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Editor

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Actividades de la Academia

Sesión solemne estatutaria

La *Sesión Solemne Estatutaria* tendrá lugar el 18 de agosto de 2004, en el Paraninfo de la Academia Colombiana. Por designación del Presidente de la Academia, el *Estudio de fondo*, titulado *Ciencia en Colombia: Balance y perspectivas*, estará a cargo del señor Académico numerario Don JOSÉ LUIS VILLAVECES.

Nueva Junta Directiva

En su sesión del 28 de julio de 2004, la Academia eligió nueva *Junta Directiva*, así:

- *Presidente*: Don MOISÉS WASSERMAN LERNER

- *Vicepresidente*: Don JAIME RODRÍGUEZ LARA

- *Secretario*: Don JOSÉ A. LOZANO

- *Tesorera*: Doña INÉS BERNAL DE RAMÍREZ

- *Director de Publicaciones*: Don SANTIAGO DÍAZ PIEDRAHITA

- *Director de la Biblioteca*: Don DIÓGENES CAMPOS

La nueva Junta tomará posesión

tomará posesión en la sesión solemne estatutaria del mes de agosto.

Premio de la TWAS a un joven científico colombiano.

De manera unánime el Jurado concedió el Premio, esta vez en el área de matemáticas, al señor Profesor DON ÓSCAR MARIO PERDOMO, de la Universidad del Valle. El galardonado lo recibirá en la sesión solemne estatutaria del mes de agosto de 2004.

IANAS Program on science Education

I- The generation of the Program.

1. Background. Science education is the most important way through which national societies of all countries learn about science, its values, concepts and objectives, and through which they can understand the importance of scientific endeavour for their cultural and socioeconomic development. It is a source of concern that in the present age of an unparalleled velocity of scientific discovery, science

education of our children at the primary and secondary levels is generally inadequate. The curricula and the methods used in most schools of the hemisphere and of the world do not convey the fascination of scientific research and do not transmit the values and approaches that make science relevant to everyday life and to responsible citizenship.

This pressing need to improve science education at all levels has been identified by the most prestigious international scientific networks such as the *Inter Academy Panel (IAP)*, the *International Council for Science (ICSU)* and the *Inter Academy Council (IAC)*. In the Americas, National Academies have joined other institutions to generate active programs in Inquiry-Based Science Education (IBSE) projects. For example, the US National Academies of Sciences and the Smithsonian Institution have jointly developed the National Science Resource Center that has generated IBSE projects that cover approximately 25% of the school children of that country. In Mexico, the Mexico-US Foundation with the active participation of the Mexican Academy has promoted a similar

project that is now being implemented in several States of that country. In Chile, the Chilean Academy of Sciences and the Ministry of Education have launched a Pilot IBSE Project that is being implemented in some of the poorest municipalities of the Metropolitan Area of Santiago. This project has received much support from the U.S., Mexico, and French Academy projects. The Academies of several other countries, Brazil, Cuba, Colombia, Argentina have also initiatives in this area.

2. The Proposal. The original proposal was generated by the Chilean Academy of Sciences and it was circulated to all IANAS Academies and subsequently discussed in the IANAS General Assembly meeting held in Santiago May 5-7, 2004. The discussion added some important ideas and activities that allowed the preparation of a revised version that was formally approved by the IANAS General Assembly. This revised version is presented in the following text.

II-Program Objectives.

It is proposed that IANAS generates a Hemispheric Program on Science Education for a 5 year period.

The **general objective** of this program is to improve the level and the relevance of science education in the hemisphere through the active participation of science academies and the most prominent scientists in the nations of the Americas working together with teachers and educational authorities.

The **specific objectives** are:

1- To promote collaboration and synergism in the implementation of

science education projects sponsored by science academies in the countries of the Americas.

2- To stimulate the sharing of materials and experiences among projects dedicated to Inquiry-Based Science Education (IBSE)

3- To generate common methods, mechanisms and guidelines to evaluate the progress of the individual projects

4- To create a forum for the discussion of the optimal materials and methods that should be used in science education.

5- To stimulate collaboration among academies in the organization of science fairs, scientific Olympics and science prizes to children.

Focus. The initial main focus of the program will be on elementary level science education. However worthwhile activities on secondary and tertiary science education will be considered.

III- Activities of the Program

1) Exchange of science education materials. The program will encourage the exchange of education materials financing the purchase and shipment of prototype materials (modules, kits) from one country to another. It will also encourage the exchange of written teacher and student guides, text-books, CDs, etc.

The participating academies that have intellectual property ownership of some of these materials are encouraged to freely license or waive payment for their use by other member of IANAS.

2) Interamerican Courses and Workshops for teacher training.

These courses should provide openings to qualified applicants from other countries of the Ameri-

cas in addition to the host country. These courses should in general include theoretical as well as practical activities and should last a minimum of one week. These courses should provide fellowships to the foreign selected participants and ideally should include lecturers and professors from several countries in the hemisphere.

3) Interamerican Strategic Planning Workshops. These workshop modeled after the LASER K12 Strategic Planning Institutes organized by the Smithsonian Institution – NRC in the United States, are designated to prepare multidisciplinary teams from countries, states or educational districts who are planning to introduce IBSE-projects in their schools. These week-long workshops provide these multidisciplinary teams with an in depth exposure to the collective experience of leaders of successful projects that have been implemented.

These workshops will be open to teams who originate from different countries of the Americas and will use experts also from several countries where these projects are being executed.

These workshops will provide partial fellowships to the foreign multidisciplinary teams that are participating and may also provide prototype materials to their participants.

4) Interamerican short-term fellowships on science education. A limited number of fellowships will be provided for science teachers or scientists to visit other countries to learn specific aspects of science education methods. These fellowships which may last from a

minimum of two weeks to a maximum of 3 months will provide for economy class air travel and partial coverage of living expenses during the fellowship. The sending and receiving institutions are expected to cover the remaining expenses. Candidates will be selected in a competitive call on the basis of their CVs, the value of their proposed training and geographic distribution.

5) Visiting Interamerican Science Education Experts. IANAS members can request funds to cover the travel and living expenses of experts from another country of the Americas who will participate in a bona fide activity of science education in the host country.

Stays from 3-15 days can be covered by this activity.

6) Joint Evaluation Initiatives. One of the most challenging aspects of IBSE projects is to obtain a valid evaluation of the achievement of their original goals. It is, therefore, advisable to attempt to generate mechanisms that can serve to assess these projects at the international level. Recently (Jan. 22-23, 2004) in Santiago, Chile an International Workshop extensively discussed this problem and its complexity and recommended the establishment of an international project to generate such a mechanism.

In addition to the generation of such an international mechanism, it seems pertinent to support research projects that study different aspects of evaluation. These projects would be supported by the IANAS Project only in their international components.

7) Interamerican Forum on Science Education. This Forum would promote interest and discussion about science education

and about new methods and approaches in this field. This Forum would have two parts:

a) An Internet Discussion Group that would serve as an open space for a free exchange of ideas, opinion and new concepts. Linked to this portal, there should be relevant data banks on science education materials, results, evaluations as well as question and answer corners for teachers and students. This IANAS electronic communication medium should be linked to all major related portals (IAP, IAP/ICSU, Main à la Pâte, Portal of the Americas).

b) An Annual Conference on Science Education that would rotate in different countries of the hemisphere. These conferences would serve the purpose of focusing the attention of social and political leaders on the importance of this topic as well as on the urgency to support academy initiatives to improve the level of science education in our countries.

8) Science fairs, scientific Olympics and prizes for children that excel in science are mechanisms that greatly stimulate their interest in science. Science academies should participate in these activities and should try to make these events regional by promoting participation of children and scientists from other countries in the Americas.

IV- Structure of the IANAS Program on Science Education. IANAS Academies will decide freely to participate in this Program.

· One Representative or Focal Point from each participating academy will conform the Hemispheric Council for the IANAS Science Education

Program. This Council will meet annually and will decide on the major policies and activities of the Program. The IANAS General Assembly decided to request Academies to appoint their Representatives before June 15 and to send their respective names to Dr. Jorge E. Allende of the Chilean Academy [Email: jallende@abello.dic.uchile.cl] who has agreed to coordinate the Program until the PSE Council is constituted.

· The Program Executive Coordinator will act as Secretary to the Council and will be responsible for the execution of the activities approved by the Council and for the administration of the Program. The Executive Coordinator will be appointed by the Council.

· Each participating academy will generate a National Committee for the IANAS Program. These National Committees should include educators and scientists with expertise in the different disciplines involved in science education and should serve as a nexus with the national authorities with responsibility in science education (Ministers of Education, Science Councils, etc.). The National Committees have the responsibility to generate the initiatives that the Academy of their country will propose and to disseminate the other activities of the program to insure the participation of the appropriate persons and institutions of that country.

V- Financing. Policy. All the activities sponsored by the IANAS Program for Science Education (IANAS-PSE) should receive sig-

nificant funding from the host Academy or other national institutions in the host country. The IANAS-PSE will provide funds that will primarily cover costs for international participation. The funds for the support of these activities will be obtained from grants and direct contributions given to IANAS by national or international public or private institutions. The budget of the Program will depend on the financing obtained but the decision of IANAS is to keep administration costs of this Program under 10%. As an example: A budget of USD \$650.000 per year could allow this Program to support the following activities:

- 10 Interamerican courses of teacher training USD\$ 15.000 each , USD \$ 150.000.
- 5 Strategic Planning Workshops USD\$ 40.000 each, USD\$ 200.000
- 25 short-term fellowships and visiting professorships USD\$ 2.000 each, USD\$ 50.000
- Joint Evaluation Initiatives USD\$ 100.000
- The Interamerican Annual Conference on Science Education USD\$ 50.000
- Portal for an internet network on IANAS Science Education, USD\$ 50.000
- Support for 5 Regional Science Fairs or Olympics, U S D \$ 50.000

VI- Itinerary 2004

June 15. Appointment of the representatives of the Academies that will participate in the IANAS-PSE

August 1. Initial activities are circulated for approval and fund raising

August-October. Fund raising efforts by the IANAS Executive Committee and IAP

October-November. Meeting of the Program Council to decide on the Work Plan for the first year Elect the Program Executive Coordinator.

VII- Evaluation. This program should submit annual reports to the IANAS Executive Board. Half way through its five year period and at its end, the program should undergo a through evaluation that will assess the progress achieved towards its original goals and its efficiency in the attainment of increased collaboration among the Academies in the field of science education. This evaluation would be carried by an Ad Hoc External Committee appointed by the IANAS Executive Board.

Premio *Blue Planet*



Fotografía tomada del Daily Camera, Boulder, Co.

A SUSAN SOLOMON de la *National Oceanic and Atmospheric Administration* y del *Cooperative Institute for Research in Environmental Sciences* de la Universidad de Colorado, le fue otorgado el **Premio Blue Planet**, considerado el equivalente del

Premio Nobel en el campo de de las ciencias ambientales. SOLOMON fue uno de los líderes que identificaron el mecanismo que produce el hueco de la capa de ozono en la Antártica. Sus hallazgos constituyeron una de las piedras angulares que hicieron modificar el Protocolo de Montreal, lo que condujo a la prohibición, a principios de 1990, de los CFC, contribuyendo así a la protección de la capa de ozono global. SOLOMON ha dicho que "además de la divertida y fascinante ciencia (detrás de todo esto), la grandeza física de las regiones polares y la espléndida historia de su exploración han sido para mí un gran regalo."

El nuevo número primo más grande conocido

La *Great Internet Mersenne Prime Search* (GIMPS) ha registrado un nuevo hallazgo: el cuadragésimo primero primo de Mersenne (es decir, un primo de la forma $2^p - 1$, donde p es primo), descubierto por el computador de JOSH FINDLEY.

El número, $2^{24,036,583} - 1$, tiene más de siete millones de dígitos y en este momento es el número primo más grande conocido. La GIMPS es un proyecto de computación distribuido que usa el tiempo de ocio de computadores para calcular números primos. El proyecto empezó en 1996 y ha encontrado siete de los 41 primos de Mersenne conocidos. El cuadragésimo de Mersenne fue descubierto en noviembre de 2003.

Cabe anotar que existe un premio

de cien mil dólares por el hallazgo de un primo con diez millones de dígitos.

¡Feliz centésimo cumpleaños, Henri Cartan!



HENRI CARTAN (1904)

El legendario matemático francés HENRI CARTAN cumplió 100 años el 8 de julio de 2004. Hijo del célebre ÉLIE CARTAN, fue una de las grandes figuras de la matemática del siglo XX por sus notables contribuciones a varios campos de la matemática. Dirigió el afamado *Séminaire Cartan* en París y es muy conocido por su libro de 1956 titulado *Homological Algebra*, escrito conjuntamente con SAMUEL EILENBERG. En octubre 28 de 2004 la comunidad matemática internacional celebrará su centésimo cumpleaños en las **Journées Cartan**, que se llevarán a cabo en en la *École Normale Supérieure* de Paris, de la que fue siempre su profesor.

Adaptado de las *Notices de la American Mathematical Society*, agosto de 2004, pág.771.

Un ejemplo a seguir

Premio Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student. Este Premio, establecido en 1995, se otorga a un estudiante o estudiantes de pregrado por una trabajo de investigación sobresaliente. Su financiamiento está basado en una donación hecha por la señora BRENNIE MORGAN (esposa de FRANK MORGAN). Pueden concursar, en este Premio anual de mil dólares, estudiantes de pregrado de Canadá, México o los EE. UU. AA. El otorgamiento lo hacen conjuntamente la *American Mathematical Society*, la *Mathematical Association of America* y la *Society for Industrial and Applied Mathematics*. En 2003 le fue otorgado a MELANIE WOOD por su investigación en aplicaciones extensibles de Belyi y los *P-órdenes*. A KAREN YEATS se le concedió una mención honorífica.

Noticias

❖ La *Academia Americana de Ciencias y Artes* ha elegido a los siguientes matemáticos como miembros, en sus diversas categorías: *Miembros honorarios*: DAVID ALDOUS (Universidad de California, Berkley), LEONARD GROSS (Universidad de Cornell), ANATOLE KATOK (Universidad del Estado de Pennsylvania), FANG-HUA LIN (Courant Institute of Mathematical Sciences, Universidad de New York), YURI I. MANIN (Universidad de Northwestern), GANG TIAN (Massachusetts Institute of Technology), NOLAN WALLACH (Universidad de California, San Diego),

LAI-SANG YOUNG (Courant Institute of Mathematical Sciences, New York University). *Miembro extranjero honorario*: YVES COLIN DE VERDIÈRE (Université de Grenoble, France). La Presidenta de la Academia, PATRICIA MEYER SPACKS, al anunciar estas elecciones precisó que los favorecidos han hecho extraordinarias contribuciones en sus respectivos campos y disciplinas.

❖ **Los Premios Felix Klein y Hans Freudenthal para investigaciones en educación matemática.** La *International Commission on Mathematical Instruction* (ICMI), fundada en Roma en 1908, ha establecido por primera vez premios para reconocer logros sobresalientes en la investigación de la educación matemática. La *Medalla Felix Klein* recuerda al primer presidente de ICMI (1908-1920), y honra los logros de toda una vida. La *Medalla Hans Freudenthal*, en memoria del octavo Presidente de la ICMI (1967-1970), da reconocimiento a un programa investigativo acumulativo de envergadura. Estos premios se concederán los años impares y se entregarán en el siguiente *Congreso Internacional de Educación Matemática* (ICME). Los primeros ganadores de estos premios han sido: *Medalla Felix Klein* (2003) para GUY BROUSSEAU, Profesor Emérito del Instituto Universitario para la Educación de maestros de Aquitania, en Burdeos, Francia, por el desarrollo de la *teoría de las situaciones didácticas* y sus aplicaciones a la enseñanza y el aprendizaje de las matemáticas.

Medalla Hans Freudenthal (2003) para CELIA HOYLES, Profesora en el Instituto de Educación de la Universidad de Londres, por su investigación seminal en los usos de la tecnología en la educación matemática. La ceremonia de entrega se hizo en el ICME-10, el 4 de julio de 2004, en Copenhague.

❖ **Oficina Regional de la TWAS y portal.** El 25 de junio de 2004 fue lanzado el sitio WWW de la TWAS, en Río de Janeiro::

www.rio.twas.org

Este sitio contendrá información en español, inglés y portugués para los miembros de América Latina y del Caribe, incluyendo noticias sobre actividades en ciencia y tecnología, enlaces interesantes, una lista de miembros, el plan de trabajo 2004/2005, y, por supuesto, información sobre la TWAS.

❖ **El InterAcademy Medical Panel se muda a Trieste.** El *InterAcademy Medical Panel* (IAMP), un grupo de 45 academias de medicina o de divisiones médicas de academias de ciencias de todo el mundo, mudará su sede secretarial del *Instituto de Medicina de la Academia Norteamericana de Ciencias*, a la *Academia de Ciencias del Tercer Mundo* (TWAS) en Trieste, Italia. Para información adicional dirigirse a fanin@twas.org.

En México estará la Oficina Regional de ICSU

Han concluido las negociaciones con la Academia Mexicana de Ciencias y el Consejo Nacional de

Ciencia y Tecnología (CONACYT) de México para albergar la Oficina Regional de la ICSU para América Latina y el Caribe.

International Network for Access to Scientific Publications (INASP)

One of the key recommendations in the draft PAA report on data and information is that the ICSU family and partners should work more closely together to address the information divide between North and South. INASP wants to hear from ICSU members interested in making their publications and data-bases more widely available in developing countries. PERI, the Programme for the Enhancement of Research Information, is one of the range of activities of INASP - the International Network for the Availability of Scientific Publications. PERI supports capacity building in the research sector in developing and transitional countries by strengthening the production, access and dissemination of information and knowledge. PERI comprises 4 separate but related components: Component 1: Delivering International Information - facilitating access to international information and knowledge. Component 2: Disseminating National and Regional Research - supporting access to national and regional publishing, strengthening and developing access to national and regional journals as a medium for the dissemination of local information and knowledge. Component 3: Enhancing ICT Skills - providing awareness and training in the use and/or evaluation of ICTs. Component 4: Strengthening Local Publishing - enhancing skills in the preparation, production and management of scholarly publications

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