

NATO Science and Society

NATO Science Committee and Committee on the Challenges of Modern Society

CHANGES TO COME - BUT FIRST IN OUR HEADS

The world changes, NATO adapts, our science programme evolves, and this Newsletter will soon be completely refashioned.

Some will ask - why so many changes? Others might wonder about their implications. A few will no doubt regret the good old days, when everything was simpler, easier, better! The magic of time will give a new patina to the past. But we all know that the future will soon be the present, and then it will be gone. Tomorrow the innovations of today will take on the charm of nostalgia.

So, let there be no holding back - let us embrace these reforms which are vital to ensure that our programme will still be as necessary, as lively, and as strong as ever in its primary vocation of uniting the scientific communities in their common research for progress.

Many have already understood this in accepting the idea that, within the framework of the Alliance, this can only come about in the future through a better awareness of security. So I hope that large numbers of you will take up the challenge and propose projects in this direction, and support the transformed NATO.

My Best Wishes for a Happy and Prosperous 2004.

Jean Fournet

The NATO Programme for Security Through Science



This issue of the Newsletter will expand on the new NATO Programme for Security Through Science, which was announced in the last issue, and details of which have been posted at our renewed Security Through Science web site. Applications for support following the revised criteria have begun to arrive, and we look forward to a vibrant new programme as the scientific experts of NATO, Partner and Mediterranean Dialogue countries bring their talents to bear on the problems facing the security of our societies in the coming years.

Among the items featured is a rationale for the new programme which was drawn up by the NATO Science Committee as it deliberated the way forward earlier this year. There follow a number of examples of grants already awarded in security-related areas resulting from the inclusion of 'Research Topics of Special Interest' in our support criteria during 2003, which will demonstrate the variety of security-related topics and the requirement for gaining and sharing knowledge. Some of the security-related projects of the Committee on the Challenges of

Modern Society are also highlighted, as well as the co-sponsored Science-CCMS workshop on security issues of desertification in the Mediterranean region held in early December.

The "NATO Science and Society Newsletter" was launched 20 years ago - the first edition appearing in 1984. In an editorial the then Assistant Secretary General, Henry Durand, stated the objective of the new Newsletter, which was to make the achievements of the Science Programme known to policy-makers, decision-makers, journalists, public opinion leaders, national and international personalities, as well as to the more traditional audience of scientists and engineers. This remains the objective today, as the programme evolves to tackle the security challenges of a new era.

To mark both this 20-year anniversary and the new security-related approach to funding civil science in NATO, the next edition of the Newsletter will have a new look, and a new name.



NATO
+
OTAN

Newsletter

N° 65
December
2003

NATO Science and Society

NATO Science Committee and Committee on the Challenges of Modern Society

A Rationale for Change

In arriving at a decision to transform the NATO Science Programme, which had proved its worth over 45 years, the Science Committee called upon advice from many quarters, including its international advisory panels of scientists working in NATO and Partner countries, who came together in a "Grand Gathering" at the end of 2002. In further considering the relevance of the programme to a transformed NATO Alliance at its meeting in June 2003, the Committee asked itself a series of questions:

- **Why Science?**
- **Why Security Through Science within NATO?**
- **Why Now?**
- **What is New in the Proposed Programme?**

The answers to these questions provide a rationale for a re-directed NATO Programme for Security Through Science. They are summarised below.

- **Why Science?**

The Committee noted that civil science has proved to be a highly effective vehicle for international dialogue, due to its universality and its ability to create new and highly-effective international networks, and it observed that the talent garnered in these scientific networks can be applied to the emerging threats to the Alliance.

Science is able to address vulnerabilities and provide the knowledge to counter the associated threats. This ability can be used in facing new and dangerous threats to security, such as international terrorism, which conducts a form of asymmetrical warfare, where the weaker of two unequal powers is able to exploit the vulnerabilities of a stronger one using unconventional and ruthless means.

It is forecast that terrorists will become more sophisticated scientifically, and could begin to use more advanced technologies including chemical, biological and nuclear weapons. Responding to these challenges will require the best advice that our international community of scientists can provide.

Other threats to security and stability cannot be ignored, in our increasingly complex, interconnected and fast-paced societies. Problems which were previously localised (e.g., pandemic disease, food security, cyber security, perceived risk) rapidly become global in today's environment.

Summarising this point, two main themes emerge from an examination of the contributions of science: science is both a means of *finding answers to critical questions* and a way of *connecting nations*.

- **Why Security Through Science within NATO?**

Tackling security issues in an innovative way demands inputs from fundamental and applied research. NATO provides a unique forum for a multinational and multicultural approach to the problems of security. Achieving security through science within NATO is addressed through transatlantic, European and Partner country networks which



are central to NATO Science. These cohesive networks are flexible, add value, provide competitive advantage, and offer a structure for expanding cross-boundary cooperation.

Science in NATO has built an effective and versatile political tool by improving NATO's image in the Partner countries, a fact which is frequently underestimated in the Alliance countries. It is essential to capitalise on this and related investments by implementing a focused programme on security through science.

- **Why Now?**

NATO as an organization is restructuring to meet asymmetric threats and challenges, and the NATO Science Committee is responding on an urgent basis to this development, with a new focus on security.

The expansion of NATO to include seven new member countries has provided an additional impetus for immediate change.

- **What is New in the Proposed Programme?**

The NATO Science Programme has contributed to an environment of stability and solidarity in Alliance and Partner countries in the past decade. Direct initiatives focused on security signal a new dimension for NATO Science. The new priorities will include, among others, scientific collaboration for defence against asymmetric threats and challenges; scientific collaboration to counter other threats to security; technology sharing and transfer to address Partner country priorities; and addressing relevant societal issues.

An additional initiative is that the Science Committee will provide science advice to the North Atlantic Council on security issues, and will also make annual presentations to the Council on the outcome of the new programme.

Future Perspectives

Following the launch of the Security Through Science Programme at the end of 2003, and based on this rationale, the Science Committee is now working to expand the activities and hone the management of the programme to meet the objectives and requirements of a transformed North Atlantic Alliance.

NATO Science and Society

NATO Science Committee and Committee on the Challenges of Modern Society

New Collaborative Linkage Grants Support Security-Related Studies

The following grants, in different scientific disciplines, have been selected to illustrate the type of project that is supported through the new Security Through Science Programme.

Biosensors for Monitoring Complex Ionizing Radiation

A grant has recently been awarded to link five research teams to collaborate on making an optical biosensor which will be able to monitor the effect of ionizing radiation on the human body. A biosensor is a device incorporating a biological element which can detect physiological change or the presence of chemical or biological agents in the environment. Successful development of



photo by NASA

optical biosensors would overcome size and cost problems associated with current biosensors used in research, and open them up to the mass market. The Italian co-director of this project first began her research in this promising field of optical biosensors with a linkage grant from NATO in 1995-1997, which then led to contacts with others working in the field and to investigation of further uses for the technology. The current grant will assist collaboration with Russian experts in radiation who were in charge of determining complex ionizing radiation in the MIR Space Station. As well as Russia and Italy, research groups in Poland and Bulgaria will contribute their different areas of expertise to the project.

Project Coordinators: Maria Teresa Giardi (Italy) Vyacheslav Shurshakov and Serge Druzhinin (Russia) Halina Gabrys (Poland) Katya Georgieva (Bulgaria)

Agriculture and Natural Resource Protection Policy in a Transition Period

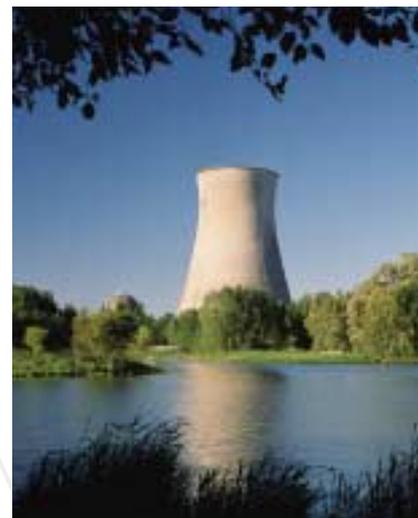
Socio-economic difficulties accompanied by unfavourable natural conditions have led to the sharp decline of agriculture in Armenia and a relaxation of all the measures for protection of natural resources. Effective preventative measures are therefore urgently required to counter potential social and ecological disaster. Scientists from Armenia and the United Kingdom are collaborating to elaborate a strategy which will encourage sustainable development of agriculture in ecologically safe conditions during a transition period. More than half the territory of land-starved Armenia is represented by rocky mountain areas, and less than half is suitable for agriculture. Moreover, due to erosion, desertification, etc. only 40% of this land is able to be cultivated. This research programme will study the possibilities of enlargement of small farms; analyse methods of biointensive agriculture and study the principles of balanced farming, selecting efficient ways most applicable to the local conditions. A university level educational programme of agriculture and natural resource protection policy in a transition period will also be developed. Following publication of the results of the study, the Armenian model will be able to be extrapolated to other transition economy countries.

Project Coordinators: Jules Pretty (UK) and Vardan Haykazyan (Armenia)

Developing Programme for Training Physical Protection Experts at Russian Nuclear Sites

The international community has been much concerned about the threat posed by the leakage of nuclear materials and technology following the breakup of the Soviet Union a decade ago. In providing assistance to address these matters, however, very little attention has been given to the human dimensions of the problem. A recent NATO-funded study found that nuclear security problems in Russia have more to do with the practices of personnel than with the presence or absence of technology. Under this collaborative project, a nuclear security training curriculum for mid-level managers and younger professionals will be developed that will inculcate nuclear security values. The training curriculum and materials to be developed will include general courses on non-proliferation, nuclear-material protection, control and accounting, export controls, international cooperation in security and non-proliferation and personnel management. The main goal of the training materials will be to convey the concerns and dangers of nuclear proliferation in the age of global terrorism, stressing the importance of their future roles as custodians of nuclear materials, and equipping them with some of the necessary tools to perform this role successfully.

Project Coordinators: Igor Khripunov and Alan Blancett (USA), Alexander Rummyantsev and Vladimir Kornelyuk (Russia)



Sensors for Chemical Weapons Detection Based on Molecularly Imprinted Polymers

Chemical sensors are further devices in the armoury of detection of chemical warfare agents. Four research teams from Greece, Poland, the UK and the USA have been awarded a grant to collaborate on developing such a sensor using the technique of molecular imprinting. Molecularly imprinted polymer (MIP) technology may overcome limitations of biological receptors such as intolerance to extreme conditions, the need for animal experiments, and high cost. MIPs are robust, inexpensive and provide long shelf-life. Additionally the polymerisation step may be combined with the construction of the sensor, hence MIPs may be ideally combined with sensors for rapid detection of biological-chemical warfare agents even under harsh conditions. The collaboration brings together teams with multidisciplinary expertise, know-how, facilities and resources to bring to bear on the problems still to be resolved.

Project Coordinators: Georgios Theodoridis (Greece) Pawel Koscielniak (Poland) Peter Fielden (UK) George Murray (USA)

NATO Science and Society

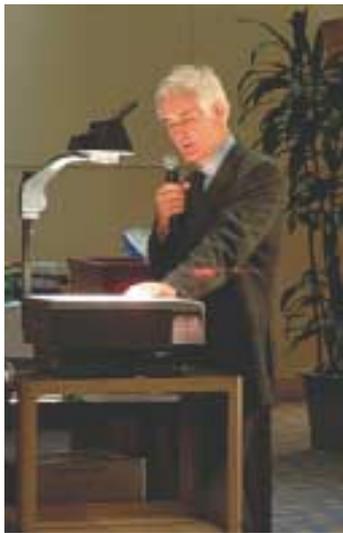
NATO Science Committee and Committee on the Challenges of Modern Society

NATO Scientific Meetings in 2004

Almost 80 scientific meetings - i.e. Advanced Study Institutes (ASI) or Advanced Research Workshops (ARW) - have already been selected to take place in 2004. Further meetings will be considered for support during the year. From these 80 meetings four are featured below to illustrate those being held in security-related areas. The full 'Calendar of Meetings' may be found at the NATO science web site (www.nato.int/science). For further information on any meeting, or to apply to attend, please contact the co-directors listed.

Flow and Transport Processes in Complex, Obstructed Geometries: from Cities and Vegetative Canopies to Industrial Problems

Kyiv, Ukraine, 4-15 May (ASI)



This ASI on a topic of fluid dynamics and agricultural engineering will feature a special full-day session on environmental security and agro-terrorism counter-measures in the context of reduction and dispersion of hazardous materials in the event of a terrorist attack. Among the topics to be treated at the ASI are atmospheric turbulence in forests; urban flows and turbulence; measurements and theory of extremely high turbulence in obstructed flows.

ASI Co-Directors: Prof. Lord Julian Hunt, University College London, UK (jcrh@cpom.ucl.ac.uk) and Prof. Victor T. Grinchenko, Institute of Hydromechanics, Kyiv, Ukraine (vgr@ihm.kiev.ua)

URL: <http://www.hydromech.kiev.ua/eng/news.htm>

Assessment of Preparedness of the Caucasus Countries for Bio-Terrorist Attacks and Planning of the Countermeasures

Tbilisi, Georgia, 25-30 September (ARW)

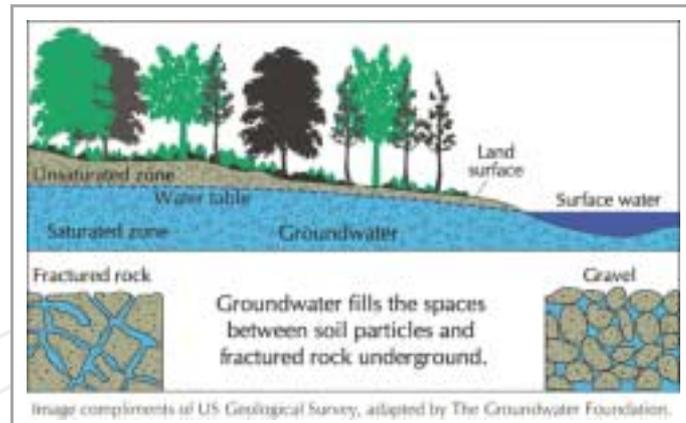
The level of preparedness in countering a bio-terrorist attack is different for various countries, and depends on such factors as economic background, technical capacity, presence of infrastructure, ability for early detection of the infectious agent and rapid response to it, etc. This workshop aims to render aid to the governments of the republics of the Caucasus in planning and organization of the total civil defence programme. Participants in the workshop will be representatives of research institutions and government agencies and recommendations will be made for local governments regarding organization of specific defence. A database of available methodology and research potential will also be developed.

ARW Co-Directors: Prof. Richard Sharp, Centre for Applied Microbiology and Research, UK, (Richard.Sharp@hpa.org.uk) and Dr. Nina Chanishvili, Georgian Academy of Sciences, Tbilisi, Georgia (chanish@kheta.ge)

Management and Sustainable Development of Urban Groundwater Systems

Baku, Azerbaijan, 6-15 August (ASI)

In most rapidly-growing cities a major challenge will be to meet the growing demand for sustainable safe water supplies. Underground water supplies - or groundwater - are usually favoured over surface water in urban water needs since they are usually better protected from pollution, including terrorist attack, require less capital expenditure, and can be developed incrementally to meet growing need. Apart from its pedagogical role, this Advanced Study Institute will aim to gain a consensus on how to resolve the complex issues involved in maintaining groundwater supplies, which are usually tackled only in a piecemeal fashion often duplicating work done elsewhere. Both researchers and practitioners, with disparate interests and cultural backgrounds, will consider a thought-provoking juxtaposition of topics.



ASI Co-Directors: Prof. John Tellam, University of Birmingham, UK (J.H.Tellam@bham.ac.uk) and Prof. Rauf Israfilov, Azerbaijan National Academy of Sciences, Baku, Azerbaijan (raufisrafil@hotmail.com)

Radiation Inactivation of Bioterrorism Agents

Budapest, Hungary, 7-9 March 2004 (ARW)

Radiation processing is widely used in the healthcare sector, in the food preservation industry, and in wastewater treatment. The possible use of ionizing radiation for the inactivation of biological weapon agents is now being studied by experts. Such radiation might be employed, for example, by postal services in processing mail to eliminate potentially dangerous microorganisms. This workshop will review recent progress in the field and enable an exchange of views on the way forward.

ARW Co-Directors: Prof. Lajos Gazso, National Centre for Public Health, Budapest, Hungary (gazso@hp.osski.hu) and Dr. Corneliu Ponta, Nat. Inst. for Physics and Nuclear Engineering, Bucharest-Magurele, Romania (cponta@fin.nipne.ro)

Image compliments of US Geological Survey, adapted by the Groundwater Foundation. This material is reproduced from groundwater.org with the permission of The Groundwater Foundation. Copyright ©2003 The Groundwater Foundation. All Rights Reserved.

NATO Science and Society

NATO Science Committee and Committee on the Challenges of Modern Society

CCMS Pursues Key Objectives on Issues of Security

The Committee on Modern Society has defined a number of Key Objectives to guide its work, and these are: Reducing the environmental impact of military activities; Conducting regional studies including cross-border activities; Preventing conflicts in relation to scarcity of resources; Addressing emerging risks to the environment and society that could cause economic, cultural and political instability; and Addressing non-traditional threats to security. Following is a sample of the ongoing studies which fulfil these key objectives.

Food Chain Security

The objective of this study, led by Turkey, is to examine the safety and security of foodstuffs in the face of their ignorant or careless handling, and more importantly against potential terrorist attacks. Such attacks may destroy or degrade the food system during distribution, processing or in the consumption phase. The study will include possible protective and response measures which may have to be taken to reduce the risk and mitigate the consequences of these threats to the food system (including managing communication and media issues).

At their first meeting, in Istanbul in October 2003, experts from Belgium, Finland, Hungary, the former Yugoslav Republic of Macedonia⁽¹⁾, Turkey and the United States, presented their national systems and the regulations used to ensure the security and safety of the food chain. Professors Brunet and Balancier from Belgium presented the "Food terrorism" case study used in the framework of another CCMS long term Pilot Study on "Effective Risk Response Strategies" and proposed to use the same analytical matrix. The next pilot study meeting will take place in Belgium, in April 2004.

⁽¹⁾ Turkey recognises the Republic of Macedonia with its constitutional name.

photo US Department of Agriculture



Effective Risk Response Strategies

The aim of this study is to improve risk management by helping individuals and agencies to predict, inform and manage the responses of various stakeholders involved in any risk event. The study is led by the United Kingdom, and it has been decided to pursue eight case studies covering different types of risk, as follows: postal anthrax (USA); climate change (Canada); very low frequency electro-magnetic fields (USA); legionnaires disease (Norway); food security (Belgium); floods (Hungary and Romania); earthquakes (Turkey); and waste incineration (Canada). Participants from the Czech Republic and Georgia are also bringing their expertise to the group. The study will operate within a so-called SPEIR framework - Source, Propagation, Exposure, Impact, Response. Alternative systems diagrams will be generated which will focus on risk responses and management. Results from these will be brought together through a cross-cutting analysis, to derive general lessons and guidelines for effective risk communication. This cross-cutting

analysis will compare and contrast the lessons of the different case studies from the point of view of various stake-holders, in relation to: (a) the geographic scale of the risk (global-national-local), (b) the timescale of the risk (acute-chronic-both), and (c) the source of the hazard (natural-human, imposed-voluntary).

Integrated Water Management

The main objective of the study, which is led by Belgium, is exchanging expertise in water system research, considering different dimensions of water management and their inter-relationships. The three dimensions to be studied are - "Integration of knowledge" which includes scientific as well as social and economic aspects, "Organizational Integration" involving the participation of stakeholders, and the "Legislative basis" which will set out the basic regulatory framework. The first meeting of the pilot study took place in Antwerp, Belgium in May 2003, and experts participated from Belgium, Bulgaria, Canada, Estonia, Georgia, Greece, Italy, Latvia, Lithuania, Luxembourg, Morocco, the Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Spain, Turkey, United States and UNESCO. Four working groups were created, on Environmental Indicators/Human Health, to be led by Canada, Community Involvement/Stakeholders, to be led by the Netherlands, Transboundary Cooperation, to be led by Estonia, and Ecological Services/Policy Analysis/Pricing, to be led by Turkey. River basins have been selected to provide examples and data, based on the experience of the participating experts. The second meeting of the pilot study will take place in Italy on 28 - 29 January 2004.

Risk Assessment of Chernobyl Accident Consequences: Lessons Learned for the Future

The Chernobyl accident prompted a considerable improvement in national and international procedures for nuclear emergency management and preparedness, especially in the areas of international communication and information exchange. However, there still remains room for improvement, for example in the field of coordinating the response to nuclear accidents, as well as in the area of decision making in the initial and later phases after an accident. The CCMS pilot study on "Risk Assessment of Chernobyl Accident Consequences: Lessons Learned for the Future" represents the continuation of a collaborative scientific activity started in April 2002 with an international workshop held in Kyiv, Ukraine, on "Risk Assessment of Chernobyl Accident Consequences". Under the co-leadership of Italy and the USA, the pilot study held its first meeting in Rome in October 2003 to collect preliminary data, evaluations and assessments on the issues to be examined, and to discuss the future programme of work. Belarus, Germany, Hungary, Lithuania, and Ukraine are participating in the study. The specific issues that will be reviewed during the pilot study are: dosimetry, effects on children, other carcinogenic effects, non-cancer endpoints, and psychological effects. The next meeting of the pilot study is scheduled to be held in Kyiv in spring 2004.

NATO Science and Society

NATO Science Committee and Committee on the Challenges of Modern Society

Security Issues of Desertification

In an Executive Summary dealing with the results of the Joint Science Committee-CCMS Workshop on Desertification in the Mediterranean Region: A Security Issue, which was held in Valencia, Spain, 2-5 December, the workshop co-directors summarised their view of the broad concept of international security, and the link between environment and security, as follows:

“Since the end of the Cold War, traditional security concepts based on national sovereignty and territorial security have increasingly been brought under review. Currently, a broader definition of security that would incorporate non-traditional threats and their causes, including environmental stress, has been advocated. Most current research indicates that global environmental change and its subsequent socio-economic effects are likely to continue and intensify in the future. The intensity as well as the interdependence of these problems will have effects not only at local scales, but also on an international scale and will begin to impact developing and industrialized countries more directly. These challenges call for mutual cooperation at the international level which provides for multi-disciplinary integration of both technical and policy-making individuals involved in the areas of environment, development of natural resources, foreign relations, and security.”



The co-directors of the workshop were **William G. Kepner**, US Environmental Protection Agency, Office of Research and Development, Las Vegas, Nevada, USA and **Jose L. Rubio**, Centro de Investigaciones sobre Desertificación, Valencia, Spain. They went on to say:

“There is strong evidence that desertification exacerbates poverty and negatively affects social order and stability. It can contribute significantly to water scarcity, famine, internal displacement of people, migration, and social breakdown and thus presents a recipe for political, social, and economic instability which can also lead to tension between neighboring countries and armed conflict.”

It is against this background that the joint Science Committee/CCMS workshop was organized. Desertification was not treated solely as an environmental problem but as an issue with cultural, political, social, and economic importance.

The full Executive Summary, together with further details of the workshop discussions, including slide presentations, may be found at the NATO web site, and information is also available at the web site of the US Environmental Protection Agency. (www.nato.int/science; www.nato.int/ccms; epa.gov/nerlesd1/land-sci/desert/index.htm)

Problems of Desertification in Central Asia

Asia is the continent with the largest land area affected by desertification, i.e. 1.4 million ha, of which 71% is moderately to severely degraded. The problems posed by desertification present a daunting challenge for the region. Two workshops dealing with different aspects of the problem are described here.

Desertification Problems in Central Asia and Its Regional Strategic Development

Samarkand, Uzbekistan, 11-14 June 2003

About 45 participants, from Central Asian countries Kazakhstan, Kyrgyz Republic, Tajikistan and Uzbekistan, and from France, Germany, Israel, Japan, Russia and the United States, attended this workshop, held at the State University of Samarkand. It allowed



Salt-affected lands in the Buchara oasis, Uzbekistan

scientists and policy-makers, including representatives of the region's local authorities, to review desertification issues and the potential for environmentally sound strategic management of Central Asian arid zones, in light of widespread problems such as salination after inadequate irrigation, deforestation and fuel wood collection, degradation of rangeland by over-stocking and over-grazing, reduction of soil productivity through inappropriate agricultural practices, and also mining of oil and gas, pumping of wastewater into deserts, etc. The results of

the workshop will shortly be available in the NATO Science Series of books.

ARW Co-Directors: Prof Frank Schrader, Lahmeyer International, Nudow, Germany (schrader_frank@t-online.de) and Prof. Pulat Khabibullaev, Academy of Sciences, Tashkent, Uzbekistan (khabibullaev@mail.ru)

Desertification combat and food security

Ashgabat, Turkmenistan - 19-23 April 2004

This will be the first NATO workshop to be held in Turkmenistan. It will enable young scientists and experts of this remote area to interact with the international network of specialists. New trends in science will be introduced to the local community. Technical research will be combined with social and economic aspects, and sustainable husbandry practices and ways of improving range management will be studied, to help to decrease land degradation, alleviate poverty and improve living standards. Training will be given in laboratory techniques in hygiene, disease diagnosis, etc. The workshop will also target senior government officials at the provincial, prefecture and county levels.

ARW Co-Directors: Dr. Bernard Faye, Animal Production Programme, Montpellier, France (faye@cirad.fr) and Dr. Paltamed Esenov, National Institute of Deserts, Ashgabat, Turkmenistan (desert@online.tm or sic@online.tm)

NATO Science and Society

NATO Science Committee and Committee on the Challenges of Modern Society



Science and CCMS Web Pages Redesigned

Following the merger of the Scientific Affairs Division with the NATO Office of Information and Press to form the Public Diplomacy Division of NATO, the science and CCMS web sites have been redesigned in the manner of the NATO Home Page. The redesign also reflects the transformation of the science programme, and below may be found some of the news items currently on the new Security Through Science home page, which may be accessed at: www.nato.int/science.

“Modernization of Science Management Approaches”



was the title of an Advanced Training Course on science policy which took place in Ljubljana, Slovenia, from 28-29 November. Assembled at this NATO course were public administrators attached to ministries responsible for science and technology from all the republics which were formerly part of Yugoslavia, and Dr. Zoran Stancic, State Secretary of the Ministry of Education, Science and Sport of Slovenia, gave a welcoming address on behalf of the Government of Slovenia.

A NATO Science for Peace project



has sponsored the setting up of a small network of four water monitoring stations on the rivers Nistru and Prut, which form the borders between Moldova and Ukraine and Moldova and Romania respectively. The opening of the water monitoring stations was marked by an inauguration workshop in Chisinau, Moldova, in late September, chaired by Prof. Georghe Duca, Minister of Ecology, Construction and Territorial Development of Moldova, co-director of the project. About 40 international experts participated in the workshop, including the NATO-country project director, Prof. J. Poças Martins of Portugal.

Presentation ceremony, 2003 NATO Science Partnership Prize:



NATO Secretary General, Lord Robertson, presented the NATO Science Partnership Prize 2003 to the two winners, Dr. Larichev (Russia) and Dr. Otten (USA) at NATO Headquarters on 22 October. A NATO Science for Peace grant in 1999 allowed the prizewinners to collaborate on the development of a high resolution imaging system that has revolutionised the production of images of the living human retina.

How can geology help society?



This was a question addressed during a workshop on geological cartography, which took place in Kazimierz Dolny, Poland, at the end of November. The context of the question was the relationship of geology to land-use and water planning. Five specific recommendations were framed by experts from 29 countries with the aim of providing government decision-makers in NATO and Partner countries with the geological information necessary to make crucial water, resource and environmental decisions, and to deal with potential hazards such as earthquakes and landslides.

See too the redesigned CCMS site, which may be accessed at www.nato.int/ccms



NATO Science and Society

NATO Science Committee and Committee on the Challenges of Modern Society

People in the News

Nobel Prize for former NATO grantees

The 2003 Nobel Prize for Physiology or Medicine was awarded to **Paul C. Lauterbur** (USA) and **Peter Mansfield** (UK) for their discoveries concerning magnetic resonance imaging. In 1977 and again in 1979 they received a NATO research grant for development of Magnetic Resonance



Imaging (MRI) Techniques. At the time there were still numerous problems to overcome before use of the technique could become feasible. Today, use of magnetic resonance imaging is routine within medical diagnostics. Worldwide, more than 60 million investigations with MRI are performed each year and MRI has replaced many invasive methods of examination.

The 2003 Nobel Prize for Chemistry was awarded to US scientists **Peter Agre** and **Roderick MacKinnon** for their discoveries concerning water and ion channels in cell membranes. Both scientists were NATO grantees in the 1980s and early 1990s, during which period they were involved in the research which eventually led to their Nobel

Prize. Roderick MacKinnon received a NATO grant to collaborate with Dr. Jacques Neyton of the Ecole Normale Supérieure, France, on the study of ion permeation in potassium-selective ionic channels. Peter Agre and colleagues from Johns Hopkins University (USA) were awarded a NATO grant to collaborate on the study of red cell membrane protein blood group antigens with Jean-Pierre Cartron and his team at the National Blood Transfusion Service, France. It was in studying such proteins that he came across the long-sought cellular water channel. Cell membrane channels are part of all living matter, and are important for the proper functioning of the nervous system and the muscles. They are thus important targets for drugs in efforts to combat disease. (More information from www.nobel.se)

Prize-winning e-science

NATO support has contributed to a prize-winning project at the UN World Summit on the Information Society, in Geneva, on 10-13 December. The Armenian-based Data Visualization Interactive Network (DVIN) was awarded world-best in the category of e-science by the World Summit Award Grand Jury. The President of Armenia, Mr. Robert Kocharian, presented the prize to Dr. Ashot Chilingarian of Yerevan Physics Institute, Armenia. Dr. Chilingarian received NATO support to develop wireless connections for real-time data transfer from mountain detectors, and also a reliable data acquisition system for modern astroparticle physics. The prize-winning programme is specialised in providing data and advance warning on sunspots and other space weather conditions, which knowledge is necessary for the safety of satellites. (More information from <http://crdlx5.yerphi.am/DVIN/index2.php>)

The NATO Science Series - recent publications

- **Future NATO Security: addressing the challenges of evolving security and information systems and architectures**, Editors M. Edmonds and O. Cerny, 2004 160 pp Published by IOS Press, Amsterdam, hardcover price \$116/€105/£74
- **The Integration of Science and Technology Systems of the Central Asian Republics into the Western World**, Editors N.K. Pak and P.C. Rambaut, 2003 168 pp Published by IOS Press, Amsterdam, hardcover price \$116/€105/£74
- **Urban Water Management: Science, Technology and Service Delivery**, Editors Roumen Arsov, Jiri Marsalek, W. Ed Watt, Evzen Zeman, 2003 348 pp Published by Kluwer Academic Publishers, paperback price \$66/€60/£41
- **Remaining Issues in the Decommissioning of Nuclear Powered Vessels**, Editors Ashot A. Sarkisov, L.G. LeSage, 2003 420 pp Published by Kluwer Academic Publishers, paperback price \$75/ €68/£47
- **Risk Science and Sustainability - Science for Reduction of Risk and Sustainable Development of Society**, Editors Tom Beer, Alik Ismail-Zadeh, 2003 256pp Published by Kluwer Academic Publishers, paperback price \$66/€60/£41
- **Applications of Genomics and Proteomics for Analysis of Bacterial Biological Warfare Agents**, Editors V.G. Delvecchio, V. Krcmery, 2003 196pp, Published by IOS Press, Amsterdam, hardcover price \$116/€105/£74

Available from the publishers - see www.nato.int/science (about . . . /publications)

This NEWSLETTER is published by the NATO Public Diplomacy Division, Brussels.

Any article of the newsletter may be reproduced with proper acknowledgement.

NATO
Science and Society
Public Diplomacy Division
Boulevard Leopold III
B-1110 Brussels, Belgium

Managing Editor : Jean Fournet
Editor : Enid I. Austin

<http://www.nato.int/science>
<http://www.nato.int/ccms>