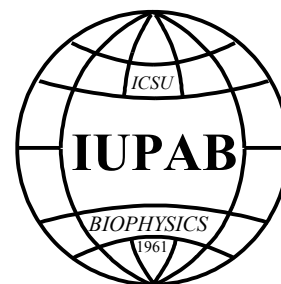


# IUPAB NEWS



REPORTS ON THE ACTIVITIES OF THE INTERNATIONAL UNION FOR PURE AND APPLIED BIOPHYSICS

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### IUPAB 2005 - 2008

PRESIDENT: Ian C P Smith (Canada), PAST PRESIDENT: J Garnier (France),

VICE-PRESIDENTS: K Nagayama (Japan), Wilma K Olson (USA),

SECRETARY-GENERAL: F G Parak (Germany)

MEMBERS OF COUNCIL:

R Brasseur (Belgium), P Brzezinski (Sweden), F Conty (Italy), P Laggner (Austria), G Pifat-Mrzljak (Croatia), J E Ponce-Hornos (Argentina), M Prieto (Portugal), Z Rao (China), C G dos Remedios (Australia), G C K Roberts (UK), A B Rubin (Russia), T P Singh (India).

CONVENORS OF TASK FORCES:

Bioinformatics J Garnier; Biomedical Engineering I C P Smith; Capacity Building and Education in Biophysics J R Grigera; NMR in Biological Sciences G Govil; Inter-Union Bioinformatics Group H J C Berendsen / J Garnier

## Letter from the President of IUPAB

It is a great honour to be elected President of IUPAB. I have been collaborating with the Union since 1988 when I was responsible for planning the 1990 Congress for Vancouver. I have always believed in the aims and goals of IUPAB and endeavoured to implement them during the ensuing seventeen years. I am delighted that in this same year Brian Henry, a Canadian colleague, has become the President of IUPAC.

IUPAB serves the world's biophysical community. It unites the various national and regional organizations. The Congresses serve to enlighten all of us as to the state of our discipline and enable us to meet one another. Our outreach programmes spread the latest biophysics throughout the world.

We have a few challenges ahead of us. In many countries biophysics is not recognized as a discipline, and therefore suffers in competitions for research funding. Biophysics overlaps with many of the conventional disciplines – from engineering to medicine. We must therefore strive to demonstrate the enormous usefulness of our subject – our interdisciplinary approach is the way of the future.

A second challenge is to widen the scope of our usefulness. At the Amsterdam and subsequent Congresses we included a number of symposia where the influence of biophysics in medicine was demonstrated. This is a giantly underdeveloped application, with fantastic personal satisfaction for those who undertake it. The future for application of the knowledge and methods of physics and chemistry to medicine is brilliant. As teachers we must demonstrate to our students the satisfaction that comes from not only understanding these fascinating subjects, but also from applying them to relieve human suffering and extend human life.

An unexpected current challenge is our relationship with ICSU, the International Council for Science. ICSU has served as an umbrella organization for over 50 years. It has stimulated interaction between disciplines and addressed a wide variety of global problems where science can intervene and help. Of particular current interest is the translation of knowledge from the favoured to the less favoured countries of the world. The funding base for ICSU has been steadily eroded over the last several years. This must be reversed or ICSU will cease to exist. IUPAB must seriously consider whether ICSU is still relevant in today's world, and therefore if we should continue to adhere to ICSU. This will be addressed and decided upon in 2006.

On to happier matters, IUPAB will support several workshops in 2006, which will help to spread the word of biophysics. These are a Latin-American workshop on biophysics, La Plata, Argentina, a workshop on biocalorimetry and biological thermodynamics, Rio de Janeiro, Brazil, a summer school on supramolecular structure and function, Rovinj, Croatia, and possibly a workshop on biophysics in Ibadan, Nigeria. In my view this is an extremely valuable function of IUPAB, which should be increased in frequency and geographic outreach. Our various task forces have the responsibility to determine where, when and about what these workshops will be. We are open to suggestions from all of you.

In 2005 we held our IUPAB triennial congress in Montpellier, France in partnership with the European Biophysical Societies Association, and the French Biophysical Societies. In 2008 we shall do the same with the Biophysical Society of North America and in 2011 with the Chinese Biophysical Society. These partnerships give us access to many more citizens of the world. We biophysicists must communicate, interact, and collaborate in order to gain the full potential of our discipline. IUPAB is a catalyst of this process. I look forward to more of the same, with an even wider global spread.

Finally, I encourage you all to do your best to communicate to your local authorities the value of biophysics – we incorporate the value of many disciplines and yet we are rarely recognized. We must increase attendance at our triennial Congresses and expand the reach of our workshops. We cannot teach biophysics properly if we do not appreciate the breadth of our usefulness and maintain our knowledge of current trends. I challenge you to interact more and to draw even more disciplines into our field of view.

Ian C. P. Smith, Winnipeg, Canada, November, 2005

## Two short scientific contributions

### I. Phase Contrast Electron Microscope

Kuniaki Nagayama,

*Okazaki Institute for Integrative Bioscience, National Institutes of Natural Sciences, Okazaki, Japan*

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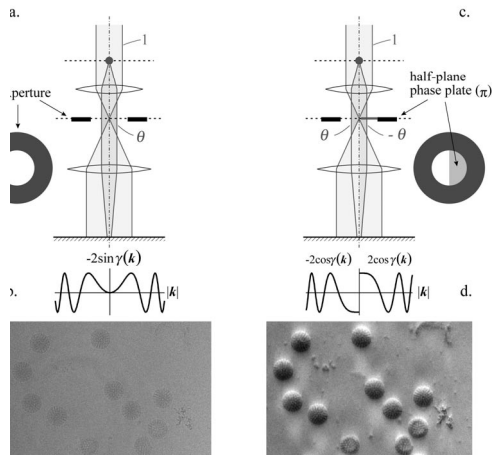
Biological materials, whether they are stained or not, are transparent to electron waves. What is disturbed by materials in the waves is the phase but not amplitude. Therefore the best method has long been considered to be the phase contrast transmission electron microscope (TEM). There have been three obstacles, however, to the development of phase contrast method.

First, a phase contrast scheme (defocus phase contrast) based on defocusing, which had never been employed in light microscopy (LM), has been accepted in the EM community requesting high resolution images. Second, another contrast scheme (scattering contrast) based on the aperture limitation has been accepted in the biological community taking no care of high resolution images. Third the phase contrast scheme using phase plates, which is the one employed in LM, has been abandoned due to the fundamental issue of phase plates charging. People's satisfaction seems to make a happy balance in both fields suppressing the desire to have the phase-plate-assisted phase contrast EM.

This balance has recently broken by our success of the Zernike phase contrast TEM, which is an EM duplicate royal to the Zernike's original idea. The breakthrough has supported by an integrative engineering for anti-charging phase plates. Six years effort to get the final goal has been recently published in a review [1]. Actually three phase contrast methods using different kinds of phase dates, the Zernike, the Hilbert and the Foucault, have been developed. Their experimental and theoretical aspects are detailed in the review. A particular focus has been given to integrate various phase contrast schemes into a comprehensive spatial filter theory.

### **Hilbert Differential Contrast**

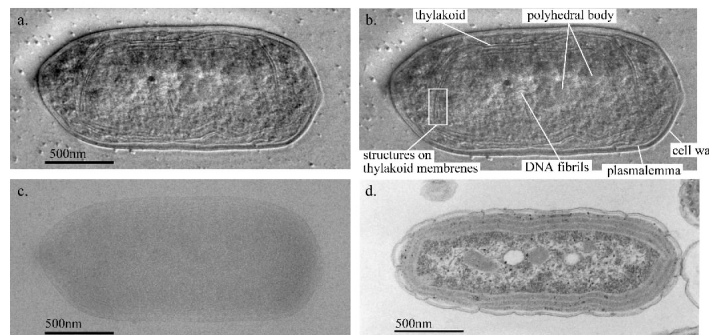
A class of phase contrast corresponding to the differential-interference-contrast in LM seems to be quite useful. A differential feature of images is introduced by inserting a half-plane phase plate into the back-focal plane of an objective lens, which emulates a spatial filter with a step-function like filter function inducing a Hilbert transform in the image. Corresponding contrast transfer function (CTF), which is responsible for the image contrast, is that of but odd natured as shown in Fig. 1d. An experimental result is given in Fig. 1.



Schematics of conventional defocus phase contrast TEM (a) and Hilbert differential contrast TEM (c), and corresponding images, the conventional (b) and the Hilbert (d), taken for ice-embedded rotaviruses with a 300-kV cryo-TEM system. Function forms put above virus images are contrast transfer functions (CTFs), which take over the image contrast through the extent of recovery of low frequency components.

Rotavirus particles are topographically visible with a high contrast in the Hilbert differential contrast (Fig. 1d). The advantage of using the Hilberts is the recovery of very low frequency components compared to the Zernike phase contrast. Relative disadvantage is the severe loss of electrons impairing high frequency components due to the phase plate thickness twice as much as that of the Zernike phase plate. Nevertheless the power of high contrast images recovered with the Hilbert has been remarkable. A typical example is shown in Fig. 2 by using a bacterial sample, cyanobacteria [2].

Fig. 2



Comparison of TEM images of cyanobacterial cells (adopted from Fig. 1 in ref. 2).

a) 300-kV Hilbert contrast image of an ice-embedded unstained whole cell (near-focus).

b) Identified subcellular structures in Fig. a.

c) 300-kV defocus contrast image of the same ice-embedded unstained whole cell as shown in Fig. a (~15μm defocus).

d) 100-kV scattering contrast image of a resin-embedded, sectioned and stained cell.

The differential feature together with the high contrast is demonstrated in Fig. 2a for an ice-embedded unstained whole cell. Ultra structures surviving in the process of quick freezing have been recognized as indicated in Fig. 2b. Counterexamples obtained with the defocus phase contrast are shown in Fig. 2c. An obscure structureless image is observed for the sample shown in Fig. 2c, which was taken under the same experimental conditions as for Fig. 2a except for the phase plate and the defocus. The unexpectedly large difference in contrast between the two images is likely attributable to the difference in the CTF coupled with the large defocus variation happening in a thick sample.

Comparing another pair of images, the ice-embedded whole cell (Fig. 2a) and the resin-embedded sectioned cell (Fig. 2d), we recognize a large difference in the image appearance which may be attributable to the enormous difference in specimen treatment. In the sectioned cell, we see a ragged cell wall, which indicates that some shrinkage of the cell has occurred during the TEM-preparation. Many aggregates and associated voids are also recognized, which are indubitably induced by chemical treatment, such as dehydration and selective staining of cellular organelles. On the other hand, the images of the ice-embedded cell are smoothly round and recognizably space-filled everywhere. Notice here that the quick freezing

is expected to preserve the overall structure, such as the cell shape, as well as subcellular structures. The preserved roundness of cyanobacterial cells allows us to estimate the specimen thickness to be  $\sim 1\mu\text{m}$ .

A typical reaction, I have met so far when I have shown high contrast images taken with phase plate TEM to people, was a surprise first and a suspicion next. The surprise could be natural but the suspicion may vary depending on the one's experience in TEM. The end-users suspicion could be fairly dispelled by this article and the related. The professional one, however, is still difficult to be cleared because from the quantitative viewpoint, actually, there are evils in the phase plate TEM such as the loss of electrons. Further development of the phase plate technology is called for, for example, by replacing the phase manipulation with matter (carbon) by that with non-matter such as electric or magnetic field.

1. K. Nagayama, "Phase contrast enhancement with phase plates in electron microscopy", *Adv. Imag. Electr. Phys.* 135, 69-146 (2005).
2. Y. Kaneko, R. Danev, K. Nitta and K. Nagayama, "*In vivo* subcellular ultrastructures recognized with Hilbert-differential-contrast transmission electron microscopy", *J. Electr. Microsc.* 54, 79-85 (2005).

## **II. Some comments on scientists and more generally on science**

to avoid confusion between science and its applications and beyond the control of biological research in compliance to the Biological and Toxin Weapons Convention.

It is the usage to make a difference between basic research, applied research and the applications of research. Biophysics is a scientific discipline to study the biological processes with the tools and concepts of physics. IUPAB is concerned by basic and applied research in biophysics.

I will limit my comments to basic research because applied research corresponds to the development of tools and the technology in biophysics. What I will say about basic research applies to any scientific discipline from mathematics to social sciences including of course biophysics.

Basic research objective is the development of knowledge that I will qualify as a scientific knowledge, to differentiate it from a philosophical or a religious knowledge. Scientific knowledge limits itself to reproducible and measurable phenomenon. It implies a code of good conduct, that I will call a code of scientific conduct well established quite a while ago: to make publicly available results and data supporting the results, under the form of specialised peer-reviewed publications. The peer-reviewed system has the purpose to check if the results have not yet been published somewhere else, that the data support the derived conclusions and with enough details to reproduce the experiments if need be. The peer-reviewed system is not perfect but it is the best we know for the advancement of science. Consequently basic research results, by definition, are available to all scientists and all public, whatever the nationality or political regime they belong to. Freedom of communication is an essential aspect for the development of knowledge. Scientists universally recognise science as a common human adventure that goes beyond the frame of nations, in which each scientist has his share, certainly at various degrees but nevertheless necessary. It would be a mistake to believe that Nobel Prize winners make science without the scientific community, which include also engineers, technologists and other specialists besides their scientific peers. Science is a social phenomenon.

Basic research is a long-term process; I will give some examples below. The first motivation of scientists for basic research is to understand rather than to apply. This is because most of

the time applications cannot be predicted in regards to the delay that elapses from a scientific discovery and its applications.

When a discovery is made public it may some times disturb the common way of thinking: then the necessity to add the academic freedom at the freedom of communication: in that case the scientist has to benefit in principle of a permanent research or teaching position, independent of the political or religious power. We learned our lesson in Europe from the Middle Ages when universities were depending on the religious power.

Basic research requires regular long-term financing. It is the reason why today only government agencies or non-for-profit organisations are able to finance basic research to get results after several decades. Private companies cannot easily afford to wait so long for a commercial application.

To make myself better understood, I give two examples:

An example is taken from biology. Right at the beginning of the discovery of the bacterial world following the works of Pasteur, scientists were amazed by the ability of some bacteria to grow at high temperature. It is only in 1970 that the enzyme synthesising DNA was isolated from a bacteria growing at 70 C: this enzyme was not destroyed at that temperature. In 1998, Mullis, used that heat-resistant enzyme to make millions of copies of DNA fragments, this technique is now widely used for diagnostic purposes of infectious diseases, for forensic analysis but also in disciplines far from medicine, as in paleogenetics to detect evolutionary relationships between species.

Another example is taken from physics. Hertz discovered at the end of the XIX century that light expels electrons from a metal plate if its frequency is above a certain value of energy. Einstein gave an explanation in 1905 by considering light not like a wave but like a series of quanta or grains of energy. This was the foundation of quantum mechanics, twenty years later. From this we can trace a whole series of technological revolutions, from electronic devices to digital recording but also to the atomic bomb and the nuclear waste. These two last applications of science lead us to the aim of this conference, the misuse of science and its control. Neither Hertz or Einstein at the time of their discovery were having a code of scientific conduct different of what I described above, because they were dealing with scientific matters, not with the applications of science.

Certainly scientists are concerned and some times involved in the applications of science, at two levels, their knowledge and their citizenship. However they are not the only actors of the applications of science: they are engineers, technologists and more importantly government agencies financing the research and development. In democratic countries, citizens have a right and a responsibility on the applications of science. The scientists should not be the scapegoat for a harmful usage of science. It will be better to speak of a code of good conduct of the applications of science, which concerns all citizens including governments themselves, rather than to search for a specific code for scientists as if they were the only ones dealing with the misuse of science. I would add that they have no specific skill for that misuse.

As biological weapons are the focus of this meeting, biology is not different from other scientific disciplines such as chemistry or physics in regards to misuse of science. If we want to make a difference, it is in the complexity of biology: it is likely more difficult to control their applications by governments or criminal groups than the manufacturing process of an atomic bomb or a toxic gas.

Jean Garnier

## **Executive Committee Meeting Montpellier, August 27<sup>th</sup> 2005, 9:30h**

### **Minutes**

**Present:** J. Garnier, President; I. C. P. Smith and C. G. Remedios, Vice President; I. Pecht, Past President; F. G. Parak, Secretary General

The aim of this meeting was the preparation of the next Council and of the General Assembly. Therefore, there was no own agenda. The following topics of the agenda for the 50<sup>th</sup> Council were discussed:

- 50.5ex**            **Minutes of the Executive Committee, Long Beach, February 2005**  
The minutes were accepted.
- 50.6ex**            **Matters arising from the Executive Meeting**  
It was emphasised that the minutes of Ro Kapman will be the basis for our contract with the Biophysical Society (USA). The obligations for the IUPAB are the following: 50.000,00 USD for travel fellowships, all cost for the Council Members (including registration fee), the costs for the three IUPAB representatives at two meetings of the Program Committee at the Annual Biophysics Society Congresses (2006 and 2007), one meeting to select the travel fellowships (1 IUPAB representative). There is no gain sharing. Instead, the Biophysical Society will transfer 25.000,00 USD to IUPAB. There will be no contribution of IUPAB for invited speakers.  
The IUPAB representatives in the Program Committee should be: Jean Garnier, Israel Pecht and David Parry. They have to take care that qualified invited speakers from less developed countries are sufficiently supported. The selection of travel fellowships shall be done by Ligia Torre (Biophysical Society) and Jean Garnier, 6 months before the USA meeting.
- 50.9ex**            **Business for 16<sup>th</sup> General Assembly**  
The present statutes may be modified only by a two-thirds vote of all adhering bodies present at a General Assembly to which prior notice of the change has been given on the agenda. The statutes and minutes of the General Assembly have to be sent to the French officials in French language. Jean Garnier is willing to translate the minutes and the new statutes.
- 50.9.1ex**        **Official delegates appointed by Adhering Bodies**  
Also late nominations of Delegates should be accepted.
- 50.9.2ex**        **Applications for Admission/changes of membership arrangements**  
The application of the Biophysical Society to become an Adhering body as well as the change of category of Spain is supported.
- 50.9.3ex**        **Nomination of candidates for Posts of Officers and Council Members**  
It is emphasized that candidates represent the Adhering Body to which they belong and not the country which performed the nomination.

- 50.9.4ex**      **Invitations to host the 2011 Congress**  
Candidates for the 2011 Congress are Beijing (China), Cairo (Egypt) and Graz (Austria). There is an intention to host the 2014 Congress by Australia or Canada.
- 50.10ex**      **Financial Report for 2002 – 2004**  
The report communicated in IUPAB NEWS was approved. While the audit report for 2004 is available the report on 2003 is still missing.
- 50.11ex**      **Budget for 2005**  
The report communicated in IUPAB NEWS was approved.
- 50.12ex**      **Arne Engström and Ramachandran Lectures**  
The capital is invested at Merrill Lynch as Federal Home Ln Mtg Corp. till November 23, 2011 with increasing interest ( present: 3 5/8% , Nov. 2006: 4 3/4%, Nov. 2008: 5 1/2 % , Nov. 2010: 6 1/2 %). Up to now there was no Arne Engström lecture. Several years ago the Swedish Academy had the intention to increase the capital. The Swedish representative in the Council should be asked to contact again the Swedish Academy.  
The Ramachandran Lectures should be discussed in the Council if Girjesh Govil is present.
- 50.13ex**      **Quarterly Review of Biophysics**  
The journal is successful. However, IUPAB has no influence on it.
- 50.14ex**      **Applications for sponsorship 2006**  
The discussion of Grants was postponed to the Council.
- 50.16ex**      **Other Business**  
Jean Garnier reported on the Geneva meeting. There is some tendencies of governments to control scientific publications to prevent that scientific results are misused. Jean will discuss this topic at the Council and the General Assembly.  
The Secretary General remarks that other Unions have a more effective organisation. The officers are: President, Past President, Elected President Secretary General and Treasurer. A possible change of the statutes should be discussed at the Council and the General Assembly.

**50th Council Meeting of IUPAB  
August 27, 2005, Montpellier**

**Minutes**

**Present:** J. Garnier, President; I. C. P. Smith and C. G. dos Remedios, Vice-Presidents; I. Pecht, Past President; F.G. Parak, Secretary General; M. I. El- Gohary, G. Govil, W. Junge, K. Nagayama, W.K. Olson, G. C. K. Roberts, F. Separovic, T. P. Singh, Members



- 50.1 Adoption of the Agenda**  
The tabled agenda was adopted with the addition of top 50.14a “Proposed Commission on Sponsored Meetings”.
- 50.2 Apologies for absence**  
F. Conti, J. E. Ponce-Hornos and Nan-ming Zhao, were unable to come. The Council accepted S. del Valle Alonso as substitution for Ponce-Hornos and Jun-Xian Shen for Nan-ming Zhao.
- 50.3 Minutes of the 49<sup>th</sup> Council Meeting, Paris, April 2004** published in IUPAB NEWS 49 were accepted.
- 50.4 Matters arising from the above meeting**  
The Commission on Sponsored Meetings, proposed by C. G. dos Remedios and Wilma Olson was not mentioned in the minutes but will be discussed in this Council Meeting
- 50.5 Minutes of the Executive Committee, Long Beach (USA), February 2005**  
The minutes have been published in IUPAB NEWS 49. In addition Ro Kapman from the Biophysical Society (USA) sent a protocol for this meeting to IUPAB. This protocol will be the basis for IUPAB’s agreement with the Biophysical Society.
- 50.6 Matters arising from the Executive Meeting**  
The final program for the 2008 Congress will be made by a committee of eight members, five will represent the Biophysical Society (BPS), three the IUPAB. The timetable is rather tight. The committee has to be formed in 2005. The Council decided that the IUPAB members will be: Jean Garnier, Israel Pecht and David Parry.
- Time-table for the program committee:  
In February 2006 the program committee will meet at the Biophysical Society Annual Meeting in Salt Lake City, Utah. August 2006: Approval of the first flyer/announcement listing symposia topics/chairs and tentative speakers. September 2006: Mailing of the first flyers/announcement, March 2007 in Baltimore, Program committee meeting to finalize program, March/April: Call for abstracts, October 1<sup>st</sup> 2007: Deadline for abstracts. If the IUPAB Council wants to have any influence on the final program it has to meet well before February 2007. September or October 2006 was under discussion. The Adhering Bodies should be asked for proposals of invited speakers early in 2006.
- The financial arrangements will follow the minutes of Ro Kampman agreed upon at the Long Beach meeting. The BPS will provide 62.500,00 USD to cover partial travel reimbursement for invited speakers. BPS will provide 37.500,00 USD as travel grants. In addition the NAS and BPS will apply for an NSF grant which may be 20.000,00 to 22.000,00 USD. This grant can only be used for US citizens. IUPAB will provide travel fellowships of 50.000,00 USD. BPS will give to IUPAB 25.000,00 USD to be used according the wishes of IUPAB. However, BPS will not cover any expenses for the members of the IUPAB Council. One also has to take into account that IUPAB is responsible for the costs of their representatives at the meetings of the program committee. There will be no sharing of a possible gain of the Congress.

The travel grants will be decided by one representative of BPS and one of IUPAB. The representative of BPS is Ligia Toro. The Council nominated Jean Garnier as representative of IUPAB. The Council asked for a special consideration of applicants from less developed countries in the evaluation for travel grants.

**50.7 15<sup>th</sup> International Congress, Montpellier**

At the time of the Council there was no need for a detailed discussion. All agreed that the prearrangements were done well. The location looks very good and the number of participants will be large.

**50.8 16<sup>th</sup> International Congress, Long Beach (USA)**

The essential topics were already treated in 50.6.

**50.9 Business for 16<sup>th</sup> General Assembly**

**50.9.1 Official delegates appointed by Adhering Bodies** were accepted by the Council.

**50.9.2 Applications for Admission/changes of membership arrangements**

The change from Category 3 to Category 2 of the Spanish Society of Biophysics was confirmed. The Biophysical Society (USA) has asked to become an Adhering Body of IUPAB in addition to the Academy of Sciences USA. The 2004 Paris Council supported the application. This support was confirmed.

**50.9.3 Nomination of candidates for posts of Officers and Council Members** as communicated in IUPAB NEWS 50 was accepted by the Council.

**50.9.4 Invitations to host the 2011 Congress**

Three cities are candidates for the Congress in 2011: Beijing (China), Cairo (Egypt) and Graz (Austria). Representatives of these candidates will introduce the applications at the General Assembly.

**50.9.5 Reports from Task Forces and future policy for Task Forces**

The report of the “Task Force on NMR in Biology” and of the “Task Force on Bioinformatics are printed in IUPAB NEWS 50. I. Smith gave an oral report on the Task Force on Biomedical Spectroscopy. The report on Capacity Building and Education in Biophysics could not be printed in time but will be given orally at the General Assembly. These two reports will be communicated in IUPAB NEWS 51 (December 2005). It was decided that all task forces shall continue for the next 3 years.

**50.10 Financial Report for 2002 – 2004**

It is printed in the IUPAB NEWS 50 and was approved by the Council. Meanwhile an audit report exists for the year 2004. A report for 2003 is on the way.

**50.11 Budget for 2005** as communicated in IUPAB NEWS 50 was accepted by the Council.

**50.12 Arne Engström and Ramachandran Lectures**

The Arne Engström fund contains 28.715,00 USD. It is invested at Merrill

Lynch. The interest should be used to finance a lecture at the International Biophysics Congress in honour of Arne Engström.

G. Govil explained that the Indian Government is willing to create an endowment in the memory of the famous Indian Biophysicist Prof. G.N. Ramachandran. From the interest of the capital one should finance a Congress lecture similar to that planned in case of Arne Engström Lecture. At a former meeting the IUPAB Council had already appreciated this proposal. An estimation yields that about Rs. 300.000 (approx 60.000,00 USD) would be necessary. G. Govil raised questions about the logistics of the award. The Council decided that the capital should stay in India. Only the interest should be transferred to IUPAB in the year of the Congress in order to support the Ramachandran lecture. The topics of a Ramachandran lecture can be chosen from the whole field of biophysics. This reflects the broad interests of Prof. Ramachandran who made contributions in structural biology, crystallography, general biophysics and mathematical logic. The Secretary General will contact Prof. Govil to relay the opinion of the Council.

**50.13** **Quarterly Reviews** has transferred 86,10 English pounds in 2004. The proposal for new editors submitted by the Council in Paris was not taken into account. Meanwhile the Secretary General has not obtained copies of the Quarterly Reviews of Biophysics.

**50.14** **Applications for sponsorship 2006**

The following applications were discussed:

1.) A Latin American Post-graduate Program of Biophysics in La Plata, proposed by J. R. Grigera. The workshop will be supported with 5.900,00 USD.

2.) Workshop on Biocalorimetry and Biological Thermodynamics in Rio de Janeiro proposed by M. L. Bianconi and M. F. Colombo. IUPAB supports it with 8.000,00 USD.

3.) 14<sup>th</sup> European Bioenergetics Conference in Moscow proposed by V. P. Skulachev. Support is rejected since IUPAB is not contributing to periodic events.

4.) The International Summer School on Biophysics “Supramolecular Structure and Function” in Rovinj proposed by G. Pifat- Mrzljak. This Summer School has already carried out successfully several times. IUPAB can not support periodic events.

5.) Proteins as Cellular Nanomachines: Molecular Motors, Channels, Pumps in Rio de Janeiro proposed by J. R. Sotelo et. al. The proposal was not clear enough. Especially the ratio of speakers to students was unconventional. Before a decision some questions have to be clarified.

6.) Winter School of NMR in Biological Systems in Ibadan, Nigeria, proposed by Gabriel Ogunmola. The Council appreciates that a proposal comes from Nigeria, since Africa needs more support. However, there are some points which should be clarified before a decision can be made. I. Smith will try to get the necessary information.

**50.14a** **Proposed Commission on Sponsored Meetings**

This proposal by Wilma Olson and Cris dos Remedios raises the question how IUPAB can improve the sponsoring of high level workshops in Biophysics. There was a general agreement that this is an important issue. Wilma Olson and

Cris dos Remedios agreed to formulate a compact version of their ideas taking into account the discussion in the Council.

Girjesh Govil mentioned that IUPAB has a moral responsibility to promote Biophysics in least developed countries (LDC). While some of the activities of the Task Forces and sponsored meetings have served the needs of LCDs in Asia, eastern Europe and Latin America, it will be desirable that IUPAB sponsors educational programs on different subjects in Africa.

**50.15 Draft Agenda for the 51<sup>st</sup> Council Meeting**

The agenda will be ready at the beginning of the 51<sup>th</sup> Council.

**50.16 Other Business**

Jean Garnier reported on a June 2005 meeting at the seat of the United Nations Organisation in Geneva where he was representing IUPAB. It was related to the 1972 convention on the prohibition of the development, production and stockpiling of bacteriological (biological) and toxin weapons and their destruction (BWC). 148 countries have presently ratified this convention. The goal of the meeting was to bring together experts and State parties to establish guidelines (also called code of conduct, or code of good conduct) for the scientists to avoid “the potential misuse of their scientific results acquired from legitimate activities that involve theoretical, experimental or applied work in life sciences...” A report will be communicated in the next IUPAB NEWS. This matter has to deal with the freedom of science and will involve the control of the publications of scientific results. ICSU and the scientific unions concerned by life sciences like IUPAB carefully follow this.

The Secretary General noted that, in his opinion, the organisation form of the IUPAB Executive Committee is not optimal. In most similar Unions the positions of a Secretary General and a Treasurer are separate, while in IUPAB the Secretary General has both functions. The viewpoints of a Secretary General and a Treasurer on some topics may differ strongly. Moreover, the present burden is rather high especially if the Secretary General is still active in his profession. The Council expressed its understanding for these arguments and supported a proposal for a change of the statutes.

**Extraordinary General Assembly of IUPAB  
Montpellier, August 28<sup>th</sup> 2005**

**Minutes**

**1. Accreditation of Delegate**

The following delegates represent the Adhering Bodies:

<b>Adhering Body</b>	<b>Name</b>	<b>Given Name</b>	<b>Category</b>
Argentina	del Valle Alonso	Silvia	3
Armenia	Trchounian	Armen	Observer
Australia	dos Remedios	Cris	3
Austria	Laggner	Peter	3
Azerbaijan			Observer
Belarus			Observer

Belgium	Engelborghs	Yves	3
Brazil	Silva	Jerson L	3
Bulgaria			Observer
Canada	Thewalt Smith	Jennifer Ian	2
Chile			Observer
China (Beijing)	Shen Rao	Jun-Xian Zihe	2
China (Taipei)	Chun-hung Po-huang	Lin Liang	2
Colombia	Avellaneda	Carlos Rojas	Observer
Croatia	Svetličić	Vesna	3
Czech Republic	Vetterl	Vladimir	3
Denmark	Mouritsen	Ole G	3
Egypt	El-Gohary	M I	3
Finland	Puustinen	Anne	3
France	Croquette Kochoyan Moras	Vincent Michel Dino	1
Germany	Rüterjans Nienhaus Grubmüller	Heinz Ulrich G. Helmut	1
Greece			Observer
Hong Kong	Chang	Donald D.	Observer
Hungary	Tigyi	Joseph	3
India	Singh Mishra	T P K P	2
Iraq	suspended		3
Israel	Haas	Elisha	3
Italy	Conti Frediani	Franco Carlo	2
Japan	Nagayama Yomo Sokabe	Kuniaki Tetsuya Masahiro	1
Korean Republic	Kang	Sa-Ouk	3
Mexico			3
Netherlands	van Grondelle Schmidt	Rienk T	2
New Zealand	Parry	David A. D.	3
Norway	Andersson	Kristoffer	3
Poland	Bartosz	Grzegorz	3
Portugal	Soares	Claudio M.	3
Romania	Kovacs	Eugenia	3
Russia	Rubin Krupyanskii Prusakov	Andrew B. Yurii Valeriy	1
Saudi Arabia			3
Serbia & Monten.	Radotic	Ksenija	3
Slovak Republic			3
Slovenia	Strancar	Janez	3
Spain	Carrascosa Alonso	Jose L. Alica	2

Sweden	Nilson Brzezinski	Lennard Peter	2
Switzerland	Vogel	Horst	2
Turkey			Observer
Ukraine			Observer
United Kingdom	Watts Seddon Ferenci	Antony John M.	1
United States	Olson Toro Barrick	Wilma Ligia Douglas	1
Uruguay			Observer
Venezuela			Observer
Vietnam	suspended		Observer

**2. Adoption of Agenda**

The tabled agenda was adopted.

**3. Change of the Category of Adhering Bodies**

The change of category from 3 to 2 of the Spanish Society of Biophysics was confirmed.

**4. Admission of New Adhering Bodies and Observers**

The Biophysical Society (USA) has asked to become an Adhering Body of IUPAB in addition to the Academy of Sciences USA. This application had already been discussed at the Council meeting in Paris 2004 and in the Council in Montpellier on August 27<sup>th</sup>. Both Councils supported the application. After a detailed discussion which was controversial in part, the General Assembly accepted the application without dissenting votes. The Biophysical Society is now an Adhering Body of category 1.

**5. Change of Statutes**

The proposed change of Statutes was communicated to the Adhering Bodies in August 2004 (IUPAB NEWS 49) and once more in June 2005 (IUPAB NEWS 50). The changes were restated orally by the President of IUPAB. According to the Statutes they can be modified only by a 2/3 majority of all the Adhering Bodies present at the General Assembly. The new statutes were accepted with two dissenting votes and no abstains.

**6. Rules of Procedure**

The Rules of Procedure were accepted unanimously.

**16<sup>th</sup> General Assembly of IUPAB  
Montpellier, August 28<sup>th</sup> 2005**

**Minutes**

**1. Accreditation of new Delegates**

As delegates of the Biophysical Society the General Assembly accepted:  
Steve Harvey, Richard Ludscher and Fred Sachs

- 2. Adoption of the Agenda**  
The tabled agenda was adopted.
- 3. Approval of the Minutes of 15<sup>th</sup> General Assembly, Buenos Aires 2002**  
The minutes were communicated in the IUPAB NEWS 47 in July 2002. They were accepted univocally.
- 4. Report of the President**  
This report is printed in the IUPAB NEWS 50. The additional remarks on the Geneva meeting will be communicated in IUPAB NEWS 51 (December 2005).
- 5. Report of the Secretary General and Financial Report**  
It is printed in the IUPAB NEWS 50. Meanwhile an audit report exists for the year 2004. A report for 2003 is on the way. After the Financial Report the General Assembly discharged the Secretary General.
- 6. Presentation of Reports of Task Forces**  
The reports of the “Task Force on NMR in Biology” and of the “Task Force on Bioinformatics” are printed in IUPAB NEWS 50. The other reports will be printed in IUPAB NEWS 51 (December 2005). All task forces shall continue for the next 3 years.
- 7. Election of Officers and Council Members**  
These are the new Officers and Council members of IUPAB:  
President: Ian C. P. Smith (Canada), Past President: Jean Garnier (France), Vice-Presidents: Kuniaki Nagayama (Japan) and Wilma K. Olson (USA), Secretary-General Fritz G. Parak (Germany), Members: Robert Brasseur (Belgium), Peter Brzezinski (Sweden), Franco Conti (Italy), Peter Laggner (Austria), Greta Pifat-Mrzljak (Croatia), J. E. Ponce-Hornos (Argentina), Manuel Prieto (Portugal), Zihe Rao (China), Cris G. dos Remedios (Australia), Gordon C. K. Roberts (UK), A. B. Rubin (Russia), Tej P. Singh (India).
- 8. 16<sup>th</sup> International Biophysics Congress, Long Beach, USA**  
The contract between the Biophysical Society (USA) and the IUPAB comprises the minutes of the 2005 IUPAB and BPS meeting in Long Beach submitted by Ro Kampman. The three representatives of IUPAB on the program committee are J. Garnier, I. Pecht and D. A. D. Parry. J. Garnier will also represent IUPAB in the travel grant selection committee. The Biophysical Society will be represented by Ligia Toro on the latter committee.
- 9. Place and date of 17<sup>th</sup> International Biophysics Congress**  
There were three applications to host the congress in 2011. Candidates were the cities of Beijing (China), Cairo (Egypt) and Graz (Austria). Zihe Rao introduced the possibilities of Beijing and M. I. El-Gohari presented the advantages of Cairo. Peter Laggner withdrew the application of Graz promising to apply again in three years. The General Assembly recommended Beijing by a large majority.
- 10. Any other approved business**  
No other business.

**51<sup>th</sup> Council Meeting of IUPAB**  
**August 31, 2005, 17:30h, Montpellier**

**Minutes**

**51.1 The new Council**

I. C. P. Smith (Canada), President; J. Garnier (France) Past President; K. Nagayama (Japan) W. K. Olson (USA) Vice-Presidents; F. G. Parak (Germany) Secretary-General; R. Brasseur (Belgium), P. Brzezinski (Sweden), F. Conti (Italy), P. Laggner (Austria), G. Pifat-Mrzljak (Croatia), J. E. Ponce-Hornos (Argentina) M. Prieto (Portugal), Z. Rao (China), C. G. dos Remedios (Australia), G. C. K. Roberts (UK), A. B. Rubin (Russia). T. P. Singh (India) Members

**51.2 Adoption of the Agenda**

The tabled agenda was adopted.

**51.3 Grants 2006**

The following grant applications were discussed and decided in the 50<sup>th</sup> Council:

1.) A Latin American Post-graduate Program of Biophysics in La Plata, proposed by J. R. Grigera. The workshop will be supported with 5.900,00 USD.

2.) Workshop on Biocalorimetry and Biological Thermodynamics in Rio de Janeiro proposed by M. L. Bianconi and M. F. Colombo. IUPAB supports it with 8.000,00 USD.

3.) 14<sup>th</sup> European Bioenergetics Conference in Moscow proposed by V. P. Skulachev. Support is rejected since IUPAB policy is not to contribute to periodic events.

4.) International Summer School on Biophysics "Supramolecular Structure and Function" in Rovinj proposed by G. Pifat- Mrzljak. This Summer School has already been carried out successfully several times. IUPAB can not support periodic events. However, this decision of the 50<sup>th</sup> Council was revised. The Summer School is supported by 2.500,00 USD for the last time for travel fellowships.

5.) Proteins as Cellular Nanomachines: Molecular Motors, Channels, Pumps in Rio de Janeiro proposed by J. R. Sotelo et. al. The proposal was not clear enough. Especially the ratio of speakers to students was unconventional. Before a decision can be made some questions have to be clarified.

6.) Winter School of NMR in Biological Systems in Ibadan, Nigeria, proposed by Gabriel Ogunmola. The Council appreciates that a proposal comes from Nigeria, since Africa needs more support. However, there are some points which should be clarified before a decision can be made. I. Smith will try to get the necessary information.

**51.4 15<sup>th</sup> International Biophysics Congress Montpellier**

Michel Kochoyan gave a first overview. There were about 1000 participants. The travel fellowship program was very successful. The Conference Organisers waived the conference fee also for non successful applicants. A problem arose from the fact that the Convention Centre was very expensive. However, the organisers could not find an alternative because of the large number of



participants. One also has to consider that even participants which did not have to pay the registration fee increased the costs because the Convention Centre asked a fee for each registration. The exhibition was not very successful. There is no tradition for the companies to go to this type of meeting. Probably there will be no gain and no lost. A detailed balance will be given later.

**51.5 16<sup>th</sup> International Biophysics Congress Long Beach**

The decisions of the 50<sup>th</sup> Council were explained.

**51.6 Place and date of the 17<sup>th</sup> Congress**

In agreement with the vote of the General Assembly it was decided that the 17<sup>th</sup> International Congress will take place in Beijing (China). The time will probably be end of August/beginning of September 2011. The Congress has to end before September 5.

**51.7 Commission of Sponsored Meetings**

This proposal by Wilma Olson and Cris dos Remedios raises the question how IUPAB can improve the sponsoring of high level workshops in Biophysics. Wilma Olson and Cris dos Remedios agreed to formulate a compact version of their ideas taking into account the discussion in the Council. The idea should also be discussed with EBSA.

**51.8 Change of the Statutes**

The Secretary General has noted in the 50<sup>th</sup> Council and in the General Assembly that, in his opinion, the organisation form of IUPAB is not optimal. In most similar Unions the positions of Secretary General and Treasurer are separate, while in IUPAB the Secretary General has both functions. The 50<sup>th</sup> Council as well as the General Assembly expressed their understanding for these arguments and supported a proposal for a change of the statutes. The 51<sup>st</sup> Council agreed. It is however, important not to reduce the number of Council members.

**51.9 Any other business**

Jean Garnier reported on a meeting in Geneva which will be communicated in the next IUPAB NEWS.

According to the 50<sup>th</sup> Council the **next Council** will take place in September or October 2006, probably in Canada.

## Reports on activities from Task Forces

### ~~IUPAB Task Force on Biomedical Spectroscopy, 2002-2005~~

#### Overview

This Task Force was formed by splitting the former Task Force into two, the other being the Task Force on NMR in Biological Systems. There is occasional overlap between the aims of the two, in which case they cooperate on actions taken.

## **The Aims of the Task Force**

- Knowledge translation from the physics and engineering disciplines to those able to make use of it in biochemistry, biology, and medicine
- Linkage of scientists of different specialities, especially in areas of dilute population or limited opportunity
- Organization of workshops to accomplish the above
- Interaction between our Union and other international organizations, in order to accomplish the above
- Increase the awareness of the value of biophysics in the biological and medical sciences

## **Task Force Members**

Ian C. P. Smith (Canada)

Carolyn E. Mountford (Australia)

Shirley Schreier (Brazil)

Girjesh Govil (India)

Gheorghe Mateescu (USA)

Our Task Force interacts regularly with the IUPAB Task Force on NMR in Biological Systems.

## **Impacts**

### **Workshops on Spectroscopy in Biology in Medicine, Sinaia, Romania, June 2003, 2004, 2005**

The IUPAB contribution to this workshop in 2002 catalyzed its success, with attendees from surrounding countries and a very significant knowledge transfer. Partnerships were formed where instruments and expertise were shared to accomplish research otherwise impossible. Drs. Mateescu and Smith were the principal organizers for all four years. Since 2004 this workshop has been supported by the International Society of Magnetic Resonance in Medicine, and in 2005 attracted participants from 18 countries. It is now close to self-supporting. Approximately 500 radiologists have been trained and are now practising MR radiology in East European hospitals.

### **Workshop on Spectroscopy in Biology, Rio de Janeiro, April, 2004**

Organized by Drs. Schreier and Smith, and supported by IUPAB, this workshop aspired to connect scientists from South and Central America, to facilitate joint research projects, and to transfer knowledge. Approximately 200 scientists from ten countries participated.

### **Workshop on Magnetic Resonance in Medicine, Delhi, India, January, 2005**

Ian Smith was on the programme committee for this workshop, which has aims similar to those of the Romanian workshops. These are to transfer knowledge and practical details of magnetic resonance in medicine to medical practitioners from India.

### **International Conference on Magnetic Resonance in Biological Systems, Hyderabad, India, January, 2005**

This conference covered high resolution NMR applications in biological systems. Both Girjesh Govil and Ian Smith were on the organizing committee.

### **Conference on Spectroscopy in Biology, Poiana Brasov, Romania, October 2005**

This conference was sponsored once by IUPAB in 2003. It was a great success and attracted participants from many countries in Eastern Europe. It is now self-supporting. Ian Smith was a member of the organizing committee for 2005, and will participate.

### **Conference on Spectroscopy in Biophysics, Ibadan, Nigeria, 2006**

Discussions are underway with Nigerian authorities for our first workshop in Africa. We are hoping to follow up in 2007 with a similar workshop in South Africa. These will involve both task forces.

### **Overall**

The Task Force has had much success in the transfer of knowledge and the linking of research groups of different specialities. The small investments of IUPAB have had very significant leverage in fund raising and in bridging interdisciplinary barriers. Details of IUPAB-sponsored workshops are already on IUPAB records.

Ian C. P. Smith, Convenor, Task Force on Biomedical Spectroscopy, August 2005

### **IUPAB Task Force on Education and Capacity Building on Biophysics, 2002-2005**

#### **Roorkee (India), 24-25 February 2003**

The first meeting done in the Asian area takes place in Roorkee, India, with the co-operation of Prof. G. Govil. The conclusion can be abstract as following:

The immediate actions to be taken on Capacity Building will be the organization of one Workshop per region. The dates and the topics of each of them will be defined in the future by the Task Force. Exchange programs of the kind of the pilot experience in Latin America will be welcome. Funds have to be seeking.

As regards the Education it was considered the need of a program on Master and PhD level for the region. This will strongly promote the formation of high level biophysicists and, therefore, facilitate also the Capacity Building for the future.

It was unanimously accepted the proposal of Professor S. Arapetyan in the sense of make the necessary steps to prepare a PhD/Ms Program for the region based in the UNESCO Postgraduate University on with the participation of UNESCO Chairs in Life Sciences and local Universities along the region. A working group composed by Prof. Arapetyan, Prof. Jagannathan, Prof. Akasaka, and Prof. Grigera was set. The mission of this working group and is to prepare a draft of such a project as well to make the preliminary contacts. Such a draft will available for analysis and circulation among the rest of the participants.

It was recommended to restart the BiophNet to carry the information related to the activity of the Task Force.

#### **Yeravan, (Armenia) 1-5 March 2005**

Due to the lack of funds it was not possible to do a full workshop. Instead, in March 2005 a Round Table was organised, together with Prof. S. Arapetyan, in the framework of an UNESCO Seminar and NATO Advanced Workshop taking place in Yeravan. During the meeting the Round Table was taking place with the participation of Biophysicists from different countries of the region plus one from Portugal, one from Greece and me as a convenor of the Task Force on Education and Capacity Building in Biophysics of IUPAB. In the subsequent days discussions go on to arrive finally to some conclusions that can be briefly stated as follows:

- One of the goals that most people want, in coincidence with the conclusion reached in Roorkee, is to establish an International Post-graduate Program in Biophysics. Asia-Africa presents a heterogeneity that precludes any unified plan. Therefore, most people agree that there should be a number of programs for different sub-regions.
- One of the elements to select the different regions is the language. Although that English should be a common language for several reasons, the regular life for a medium length stay requires a sensible communication with the students and the population. Other aspect

to be considered is the political and racial situation. In practical terms, and besides the wishes of a world without racial and political barriers, we have to be realistic and avoid the difficulties existing in different regions. Finally we have to take into account the existing facilities to optimise the resources.

Roughly, we can establish at least as sub-regions:

1. - Russian speaking area. Ex-Soviet Union Countries
2. - English –
  - a) India and surrounding area
  - b) Some African Regions
3. - French - Some African Regions.

It was suggested, during the discussions on the round Table and the subsequent days, to consider the UNESCO Chairs of Life Sciences existing on the region as operation centres of the activities in the sub-regions.

Along this line, I have contacts as the UNESCO Division of Higher Education. It seems that UNESCO can give support along this line. We are working on the details of the project to be submitted both to UNESCO and IUPAB Council.

### **Biophysical Society (USA)**

Contact with the Biophysical Society of USA where made as Prof. dos Remedios suggested giving as a result the consideration of some Latin American students for a short term visit to USA laboratories funded by the Biophysical Society. It will be possible in the future to include other areas. For the moment the action was restricted to Latin America since the information network and the evaluation system is already settled.

The first three students were selected and we are waiting for the final decision of the International Committee.

<sup>i</sup> Besides the participation of foreign teachers the need to improve the English, both speaking and writing of the young researchers is one of the action that has to be pursued.

J Raul Grigera

### **Report on the meeting of the States parties to the convention on the prohibition of the development, production and stockpiling of bacteriological (biological) and toxin weapons and their destructions, BWC, Geneva, June 13-24 2005**

The meeting was related to the International BWC of 1972 presently ratified by 148 countries. The goal of the meeting was to associate experts and State parties to establish guidelines (also called code of conduct, or code of good conduct) for scientists who have “the potential to misuse ...legitimate activities that... could involve theoretical, experimental or applied work in fields as life sciences...” . “Scientists must be understood as a very broad category of personnel,..., scientists, engineers, technologists and other specialists” (BWC/MSP/MX/WP. 9, June 9, 2005). These guidelines will concern the behaviour of the scientists and the content of their publications for potential misuse by others. These guidelines can represent a real danger to hamper the development of science in preventing the two essential freedoms for science: academic freedom and freedom of communication. This has been felt by all scientific institutions I heard their reports: C. Smith for ICSU, M. Osborn for IUBMB, the Germany delegate for “the University Science Perspective) and myself for IUPAB (see my translated presentation to the meeting). However all recognized the necessity to have guidelines or code of conduct to avoid the development and use of biological weapons by governments and their employees including scientists. Similar actions were taken in the past for atomic research.

Several countries have already developed such guidelines for their own government employees for example in Great Britain (Civil Service code, Health Protection Agency, etc...). They are mostly inspired by bio safety measures and code of integrity. They apply to scientists doing or willing to undertake experiments with dangerous materials including bacteria or toxins, recombinant technologies etc.... For some countries there is a moratorium on certain biological experiments such as stem cell research or human cloning.

More intriguing for me was the will to restrict scientific publications that could lead to the misuse of their results by others, in the name of the bio security. This has already been implemented for publications in Science, Nature, American Society of Microbiology Journal and PNAS. Fortunately it rested on the judgement of their existing editorial board. Ph. Campbell made a survey of what has happened. No publication has yet been refused for dual-use assessment except one delayed in PNAS. Then should we be worried? Certainly because there will be pressure to include subjects besides microbiology experiments (for instance synthetic biology!) and more worrisome would be to complement the editorial board with specialists in bio security.

To conclude I will say that bio safety regulations are acceptable, bio security regulations could lead to a witch-hunt and be a blow to the universality of science. Misuse of science should be the concern of any citizen not of the scientists only. It is a choice of society.

Jean Garnier

### Some Statistics of the Montpellier Congress

On line Pre-registrations	1357	1081 ( 80%) submitted abstract
Confirmed registrations	1123	230 (17%) off
Confirmed but absent	6 5	
<b>Present Participants</b>	<b>1058</b>	

<b>Registered</b>	<b>1122</b>	83% of pre-registrations
Paying Participants	846	33% students
Fellows	90	
Invited speakers+Officials	132	
OC+invited	54	

Early registration	82%
Late/on site regist.	18%

### 1122 registered participants from 53 countries

(Final number of badges distributed)

Number of participants per country:

53 Countries

Country	Nb	Country	Nb
France	323	Denmark	6
Germany	146	Armenia	6
USA	77	Ukraine	5
Japan	70	Singapore	5
UK	55	Egypt	5
China	39	Austria	5

Italy	29
Switzerland	27
Portugal	26
Spain	25
Poland	24
Hungary	24
Russia	23
India	20
Romania	19
Brazil	13
Canada	12
Taiwan	11
Slovenia	11
Israel	11
Finland	11
Belgium	10
Sweden	8
Netherlands	8
Czech Republic	7
Australia	7
Iran	6

Turkey	4
Mexico	4
Croatia	4
Chile	4
Argentina	4
South Korea	3
Lithuania	3
Bulgaria	3
Slovaquia	2
New Zealand	2
Ireland	2
Greece	2
Georgia	2
Azerbaijan	2
Yugoslavia	1
Venezuela	1
Norway	1
Latvia	1
Colombia	1
Belarus	1
TOTAL	1122

Number of participants per country and continent:

Continent	Country	Number	% of total
E.U. (extended)	France	323	
	Germany	146	
	UK	55	
	Italy	29	
	Switzerland	27	
	Portugal	26	
	Spain	25	
	Hungary	24	
	Poland	24	
	Romania	19	
	Finland	11	
	Slovenia	11	
	Belgium	10	
	Netherlands	8	
	Sweden	8	
	Czech Republic	7	
	Denmark	6	
	Austria	5	
	Croatia	4	
	Bulgaria	3	
	Lithuania	3	
Greece	2		
Ireland	2		
Slovakia	2		
Latvia	1		
Norway	1		
Yugoslavia	1		

NOTE

China, Russia, India:

Want to emerge  
Many pre-registrations  
Many abstracts

but

Funding difficulties  
Visa difficulties and  
delay

Subtotal E.U.		784	69,9%
	Japan	70	
	China	39	
Asia	India	20	
	Taiwan	11	
	Singapore	5	
	South Korea	3	
Subtotal Asia		148	13,2%
North America	USA	77	
	Canada	12	
Subtotal North America		89	7,9%
	Russia	23	
	Armenia	6	
	Ukraine	5	
Eastern Europe	Azerbaijan	2	
	Georgia	2	
	Belarus	1	
		39	3,5%
	Brazil	13	
	Argentina	4	
South America	Chile	4	
	Mexico	4	
	Colombia	1	
	Venezuela	1	
Subtotal South America		27	2,4%
	Israel	11	
Middle East	Iran	6	
	Turkey	4	
Subtotal Middle East		21	1,9%
Oceania	Australia	7	
	New Zealand	2	
Subtotal Oceania		9	0,8%
North Africa	Egypt	5	
Subtotal North Africa		5	0,4%
Total			1122

Number of abstracts per topic:

Topic	Number
Biophysics and Disease	99
Protein Reactivity and Dynamic	89
Membrane Microdomains	89
Channels and Receptors	65
Single Molecule Biophysics	60
Protein Folding	59
Functional Complexes	50
Regulation of Membrane Trans	43
Modelling Complex Systems	41
From DNA to Chromatin	40
Drug Design and Delivery	39
Redox Enzyme Mechanisms	33

Functional Cell Imaging	32
Light Driven Systems	23
Morphogenesis: from cell adhes	23
The RNA World	22
Muscle Biophysics	18
Proton Pumping Systems	14
Molecular Crowding	13
Sensing with Ion Channels	12
Rotors and Motors	12
Imaging Organisms	10
Teaching Biophysics	7
Total	956

### Excepting invited speakers

NOTE: The new “complexity” topics : Molecular Crowding & Morphogenesis. Few abstracts but very high attendance.

## Reports on Satellite Meetings

### **Report on the Cairo Satellite Meeting, 4-5 September, 2005, Azhar Conference Center - Cairo**

Cairo satellite meeting was held under the auspices of HE Prof. Dr. Amr Ezzat Salama, Minister of Higher Education and Scientific Research.

The main title of the satellite: " Environmental Biophysics". Cairo satellite meeting was held with collaboration of IUPAB.

Fifty three (53) research articles were presented throughout eight (8) sessions, in addition two sessions of poster presentation.

Four invited speakers presented four plenary lectures on the following topics:

1. Prof. Dr. Rashid Naguib (Pakistan) Professor of physics, COMSATS Institute OF IT, Lahore, Pakistan

Topic: Detection of Nuclear Radiation by SSNTDS: A Brief Introduction

2. Prof. Dr. M. EL Reay (Egypt) - Professor of physics, Institute of Higher Studies and Researches, Alexandria University

Topic: Protection of Environment against Air Pollution.

3. Prof. Dr. M.Emara (Egypt) Professor of physical chemistry, Faculty of Science, AL Azhar University

Topic: Overview of Risk Assessment and Environmental Decision Making.

4. Prof. Dr. Fatma EL Gohary (Egypt) Professor of chemistry, National Research Center

Topic: Protection of Water Resources from Pollution

Over one hundred and twenty scientists (of them about 50 young scientists) from Egypt and from a number of Arab countries such as Iraq, Sudan, Libya, and Jordan, as well as from other countries like Pakistan, United States (USA), Russia participated in the Cairo satellite meeting.

Chairman of Organizing Committee, M. I. EL Gohary



## **Report of the Satellite Meeting “Neutrons in Biology”, Institut Laue Langevin – Grenoble, France 4 - 7 September 2005**

Last September, the Institut Laue Langevin (ILL) welcomed participants of the first international Neutrons in Biology meeting in recent years, renewing a tradition started in the nineteen seventies at Brookhaven National Laboratory, USA, and providing a good opportunity to assess past and present achievements in the field and to discuss future developments. The meeting was a satellite of the 15<sup>th</sup> IUPAB, 5<sup>th</sup> EBSA International Biophysics Congress 2005, in Montpellier and the organisers are happy to acknowledge financial and material support from ILL, and financial support from NMI3, Integrated Infrastructure Initiative for Neutron Scattering and Muon Spectroscopy of the EU 6<sup>th</sup> Framework programme, the International Union of Pure and Applied Biophysics, and Spectra Stable Isotopes. Eighty three participants attended from Europe, the USA, Australia and Japan. The meeting programme and other information are available at <http://www.ill.fr/neutbio2005>.

The advantages of neutron radiation for the study of molecular structure are based on the fact that they are scattered with similar power by atomic nuclei. They can distinguish between hydrogen (H) and its isotope deuterium (D), and they are highly penetrating and non-destructive, thus allowing studies on a wide range of biological systems. Neutron diffraction experiments at high resolution locate protons in crystal structures even when they are disordered, and at low resolution provide a unique insight into the internal organisation of complex structures by using H-D labelling of the macromolecules or solvent. Neutrons of wavelength in the Ångström range, and their associated energy, exactly match the length and time scales of thermal excitations in condensed matter, making neutron radiation a perfectly suited probe for the experimental study of molecular dynamics in biological macromolecules.

After the welcome to participants expressed by Christian Vettier, the ILL science director, the current neutrons in biology situation was analysed by Joe Zaccai (Grenoble). The neutron landscape is now very different from that of thirty years ago. When the ILL user programme started in 1973, neutron diffraction data had been collected from Vitamin B12 at Harwell in the UK, neutron protein crystallography was being developed in Brookhaven to locate protons, biological membranes were studied on dedicated diffractometers in Harwell and Brookhaven, and small angle neutron scattering was applied to solve the quaternary structure of the ribosome. The variety of instruments on high flux beams at ILL significantly extended the range of biological systems and space-time windows covered by the method, and results quickly followed. Now, the ILL remains the most powerful neutron source with the largest instrument park for applications in biology. However, steady state sources in Berlin, Gaithersburg, Geesthacht, in Jülich, Oak Ridge, Paris, Tokai, and pulsed neutron sources in Oxfordshire, in Villigen, and Los Alamos have introduced instrumentation to make possible certain biological experiments. A new facility has recently become operational near Munich, and next generation pulsed sources are being built in the USA and Japan. The European neutron scattering community is making a strong argument for the building of the European Spallation Source, which should provide a major increase in beam intensities and open up new fields of study. Despite an apparently long list of neutron sources, biology projects are in practice quite restricted because of the strong competition between the different scientific areas for neutron beam time. Considering this, the recent publication record for neutrons in biology is quite impressive.

The Grenoble meeting covered all aspects of the field: high and low resolution crystallography, small angle scattering, fibre diffraction, membrane diffraction and reflectometry, and energy resolved scattering for the study of molecular dynamics. In order to favour cross-disciplinary scientific discussion, the decision was taken not to dedicate oral presentation sessions to specific methodologies, but to have representative talks from the

different aspects in each session. This led to lively discussion and cross-fertilisation of ideas. There were invited presentations on human aldose reductase, a target enzyme for diabetes treatment (Alberto Podjarny, Strasbourg), the joint use of neutron and X-ray scattering (Dmitri Svergun, Hamburg) and neutron scattering and NMR (Martin Blackledge, Grenoble), protein solvation (Christine Ebel, Grenoble) and dynamical transition (Alessandro Paciaroni, Perugia). Jill Trehwella (Sydney) reported on receptor proteins and their targets, Huey Huang (Houston) on membrane-peptide interactions, Jonathan Cooper (Southampton) on aspartic proteinases a clinically important protein family, Klaus Gawrisch (Bethesda, MD) on membrane reconstitution, Bruno Demé (Grenoble) on model membranes, Mitsuhiro Hirai (Gunma, Japan) on raft membranes, and Thomas Nawroth (Mainz) on magnetic target liposomes, nano-particles for cancer therapy. Talks followed on glycolipid membranes (Motomu Tanaka, Munich), LADI, the dedicated neutron crystallography diffractometer (Flora Meilleur, Grenoble), molecular adaptation to extreme environments via dynamics (Moeava Tehei, Grenoble), the calcium regulated switch in muscle (Paul Curmi, Sydney), hydrated protein dynamics (Koji Yoshida, Paris), low temperature neutron protein crystallography (Leif Hanson, Toledo OH) and a membrane light harvesting complex in bacteria (Stephen Prince, Manchester). Deborah Leckband (Urbana, IL) spoke of cell adhesion, Yoshiraru Nichiyama (Grenoble) of cellulose fibers, Geoff Kneale (Portsmouth) of subunit assembly and topology of the Type 1 restriction-modification complex involved in bacterial protection against foreign DNA, Mounir Tarek (Nancy) of molecular dynamics simulations, Joseph Curtis (Gaithersburg, MD) of proteins forming amorphous glasses and Daniel Sapede (Grenoble) of the structure of spider silk. The conference dinner was enjoyed on the last evening in a chateau restaurant in the town of St Marcellin about half an hour from Grenoble in the bas-Gresivaudan valley. The last morning was dedicated to talks by Fritz Parak (Munich) on protein dynamics on different time scales, Anthony Watts (Oxford) on membrane protein dynamics, Giovanna Fragneto (Grenoble) on the membrane translocation domain of diphtheria toxin, Maikel Rheinstadter (Grenoble) on membrane collective dynamics, and Stephane Longeville (Paris) on macromolecular crowding. Poster prizes were presented to Phillip Callow (Grenoble) for his poster on type I restriction-modification enzymes, to Marion Jasnin (Grenoble) for her poster on the mapping of dynamics in live bacterial cells, and to Isabelle Hazemann (Strasbourg) for her poster on aldose reductase.

A round-table on ‘Sources and Resources’ brought forward the understated role of neutrons in modern structural biology and their power to solve important problems in the post genome sequencing era. Despite significant progress in biochemical and biophysical methods for the deciphering of the large protein and protein-nucleic acid assemblies that constitute the basis of most cellular functions, we still have a lot to learn. Neutrons, and especially small angle scattering methods based on contrast variation, are ideally suited to the study of dynamic macromolecular assemblies. This was demonstrated decades ago by a number of influential studies on nucleic acid-protein interactions. Some of this work was ahead of its time, however, because crystal structures of the components were not then available. Now, there are more than 32500 structures in the protein data bank, and in many cases we have high resolution models of the interacting components in protein assemblies. The round table resulted in a consensus for a concerted action to set up programmes for solution studies of dynamic macromolecular assemblies. The programmes will require a pro-active approach on the part of the neutron sources to make available the necessary measuring time on the instruments. As a first step in this direction, EuroBioSANS, an informal association of biological small angle scattering scientists at the different European neutron sources, has been set up to emphasise that for biology studies the sources were not in competition but complementary in making available the best possible environment for successful work in this field.

Joe Zaccai

## Report on the General Assembly of ICSU

The GA of ICSU took place in Sozhou ,China, during 16-21st October 2005. This General Assembly has been a rather exceptional and unexpected experience, first because of the location that was, indeed impressive and interesting and second, because of the overwhelming hospitality that the Chinese hosts have extended to the meeting and its participants. It was impressive in both the scope and meticulous organization that were extraordinary. The general impression of the ICSU General Assembly itself was that this organizations' operations for the benefit of science and mankind are unfortunately becoming limited . One of the more important topics of discussion during the General Assembly, finances, illustrated the severity of the problem: Clearly ICSU is in a rather serious financial situation as its support which comes first from the constituent bodies is insufficient for their intended activities, let alone the daily running of the expensive operation of its administration. Past additional major support came from UNESCO, NSF and the US State Department. With these sources now dried out, the situation seems critical. At the same time, ICSU has initiated an ambitious program of opening up regional offices; The first is already opened in Nigeria (for Africa) and a second is in the process in Malaysia (at Kuala Lumpur) for south east Asia. Further offices are negotiated in South America and The Arab countries.

On top of this, other programs outlined by the Executive Board are quite demanding ; Those in the Geo sciences seem reasonable and promising. In the life sciences there is also a considerable ambition but the team involved in planning at least one specific operation seems to be limited. Namely, a program is promoted under the title: "Science for Health and Well-Being" primarily by sociologists and psychologists. A serious problem is the position of the life sciences in ICSU; several steps apparently taken by the Executive Board to organize clusters of the other sciences( e.g. Geo, Social) .This led to a marked decline in the relative weight of the life sciences' Unions. The earlier mentioned clusters selected their candidates prior to the General Assembly and hence these were already elected to the Board ahead of the General assembly . For the single slot of the life sciences Unions, there were 6 candidates! Needless to state you that the life sciences unions constitute more than 50% of the members...

Israel Pecht

## The way towards the Long Beach Congress 2008

The 16<sup>th</sup> International Biophysics Congress will take place in Long Beach (USA), **February 2 – 6, 2008**

It is organised together with the Biophysical Society of USA. Because of the large size of this Congress the organisation has to start early. The Executive Committee of IUPAB and the Biophysical Society has agreed on the following timetable for establishing the program:

- February 2006: Program Committee Meeting at the BS annual meeting in Salt Lake City. The representatives of IUPAB in the program Committee will be: Jean Garnier, Israel Pecht and David Parry. Letter to the Adhering Bodies to propose Invited Speakers
- August 2006: Approval of first flyer/announcement
- Autumn 2006: IUPAB Council to propose invited speakers
- September 2006: Mailing of first flyer/announcement (16 months before the meeting)
- March 2007: Program Committee meeting to finalise the program (Baltimore, BS annual meeting).
- March/April 2007: Mailing of Call for Abstracts (10 months before the meeting)
- October 1, 2007: Deadline for receipt of abstracts.