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Matter of Degrees

Learning to know...learning to do...learning to live together' have been the driving forces behind Trieste's efforts to advance science and build scientific capacity for nearly half a century.

These noble efforts began with the creation of ICTP in 1964, and then continued with the creation of the International Centre for Genetic Engineering and Biotechnology (ICGEB) and the Academy of Sciences for the Developing World (TWAS) in 1983, and the International Centre for Science and High Technology (ICS) in the late 1980s.

Now Trieste's scientific community has taken another step forward with the launch of two new degree-granting programmes this past autumn: a master's degree programme in physics sponsored by ICTP and the University of Trieste, and a Ph.D programme in environmental fluid mechanics sponsored by ICTP, the University of Trieste, and Italy's National Institute of Oceanography and Experimental Geophysics (OGS).

The joint master's degree programme in physics will focus on a wide range of fields that includes astrophysics, condensed matter physics, earth physics, and nuclear and sub-nuclear physics. ICTP will provide support for students, chosen each year from an international pool of applicants, to pursue their master's degrees at the University of Trieste, where they will be taught by university professors and members of ICTP's scientific staff. A pilot project, with students from Cameroon, China, Ukraine, and Uzbekistan, was launched this past autumn, and four students—one from each of these nations—are now completing their first semester of classes.

The Ph.D programme in fluid mechanics, which will follow a similar format, will be devoted to education and training in the fundamental and applied aspects of fluid mechanics and the physics of large-scale flows. This knowledge is instrumental in enhancing our understanding of such

environmental and geophysical forces as river and ocean flows, atmospheric pollution, and earthquakes and tsunamis.

While scientists at ICTP have often taught classes and supervised students both at the University of Trieste and Italy's International School for Advanced Studies (SISSA), ICTP's next-door neighbour, these two programmes mark the first time that ICTP will participate as a full partner in a degree-granting programme offered by an Italian university.

ICTP, the University of Trieste, OGS, and other Trieste-based educational and research institutions all seek to share and advance knowledge as their primary goals. These institutions have helped the city of Trieste reach far beyond its borders to the global communities of scholarship and science. Their work—both individually and collectively—has proven instrumental in boosting Trieste's growing reputation as an international centre for scientific research and training, especially for scientists from the developing world.

As vice-chancellor of the University of Trieste, I am delighted to have played a part in the launch of these programmes, which I am confident will prove beneficial not

only to Trieste's scientific institutions and the city itself, but to Italy, which has proven so generous in its support of ICTP and, more broadly, the worthy effort to provide research opportunities and training for scientists from developing countries by creating a 'home away from home' here in Trieste. □

For additional information about the master's degree programme in physics, see www.ictp.trieste.it/www_users/ItaLab/joint-programme.htm.

For additional information about the Ph.D. programme in environmental fluid mechanics, see <http://www.dmi.units.it/borse-dottorati/fluid/>.



Domenico Romeo

Weather or Not

What's the weather going to be like today and tomorrow? That's what concerns most people. Few people outside the scientific community worry about what the climate will be like a decade or century from now.



Jeremy Pal, Filippo Giorgi and Bi Xunqiang

Yet a recent series of events—a deadly heat wave in Europe three summers ago and a series of destructive hurricanes along the Caribbean and the Gulf Coast of North America this past autumn—have increased public awareness that short-term weather patterns and long-term climatic conditions may indeed be related.

The nature of the relationship between weather and climate also lies at the heart of the climate change debate among scientists. Until recently, scientists found it difficult to attribute the rising number of extreme weather events to rising levels of greenhouse gases in the atmosphere. Relying on observational evidence, they simply didn't know if what was happening was cyclical in nature or symptomatic of permanent changes in the climate; nor could they determine, with any confidence, the impact of such changes on a regional scale.

Now, high-powered computer models are enabling scientists to examine more closely the potential relationship between long-term alterations in climate and year-to-year changes in weather—and to do so in ever-smaller geographical areas.

Taking advantage of these more sophisticated modelling tools, ICTP scientists Filippo Giorgi, Bi Xunqiang and Jeremy Pal recently engaged in two research projects that examined future scenarios for climate variability and extreme weather events across virtually all regions of the globe. The findings of Giorgi and Bi were published in *Geophysical Research Letters* and subsequently reported in *Nature's* "Research

Highlights" section. The findings of Giorgi and Pal (together with their coauthors N.S. Diffenbaugh and R.J. Trapp, assistant professors of earth-atmospheric sciences at Purdue University, USA) were published in the *Proceedings of the National Academy of Sciences* and subsequently reported in *National Geographic News*.

Giorgi and Bi's article, relying on 18 different global model simulations covering 26 regions in different parts of the world, indicates that precipitation variability is expected to increase across the globe. Simply put, this means rainfall is expected to become more variable, and that periods of drought and periods of excessive rain will become more frequent. The article by Giorgi, Pal and their coauthors confirms this finding using a computer model that spans the United States. Both articles correspond to other scientific conclusions showing that as the atmosphere becomes warmer, precipitation patterns will become less predictable and more extreme.

And what does all of this mean for you and me? What can people expect the weather to be like as they plan their daily and weekly activities both now and in the future? And perhaps more importantly, what does this mean for farmers seeking to earn a living from the land or resource managers seeking to ensure adequate supplies of safe drinking water for their citizens?

First of all, it is important to note that scientists can never be entirely sure of their findings regardless of how sophisticated their models are. Yet, this much can be said with some degree of scientific confidence. As temperatures warm, year-to-year variabilities in weather and climate are expected to increase. And, as this variability increases, extreme weather events are likely to become more frequent, rendering many economic and social sectors—for instance, agriculture, public health, and ecosystem management—more vulnerable to the whims of nature.

And there's another important point. Because weather and climate variability is expected to be most intense in tropical regions, we can anticipate that a host of countries in the developing world will find themselves most at risk. That makes it more important than ever for developing countries to devise adaptive measures to help them meet the challenges posed by climate change, not just a century from now but today. □

For more detailed information about these findings, see F. Giorgi and Bi Xunqiang, "Regional Changes in Surface Climate Interannual Variability for the 21st Century," *Geophysical Research Letters* 32 (29 October 2005) and N.S. Diffenbaugh, et al., "Fine-Scale Processes Regulate the Response of Extreme Weather Events to Global Climate Change," *Proceedings of the National Academy of Sciences* 102 (2 November 2005).

In a candid and broad-ranging discussion, ICTP Director K.R. Sreenivasan assesses his first two-and-a-half years in office and examines what lies ahead.

Mid-Term Report

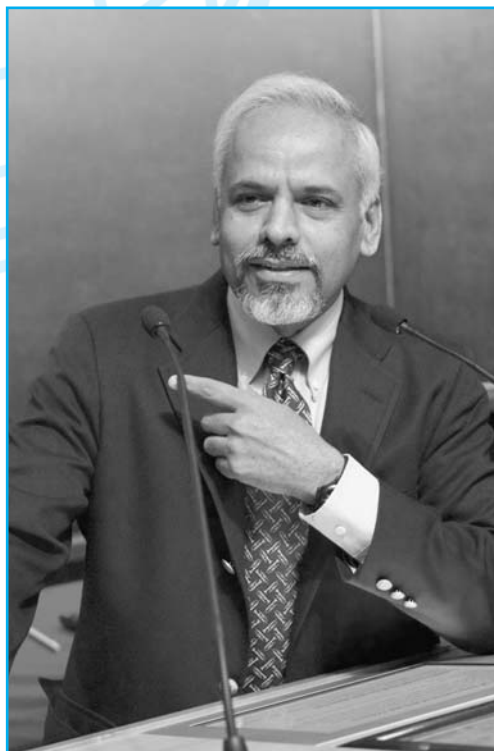
You have recently crossed the midway point in your first term. What are your thoughts?

I am proud of what ICTP has accomplished, and feel good about the Centre and its staff, and also about coming here.

What are you most upbeat about?

Forty years ago, industrialised countries did not seriously consider the importance of science in developing countries. As a pioneer, ICTP has successfully drawn attention to this important consideration. Let me give a few examples of how participants in the Centre's activities feel about their experience. At the inaugural meeting of the World Year of Physics in UNESCO headquarters in Paris last January, a distinguished French professor, whom I had not met, stood up at the end of my talk to praise ICTP's work in Africa. At a meeting I recently attended in South Africa, when someone asked, "How many people have been to ICTP?" many hands went up. I can cite other examples of public expressions of thanks and recognition, and there are endless examples of the important difference which ICTP has made. Obviously, credit for this goes to the wider ICTP community—past and present.

Our efforts on behalf of individual scientists have proven effective and we will not waver in that commitment. By the way, our focus has been on individuals chiefly because of the dearth of strong and nurturing institutions in the developing world. A large number of scientists need us, look up to us and benefit from us. If we were to disappear, people from around the world would miss us. Our scientific and administrative staff, consultants, and friends have made the Centre's guiding principles of quality and accountability their own. The scientific community—notably, the Italian scientific community and that in Trieste—have been continually supportive. Italy's ministries appreciate us, as do our two parent institutions, the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the International Atomic Energy Agency (IAEA). Many governmental and international bodies across the world respect—and increasingly



Katepalli R. Sreenivasan

emulate—our work. All of this is exceedingly positive.

You mentioned quality and accountability. Can you elaborate?

There is a huge difference between doing things and doing them well, and the latter must be our underpinning ideal. Without quality, we cannot continually build on the past. ICTP must remain accountable to its mission. Accountability adds to the sense of self-worth instead of demeaning or diminishing a person's status. One cannot repeat like a mantra that we care about developing countries without making conscientious and time-consuming efforts to understand their needs and assisting them in meeting such needs.

Are you concerned about any aspects of ICTP?

In broad terms, ICTP's mandate is to speak out for science in developing countries and to raise its level. The task is immense. I am concerned that, 40 years on, we have just scratched the surface of the issues we face. Our support for individual scientists has not been institutionalised well enough to build self-sustaining scientific programmes of world-class stature. Without generating such institutional changes in developing countries, the problems will not diminish and the Centre will be constantly putting out little fires. Even when it comes to supporting individual scientists, we should do better, both when they come to ICTP and when they stay home.

Several countries that have benefitted from ICTP in the past can help us financially now. This has not yet happened though everyone appreciates the value and impact of the Centre's work. In the meantime, I am grateful for Italy for continuing to be our major benefactor.

Internally as well, I would like to see the mission of ICTP institutionalised better. The director's role is much too critical in determining the Centre's directions. Our goals of excellence, diversity and service must advance without revolving around the director; only then will the Centre be able to innovate without pain. On daily matters, I would like to see a greater responsiveness to change on the part of the ICTP staff (myself

included). This applies from the smallest to the most important task. Everyone understands what I am saying but to paraphrase Bismarck: Change is welcomed as long as one's personal domain is exempt.

An expanded view of the world may present challenges too large for ICTP to address. Should the Centre do whatever is possible without aiming so high?

It will be unforgivable if the Centre thinks that the problem is too daunting and shirks from it. Few institutions in the world enjoy our scientific credibility and sense of purpose. I realise that problems are tackled one at a time. But we must aim towards long-term effectiveness instead of short-term deeds. If we become nothing more than a research institution—even a great one—while ignoring our larger responsibilities, we will lose our soul. If we fail to remain a place where excellence is pursued relentlessly through example, we will lose our credibility. Only by placing challenging and difficult goals in front of us can we live up to our mission.

How should the Centre pursue its mission?

ICTP must continually aspire to improve its scientific stature. In addition, ICTP has a responsibility to help scientists in developing countries build self-sustaining groups and centres of excellence so that the 'ICTP effect' can multiply. We must identify good people and help them develop and sustain their activities; we must avoid disjointed efforts. Conversely, I have been urging our visiting scientists to think more of their own scientific dreams holistically and of how, through ICTP acting as the seed, those goals can be realised. Some have responded positively and I hope that many more will. The world has changed more in the past few years than at any time since World War II. This calls for changes in ICTP's operations. For instance, some developing countries have done quite well in science. We must make common cause with them as part of a larger effort to advance our mutual goals. Our recent agreements with like-minded institutions in Brazil, China and India have expanded their regional roles—and I hope to broaden such agreements even more in the future.

What role do you see for the developed countries in advancing ICTP's long-range goals?

Industrialised countries must be fully engaged in ICTP. They, and other entities, such as the European Union and G8 group of industrialised countries, should regard ICTP as a vehicle and source of knowledge for promoting their broad goals for scientific development. I would like to see developed countries give ICTP both moral and material support. I am making special efforts to get the EU and G8 countries interested in our programmes. All good scientists

from every part of the world, including the developed world, should feel that they are part of ICTP's mission. In our line of work, some give, some receive, and some do both, but all must feel welcome at our Centre.

What arguments do you use to solicit broad support for ICTP?

Among developed countries, I emphasise that their support should not be regarded as magnanimity or moral responsibility, although it is indeed both. The greater truth is that they cannot afford to leave poorer countries too far behind for reasons of self-interest alone. We live in a time when the finiteness of the Earth's resources is becoming abundantly clear, just as it is becoming clear that we will survive together or not at all. To avoid catastrophe, those of us who have more should share with those who have less. This does not mean that rich countries should assume full responsibility for poorer countries—that would be a mistake—but they should do everything possible for poor countries to more effectively shoulder their responsibility. Since only serious people can bring about serious changes, and since ICTP is connected to such people worldwide, we are a great resource that should be utilised more fully. As regards emerging countries with improved scientific capabilities, I ask them to recall their own struggles not so long ago, and to now support the Centre just for that reason. For scientists from poorer countries, I remind them that ICTP is a place whose resources they should use effectively to build their own long-term scientific capabilities.

How do the world's political difficulties today affect ICTP?

ICTP is politically neutral—and should remain so. Yet we are in the midst of it all. For instance, obtaining visas for scientists from some countries has become increasingly difficult—in large part because of the legitimate concerns that Italy has for its security. I am fully aware of the risks and of the responsibilities of the Centre. This is a difficult time to maintain the mobility of people, knowledge and ideas. Yet, if some scientists cannot come to ICTP because they have been unable to obtain a visa, our purpose is diminished. It is precisely scientists coming from the most troubled parts of the world that need us most. This is the irony of our times.



Scientific Council, 29 May 2003

What do you say to those who claim that scientists from some countries who receive training at ICTP could abuse it?

It is increasingly acceptable to think that some countries misuse their scientific knowledge and must therefore be shut out. ICTP stands for the use of science to promote both economic development and cultural exchange, and we therefore abhor its abuse. We build scientific capacity with the expectation that it will feed into proficient public policies benefitting all of society: we all suffer even if a few countries make bad decisions. I should also note that ICTP is not in the business of technology transfer. Claims of potential abuse can be made against any institution, and those with high profiles like ours are more vulnerable to such accusations. It is a risk we must take, and history is firmly on our side.



Open Day, 18 September 2004

That said, we must acknowledge that a tyrant can indeed get hold of a potentially destructive technology and abuse it. Part of the solution is that, even as we advocate science, we must simultaneously promote ethical values, civil society and respect for human rights and individual dignity.

What role should ICTP play in the Trieste system?

Because of ICTP, international scientific cooperation is now a priority among Trieste's scientific institutions. This makes Trieste unique. ICTP should continue to engage local institutions in promoting this goal. It is also important to remember that ICTP is an international institution with its own obligations and functions, and that our primary task is to discharge them well. Yet, since the Centre is located in Italy and receives most of its funding from the Italian government, we have a special obligation to Italy's institutions and scientists, especially those in Trieste; ICTP must thus balance its multifaceted tasks with care and thought. I take this missive seriously.

The best way to increase cooperation among institutions is to develop common research and educational programmes. We have just launched a joint master's programme in physics with the University of Trieste and a joint Ph.D. programme in environmental fluid mechanics with the University of Trieste, the National Institute of Oceanography and Experimental Geophysics (OGS) and other institutions in

Trieste; we have strong collaboration with our next-door neighbour, the International School for Advanced Studies (SISSA), in condensed matter, high energy physics and mathematics; and long-standing collaboration with *Elettra* Synchrotron Light Laboratory and Area Science Park. We recently signed a joint agreement with the International Centre for Genetic Engineering and Biotechnology (ICGEB) laying the groundwork for joint programmes with the United Nations University in Tokyo.

Such initiatives will undoubtedly expand in the future. However, progress requires constant dialogue about the goals within each of our institutions, among institutions, and between Trieste and the Italian ministries. This is already happening as evidenced by recent coordination efforts between Trieste's scientific institutions and Rome. Though last year's campaign to bring Expo2008 to Trieste did not succeed, it drew Trieste's scientific institutions closer together and made the city as a whole more aware of this enormous resource.

What measures do you anticipate taking in the remainder of your term?

I expect the Centre's science to grow through a few new appointments, especially in areas related to sustainable development, biology and nanoscience, though not overwhelmingly. Our Centre cannot ignore large-scale scientific enterprises such as the Large Hadron Collider (LHC) and ITER. I would like to see the work of our Centre better known within Trieste, Italy, Europe, and North America.

A constant refrain about ICTP is that it is more famous in Rio than in Rome. We have acted with some success to change this perception. Similarly, people within UNESCO and the UN system know ICTP less than our work deserves. This has been an eye-opener to me. We have taken a few steps to correct it, but there is a long way to go.

There is a strong need to assist in the creation of a few world-class centres, or networks of centres, in Africa and the Middle East. Such centres can have a tremendous impact by example. We have possibilities to reach this goal in sub-

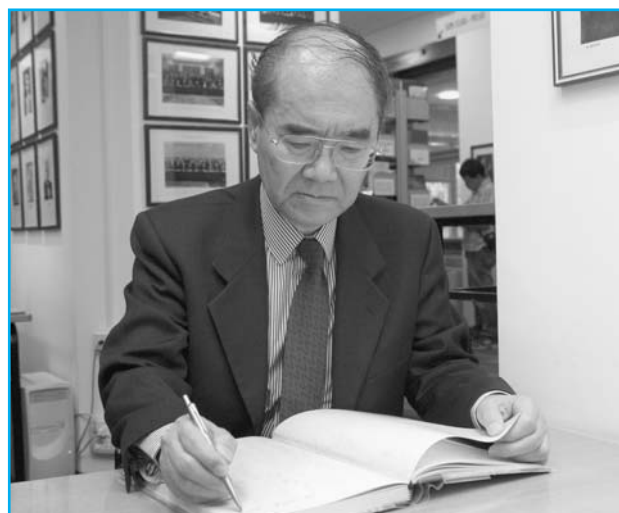


Nobel Laureates A. Zewail, R. Marcus, W. Kohn and J. Nash
40th Anniversary Conference, 4 October 2004

Saharan Africa through the optics and mathematics networks in which ICTP has been involved for many years, and a new network on nanoscience is now being fostered within Africa in collaboration with South Africa. We are exploring possibilities in the Middle East as well.

Our obligation to scientists from developing countries is of three varieties. When they are young, they need to come here to gain exposure to the best science and the best people in their fields. I believe that a large portion of our visitors will continue to be young and in need of ICTP's nurturing. This is something we already do well. When scientists reach the mid-stage of their careers, they must focus on strengthening and advancing their own activities in their own countries. I would place a premium on ICTP's efforts to help deserving scientists achieve this goal because models of success inspire younger generations like nothing else. A fraction of this advanced group will be successful and we should draw them into ICTP's activities, encouraging them to participate as lecturers in our activities and to serve as ambassadors of good will for ICTP in their home countries. Our threshold of excellence must increase as we go from one stage to the next, and all our programmes, particularly our Associateship Programme, should reflect this.

There are other new measures we are exploring as well. First, we are currently discussing new diploma course programmes in earth system physics, applied mathematics and general physics without specialisation. Second, our scientific programmes need some changes in so far as they should all have some special purpose. A programme, for example, should serve the needs of students and other researchers who are considering entering a new area of study; or should focus on an issue that may be at the cutting-edge of a field, calling attention to aspects before they become fashionable; or should be integrated with issues of a larger scope; or be of deep concern to developing countries. We are doing well in some regards but there is big room for improvement. Third, I would like to see less balkanisation than exists now within ICTP—understandably reflecting our somewhat haphazard growth. Finally, some of these new



K. Matsuura, UNESCO Director General, at ICTP, 17 May 2005

measures require additional resources. I am working on this but not with the devoted attention that fund-raising requires. We have to create mechanisms within the Centre for carrying out this activity successfully.

What strengths do you personally bring to the Centre towards fulfilling these goals?

I think in terms of long-term goals rather than short-term gains. As a result, I am often content if some of my work yields fruit in years hence. Only by making large numbers of good people feel that they are part of the 'ICTP experiment' will the Centre be able to meet its future challenges. One of my primary tasks is to enhance this sense of belonging. I think that more people than ever before feel that they belong to the Centre. I hope it is clear that I care for the Centre and its community in its widest sense. This commitment means saying 'no' to some things and some people at times but I do it without favouritism or factionalism. I detest arbitrary decisions and do not act out of personal prejudices or ignore advice, and would like to create conditions by which people have faith in the fairness of the system. I don't lose track of big things or neglect details. I work hard, and so forth. But I do know that better things are possible and I am aware of my many limitations.

What legacy would you like to leave?

One is free only if one is not burdened by such thoughts. The Centre will be successful—with or without me—if it understands its role intuitively and works diligently to fulfil it. Nevertheless, I am glad to have this opportunity to explain a few of my thoughts and concerns. Waiting until the last day of my tenure to dwell on the past while voicing concern for the future would have been futile. Retiring directors, like retiring generals, ought to fade from the scene, and I intend to do just that. □



UN Day, 24 October 2005

Mori Fellowships

The Japanese Government has approved a proposal by ICTP to fund doctoral and post-doctoral students from sub-Saharan Africa. The Mori Fellowship programme will provide research and training opportunities in mathematics and physics (broadly defined to include, for example, the physics of climate and weather, fluid dynamics, oceanography and seismology) to 20 doctoral or post-doctoral students per year. Fellows will enrol in universities in their home countries while receiving training at ICTP for extended periods. The aim is to nurture the next generation of African physicists and mathematicians. The programme is named after Japan's former Prime Minister, Yoshiro Mori. For additional information, please contact oea@ictp.it.

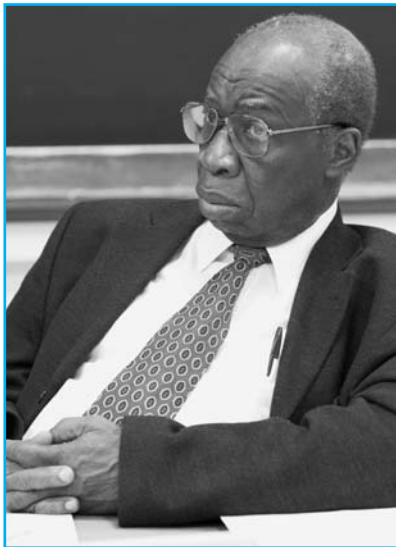
Ramanujan Prize

Marcelo Viana, *Instituto de Matemática Pura e Aplicada* (IMPA), Brazil, has been awarded the first-ever Srinivasa Ramanujan Prize. The prize is sponsored by the Niels Henrik Abel Memorial Fund in Norway in collaboration with the International Mathematical Union (IMU). Administered by ICTP, it is designed to honour researchers under 45 years of age who have conducted outstanding research in developing countries. Viana is an internationally renowned mathematician in the field of dynamical systems. He has also played a key role in the development of mathematics at IMPA and, more generally, in Brazil. Viana has lectured at ICTP schools and workshops on dynamical systems since 1988 and was course director in 2001 and 2004.



Ghana Honours Allotey

Francis K.A. Allotey, a member of ICTP's Scientific Council since 1996, has received Ghana's 2005 Millennium Excellence Award "for his contributions to science and for promoting science in Ghana and Africa."



The awards, which are given once every five years, are designed to honour Ghana's most prominent citizens in broad fields of endeavour that include agriculture, education, gender balance, industrial and rural development, and science. Twenty-five individuals and institutions were honoured in 2005, including UN Secretary General, Kofi Annan. The awards are sponsored by Ghana's Excellence Awards Foundation, a private institution established in 1999. The ceremony took place in Accra, Ghana, on 19 August.

Radicella Earns Honorary Degree

Sandro Maria Radicella, head of the Aeronomy and Radiopropagation Laboratory (ARPL), will receive an honorary degree from Obafemi Awolowo University, Ile-Ife, Nigeria. The official ceremony will take place at Obafemi Awolowo University. ARPL has collaborated with Obafemi Awolowo University since 1995, helping it and other Nigerian universities to develop electronic communication networks that provide quick and easy access to information on the world wide web.

Denardo Receives SPIE Educator Award

Gallieno Denardo, former head of the ICTP Office of External Activities and organiser of training and research activities in optical physics, has been awarded the SPIE (International Society for Optical Engineering) Educator Award "for organising dozens of optics and photonics ICTP schools, colleges, conferences, and workshops educating students and young researchers throughout the last 20 years." SPIE established the award in recognition of outstanding contributions to optics education. For additional information, see the June 2005 issue of *OE Magazine* at oemagazine.com.

Palis and Rao Selected Members of Legion d'Honneur

Jacob Palis, chairperson of the ICTP Scientific Council 2003-2005, and **C.N.R. Rao**, long-time visitor to ICTP and president of the Academy of Sciences for the Developing World (TWAS), have been selected members of France's *Legion d'Honneur*, the national order of merit instituted by Napoleon in 1802. The honour is given to individuals of the highest accomplishment in a broad range of human endeavours, including science.



Jacob Palis



C.N.R. Rao

2005 Dirac Medal

Sir Samuel Frederick Edwards, emeritus Cavendish professor of physics, University of Cambridge, UK, and **Patrick A. Lee**, William and Emma Rogers professor of physics, Massachusetts Institute of Technology, USA, have been awarded the 2005 ICTP Dirac Medal. Edwards, one of the founding fathers of condensed matter physics, is being honoured for his fundamental contributions to polymer physics, spin glass theory and the physics of granular matter. Lee, who is internationally known for his work on weak localisation and interaction effects, is being recognised for his pioneering contributions to our understanding of disordered and strongly interacting many-body systems. Edwards lectured at the ICTP Research Workshop on Challenges in Granular Physics in 2001 and the Seminar on Plasma Physics in 1964. Patrick A. Lee participated in condensed matter training activities in 1995 and 2000. For additional information about the Dirac Medal and the list of previous winners, see www.ictp.trieste.it/~sci_info/awards/Dirac/DiracMedal.html.



Sir Samuel Frederick Edwards

Diploma Graduates 2004-2005

Twenty-four students have successfully completed their year-long Diploma Course studies. The 'graduation' ceremony, in which 18 students were present to receive their certificates, was held on 29 August. ICTP Director K.R. Sreenivasan presided. The programme enables promising university students from the world's least developed countries (LDCs) to pursue their studies in high energy physics, condensed matter physics and mathematics.



Open Access Archive

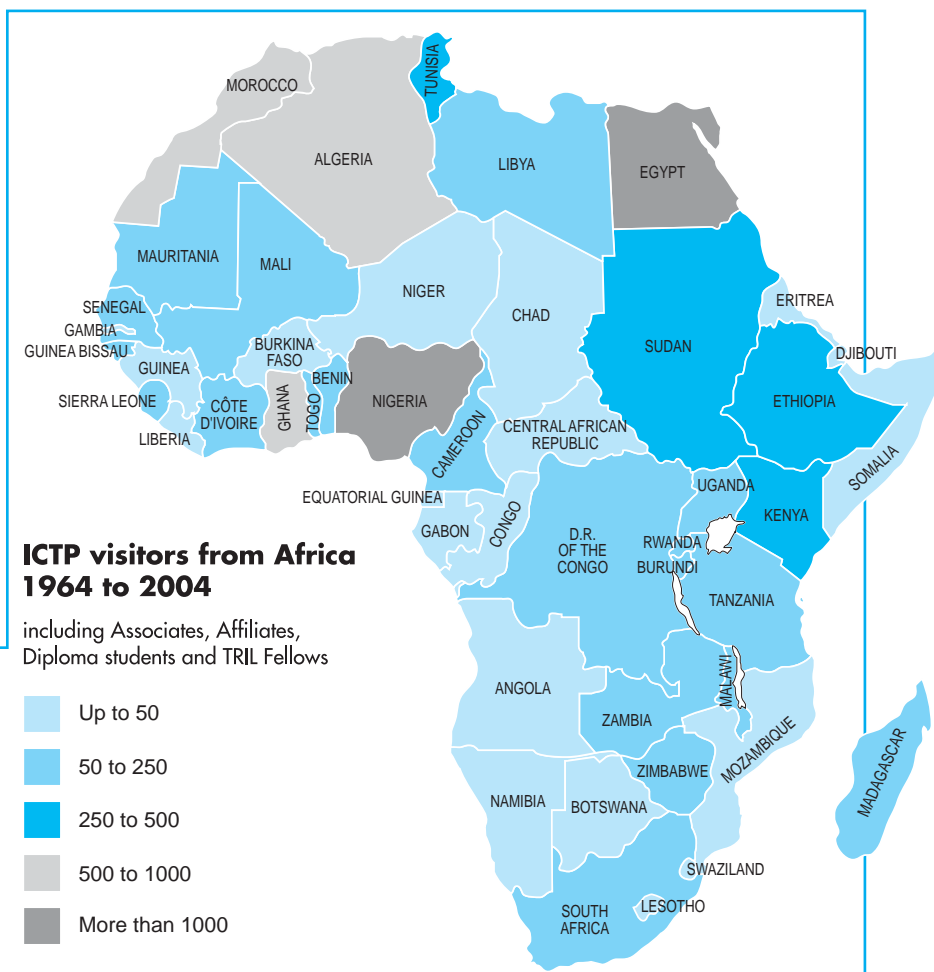
ICTP has launched an Open Access Archive that allows scientists from around the world to file their research findings free-of-charge. Postings include pre-prents, reprints, conference papers, pre-publications, book chapters and curriculum vitae. For additional information, see eprints.ictp.it.

Stenflo's Honorary Degree

Lennart Stenflo, an internationally renowned plasma physicist and professor of physics, University of Umeå, Sweden (see "Profile", *News from ICTP*, Winter 2004-2005), has received an honorary degree from the Russian Academy of Sciences.



Vladimir Fortov and Lennart Stenflo



ICTP AND AFRICA

Since its inception in 1964, ICTP has received more than 100,000 visits from scientists worldwide. Nearly 10,000 have come from Africa.



ACTIVITIES

SUMMER SCHOOL AND CONFERENCE ON POISSON GEOMETRY

4 - 22 July

Organisers: T. Ratiu (*Ecole Polytechnique Fédérale de Lausanne*, Switzerland), A. Weinstein (University of California, Berkeley, USA) and N.T. Zung (*Université Toulouse III*, France).

Local Organiser: Li Jiayu (ICTP).

SCHOOL ON QUANTUM PHASE TRANSITIONS AND NON-EQUILIBRIUM PHENOMENA IN COLD ATOMIC GASES

11 - 22 July

Organisers: M. Cazalilla (Donostia International Physics Center, San Sebastian, Spain), M. Gunn (University of Birmingham, UK), A. Ho (University of Birmingham, UK) and W. Zwerger (*Universität München*, Munich, Germany)

Local Organiser: V.E. Kravtsov (ICTP).



FIRST REGIONAL WORKSHOP ON DISTRIBUTED LABORATORY INSTRUMENTATION SYSTEMS, Jakarta, Indonesia

18 July - 12 August

Organisers: A.S. Induruwa (Canterbury Christ Church University College, UK), C. Kavka (*Universidad Nacional de San Luis*, Argentina), U. Raich (CERN, Geneva, Switzerland) and C. Verkerk (formerly CERN, Geneva, Switzerland).

Local Organiser: S.K. Wijaya (University of Indonesia, Jakarta).

Local Scientific Secretary: S. Darma (University of Indonesia, Jakarta).



SUMMER SCHOOL AND MINICONFERENCE ON DYNAMICAL MEAN-FIELD THEORY FOR CORRELATED ELECTRONS APPLICATIONS TO REAL MATERIALS, EXTENSIONS AND PERSPECTIVES

25 July - 3 August

Organisers: V. Anisimov (Institute of Metal Physics, Ekaterinburg, Russian Federation) and D. Vollhardt (University of Augsburg, Germany).



ICTP-INFN MICROPROCESSOR LABORATORY ICTP-KNUST REGIONAL MICROELECTRONICS WORKSHOP ON FPGA AND VHDL FOR RESEARCH AND TRAINING IN AFRICA, Kumasi, Ghana

25 July - 5 August

Organisers: N. Abdallah (Actel Corp., Mountain-View, CA, USA), F.K.A. Allotey (Institute of Mathematical Sciences, IMS, Accra, Ghana) and A. Cicuttin (ICTP).

Local Organisers: K. Andam (Kwame Nkrumah University of Science and Technology, KNUST, Kumasi, Ghana), P.K.F. Okyere (Siemens AG, Munich, Germany) and S. Osae (Ghana Atomic Energy Commission, Accra, Ghana).



SUMMER SCHOOL ON DESIGN AND CONTROL OF SELF-ORGANIZATION IN PHYSICAL, CHEMICAL, AND BIOLOGICAL SYSTEMS

25 July - 5 August

Organisers: A.S. Mikhailov (*Fritz-Haber-Institut der Max-Planck-Gesellschaft*, Berlin, Germany) and K. Showalter (West Virginia University, Morgantown, West Virginia, USA).

Local Organiser: H. Cerdeira (formerly ICTP).

CONFERENCE ON STRONGLY INTERACTING SYSTEMS AT THE NANOSCALE

8 - 12 August

Co-sponsors: Office of Naval Research Global (ONRG, Arlington, Virginia, USA), European Office of Aerospace Research and Development of the USAF (EOARD, London, UK), and International Institute for Complex Adaptive Matter (I2CAM, Oakland, California, USA).

Organisers: V.I. Falko (Lancaster University, UK), A.J. Millis (Columbia University, New York, USA) and B.N. Narozhny (ICTP).

INTRODUCTION TO MICROFLUIDICS

8 - 26 August

Organisers: S. Raghu (Advanced Fluidics, USA) and K.R. Sreenivasan (ICTP).



ADVANCED SCHOOL AND WORKSHOP ON SINGULARITIES IN GEOMETRY AND TOPOLOGY

15 August - 3 September

Organisers: J.P. Brasselet (*Institut de Mathématiques de Luminy*, CNRS, Marseille, France), J. Damon (University of North Carolina, USA), M. Lejeune-Jalabert (*Université de Versailles*, France) and M. Oka (Tokyo Metropolitan University, Tokyo, Japan).

Local Organiser: Lê Dung Tráng (ICTP).



AUTUMN COLLEGE ON PLASMA PHYSICS

5 - 30 September

Organisers: S.M. Mahajan (University of Texas at Austin, USA), P.K. Shukla (*Ruhr-Universität Bochum*, Germany), R. Bingham (Rutherford Appleton Laboratory, Didcot, UK), W. Dorland (University of Maryland, College Park, USA), L. Stenflo (University of Umeå, Sweden) and Z. Yoshida (University of Tokyo, Japan).

Local Organiser: B. Stewart (ICTP)

COLLEGE ON SOIL PHYSICS

12 - 30 September

Organisers: D. Gabriels (Ghent University, Belgium), D. Nielsen (University of California at Davis, USA), I. Pla Sentiés (*Universidad Central de Venezuela*, Maracay, Venezuela, and *Universitat de Lleida*, Spain) and E. Skidmore (U.S. Department of Agriculture, Manhattan, Kansas, USA).

Local Organiser: GC. Ghirardi (University of Trieste and ICTP).



JET Action

K.R. Sreenivasan, ICTP Director, and **Claudio Tuniz**, Assistant Director, recently visited the JET (Joint European Torus) facilities in Culham, UK, to speak with Jerome Pamela, associate leader of JET, and Richard Kamendje, the associate leader's scientific advisor, on possible avenues of future collaboration. Following the discussions, JET announced that in 2006 it will join ICTP and the International Atomic Energy Agency (IAEA) in sponsoring two Trieste-based workshops on 'new frontiers of plasma research' and 'molecular data for fusion energy research.' In 2007, the three organisations plan to



collaborate on a workshop exploring the current state of fusion energy research and to lay the groundwork for 'remote participation' activities allowing students from developing countries to collaborate on state-of-the-art experimental fusion research. Both organisations believe that future opportunities in this field will increase dramatically following the June 2005 decision to locate the US\$12-billion ITER facility in Cadarache, France. ITER, which will produce 500 megawatts (MW) of fusion power, is scheduled for completion in 2016. For additional information about JET, see www.jet.efda.org.



Portraits of Istria

ICTP's cultural committee assisted in the organisation of a photography festival held in Trieste. The festival highlighted the work of the Croatian-born **Virgilio Giuricin**, an internationally renowned photographer who has lived and worked in Italy for the past half century. Following the festival, a collection of Giuricin's photos portraying the people and scenic beauty of his native Istria were placed on display in ICTP's lobby.

Kun Huang 1919-2005

ICTP Senior Associate (1986-1991) Kun Huang, an internationally renowned physicist and professor emeritus at the Chinese Academy of Sciences' Institute of Semiconductors, died on 6 July 2005. He was 86. Educated at Tsinghua University in Beijing, Kun, while living in the United Kingdom during the post World War II era, worked closely with Nobel Laureate Max Born. In 1954, the two coauthored a classic textbook on lattice dynamics in solids. Back in China, Kun played an instrumental role in reestablishing links between China's and the West's scientific communities in the aftermath of the Cultural Revolution. In 1979, he headed a 12-person 'ice-breaking' delegation of Chinese theoretical physicists to ICTP, a visit that opened the way for wide-ranging exchanges between China and the Centre in the years that followed. Kun returned to ICTP in 1989.



ICTP, 1979: The first group of Chinese visitors with Mario P. Tosi and André-Marie Hamende. Kun Huang is second from right.



John Bahcall 1935-2005

John Bahcall, one of the world's leading astrophysicists and a professor at the Institute for Advanced Study in Princeton, USA, died this August. He was 70. Bahcall was a close collaborator of ICTP staff scientist Alexei Smirnov. Together they coauthored 10 papers and the monograph, *Neutrinos:*

The First Thirty Years. In 1993, Bahcall lectured at the ICTP conference on Highlights of Particle and Condensed Matter Physics.

Adalberto González Debén 1965- 2005

ICTP Group Associate (2000-2005) Adalberto González Debén passed away in July at the age of 40. As a professor of physics of *Academia de Ciencias de Cuba, Instituto de Cibernética, Matemática y Física* in Havana, Cuba, visited ICTP annually for the past three years and was scheduled to return to Trieste in September. Applied mathematics was his primary field of study.



Maria Zingarelli 1936-2005

Maria Zingarelli, ICTP's former head librarian who served in that capacity for nearly three decades, died in July. She was 69. Born in Italy and raised in Eritrea, where her family had moved when she was three years old, Zingarelli returned to Italy in 1963. She began her career with ICTP one year later, just three months after the Centre's creation, and was appointed head librarian in 1967. She remained with ICTP until her retirement in 1996. In 1989, the International Atomic Energy Agency (IAEA) honoured Zingarelli with a special service award. Zingarelli oversaw the growth of the ICTP Library into one of the most important technical libraries in Europe. She will be missed by both the Centre's staff and visiting scientists, and remembered as a key figure in helping ICTP earn an international reputation for outstanding service to the international scientific community.



PROFILE

GianCarlo Ghirardi, one of Italy's most prominent physicists, recently celebrated his 70th birthday.

Passion for Physics

Last 5 September, in a jam-packed Main Lecture Hall, ICTP celebrated the 70th birthday of **GianCarlo Ghirardi**, a leading scientist in the field of quantum mechanics, professor of theoretical physics at the University of Trieste and long-time ICTP consultant. The conference—"Are There Quantum Jumps? On the Present Status of Quantum Mechanics"—attracted some of the world's most celebrated high-energy physicists, including Roger Penrose, Oxford University, UK, and Stephen L. Adler, Institute for Advanced Study, Princeton, New Jersey, USA.

The conference also reunited the three authors of the so-called GRW theory, derived from the initials of its proponents: GianCarlo Ghirardi, Alberto Rimini (University of Pavia, Italy) and Tullio Weber (University of Trieste). The theory aimed to reconcile the paradoxical behaviour of quantum mechanics in the subatomic world with the more predictable behaviour of particles in the macroscopic world that we all experience.

GianCarlo Ghirardi, who was born and raised in Milan, Italy, earned a doctorate degree in physics from the University of Milan in 1959. He then moved to Trieste in August 1963 where he assumed a full-time teaching position with the theoretical physics group at the University of Trieste. "The year before", he recalls, "I was fortunate enough to attend the first-ever international seminar in theoretical physics in Trieste that was organised by Paolo Budinich and Abdus Salam. The event, held at Miramare Castle's horse stables, took place just two years before the establishment of ICTP in Trieste. I could hardly imagine that over the next 40 years I would be immersed in the life and activities of such a prestigious institution."

At the University of Trieste, Ghirardi has focussed his teaching on quantum mechanics (to which he has recently added a course on new frontiers in quantum mechanics). He has taught related courses on the same subject at the International School for Advanced Studies (SISSA), ICTP's next-door institute. Teaching assignments abroad have included brief stints at the University of Cincinnati, Ohio, USA, and the University of Santiago, Chile.

Scattering theories and quantum symmetry were Ghirardi's first fields of interest and these subjects served as focal points of his book, *Symmetry Principles in Quantum Theories*, which he coauthored with Luciano Fonda, a close friend and colleague at the University of Trieste's Department of Theoretical Physics.

Ghirardi earned a full professorship in 1976 and from 1981 to 1985 he served as head of the University of Trieste's Institute of Theoretical Physics, housed at ICTP's Main Building. He was appointed to the position two additional times, from 1985-1991 and from 1993-1999 when the Institute was reconstituted into the Department of Theoretical Physics.

"Serving as director for nearly 20 years proved very fruitful for me both in terms of my research and career development," Ghirardi says. "And it also proved fruitful for the Centre's scientific staff. In 1982 I secured an agreement between the University and ICTP that led to even closer collaboration between the institutions. At the same time, as an ICTP consultant, I acted as a local organiser for a large number of courses in medical physics, neurophysics and soil physics. In 1990 Abdus Salam appointed me head of the Associates and Federation Arrangements Programmes, a position that I have maintained ever since. And in 2003 I was named president of the *Consorzio per l'incremento degli studi e delle ricerche in fisica*, the organisation responsible for co-ordinating the wide-ranging physics groups in Trieste."

Ghirardi has two great personal passions beyond his scientific research. The first is a deep interest in the history and philosophy of physics. He is one of the founders and first president of the Italian Society for the Foundations of Physics and is author of a book on quantum mechanics, *Un'occhiata alle carte di Dio*, published in 1997 by Il Saggiatore in Milan, which has sold some 20,000 copies and was translated last year by Princeton University Press under the title, *Sneaking a Look at God's Cards*.

His second deep interest is known only by his closest friends: a collection of about 350 banknotes from 70 countries in which the portraits of eminent scientists appear. Of notable value, with several extremely rare pieces, "it is perhaps the most complete collection of 'scientific' banknotes in the world. Sooner or later I would like to organise a public exhibition." □

3 - 7 October

Workshop on Noise and Instabilities in Quantum Mechanics

3 - 15 October

Eighth Workshop on Non-linear Dynamics and Earthquake Prediction

17 - 28 October

Technology and Applications of Accelerator Driven Systems (ADS)

17 - 28 October

School on Pulsed Neutron Sources: Enhancing the Capacity for Material Science

17 - 29 October

Workshop on Physics for Renewable Energy

31 October - 11 November

Nuclear Power Plant Simulators for Education

7 - 12 November

Web Enabling Technologies and Strategies for Scientific e-Learning

14 - 25 November

Workshop on Modelling and Quality Control for Advanced and Innovative Fuel Technologies

19 - 23 November

Meeting on a Book on Property Rights in the Indian Subcontinent

5 - 16 December

1st Teaching Workshop on Environmental Economics for the Middle East and North Africa & Joint EEE Programme – CEEPA First Training of Trainers Workshop



Throughout the year, the most up-to-date information on ICTP activities may be found on the World Wide Web and via e-mail. Here's how to find out what's going on.

ON THE WORLD WIDE WEB (WWW)

Our address is <http://www.ictp.it/>

The site includes detailed information on our research groups and activities, and a listing of our preprints, awards and job opportunities.

ON E-MAIL

(1) For Scientific Calendar of Activities

Create a new e-mail message and type

To: smr@ictp.it

Subject: get calendar 2006

Leave the body of the message blank. Send it.

Your e-mail will generate an automatic reply from the ICTP server containing the most updated version of the Calendar.

(2) For Information on a Specific ICTP Activity

Each activity in the Calendar has its own 'smr' code number, which is located on the last line of each activity description. The 'smr' number will enable you to obtain more information—if available—on those activities you are interested in. To receive this more detailed information, create a new e-mail message and type the smr code number that you found on the Calendar:

To: smr####@ictp.it

Under the e-mail's subject, type

Subject: get index

Leave the body of the message blank and send it.

You will receive automatic reply messages containing all documentation available on that particular activity.

(3) For Information on All ICTP Activities

A free online service for the dissemination of information on all ICTP activities, programmes and related announcements is available via e-mail. To subscribe, create a new e-mail message and type:

To: courier-request@ictp.it

Leave the subject line empty.

In the body of the message type

subscribe

and your e-mail address. Send the message.

Any comments or suggestions on this service are most welcome. Please address them to pub_off@ictp.it.

NEWS from ICTP

The Abdus Salam International Centre for Theoretical Physics (ICTP) is administered by two United Nations Agencies—the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the International Atomic Energy Agency (IAEA)—under an agreement with the Government of Italy. Katapalli R. Sreenivasan serves as the Centre's director.

News from ICTP is a quarterly publication designed to keep scientists and staff informed on past and future activities at ICTP and initiatives in their home countries. The text may be reproduced freely with due credit to the source.

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