A Piccolo of Naples, Campania, in Italy, to work jointly on a better understanding of Natural organic matter pathways in soil chemistry.

■ The Project

Oxidative coupling reactions are often conducted using homogeneous copper based catalysts, such as copper(II)-amine complexes in methanol or dichloromethane. Studies conducted in this project has shown that oxidative coupling can be achieved using soluble iron salts in water. These conditions are 'green', as iron is less harmful to the environment than copper, and water a more benign solvent than the traditional and widely employed organic solvents, methanol or dichloromethane. Furthermore, improved yields can be obtained when reactions are biphasic or heterogeneous in nature, enabling simpler workup and catalyst recycling.

Clay minerals have been widely employed in synthetic procedures as effective catalysts for covalent bond formation involving a range of organic substrates. In addition, modification of clay mineral surfaces and interlayers with hydrated metal ions enhances the reactivity of clays in certain

reaction types. Fe(III)- loaded clays, and hydrated iron salts, for example, represent attractive template catalysts for use in oxidative coupling reactions with substituted phenols.

■ The partnership

Having met Professor Alessandro Piccolo's at a conference a couple years ago the collaboration went ahead. Through the Victorian branch of the ARIA association, Tony Patti and his research group at Monash met an official delegation from the Regione Campania in Italy. To support the existing collaboration they signed an agreement for research as detailed below.

Their research lies within the framework of the cooperation promoted by the Embassy of Italy in Canberra. Therefore the Regione Campania and the ARC Centre for Green Chemistry at Monash, have agreed to provide additional funding for Doctoral Researchers or

Staff to engage in collaborative research. This agreement enables a regular exchange of PhD students and staff, by covering the costs attached to mobility (i.e. three-month research periods in Naples). The association will eventually be strengthened by the signature of their first double badged PhD between Monash University and University of Naples Federico II in the coming weeks, with projects focused towards sustainability and Green Chemistry, is also in progress. Steps were also taken through this engagement to initiate other collaborative activities through the INCA (Interuniversity Consortium Chemistry for the Environment) network across Italy.

In Italy, Alessandro Piccolo, head of the Research Group on "Supramolecular humic systems in the environment" at University of Naples, is also responsible for a large national network, the "Progetto Strategico Nazionale su Sviluppo Sostenibile e Cambiamenti Climatici" (2005-2008), a large National project titled "Sustainable Methods for organic carbon sequestration in agricultural soils. Evaluation of the effects on the chemical, physical, biological, and agronomical quality of soils (MESCOSAGR)".

a key role in the formation and turnover of the humic fraction.

The Challenge

There is an overlap in the knowledge of soil chemists studying abiotic catalysis in new bond formation in organic components of soils and organic synthetic chemistry employing catalysts such as clays.

An understanding of the chemical transformations and dynamics of organic matter in soils is necessary in order to develop appropriate treatments and sustainable management practices to restore, retain and even increase organic matter in soils, as well as assist greenhouse gas abatement through carbon sequestration. Humic substances, formed from the turnover and transformations of smaller natural organic molecules in the soil, represent the more stable and essential fraction of the organic matter of fertile soils. Microbial activity and associated soil enzymes, as well as abiotic reactions involving catalysis by metal salts, clays and primary minerals in the soil, play

An understanding of these reactions, such as the oxidative coupling of phenols, could lead to soil improvement but also the use of natural catalysts in the synthesis of fine or specialty chemicals. Since such reactions essentially occur under 'green' conditions in the environment, they warrant further study, particularly in circumstances where larger molecules, including polymers, are formed. Hence, these reactions can lead to more stable organic structures, which are more resistant to the natural processes that degrade organic matter. Phenols, derived from decaying plant material, are widespread in the environment and appropriately chosen simple phenol compounds make good model systems to study the pathways, mechanisms and efficiency of these natural transformations. This project focuses on a study of abiotic and biomimetic reactions of model compounds, related to processes that might occur in soils.

Hyperionissimo

This article illustrates the collaboration between CNR-IREA and CSIRO Land and Water since 2002 on earth observation for adaptive management of inland and coastal waters. This project is supported by the Italian Embassy in Canberra and by the CNR-CSIRO Agreement (2004-2006).

■ The Challenge

Inland and Coastal water managers require accurate, spatially comprehensive measurements of water quality across their management areas (ranging from rivers and dams to estuaries and continental coasts). As an integrating technique, remote sensing extends the standard point observations into the spatial domain, in the form of time-series of data. These time series permit monitoring and evaluation of changes in water quality that are the result of human and natural changes to the aquatic ecosystems.

Lake Garda, the largest Italian lake with a surface area of 368 km² and a water volume of 49 km³, represents an important environmental resource for a variety of purposes – such as irrigation, navigation, water supply and drinking water. In the last few years, however, the water quality, together with the growth of submerged vegetation, especially in the southern part of the lake, has become an increasingly significant problem, particularly in summer.

This project aims to improve methods of interpreting remotely sensed data over water bodies, translating the remote sensing data into relevant information for decision makers and other end-users.

■ The partnership

A collaboration started in 2002 with the support of the Italian Embassy in Canberra and the Italian Space Agency (ASI, Ninfa project) and the participation of Dr. Eugenio Zilioli (from the Optical Remote Sensing Group of CNR-IREA, Milano, Italy) at the IATICE Workshop “Remote Sensing of Coastal Waters”, chaired by Dr. Vittorio Brando of CSIRO Land and Water. The Embassy and ASI subsequently supported a visit of Dr. Claudia Giardino

to the Environmental Remote Sensing Group of CSIRO-Land and Water in Canberra.

From this point the project strengthened around Dr. Claudia Giardino at CNR and Dr. Vittorio Brando at CSIRO. The collaboration would lead to the parameterisation and calibration of this bio-optical model for Lake Garda waters, and the subsequent water quality mapping. In other words, the robustness of the methodology developed by the CSIRO is demonstrated by its application done together with the Italian team on Lake Garda. The further implementation of the project was made possible by funding provided under the 2004-2006 CNR-CSIRO Agreement.

■ The Project

Hyperion, mounted on the Earth Observing One (EO-1) satellite platform, is the first civilian hyperspectral satellite sensor in space: it is capable of resolving 220 spectral bands from 0.4 to 2.5µm, with 30m spatial resolution. In 2001, the Environmental Remote Sensing Group of CSIRO Land and Water analyzed the performance of Hyperion in coastal water. In their study they mapped in the Deception Bay waters (Brisbane, Queensland, Australia) these water quality parameters: chlorophyll, tripton, colored dissolved organic matter, Secchi disk transparency and vertical attenuation of light.

The joint team evaluated Hyperion’s capabilities for assessing the chlorophyll and tripton (nonphytoplankton particles) contents in Lake Garda. The procedure used to map chlorophyll and tripton concentrations in the lake involved a direct inversion of a bio-optical model by means of a linear Matrix Inversion Method (MIM).

The Lake Garda satellite chlorophyll map showed lower values in the southern part of the lake

and higher values in the north; on the contrary tripton was higher in the south and lower in the northern part of the lake. To evaluate these water quality maps, a 20 km long transect of fluorescence and turbidity was measured. Fluorescence and turbidity data were collected using a flow-trough system, called Fluorescence And Turbidity Analyzer (FATA), mounted on a 6 meter motor boat cruising at speed about 12 knots. FATA data were converted into chlorophyll and tripton values using the chlorophyll and tripton concentrations derived from the water samples collected in 6 stops during the cruise. Flow-trough measurements were compared with Hyperion-derived chlorophyll and tripton concentrations. The spatial variation of chlorophyll and tripton in the Hyperion-based map was in agreement with the trend of in situ measurements. As expected the image data amplifies the spatial variation with respect to in situ observations.

In July 2005, measurements were performed close to the coast of the Sirmione Peninsula, to ensure the bio-optical model is also parameterised over the shallowest waters, where several species of submerged vegetation grow.

■ Outcomes

These collaboration activities are based on a series of visits leading to numerous joint publications. Both parties involve each other in a significant exchange of expertise and technology transfer as illustrated in the participation of Dr. Arnold Dekker from CSIRO in the 2003 submission of a FP6 project (BOWSER), or the participation, in April 2005, of Arnold Dekker together with Claudia Giardino to a workshop to define the strategies of earth observation of inland waters of the Environmental Protection Agency of Regione Lombardia in Italy. Ongoing activities include the participation, of Vittorio Brando in the ongoing fieldworks in Lake Garda and renewed projects with Italy, including the JRC in Ispra.

*Acknowledgement
Vittorio Brando*

MILESTONE:
build on
partnership



European consortia are studying how to build a land-based telescope bigger – in a field where size matters - and more powerful than any Earth-bound star-gazing tool built to date...

more details at:
www.feast.org/?article&ID=31

MILESTONE: global events



Mycoglobe

Mycotoxins are produced by a range of different species of fungi, but most prominently by Fusarium, Aspergillus and Penicillium. Historically, these toxins have been a concern when they contaminate foodstuff. They may trigger various illness, including oesophageal cancers.

Today mycotoxins continue to be a concern, particularly in developing countries. *Fusarium* toxins, especially the toxin fumonisin, are implicated in large scale occurrences of oesophageal cancers in sub-Saharan Africa communities depending on maize and sorghum as staples in their diet. Even in the developed world toxins are of major concern in foodstuffs as diverse as maize, peanuts, grapes and pineapples. Major toxins such as aflatoxin, fumonisin and ochratoxin are carefully controlled in regulated human foodstuffs in Europe, North America and Australia. Nevertheless they still continue to cause enormous damage and require significant investments to ensure that these controls are effective. In Australia there have been a number of mycotoxin

scars in recent years affecting components of the wheat and maize (both field maize and sweet corn) industries and this has raised the prominence of mycotoxins at a regulatory and industry level.

The Mycoglobe Specific Support Action (see FEAST focus #17) was initiated in 2004 to facilitate communication and exchange of information amongst researchers around the world. The project team is coordinated by the Institute of Sciences of Food Production - CNR, Bari, Italy and headed by Dr Angelo Visconti. After symposiums held in America and recently in Ghana, the next event will be organised by a program

committee that includes Dr Brett Summerell, Botanic Gardens Trust, Dr Ailsa Hocking, Food Sciences Australia, CSIRO and Dr John Pitt, Food Sciences Australia, CSIRO and will be held at the Botanic Gardens Trust in Sydney. The program will run for 4 days between 15 and 17 February 2006, and will involve approximately 40-50 participants, including 8 visiting researchers funded by the Mycoglobe project. The remainder of the participants will be from Australian research institutions and it is expected that this will include participants from the University sector, state Departments of Primary Industry, CSIRO and industry representatives. The program will reflect Mycoglobe's focus on foodstuff as illustrated by the inclusions of members of a maize mycotoxin steering committee established several years ago through funding from the Grains Research and Development Corporation.

You may find some more info at:
http://www.scientificambitalia.org/eventi_tot.htm

Econophysics

Econophysics aims to apply techniques developed to model complex natural phenomena to financial market analysis and economic modelling.

The first conference on Econophysics in Australia will be held at the Australian National University in Canberra between the 14th and 18th November 2005. The aim of the conference is to gather together researchers from different communities (physics, economics, finance, mathematics and engineering) in order to review recent results, exchange ideas and methods and confront different view points on common problems linking economics and physical sciences. The ambition is to promote open-minded, fruitful, cross-fertilizing exchanges between renowned academics of different fields, market analysts and practitioners. The conference will be attended by participants from more than 20 countries.

This initiative involves the ARC Complex Open Systems Research Network

(www.complexsystems.net.au), and two international collaborative projects in which the Australian conference organizers are involved at the level of the management committee:

- The European COST action P10 "Physics of Risk", a project that started in 2003 and involves more than 50 participants in Europe, Israel and Australia (<http://gisc.uc3m.es/COST-P10/>);
- The FISR project "High-frequency dynamics of financial markets" funded by the Italian Ministry of Education Research and Technology (www.mfn.unipmn.it/%7Escalas/fisr.html).

Financial markets are intrinsically complex systems in which a large number of agents interact in an interdependent way, generating actions that span several orders of magnitude in size and time. A surprising and fascinating aspect is that

from such intricate systems there emerge behaviors and patterns that appear to be universal and common to several other complex physical systems. The disentanglement of such complexity is a challenging, and potentially rewarding, research area. Indeed, a better understanding of the properties of financial markets is of great importance: the lives of most of us depend on the dynamics of financial markets that affects investments, savings, business, employment, growth, wealth and — ultimately — the daily functioning of our society.

The Econophysics conference is organized by Tiziana Di Matteo and Tomaso Aste, two (econo)physicists based at the Australian National University. Their goal is to understand the hidden mechanisms that lead to emergence of patterns in the markets. Breakthrough results have been obtained by a new technique that maps complex systems into graphs with controllable interconnectedness. This allows them to uncover hidden mechanisms that govern the collective behaviors of markets.

GRAIN legumes

Grain Legumes Integrated Project (GLIP) is a large multinational project with Australian participants of the European Commission's FP6, striving to develop new strategies to enhance the use of grain legume crops in Europe and beyond

Grain legumes such as peas, chickpeas, beans and lupins play a significant role in agriculture because of their value as an important source of vegetable protein for humans and animals alike and their beneficial impact on the environment. However, the use of these crops in European farming systems is relatively limited compared with the rest of the world because of problems with nutrition, disease, drought and plant morphology.

The story started in the years 1999-2000 when Prof. Richard Oliver from Murdoch University and Dr Karam Singh from CSIRO-Plant Industry established a *Medicago truncatula* research collaboration. In recent years this legume species has emerged as the "model species" for legume research. They were specifically interested in the genetics of resistance to fungal diseases and insect pests. Because the major legume grain crops in Australia contribute \$AU500million/p.a. to the Australian economy, agencies like the GRDC support their work. Following the First Australian *Medicago truncatula* Conference in Perth (2002), they were invited to participate in the GLIP proposal by members of the nascent European Consortium, who had attended the meeting and were playing key roles in planning the GLIP application. Oliver and Singh's specific leading expertise in the genetics of resistance to fungal diseases and insect pests of legumes, and their research work based on *Medicago* were a major incentive that led to the invitation to join the partnership.

The principle objective of the IP is to mobilise and integrate the European research effort on grain legumes to address the major agricultural constraints affecting the production of legume crops in Europe. Emphasis is placed on using

state-of-the-art methodologies including genomics, genetics and bioinformatics.

- This project follows a truly integrated approach to addressing the problems of growing grain legumes. GLIP features a wide range of activities as listed in the article about IPs on p. 11. A large programme of pure and applied agricultural research is taking place. It ranges from quantifying the impact of grain legumes on the environment and their use in animal feed, to studying the fundamental genetic mechanisms that govern the growth and development of grain legumes and their responses to abiotic and biotic stress.

- An important part of the dissemination effort involves the formation of a technology transfer platform to facilitate interactions between researchers and end-users active in grain legumes and to disseminate knowledge and products developed from the research programme.

- A training fund to sustain grain legumes research by providing fellowships to individual scientists and to support a programme of short courses & workshops.

Currently, 18 countries are involved in the Grain Legumes Integrated Project and the Australian activities are well integrated through collaborations with a number of EU groups including researchers in Toulouse, Montpellier, Bielefeld, Norwich and Cordoba.

■ Australian Participation

The specific input of Oliver and Singh in the project is mainly concerned with the analysis and genetic dissection of biotic stress responses. It is coordinated through Work Package 4.2. The starting point is to analyse fungal and insect interactions with the model plant *Medicago*. The network enables them to share expertise with other teams

addressing crop productivity in general. They have used genomic tools like the GLIP expression profiling platform at Bielefeld to help with their research. They also contribute to comparative genetic mapping projects coordinated by GLIP. Furthermore Murdoch and CSIRO provide an important training component to the whole project.

In terms of funding they received conflicting advice about whether they were eligible for EU funding but were ultimately ruled ineligible. However, their collaborative work is financed from Australian sources; they received a grant of \$AU630,000 from the DEST's ISL. This funding allowed the incorporation of Dr Ram Nair of SARDI into the project. He curates the world's largest collection of *Medicago*. Thus an added benefit for the GLIP coordinators was the opportunity to coordinate their activities with that of the Australia collection.

As the only non-EU group in GLIP, the DEST funds are essential for them to take a significant role in this project and enable the team to access European resources during short visits, strengthen their work on fungal and insect induced stress genes, and profitably exchange biomaterial including crop strains, for the first two years of GLIP.

■ Outcomes

For the Australian partners the proximate benefits stemming from the collaboration are access to the large genomic resources made available in Europe and an exchange of visitors and postgraduate students. Dr Singh sees working together on long term exchanges as a clear advantage and one he thinks will be important when "we think about how to sustain our activities post-GLIP". Results from their research may arise over the next 5 to 10 years and will be exploited by other research groups, plant breeders and biotechnologists. To facilitate the uptake of this research, the Australian groups are likely to link with the Technology Transfer Programme of GLIP.

Acknowledgement
Richard Oliver and Karam Singh

MILESTONE:
planning
success



No. of Coordinators of consortia by nationality in the first FP6 round of calls

Germany:	205
UK:	176
France:	168
Italy:	126

Source: the Swedish EU-R&D Council, 2004

Seventh Framework programme: going, going, gone...

The European Commission has recently released its proposal for the Seventh Framework Programme, 2007-2013. The Programmes proposed by the Commission outline four main elements: Co-operation, Ideas, People and Capacities.

“Europe needs a solid framework for its research from 2007”, said Janez Potočnik, European Commissioner for Science and Research. The funding available under FP6 has allowed no more than 15% of all project proposals to be funded, leaving many excellent and innovative projects without funding. Then who and what will be funded under FP7? The European Commission, on the basis of the previous framework programme assessments, estimates that the proposed doubling of the research budget to €73 billion would create 220,000 new research posts in FP7 funded research projects, compared to 70,000 in FP6, or fund 15,000 or more fellowships, compared to 4,500-5,500 in FP6. However, it is very unlikely the Commission will get even close to that figure when the EU’s budget for the coming six years is agreed. The four major Specific Programmes proposed today are:

■ Co-operation

This part remains the core of the FP7. The Co-operation programme is designed to establish “European leadership in key scientific and technological areas” by supporting collaborative research, coordination of member states programmes and Joint Technology Initiatives. The Commission is proposing a budget of €44 billion, about 60% of total proposed FP7 expenditure. The programme focuses on nine priorities. The general approach, goals and activities planned for each of these 9 topics are outlined in the Specific Programmes (see sidebar). The Co-operation should be implemented through instruments including Collaborative projects, Networks of Excellence or frontier research. Some areas

emphasize international collaboration providing opportunities for Australian researchers.

■ Ideas

The Ideas programme will establish a European Research Council (ERC), a pan-European mechanism to support bottom-up research. The ERC will operate on the basis of scientific excellence and autonomy (from the commission). It will support investigator-driven projects carried out in any field of basic scientific and technological research, including engineering, socio-economic sciences and the humanities.

■ People

This programme covers the Marie Curie actions, and should stimulate people to embark on and pursue research careers, encourage researchers to stay in Europe, and attract the best brains to Europe. The pro-

gramme will pursue four lines of actions: Initial training of researchers, Life-long training and career development (individual fellowships for advanced researchers and the co-funding of similar national schemes), Industry-academia partnerships, and International dimension (outgoing and Incoming international fellowships).

■ Capacities

The Capacities specific programme will enhance research and innovation capacity throughout Europe. This includes elements such as new research infrastructure, support for small and medium-sized companies, developing regional Research Clusters, stimulating research potential less favoured regions in Europe and improving the position of Science in Society. Finally, the Commission’s in-house research facilities, the Joint Research Centre (JRC) will be strengthened.

■ Next step

The Commission will propose Rules of participation in the various Specific Programmes. These will make the programme more accessible and straightforward for its users. Today’s proposal already goes some way in this direction, through its simple, clear architecture and the reduction in types of funding instruments.

FP7 Toolbox

The official page to follow the advance of the next framework programme:

<http://europa.eu.int/comm/research/future/>

The European information node and documentation repository, Cordis, provides some additional highlights:

<http://www.cordis.lu/fp7/>

The Brussels office of the German research organisations, Kowi, maintains a very good website with updated information about the FP7:

<http://www.kowi.de/en/fp/fp7/>

ResearchResearch has made available the following website dedicated to the FP7 - for a different point of view:

www.Framework7.com

FP7 Research Priorities:

1. Health;
2. Food Agriculture and Biotechnology;
3. Information and Communication technologies;
4. Nanosciences, Nanotechnologies, Materials and new Production technologies;
5. Energy;
6. Environment, including Climate Change;
7. Transport, including Aeronautics,
8. Socio-economic Sciences and the Humanities;
9. Security and Space.

FAST's not FEAST or FP

The French-Australian Science and Technology (FAST) Program is jointly managed by the French Government and DEST to provide financial assistance for cooperation between Australian and French researchers.

The French-Australian Science and Technology (FAST) Program is jointly managed by the French Ministry of National Education, Universities and Research (MENESR), the French Ministry of Foreign Affairs (MAE) and the Australian Department of Education Science and Training (DEST).

For Australian researchers the FAST element of the International Science Linkages (ISL) programme provides support, on a competitive basis, to promote and support scientific and technological cooperation between Australian and French researchers in both the public and private sectors, drawing on complementary strengths in

both countries and which meet the objectives of the ISL programme.

The call for FAST applications opened on 4 October 2005, and will close on 16 November 2005.

■ Support Available

FAST provides financial assistance, on a competitive basis, for collaborative research projects in leading edge areas of research, but also for small, strategically-focussed workshops. This programme may be considered as seed money.

■ Research Projects: the programme will support the following expenses: the international

travel and living expenses associated with participation in the research project.

■ Workshops: the programme will support following expenses: the international travel and living expenses associated with participation in the workshop; all workshop related organisational and logistical costs.

Projects may range from short international visits or activities to more complex projects spanning up to 3 years. All fields (excluding social sciences and humanities, where a separate scheme is available) will be eligible, but priority will be given to the areas of: natural resources, life sciences, energy, materials, and information and communication technologies. Under the FAST Programme DEST will contribute the funding support towards international travel and living expenses: i.e. travel costs of up to A\$2,500 per person and living allowances. Similar mechanisms are available for French researchers.

Application details are available at (en): <https://sciencegrants.dest.gov.au/ISL/>
or at (fr): <http://www.egide.asso.fr/fr/programmes/pai/appels/fast.jhtml>

Tidal Delay Power

Designed to facilitate partnerships between innovative organisations and their UK counterparts, The British Department of Trade & Industry (DTI) Global Partnerships brought together Melbourne-based Woodshed Technologies and two UK engineering consultancies to develop the European plants.

After a visit to the UK, Woodshed Technologies Pty Ltd's Director, Steve Hastings, has been working with the Global Partnerships programme to identify potential partners in the UK, form a consortium and bring their technology to the UK.

Woodshed's patented Tidal Delay® tidal power technology utilises an existing natural land formation, such as a peninsula or isthmus, that creates a natural tidal barrier separating moving, rising and falling bodies of seawater. As the seawater on each side of the natural barrier rises and then falls, The system captures the energy resulting from the difference in water levels across the barrier, using proven hydro-electric technology in a novel configuration. Assuming

two tidal cycles per day, that is two high and two low tides per day, the system may suffer from severe interruption of electricity generation. Therefore, reversal of water flow through the pipe(s) with the change of tide, and therefore continuing energy capture and electricity generation is critical and is a feature of the process.

Woodshed Technologies, together with fellow Australian company SMEC Developments, intends to develop and implement tidal power generation projects in Britain, supporting local engineering firms in the design and construction phases of the project. MEPL, Marine

Energy Projects Limited, an Edinburgh, Scotland based joint venture between Woodshed Technologies and SMEC Developments International, a unit of SMEC Holdings has been established to develop and implement tidal power generation and storage system plants in the UK and Europe. The venture will team up with a number of UK firms and technical institutions including AMEC PLC, Tidestream Limited, JWG Consulting, Edinburgh University & Robert Gordon University to investigate potential sites.

Ideal conditions for the world's first pilot plant for Tidal Delay exist on the west coast of Scotland and possibly Wales, as well as other parts of the British mainland coast and islands. The pilot plant site study, planned for 2006, will determine the commercial viability and local acceptance of the chosen site, maybe in Orkney, before the construction of a 1-5MW range commercial plant in 2006/07.

DTI Global Watch Service:

www.globalwatchservice.com

SNAPSHOT: bookmarks



Careers Beyond frontiers

We will follow the itinerary of Dr Timothy George, from the UK to his Marie Curie Outgoing Fellowship at CSIRO Plant Industry and his work on the plant/soil interface.

■ The project

All started at University of Reading (www.rdg.ac.uk), with Timothy's participation in Peter Gregory's team in the Department of Soil Science. The team is well connected with the European "rhizosphere" community, including by participating in a European COST action, and with strong links with Philippe Hinsinger at INRA (Montpellier France).

Tim successfully responded to an international competitive Postdoctoral fellowship from the Plant Industry CSIRO Division to work with Alan Richardson at Black Mountain (Canberra). Encouraging results obtained by Tim convinced him to stay a bit longer.

In early 2004 he applied for different fellowships and grants including through the EC Marie Curie scheme, the Biotechnology and Biological Sciences Research Council (BBSRC, www.bbsrc.ac.uk) and the Natural Environment Research Council (NERC, www.nerc.ac.uk). Despite a long decision time, the Marie Curie fellowship was the first to come through. This scheme is more generous than many other

equivalent fellowships.

■ Outcomes

Once the fellowship is granted the process is quite transparent. The financial support is directly managed by his institution in the UK, including managing all the paperwork with the host organisation in Australia (here the CSIRO). Tim reckons that the whole process is so smooth that he never met or heard from any one in the Marie Curie office in Brussels.

A large proportion of endogenous soil P is organic, of which derivatives of inositol phosphates (i.e. phytate) constitute a major fraction. The bioavailability of inositol phosphates depends on their mineralization by extracellular phytases.

At CSIRO Tim concentrates on expressing genes in plants for the production of phytases with biochemical traits that effect their interaction with soil. He worked on transgenic *Trifolium subterraneum* (clover) expressing a phytase gene (phyA) from *Aspergillus niger* (a fungus). These transformed lines showed an average increase in exuded phytase activity.

Unlike other phosphatases, exuded phytase activity was unaffected by P supply, verifying the constitutive expression of phyA. Despite variable growth and P nutrition responses, P uptake per root length was on average greater for transgenic lines. Exudation of phytase by transgenic *T. subterraneum* allowed utilization of P from phytate in nonsorbing, sterile laboratory media, but was less effective when plants were grown in soil. Release of extracellular phytase is shown not to be the only requirement for the acquisition of P from endogenous soil phytate by plants. Moreover, inhibition upon adsorption of phytase has been shown to be soil specific, particularly in terms of soil texture and mineralogy. Changes in rhizosphere pH may also affect the adsorption reactions of phytase in soils.

■ Future

Professor Peter Gregory was appointed in April 2005, as the new Director of the Scottish Crop Research Institute (SCRI, www.scri.sari.ac.uk) near Dundee in Scotland. Once returned to the UK, Tim will join SCRI for the one year reintegration phase of the fellowship. Both teams want to build on the opportunity that rose from an international PostDoc.

The "People" programme of the FP7 will maintain the Marie Curie Actions. They are a significant opportunity open to Australian researchers.

Research & development expenditure by business sector in 2002-2003 (as % of total R%D expenditure)

Japan:	73.9
Sweden:	71.9
USA:	67.3
EU (25):	55.4
Australia:	48.8
UK:	46.7

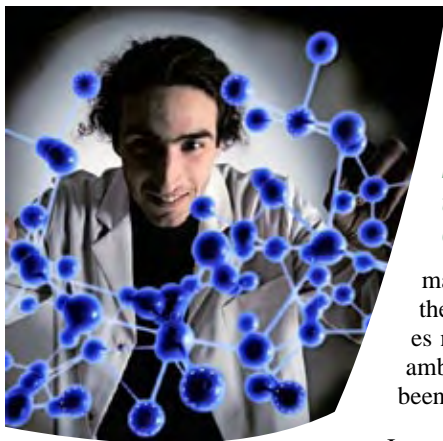
Source: Eurostat and ABS

The Challenge

At present little is known about the efficacy of phosphatase-organic P (Phosphate) interactions in soils, other than that increases in soil phosphatase activity are associated with increased P uptake by certain plants. Generally, our understanding of the fate of phosphatase enzymes upon entering the rhizosphere is poor. Even less is known regarding the nature of the P compounds mineralised by the specific phosphatases in the rhizosphere. This project quantifies the fate of phosphatases in the rhizosphere and their interaction with organic P substrates in the soil environment. The contribution of phosphatase to P nutrition of plants is quantified and the potential for improving the P-use efficiency of crops will be determined.

The approaches used in fulfilling these objectives are highly novel. Very few studies of phosphatase in the soil environment have been done specifically in the rhizosphere because of the difficulties of working in this zone. However, this study uses

novel tools such as transgenic plants to specifically alter the rhizosphere environment in-situ. Spatial, biological, chemical, physical and biochemical attributes of the rhizosphere are measured using "rhizobox" technology. Labelled antibodies specific to the phytase exuded by these plants are available and can be used in conjunction with fluorescent labelling and confocal microscopy, to trace spatial aspects of the phosphatase-substrate reaction in the rhizosphere and to assess the soil chemistry condition the enzyme is associated with. The integration of these novel techniques with standard techniques for soil chemical, biological and biochemical analysis, including chemical extractions, enzyme assays and isotopic labelling of soils allows a completely new approach to tackling the limitations to phosphatase efficacy in the rhizosphere and implement training in a unique combination of skills and techniques.



What is? An Integrated project (IP)

Large projects to support objective-driven research to reach ambitious goals: increasing Europe competitiveness or at addressing major societal needs.

mass criterion is whether the activities and resources needed to achieve these ambitious objectives have been brought together.

Integrated Projects are a key element to implement the EU research priority themes and, as such, contribute to increasing Europe's competitiveness or to addressing major societal needs. They address different objective-driven research issues and usually include several components. Their research activities may cover the whole research spectrum from basic to applied research. Projects may also focus on technological development, contain demonstration and training components.

Integrated Projects are large: they assemble critical mass to achieve ambitious objectives. Since critical mass differs from field to field, and from topic to topic within a field, the critical-

In practice, the participants are enterprises (SMEs are strongly encouraged to participate in IP), Research institutes and universities. Australian participants can participate as full partners. There must be a minimum of three participants from three different Member States or Associated States, of which at least two shall be Member States or candidate countries. Typically there may be 10 to 20 participants but they can be larger. Proposals for IPs are submitted in response to calls for proposals and evaluated using a peer-review system. To fix the conditions and modalities between partners, the conclusion of a consortium agreement is obligatory as early as possible.

■ Funding mechanism

These consortia receive funding for a duration of 3 to 5 years. IPs require overall management and coordination of the consortium that is 100% supported by the Commission. Other activities can be supported as a percentage of the total costs of the projects, generally up to 50% or 100% for training. The EU contribution usually ranges from € 4 to 25 million (AUD7-42 million).

The consortium may decide to invite new participants (with the agreement of the Commission) as the project evolves, though without additional financing from the EU. The addition of a new participant will require the prior publication of a competitive call. Participants in an Integrated Project may set aside a percentage of their initial budget to be dedicated to further partners expected to join the partnership at a later stage.

More details about all instrument under the FP6 at:
www.cordis.lu/fp6/instruments.htm

Glossary

■ CNR

Italian National Research Council (EU)
www.cnr.it

■ Consortium

A group of participants in the same FP project (EU)

■ Cordis

COmmunity Research & Development Information Service (EU)
www.cordis.lu

■ COST

European Co-operation in the field of Scientific and Technical Research (EU)
www.cost.esf.org

■ CSIRO

Commonwealth Scientific and Industrial Research Organisation (AU)
www.csiro.au

■ DEST

Australian Department of Education Science and Training (AU)
www.dest.gov.au

■ EMBL

European Molecular Biology Laboratory (EU)
www.embl.org

■ ERA

European Research Area (EU)

■ FP6/7

6th/7th Framework Programme for Research and Technological Development (EU)
europa.eu.int/comm/research/fp6

■ GRDC

Grains Research and Development Corporation (AU)
www.grdc.com.au

■ STREP

Integrated Projects in FP6 (EU)

■ IATICE

Italian-Australian Technological Innovations Conference & Exhibition (AU)

■ INRA

French National Institute for Agricultural Research (EU)
www.inra.fr

■ ISL

International Science Linkages grants of the DEST (AU)
www.dest.gov.au/science/isl/

■ JRC

Joint Research Center (EU)
www.jrc.cec.eu.int

■ Marie Curie actions

Mobility fellowships and grants (EU)
www.europa.eu.int/mariecurie-actions

■ NHMRC

National Health and Medical Research Council (AU)
www.nhmrc.gov.au

■ SSA

Specific Support Action in FP6 (EU)

■ STREP

Specific Targeted Research or Innovation Projects in FP6 (EU)

The FP6 Glossary can be found at:
fp6.cordis.lu/fp6/glossary.cfm

Diary

To add your event to this snapshot of Australia and Europe activity, please notify us at info@feast.org

NOVEMBER

■ World Science Forum

The Hungarian Academy of Sciences - in partnership with UNESCO and the International Council for Science (ICSU) - organizes the second World Science Forum.

10-12 November 2005, Budapest, Hungary

www.sciforum.hu

■ CER 2005

The EU's Directorate-General for research conference on Communicating European Research.

14-15 November 2005 - Brussels

www.europa.eu.int/comm/research/cer2005.html

■ Econophysics Colloquium

organised by the Research School of Physical Sciences and Engineering, ANU

14-18 November, Canberra

www.rsphysse.anu.edu.au/econophysics/

■ Nanotech-Montreux

The 9th Annual European Conference On Micro & Nanoscale Technologies for the Biosciences

15-17 November, Lausanne, Switzerland

www.nanotech-montreux.com

■ Getting Ready for FP7

Hyperion Ltd, Ireland organizes a series of Open Training Courses (250 euro per participant)

first dates 16, 17 November, 7 December, Brussels, Belgium

www.hyperion.ie

■ The European Biotech Crossroads

The 9th edition of this benchmarking event for the sector.

28-30 November, Lille, France

www.carrefour europeendesbiotechnologies.com

DECEMBER

■ FP7 introductory course

6 December, Cambridge, UK

walkerassociates@ntlworld.com

■ Workshops on management in FP6

KoWi invites current or negotiating coordinators and partners in an EU-project.

first dates 20 September, 11 October - Bonn (Germany)

www.kowi.de

JANUARY 2006

■ CER 2005

The EU' Directorate-General for research conference on Communicating European Research.

14-15 November 2005 - Brussels

www.europa.eu.int/comm/research/cer2005.html

FEBRUARY

■ Statistical systems out of equilibrium: random systems and complex fluids

The First Australian-Italian Workshop on Statistical Physics

13-15 February, Surfers Paradise, Queensland

<http://chem.sci.gu.edu.au/statphys/>

■ Australian Symposium on Mycotoxin

A Symposium of the Mycoglobe SSA (Mycotoxins)

15-17 February, Sydney

<http://mycoglobe.ispa.cnr.it>

July

■ ESOF 2006

The Euroscience Open Forum, the 2nd pan-European interdisciplinary science meeting highlighting research and innovation

15-19 July - München, (Germany)

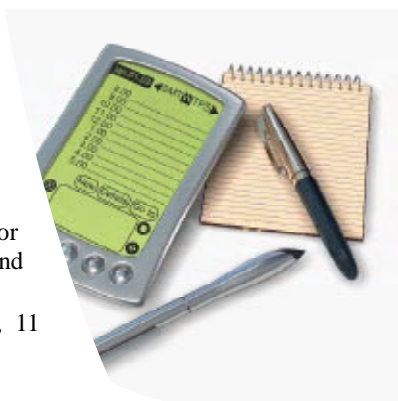
www.esof2006.org

■ TNT2006

The "Trends in Nanotechnology" 2006 conference will be held at MINATEC.

04-08 September, Grenoble, France

www.tnt2006.org



■ WCEAM

The First World Congress for Engineering Asset Management.

11-14 July, Gold Coast, Queensland

www.wceam.com

NETWORKS

■ ARIA

The Italian-Australasian research network organizes regular activities throughout Australia. Please visit their website for more information.

www.scientificambitalia.org/aria/arias.htm

■ FEAST-France

The France-Australia research network organizes regular activities throughout Australia. Please visit their website for more information.

www.ambafrance-au.org/science/



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The FEAST secretariat is hosted by the Australian National University on behalf of Australia's research Community



Forum for European-Australian Science and Technology Cooperation

www.feast.org
info@feast.org

building 67a
Australian National University
Canberra ACT 0200
Australia