

## 4<sup>th</sup> Science Centre World Congress Parallel Sessions Programme

**Monday 11<sup>th</sup> April 2005**

**Parallel Session A (16h – 17h20) , 11<sup>th</sup> April**

### **Room 1 (Panel A1) : Relevancy - What is its Optimal Meaning to our Institutions**

Nowadays, there are two compelling reasons why museums, and especially science centers, should position themselves for maximum possible relevance. First, our institutions have a unique capacity to be more useful in an increasingly unstable world. And second, our sources of funding are increasingly demanding outcomes that positively impact the community and the environment. Sooner or later, the consequences of our field's chosen actions and attitudes become matters of external accountability. Will museums, and especially science centers be part of the problem or part of the solution? An enquiry into the paradigm of relevance for the science center field on the basis of a series of reflective questions is the subject of his presentation.

*Convenor: Emlyn Koster, Liberty Science Center, USA*

*Speakers:*

*Lindsay Sharp, National Museum Of Science And Industry, United Kingdom*

*Debra Colodner, University Of Arizona Science Center, USA*

*Eric Jolly, Science Museum Of Minnesota, USA*

*Mike Bruton, MTN ScienCentres, South Africa*

### **Room 2 (Panel A2) : An International Forum on Equity and Diversity**

This session is modelled on one that the session leader chaired at the ASTC conference in October 2002, entitled ASTC's first international forum on equity and diversity. The intent was to transform the dialogue on "engaging diverse audiences" into a global one, recognizing that the issues and approach would vary from country to country. By proposing such a session at the 4<sup>th</sup>SCWC, it is our hope that this dialogue will continue on an international level. We will learn about the vastly different challenges being faced by science centres around the world committed to addressing issues of equity and diversity.

*Convenor: Lesley Lewis, Ontario Science Centre, Canada*

*Speakers:*

*Jeff Rudolph, California Science Center, USA*

*Julia Tagüeña, Red-POP, Mexico*

*Maya Halevy, Bloomfield Science Museum, Israel*

*Chew Tuan Chiong, Singapore Science Centre, Singapore*

*Derek Fish, Unizul Science Centre, South Africa*

*Ingit K. Mukhopadhyay, National Council of Science Museums - NCSM, India*

### **Room 3 (Panel A3) : How to Break Barriers and Engage Citizens? The Social Lab – Encounters, Connections and Links Through Exhibitions**

Science Centers must address socially relevant topics. The Social Lab creates new types of exhibitions—both in style and content—and employs collaborative operations to counterbalance individualism and competitive forces in society. The presenters will report on their concrete experiences with socially relevant exhibitions such Music, Adventure of Learning, Scenes of

Silence, Me Game and Dialogue in the Dark, that demonstrate how to break traditional barriers and engage visitors.

*Convenor: George Hein, Lesley University, USA*

*Speakers:*

*Mikko Myllykoski, Heureka The Finnish Science Centre, Finland*

*Orna Cohen, Cité des Sciences et de l'Industrie, France*

*Andreas Heinecke, Dialogue in the Dark, Germany*

*Silvia Singer, Espacio Cultural y Educativo Betlemitas, Mexico*

#### **Room 4 (Panel A4) : Science Communication and Society**

The session will discuss the interface between science, communication and society, on a historical and modern perspective, seeking to put in debate some modern challenges. Different approaches will be discussed, including the scientific community perspective; the journalistic perspective and the science communicator perspective. It will be also presented a historical overview on how conflicts were evoked in the society when there was a lack of public engagement activities.

*Convenor: Paulo de Góes, Academia Brasileira de Ciências, Brazil*

*Speakers:*

*Bruce Lewenstein, Cornell University, USA*

*Luisa Massarani, Museu da Vida/COC - Fiocruz, Brazil*

*Mariano Gago, Ministry of Science, Portugal*

*Vladimir de Semir, Universitat Pompeu Fabra, Spain*

#### **Room 5 (Panel A5) : Developing the classroom of the future**

The session discusses the creation of learning environments that will utilize cutting edge information and communication technologies in science education as joint initiatives of educationalists, science centre personnel and technological experts. Beyond the internet, what can be received by using Virtual Reality, Augmented Reality, Remotely controlled experiments, and Mobile devices?

*Session leader: Hannu Salmi, Heureka - The Finnish Science Centre, Finland*

*Other speakers:*

*Robert Semper, Exploratorium, USA*

*Sofoklis Sotiriou, Ellinogermaniki Agogi, Greece*

*Joaquin Fargas, Centro Científico Tecnológico Interactivo Exploratório, Argentina*

#### **Room 6 (Group Discussion A6) : Audience Research and Science Museums: current perspectives**

This session addresses audience research studies that are carried out by university faculty and students in Natural History, Archeology, History and Art museums (local, university and state museums). The interpretation and communication reception before, during and/or after visits of school groups and voluntary visitors were recorded and analyzed.

*Session Leader: Adriana Mortara Almeida, Museum Education Consultant, Brazil*

*Participants:*

*Marília Xavier Cury, Museu de Arqueologia e Etnologia - USP, Brazil*

*Sandra Murriello, Museo de La Plata, Argentina*

*Martha Marandino, Universidade de São Paulo - USP, Brazil*

*Mário Chagas, Departamento de Museus e Centros Culturais - IPHAN, Brazil*

#### **Room 7 (ABC MC Session – Group Discussion A7) : National Debate about training policies for qualification on the fields of Science and Technology**

Representatives from several Brazilian Museums and Science Centers, Universities, CEFETS and Graduate Studies Programs acting in the area will discuss activities of human resource training and qualification for scientific communication and education. The debate will provide a clear outline of the Brazilian scenario in this area.

### **Room 8 (Panel A8) : Knowledge and Research about the Brain - Art, Science and Ethics**

In the panel, participants will present the new discoveries, challenges and ethical questions related to the modern Neuroscience knowledge and research. They will also express the experience of scientists involved in science-art collaborations, discussing the value of this work. It can be a great debate including the question: how art can influence science and how science inspire art and, following this, how are the possible contributions and the ethical dilemmas of the Neuroscience in the next decades.

*Convenor: Virginia Schall, Fiocruz, Brazil*

*Speakers:*

*Pietro Corsi, Université Paris I, France*

*Robert Lent, Universidade Federal do Rio de Janeiro - UFRJ, Brazil*

*Norberto Cairasco, Universidade de São Paulo, Brazil*

*Ken Arnold, Wellcome Trust, United Kingdom*

### **Room 9 (Group Discussion A9) : Great Science Around the World**

We created an on-line survey to solicit opinions from science centre professionals around the world. Where are the favourite institutions, exhibits, demonstrations, and staff? Where are the 'hidden jewels' of the science centre world? Come and see if others share your opinion! And you can still take the survey: <[sciencecommunication.ca/scwcsurvey](http://sciencecommunication.ca/scwcsurvey)> !

*Session leader: Alan Nursall, Children's Museum, Canada*

*Other speakers:*

*Erik Jacquemyn, Technopolis, The Flemish Science Center, Belgium*

*Adam Selinger, Children's Discovery Museum, Australia*

### **Room 10 (Workshop A10) : Using Theatre to Enhance Programs Across your Centre**

This workshop uses case studies and group activities to examine different styles of performance that can enhance activities that are common across many centres. Explore theatre techniques that engage a broad range of visitors. This workshop is appropriate for centres with existing performance programs, or for those looking for affordable ways to enter this field.

*Speaker: Robert Bunzli, Theatre Programs Manager, Questacon, Australia*

### **Room 11 (Science Show A11) : Making it interesting - Communicating science through stories and interactive demonstration**

Many science shows involve interactive demonstrations, sometimes around a theme, or portray ideas through scripted drama. Increasingly, however, the relevance of science to everyday life and culture is seen as an important aspect of science centre activity. In this presentation therefore, a different approach is demonstrated. Drawing from his popular science shows framed around historical people and events, Michael Gore presents a selection of demonstrations in which the key elements are relevance and storytelling. He emphasises simplicity and familiarity of demonstration materials, building on existing knowledge to showcase some fascinating demonstrations around complex ideas in physics. The audience will be directly involved in some of the demonstrations. Michael Gore's experience in giving science shows is well known but this one is a show with a difference!

*Speaker: Michael M. Gore, National Centre for Public Awareness of Science, Australia*

### **Room 12: Speaker's Corner Sessions A12 (16h - 17h20)**

#### **Investigating astronomical concepts and topics at the Museum of Astronomy and Related Sciences, Rio de Janeiro**

Given the enormous interest that Astronomy arouses in the general public, the Museum of Astronomy and Related Sciences (MAST), since its creation in 1985, has been working on Astronomy dissemination and, consequently, contributing to the scientific literacy of the society, specially in the State of Rio de Janeiro. In order to investigate how correct are the astronomical concepts transmitted by the media and other related questions we have been collecting,

categorizing and analyzing the Astronomy news and articles published in the main newspapers in Rio de Janeiro and scientific dissemination magazines in Brazil. In this work we present the preliminary results of this research.

*Speaker: Gabriel Cid, Museu de Astronomia e Ciências Afins – MAST, Brazil*

*Others authors from Brazil: Cecília Maria Pinto do Nascimento; César Augusto Caretta; Flávia Pedroza Lima; Henrique Alves Segundo; Nathália Silva Gomes Corrêa*

### **The Museum of Astronomy and Related Sciences and the Itinerant Science Square**

The Itinerant Science Square is a project that ensembles the major groups that develop research activities in education, continuing and initial teacher formation and pedagogical material production in the State of Rio de Janeiro. Its main purpose is the dissemination of knowledge in science and technology to students, teachers and the general public. The Museum has also being projected as a research reference in non-formal education in sciences.

*Speaker: Simone Pinto, Museu de Astronomia e Ciências Afins – MAST, Brazil*

### **Kits for the Astronomy and Geo-Sciences' Learning**

In this presentation the kits for sciences' learning worked out by a group of professors and researchers from the Science and Technical Museum from the Institute for Geological Engineers of the Federal University from Ouro Preto – MG (MCT/EM/UFOP) will be shown. All the sets, models, samples and experiments making part of these kits integrate a system of elements of mediation to the study of the sciences. In this interactive proposal, the series of equipments and experiments intend to simulate the interaction between the individual (student) and the object (equipments, models and samples), for the construction of scientific knowledge in areas such as Physics, Chemistry, Biology, Sciences, Mathematics and Geography.

*Speaker: Gilson Antônio Nunes, Universidade Federal de Ouro Preto, Brazil*

*Others authors from Brazil: Francisco de Borja López de Prado; Antonio Gandini*

### **Integrated Media for Energy Learning**

This presentation consists of a general overview of energy education in Thailand, energy exhibition at the National Science Centre for Education and report of a school program "Integrated media for energy learning". This school program is arranged for students grade 3 – 4 level. It integrates hands-on and virtual activities from Thai and International website. Three main activities will be approached : Energy hands – on experiments; Energy activity through website; and Energy games. And you will have a chance to enjoy some energy experiments and games.

*Speaker: Jarinya Tanomtin, National Science Centre For Education, Thailand*

### **Multimedia "Love and Sex: Truths, Myths and Fantasies"**

This article presents the multimedia product "Love and Sex: Truths, Myths, and Fantasies" and the underlying concepts in its design. Produced by the Oswaldo Cruz Foundation (Fiocruz) and the National Research Council (CNPq), both important players in Brazil's scientific and technological scenario, the multimedia product is launching its first evaluation phase with the teenage public, consisting of students and visitors to the Museum of Life, besides professionals specializing in the target themes.

*Speaker: Sonia Mano, Museu da Vida/COC - Fiocruz, Brazil*

*Other authors from Museu da Vida/COC - Fiocruz: Fabio C. Gouveia; Ana Maria Palma*

### **Room 13 (International Union of Science Communicators Seminar) : "Science Communication – Country Experiences", Part 1**

There are several issues that we have to deal in our daily life, for example: water, electricity, health, roads, housing, agriculture, environment and so on. There are also a great number of individuals and institutions working with these issues. The speakers in this panel will talk about how science communicators are dealing with these issues in their own countries. For example, water: is there sufficient water in lakes, dams, rivers etc? Is the water safe to drink? In case of a water shortage, what are the efforts used to control it? Is there any appeal for people to use water wisely?

**Chairperson:** *Dr. Narender Sehgal (India)*

**Speakers:**

*Parul Sheth (India)*

*Beena Thambi (Oman, Middle East)*

*Ildeu De Castro Moreira (Brazil)*

## **Parallel Session B (17h30 – 18h50) , 11<sup>th</sup> April**

### **Room 1 (Panel B1) : Is Change Just More of the Same Thing?**

Change is a constant factor in our science centres as we explore new ways to fulfil our mission of propagating science. Drawing from their experiences, our four panellists will each share a ten-minute presentation on various aspects of change. A discussion with audience participation will follow this. At the end of the session it is hoped that the exchange will show up what sort of changes are simply “more of the same thing”, and which are the ones that represent fundamental and lasting shifts in the science centre community.

*Convenor: Tuan Chiong Chew, Singapore Science Centre, Singapore*

**Speakers:**

*Graham Durant, Questacon, Australia*

*Jeff Rudolph, California Science Center, USA*

*Lindsay Sharp, National Museum of Science and Industry, United Kingdom*

*Ioannis Miaoulis, Museum of Science, Boston, USA*

*Gillian Thomas, Miami Museum of Science & Planetarium, USA*

### **Room 2 (Panel B2) : University Collections and Museums: present dilemmas and challenges**

Given their strategic position, university museums can contribute significantly to the development of innovative science exhibitions. University museums are among the institutions most prepared to play a relevant role in public awareness of science and research. This session will discuss the role of university museums, as well as their contribution to the museum and science centre sector.

*Convenor: Jorge Wagensberg, CosmoCaixa, Spain*

**Speakers:**

*Hannu Salmi, Heureka – The Finnish Science Centre, Finland*

*Claudio Marcelo Abrevaya, Universidad Nacional de General Sarmiento, Argentina*

*Hugues Dreyse, Université Louis Pasteur Strasbourg, France*

*Paulo Gama Mota, Universidade de Coimbra, Portugal*

*Maria Emilia Beyer, Universum – UNAM, Brazil*

### **Room 3 (Panel B3): Nanotechnology: interpretation through Exhibits, Arts, Live Presentation and Media**

This session will provide a brief overview of the broad range of science and engineering activities collectively referred to as nanotechnology and a brief introduction to current and potential nanotech products and their societal implications. Some of the challenges of interpreting nanotech research for our science museum audiences will be delineated. The panelists will each describe how they are tackling these challenges at their institutions and their preliminary results. A brief review of additional nanotechnology exhibits will also be provided. Efforts by the U.S. National Science Foundation to facilitate broad development of nanotech informal science education will also be discussed.

*Session leader: Carol Lynn Alpert, Museum of Science, Boston, USA*

**Other speakers:**

*Marcelo Knobel, Universidade de Campinas - UNICAMP, Brazil*

*Julia Tagüeña, Red-POP, Mexico*

#### **Room 4 (Panel B4) : What people think about science and technology?**

The objective of this panel is to put in discussion the public perceptions of science and technology issues on different countries and cultures. This session will discuss what the public think about science and technology in different countries. Perceptions on the role of science in the society, on the work of the scientists and on the risks of science and technology, as well as attitudes toward new technology applications, are some of the issues, among others, that will be put in debate. The challenges of mapping out public perceptions will be also discussed by the participants.

*Convenor: Alfredo Tolmasquim, Museu de Astronomia e Ciências Afins – MAST, Brazil*  
*Speakers:*

*Ildeu de Castro Moreira, Ministry of Science and Technology, Brazil*

*Edna Einsiedel, University of Calgary, Canada*

*Carmelo Polino, Red de Indicadores de Ciencia Y Tecnología Iberoamericana e Interamericana – RICYT, Argentina*

*Martin Bauer, London School of Economics, United Kingdom*

#### **Room 5 (Panel B5) : The Public Awareness of Science - Current and Future Roles of Science Centres**

How can we reach an adult public which is largely indifferent to science? The community's relationship with science is becoming increasingly important as new technologies require more public involvement. Science centres are places where a wide variety of adults consciously seeks to engage with science. From their very different experiences, international panel members will explore progress towards achieving enhanced public awareness of science and the role that science centres are playing. The overview presented by these panellists will be informative and unique. There will be opportunity for discussion from the floor. At the end of the panel session, recommendations will be formulated for future action.

*Convenor: Sue Stocklmayer, National Centre for Public Awareness of Science, Australia*  
*Speakers:*

*Walter Staveloz, ECSITE, Belgium*

*Thanakorn Palachai, National Science Museum, Thailand*

*Ernst Hamburger, Estação Ciência, Universidade de São Paulo, Brazil*

*Mike Bruton, MTN ScienCentres, South Africa*

*Eric Marshall, New York Hall of Science, USA*

#### **Room 6 (Panel B6) : Total Inclusion – A Science Museum for Everyone**

Science popularization faces a new social challenge: inclusion. Science centers and museums cannot fail to take the opportunity to cater to the needs of sectors that have been excluded: children of the street and people with disabilities. It is therefore important that they train facilitators to respond to the needs of these visitors.

*Convenor: Leticia Chávez Martínez, Universum, Mexico*

*Speakers:*

*Patricia Ocampo, Exploratorio, Argentina*

*Isabel Aparecida Mendes, Museu da Vida/COC - Fiocruz, Brazil*

*Geoffre Snowdon, Petrosains, Malaysia*

*Dolores Arenas, Universum, Mexico*

#### **Room 7 (Panel B7) : Science Communication and Health**

The objective of this session is to promote the debate on actions for education and science divulgation in health area. It is considered that in this area, these actions are an imperative, in view of the growing intervention of biomedical sciences in every life of the populations, which confers to the projects of science education and divulgation a decisive role in formation of citizenship. It is not a new issue. Since the Declaration of Alma Ata, emphasizing the primary attention to health and, later on, Ottawa Letter, which defended the importance of promoting health as a key concept for quality of life, the role of education in health has been increasingly

valuated. A basic premise consist in the understanding that it is not only a question of guaranteeing the access to information, but to favor the formation necessary for obtaining a socio-political environment characterized by the quality of life through health in its wider sense.

*Convenor: Arlindo Fábio de Souza Gomes, Canal Saúde, Fiocruz*

*Speakers:*

*Paulo Buss, President, Fiocruz*

*Ken Arnold, Wellcome Trust, United Kingdom*

*David Roland, National Health Museum, USA*

### **Room 8 (Panel B8) : Science centre spaces for early learners**

Research points to the importance of stimulating, nurturing experiences during children's early years to the development of educational and social outcomes in later years. Panelists will provide an insight into what science centres are doing in the key area of early childhood development and education.

*Convenor: Brenton Honeyman, Questacon, Australia*

*Speakers:*

*Adam Selinger, Children's Discovery Centre, Australia*

*Luis Magallanes, Papalote, Mexico*

*Robert Bunzli, Questacon, Australia*

*Tengku Nasariah Ibrahim, Petrosains, Malaysia*

*Lesley Lewis, Ontario Science Centre, Canada*

### **Room 9 (B9) : The alliances between traditional knowledge and sciences to sustainable development**

While only twenty plant species answer for 85% of the food used across the globe, 1.300 native species are used in traditional medicine in the Amazon alone. The Brazilian biodiversity economic potential is immeasurable. The sustainable use of biodiversity requires the convergence of efforts in many science and production fields, the development of handling techniques, improvement, biotechnology and industrialization of the Country's biodiversity by-products. In countries with mega-diversity like Brazil, starting from traditional knowledge on the use of biodiversity represents immeasurable savings of time and money in new products development. Nevertheless, such impacts caused by technological, industrial development, by agricultural borders expansion, and by forest devastation are destroying not only biodiversity but also the traditional knowledge associated therewith. The extinction of indigenous groups, acculturation, rural exodus, traditional practices displaced by central economies expansion are common phenomena implying the loss of traditional knowledge on the use of biodiversity. Thus this a matter of discussing this process in the light of the alliances that have been and are being established between traditional knowledge and science for sustainable development.

*Session leader: Carlos José Saldanha Machado, Museu da Vida / COC - Fiocruz, Brazil*

*Speakers:*

*Marcos Terena, Articulador dos Direitos Indígenas e Conselheiro do Comitê Intertribal – ITC, Brazil*

*Marcus Barros, Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis – IBAMA, Brazil*

*Fernando Mathias Baptista, Programa de Política e Direito Socioambiental/ Instituto Socioambiental – ISA, Brazil*

*Pierina German Castelli, Curso de Pós-Graduação em Desenvolvimento, Agricultura e Sociedade/ Universidade Federal Rural do Rio de Janeiro - CPDA/ UFRRJ, Brazil*

### **Room 10 (Workshop B10) : The Reading and Science Program**

The art of storytelling is one of world's oldest crafts. In recent times, storytelling has been used as an important pedagogical resource to encourage reading. In the Science Museum this process seeks to foster debate on science and daily life with visitors. This workshop focusses more specifically on the elaboration, development, and follow-up of activities centered on cultural mediation.

*Session leader : Carla Gruzman, Museu da Vida/COC - Fiocruz, Brazil*

*Other speakers: Adriana Assumpção, Museu da Vida/COC - Fiocruz, Brazil*

### **Room 11 (Workshop B11) : What can you make with a piece of paper?**

This workshop, with a maximum audience of 30 people, tries to show the richness and variety of activities and phenomena that can be made and represented with such a simple and at the same time powerful thing as a piece of paper. The first set of experiments that will be done are about perception: Blind point; Images rivalry; Pulfrich pendulum; and Crayons. The second will look a little into the fields of Physics and Mathematics: Galileo; Newton; Wrinkling the paper; Wrapping things up with paper. Finally, the paper will be used to create sound effects.

*Session leader: Julián Betancourt, Museo de la Ciencia y el Juego, Universidad Nacional de Colombia, Colombia*

*Other authors / speakers: Miguel Martínez, Museo de la Ciencia y el Juego, Universidad Nacional de Colombia, Colombia*

### **Room 12: Speaker's Corner Sessions B12 (17h30 – 18h50)**

#### **Mathematics in Science Centres: an indispensable appropriation**

This presentation refers to the concept of a "mathematical culture" to be created in science centers within the general connotation of a scientific culture. Now a day we can reach an agreement of what having a scientific culture means, nonetheless, most of the people live surrounded by mathematics, but the great majority couldn't even imagine what having a mathematical culture means. Thus, the aim of UNIVERSUM, a mathematics hall, is to let our visitors know that mathematics is more than solving problems and understanding what the conic sections are, what "proportion" means, or how the non-Euclidian geometries work. We want people to take mathematics with them, to help mathematics go far beyond the exit door.

*Speaker: Cláudia Hernández García, Universum, Mexico*

*Other authors: Concepción RuizRuiz-Funes, Universum, Mexico*

#### **Microscopic Proportions: Modeling Blood**

"Microscopic Proportions" is an exhibit built in the form of a giant mobile in the Science Park of the Museum of Life, to exemplify 20 types of microscopic elements, including human blood cells, bacteria, and viruses that can be found in the human body. Involving both scientific and artistic characteristics, the construction of the project is a result of multidisciplinary work including artists, designers, and scientists.

*Speaker: Paulo Colonese, Museu da Vida - Fiocruz, Brazil*

*Other authors: Maria Paula de Oliveira Bonatto, Museu da Vida - Fiocruz, Brazil; Marcelo Alves Ezequiel, Brazil; Maulory Curie Cabral, Brazil*

#### **The Brazilian Olympiad of Health and Environment - A qualitative assessment of the Art and Science Modality**

The "Brazilian Olympiad of Health and Environment" is an institutional project designed for the Brazilian elementary schools and developed by the Oswaldo Cruz Foundation (Fiocruz) and by the Brazilian Association of Post-graduation in Collective Health (ABRASCO), whose objective is to call public attention to the concept of "health promotion" and specifically to the relation between health and the environment. Hoping to provide elements to aid elementary teachers' reflection on these matters, the present research proposes to exam the relationship between artistic figuration and the conceptions of the environment that make up the projects selected for the final phase of awards in the category Art and Science, one of the awards offered by the project.

*Speaker: Márcio Rolo, Casa de Oswaldo Cruz - Fiocruz, Brazil*

#### **Science Centers as a Source for Changing Attitudes in School Science**

The project "Unga Spekulerar" (youngsters speculate) is a national collaboration between four museums and science centers in Sweden. It aims to create an increased understanding among students for technology and science and to increase the interest for questions about science and technology in a future perspective. The project started in the autumn of 2002 and is still going

on. This paper describes nearly 900 students' (age 13-18) views about how the project has influenced their interest and attitudes towards science and technology.

*Speaker: Anders Jakobsson, Malmö University, Sweden*

### **Building Bridges: A New Centre Breaks Ground in the Barrio**

The University of Arizona, a major research university, has entered into partnership with the City of Tucson to build a new Science Center in Downtown Tucson. The planning process has been characterized by open and abundant community engagement and feedback. This session will document methods and findings from this process.

*Speaker: Alexis R. Faust, Flandrau Science Centre/University of Arizona Science Center, USA*

*Others authors: Debra Colodner, Flandrau Science Centre/University of Arizona Science Center, USA; Eric Jolly, Science Museum of Minnesota, USA*

### **Room 13 (International Union of Science Communicators Seminar) : "Science Communication – Country Experiences", Part 2**

There are several issues that we have to deal in our daily life, for example: water, electricity, health, roads, housing, agriculture, environment and so on. There are also a great number of individuals and institutions working with these issues. The speakers in this panel will talk about how science communicators are dealing with these issues in their own countries. For example, water: is there sufficient water in lakes, dams, rivers etc? Is the water safe to drink? In case of a water shortage, what are the efforts used to control it? Is there any appeal for people to use water wisely?

**Chairperson:** Dr. Narender Sehgal (India)

**Speakers:**

Parul Sheth (India)

Beena Thambi (Oman, Middle East)

Ildeu De Castro Moreira (Brazil)

**Tuesday 12th of April 2005**

**Parallel Session C (16h – 17h20) , 12<sup>th</sup> April**

### **Room 1 (Group Discussion C1) : Increasing the Level of Public Engagement in Science Centres - Evolving Methods of Science Communication**

Science Centres must respond to dual challenges of increasing our own level of engagement with the public and increasing the public's level of engagement with science. In this session, three panelists will speak to new approaches to science communication and public engagement being undertaken at each of their institutions, and one panelist will speak to his analysis of models of science communication. The session will provide an opportunity for panelists to engage with each other and the audience in an open dialogue on these new approaches and how they can contribute to the ongoing success of our field.

*Session leader: Lesley Lewis, Ontario Science Centre, Canada*

*Speakers:*

*Lindsay Sharp, National Museum of Science and Industry, United Kingdom*

*Bruce Lewenstein, Cornell University, USA*

*Jennifer Martin, Ontario Science Centre, Canada*

*Mamuto Mohri, The National Museum of Emerging Science and Innovation - Mesci, Japan*

### **Room 2 (Panel C2) : Connecting Diverse Communities and the Internet**

Boundaries can be removed by making connections. In this session, panelists from four world regions will share successful programs which have made connections between diverse communities and science culture & education, science centres, and each other. Use of the Internet as a tool to surpass obstacles in these efforts will be highlighted.

*Session leader: Eric Marshall, New York Hall of Science, USA*

*Other speakers:*

*Brenton Honeyman, Questacon, Australia*

*Judy Kass, American Association for the Advancement of Science, USA*

### **Room 3 (Panel C3) : New Business Models for Creating and Distributing Content**

This panel examines the innovative business models for funding and distribution of content developed at each of the participating institutions, such as venture capital funding, collaboration, government partnerships, and intellectual property licensing. Panelists will provide in-depth discussion and examples, including information on advantages and disadvantages, financial implications, and techniques for practical application.

*Convenor: Renee Foster, American Museum of Natural History, USA*

*Speakers:*

*Audrey O'Connell, The Natural History Museum, United Kingdom*

*Joe Hastings, Exploratorium, USA*

*Brigitte Coutant, Cité des Sciences et de l' Industrie, France*

### **Room 4 (C4 Panel) : Public Participation on Science and Technology Issues**

This session aims to discuss the public involvement and input into policies on science issues. Experiences on several deliberative public consultation approaches – including consensus conferences and citizen juries, among others –, conducted in different countries, will be put in debate, with their challenges, obstacles and advantages.

*Convenor: Alberto Pellegrini, former member of OPAS*

*Speakers:*

*Lars Kluwer, Danish Board of Technology, Denmark*

*Edna Einsiedel, University of Calgary, Canada*

*Ingrid Sarti, Sociedade Brasileira para o Progresso da Ciência, Brazil*

### **Room 5 (Panel C5) : Training Policies and Experiences in the fields of Science Education and Communication**

In this session, a debate about the challenges and experiences in training human resources for the work and research in science centres and museums, at graduate level, articulating formal and informal learning, will be carried out. Specialists from Portugal and Brazil will present the public policies for this kind of training in their countries, which integrates diverse government areas in the field of culture, environment, energy, health, science and technology, among others.

*Convenor: Cristina Araripe, Fiocruz, Brazil*

*Speakers:*

*Leopoldo de Meis, Universidade Federal do Rio de Janeiro - UFRJ, Brazil*

*Tania Araújo-Jorge, IOC - Fiocruz, Brazil*

*Jorge Croce Rivera, Universidade de Évora, Portugal*

### **Room 6 (Panel C6) : Beyond Walls: Visions of the On-line Science Center**

From the very beginnings of the World Wide Web museums have been intrigued by the use of this medium to reach their audiences in new ways. It is now time to explore the shape of the

virtual on-line science center in the 21st century. This session will present a discussion with the panelists and audience about their vision of the potential for a virtual museum experience.

*Speakers:*

*Robert Semper, Exploratorium, USA*

*Andrea Bandelli, Independent Consultant, The Netherlands*

### **Room 7 (Panel C7) : Learning in the virtual space**

In the present days, science learning and science communication in the virtual space is increasing in volume and stature day by day. With the progress of digital technology, it is expected that the science communication activities of science museums and science centres throughout the world is going to be equally important as similar activities in the physical ambience of science centres. Many of the science centres have already established a strong presence in the virtual space and many others are aspiring to have it. In this background, the session would present new ventures taken up by science centres in different parts of the world for creating effective virtual spaces for science communication and then to use such spaces for learning of science and technology.

*Convenor: Ingit Mukhopadhyay, National Council of Science Museums, India*

*Speakers:*

*Vijay Shanker, National Science Centre, India*

*Marcos Matsuma, Estacao Ciencia - USP, Brazil*

*Marcelo Sabbatini, Universidad De Salamanca, Spain*

*Chee-Kuen Yip, Hong Kong Science Museum, Hong Kong*

### **Room 8 (ABCMC Session - Panel C8) : Ethno knowledge and Social Context**

This panel will tell the personal history of the interaction between Science Center organizing and the participating scientists' efforts to foster indigenous self-education in today's Brazil.

*Convenor: Maurice Bazin, Instituto de Política Linguística – IPOL, Brazil*

*Speakers:*

*Germano Afonso, Unicamp, Brazil*

*Carlos Arguello, Universidade do Estado de Mato Grosso, Brazil*

*Gabriel Gentil, Fiocruz–Amazônia, Brazil*

*Eduardo Sebastiani, Universidade de Campinas – IMECC, Brazil*

### **Room 9 (Group Discussion C9) : The Total Museum: a Tool for Social Change**

In this session, participants will discuss the concept of a "total museum". A science museum is a space dedicate to providing a stimulus to scientific knowledge, the scientific method and scientific opinion. The museum is a tool for change, for individual change and, therefore, for social change too. It is something that is already in the air as a tendency at some present-day museums, but neither the science museums of the past nor most of today's are in line with it. Perhaps a new museography needs to be invented.

*Session leader: Jorge Wagensberg, CosmoCaixa, Spain*

*Participants:*

*Mike Bruton, MTN ScienCentres, South Africa*

*Antonio Carlos Pavão, Espaço Ciência, Brazil*

*Emlyn Koster, Liberty Science Center, USA*

### **Room 10 (Workshop C10): Understanding plastic and its role in modern society**

Molekylverkstan is a Swedish Science Centre with great experience from the world of polymers. Does plastic float? What's the point with water-soluble plastic and why are modern tennis balls filled with a white powder? The answers to these and many other questions are received through exciting hands-on experiments.

*Session leader: Eva Lind Johansson, Molekylverkstan, Sweden*

*Other speakers: Hans Hallman, Molekylverkstan, Sweden*

### **Room 11 (Science Show C11) : Live Science**

The project "Ciência ao Vivo" (Live Science) is an initiative of Estação Ciência in association with UNESP of Guaratinguetá and the Instituto de Matemática e Estatística da Universidade de São Paulo. The aim of the project is to enable an introductory and up-to-date approximation of scientific knowledge. Joining facility and correctness it intends to supplement the formal education from a practical, creative and motivating approach. A complete set of kits of Science and Mathematics is being developed and they are intended to be sent to schools, exhibitions and science fairs. Conceiving teaching-learning process as a result of social interaction, active participation and knowledge interchange, the project instigates the discussion and investigation of scientific knowledge.

*Speaker: Alberto Gaspar, Campus de Guaratinguetá – UNESP, Brazil*

*Others speakers/authors from Brazil: Eduardo Colli ; Saulo Rabello Maciel de Barros; Ernest Wolfgang Hamburger; Maria del Carmen Hermida Martinez Ruiz; Francisco José Lázaro Soares Medeiros*

### **Room 12: Speaker's Corner Sessions C12 (16h – 17:20h)**

#### **SBPC and the history of the Brazilian Scientific popularization: The Scientists in Action**

In Brazil, scientific popularization links with the scientific production, evidencing mobilization and the scientists' interest in disclosing its activities to a public determined to obtain recognition of the society. For the analysis of the scientific popularization accomplished by José Reis it is possible to understand the meaning of this in the institucionalization period and professionalization of the science.

*Speaker: Marta Ferreira Abdala Mendes, Fiocruz, Brazil*

*Other authors: Nara Azevedo, Fiocruz, Brazil*

#### **Science Communication as Social Responsibility - Comparative Study in Portuguese State Laboratories**

The main goal of this communication is to present a comparative study about science communication practices in State Laboratories in Portugal. To guide this study, we defined the hypothesis that these practices represent the accomplishment of social responsibility. In that matter, practices were characterized and articulated with attitudes, in way to build social responsibility indicators for science communication.

*Speaker: Joana Lobo Fernandes, Escola Superior de Educação, Portugal*

#### **Science Communication Challenges in Portuguese: confrontation of Brazilian and Portuguese experiences**

The aim of this presentation is to promote discussion among science communication professionals from Brazil and Portugal, two countries that despite sharing the same language, are somehow planning their science museum communication policies ignoring each other. There has been some exchange of museum researchers and students between both countries but this is still very limited when compared to what we could call real collaboration and concept sharing. This discussion is interesting as confronting two cultures united by a common language the differences may reflect its Northern/Southern or South-American/European differences.

*Speaker: Pedro Casaleiro, Museu de Ciências, Universidade de Coimbra, Portugal*

*Other authors: Luisa Coete-Real, Portugal; Maria Cristina Bruno, Brazil*

#### **Project SAVE (Saving Amphibian Vital Environments)**

This presentation introduces the Project SAVE (Saving Amphibian Vital Environments), which is a supplemental environmental / conservation education initiative emphasizing the use of amphibians as bioindicators of the anthropogenic changes to the environment. Scientists agree that populations of most North American salamanders have declined markedly since European colonization due to the above-mentioned changes to the continent.

*Speaker: David Wojnowski, Kent State University, USA*

### **Museums and Spaces of Sciences: perspectives for the spreading of Science in the University**

This paper analyses the fact that innumerable museums of science, not only in Brazil but in many other places of the world as well, are limiting themselves to display their collections without any bigger concern with the production of the scientific knowledge of which they are guardians while, in science museums that make part of Universities whose primordial function lies in the production and spreading of knowledge, such an attitude would be an apparent contradiction.

*Speaker: Helga Pôssas, Universidade Federal de Minas Gerais, Brazil*

### **Room 13 (International Union of Science Communicators Seminar) : "Scientific Temper and Cultural Systems", Part 1**

Traditionally, every society has its own faiths. Some of them are what we may call "blind faiths" (or superstitions). There are some harmless blind faiths, such as believing that the number 13 is inauspicious. However, there are some quite harmful blind faiths such as killing birds or goats to please the gods and so on. For these, scientific communicators have to inform people with those beliefs about the consequences of their actions. Speakers will discuss this subject and inform people about the efforts – either at individual or institutional level - than can be done to meet this problem.

**Chairperson:** Prof. Yash Pal (India)

**Speakers:**

Mariam Addy (Ghana)

J.V. Narlikar (India)

Henrique Lins e Barros (Brazil)

## **Parallel Session D (17h30 – 18h50) , 12<sup>th</sup> April**

### **Room 1 (Group Discussion D1) : Involving target communities through service**

Diversify attendance! Expand funding resources! Improve efficiency! Such mandates often overlook community volunteers as a potential resource. This roundtable discussion seeks to bring together museum staff involved in the oversight or direct development of volunteer programs, in order to share successes, and receive some helpful tips from industry colleagues regarding effective volunteer management. Target participants include staff from membership, development and human resources, as well as education and visitor services departments. Especially useful for museums interested in tapping volunteer resources for the first time.

*Session leader: Deirdre Araujo, Exploratorium, USA*

*Participants:*

*Caroline Mark, Science Museum, United Kingdom*

*Eric Marshall, New York Hall of Science, USA*

### **Room 2 (Panel D2) : Science Centres and Museums: Their Old and New Role for Social Inclusions**

Science Centres/Museums are social actors. This is not new, being them "public spaces". What is changing is their role in building the "public sphere", together with media, social movements, etc. The variety of issues on which they work is increasing: social inclusion; citizen participation and debate on science, technology and society; local development; etc. The session will introduce experiences from different world's regions, to individuate common aspects in this rich and various panorama and the efforts to fill the dramatic gap between *innovation* and *social advancement*.

*Convenor: Luigi Amodio, Citta della Scienza, Italy*

*Speakers:*

*Hasan Dweik, Al Quds University, Israel*  
*Vincenzo Lipardi, Fondazione IDIS - Città della Scienza, Italy*  
*Jayanta Sthanapati, Birla Industrial and Technological Museum, India*  
*Luis Magallanes, Papalote, Museo del Nino, Mexico*

### **Room 3 (Panel D3) : Academic Communities and the mission of the diffusion of knowledge**

This panel aims at debating the reasons why the mission of scientific dissemination has become paramount in certain periods for academic communities in general, and why this is an important mission for particular research institutions, in different places of the world. The recent trajectory of the Natural History Museum of Paris and the creation of the Mirador Interactive Museum of Santiago, Chile, will be especially in focus.

*Convenor: Danielle Grynspan, Fiocruz, Brazil*

*Speakers:*

*Haydée Domic Tomicic, Museo Interactivo Mirador and Explora Program, Chile*

*Jacqueline Eidelman, Université de Paris, France*

*Sharon Franks, University of California, USA*

### **Room 4 (Group Discussion D4) : Public and Science: Seeking for concrete proposals and mechanisms for stimulating the public participation in science, technology and health issues**

This Group Discussion is open to anyone interested in discussing and developing concrete proposals on how to stimulate a effective participation of wide sectors of the society in decisions on science, technology and health issues. The meeting joins two parts. In the first one, key people representing different countries are invited to do a 5-minutes presentation on local experiences, aiming at to stress suggestions and tips on how to put in practice the different mechanisms for stimulating public participation. Positive and negative aspects of previous experiences, as well as the main challenges to be faced, should be approached. In the second part of the discussion, the group will seek strategies for setting up a citizen conference or similar event in Brazil. A roundtable will be hold previously to this session, in which the participants will put in debate general issues on the theme.

*Session leader: Luisa Massarani, Museu da Vida/COC - Fiocruz, Brazil*

*Participants:*

*Lars Kluwer, Danish Board of Technology, Denmark*

*Albert Einsiedel, University of Alberta, Canada*

*Ingrid Sarti, Sociedade Brasileira para o Progresso da Ciência - SBPC, Brazil*

*Edna Einsiedel, University of Calgary, Canada*

*Alberto Pellegrini, former member of OPAS*

*Ennio Candotti, Sociedade Brasileira para o Progresso da Ciência - SBPC, Brazil*

*Reinaldo Guimarães, Ministry of Health, Brazil*

*Alberto Díaz, Universidad Nacional de Quilmes, Argentina*

*Ildeu de Castro Moreira, Ministry of Science and Technology, Brazil*

### **Room 5 (Panel D5) : Art and Science in the time of the impossible**

This session deals with the similarities and differences between science and art. We show how a samba school presented the history of some important scientific and technological achievements through dance during the 2004 Rio carnival and how science centers and museums have been using art as exhibits, as provocations, and as support for science content. We present a method for evaluating the effectiveness of narrative as a conveyor of scientific content.

*Convenor: Julia Tagüña, Director, Red-POP, Mexico*

*Speakers:*

*Fátima Brito, Casa da Ciência – UFRJ, Brazil*

*Aquiles Negrete, University Of Bath, United Kingdom*

*Maria do Rosário de Assumpção Braga, Museu da Vida/COC - Fiocruz, Brazil*

### **Room 6 (Panel D6) : The Social Context: Investigations into the social dynamics of visits to Science Centres and Museums and how these influence visitor learning**

Humans are extremely social creatures, we are all products of our culture and social relationships. Hence, one should expect science centre and museum learning to be influenced by the upbringing and culture of the individual, by the interactions and collaborations within the visitor's own social group, as well as potentially by interactions with others outside the visitor's own social group, for example museum explainers, guides, demonstrators or performers. The core of the session will be presentations of recent research investigations dealing with the social dimension of the visitor experience; each presentation will provide a different perspective on the social dimension: 1) the differences in the visitor experience when visitors visit alone or with a group; 2) the role that social interaction plays in influencing visitor motivations for learning; and 3) the role that museum facilitators play in influencing the visitor experience and learning.

*Convenor: John H. Falk, Institute for Learning Innovation, USA*

*Speakers:*

*Jan Packer, Queensland University of Technology, Australia*

*Roy Ballantyne, Queensland University of Technology, Australia*

*Hannu Salmi, Heureka - the Finnish Science Centre, Finland*

*Lynn Dierking, Institute for Learning Innovation, USA*

### **Room 7 ( D7 ) :**

### **Room 8 (ABCMC Session – Panel D8) : Scientific Research for the Brazilian Sustainable Development: Realities, Limits and Professional Challenges**

Scientific research is a cultural practice. It embodies a culture complex from which, in each generation, Men have attempted to find a form of intellectual coherence in solving their problems, disquiets and in satisfying their needs. The way in which knowledge and science get organized is the way in which society organizes its civilized paradigms. It is, therefore, a matter of contributing towards a better representation and presentation of scientific research in Brazilian Science Centers and Museums geared to a vast audience through the systematization of professional experience reports and reflections offered by the same researchers working with themes related to sustainable development.

*Convenor: Sérgio Alex Azevedo, Museu Nacional, Brazil*

*Speakers:*

*Carlos José Saldanha Machado, Museu da Vida/COC - Fiocruz, Brazil*

*Marcus Polette, Universidade do Vale do Itajaí - UNIVALI, Brazil*

*Priscila Faulhaber Barbosa, Museu Paraense Emílio Goeldi e MAST, Brazil*

*Paulo Frederico Petersen, AS-PTA - Assessoria e Serviços a Projetos em Agricultura Alternativa, Brazil*

### **Room 9 (Panel D9) : Science Centres in the Information Society**

Science Centres are engaged at all levels in the development and sustainability of the information society: by producing content, facilitating access, and empowering citizens to make responsible choices. Rather than looking at "how" science centres implement and use information technologies, this panel wants to explore and discuss "why" science centres are an important player in the information society, which responsibilities should they take, which level of commitment is expected, as well as give an overview of the opportunities that lie ahead for our institutions.

*Convenor: Andrea Bandelli, Independent Consultant, The Netherlands*

*Speakers:*

*Dietrich Schiel, Experimentoteca CDCC, Brazil*

*Marina Joubert, SA Agency for Science and Technology Advancement, South Africa*

*Ailsa Barry, The Natural History Museum London, United Kingdom*

### **Room 10 (Workshop D10) : Starting and Sustaining a Successful Museum**

### **Outreach Program**

A successful outreach program can expand the impact of your educational mission and become a major revenue generator. It must be mission-based, responsive to the market, opportunistic when it comes to strategic partnerships and sponsors, and entrepreneurial in developing and delivering creative programs, products and services. Join us for an interactive and fun exchange of ideas and best practices.

*Session leader: David Heil, David Heil Associates, Inc., USA*

*Other speakers: Mia Jackson, USA*

### **Room 11 (Science Show D11) : The Red Line in Science**

In this show we will highlight and demonstrate different connections between nature and engineering based upon the themes sound, light, water and energy. We will explore how mankind uses nature's own solutions to solve technical problems. The audience will also be taken on a journey to the year 2025 A.D. where they will envision the future of their dreams.

*Session Leader: Peter Hok, Malmo Musser, Sweden*

*Other speakers/authors from Malmo Musser, Sweden: Ulf Bergendorff; Hakan Kihlstrom; Eric Roupe*

### **Room 12: Speaker's Corner Sessions D12 (17h30 – 18h50)**

#### **Museums, knowledges and cultural diversity**

The evaluation of exhibitions and audiences are investigations that recently started in Venezuela. They are key for cultural institutions expecting to optimize their actions and have an effective balance between their mission and their visitors' needs. In this research our interest is focused on the exploration of part of our ethnical and cultural diversity through the knowledge structures and its representation in a particular segment of the audiences of some museums and science centers. We will talk specifically about the tension processes that in the field of cultural representations, dramatizations and valuation occur between the eurocentrist and scientific knowledge and the different ways to construct and give meaning to the constitutive world of our audiences.

*Speaker: Luis Galindo, Museo de Ciencias, Venezuela*

#### **Challenges in the creation of digital media on science in Amazônia**

In this essay we present reflections on the process of conceptualising the system of navigation and interface of the CD-ROM Museu Paraense Emílio Goeldi: "the museum of Amazonia", a multimedia which describes a panorama about the presence of this institution in the Amazon region, its rich collection and, above all, its institutional activities in the field of research and scientific diffusion.

*Speaker: Carlota Brito, Museu Paraense Emílio Goeldi, Brazil*

#### **The Lexical Inventory of "Magüta Arü Inü" : a CD-Rom**

Keeping the links between collective experience and language, this presentation involves the Ticuna language (an isolated and tonal language spoken in Occidental Amazon) and has two aims. On the one hand, we show the construction process through which one reached the lexical inventory linked to the Museum Goeldi's Curt Nimuendaju collection (lexical inventory with an ethnological dimension) and that is presented in the CD-Rom "MAGÜTA ARÜ INÜ" ("MAGÜTA thinking"). On the other hand, from considerations on sense production domain, we discuss how, in digital media, correspondences among senses, forms and sounds can be established in a multilinear way.

*Speaker: Marília Facó Soares, National Museum/ Universidade Federal do Rio de Janeiro, Brazil*

#### **Social Educational inclusion in Brazilian Science Centres and Museums**

As centers of scientific dissemination and education in science, many science museums and institutions in Brazil have been playing an important role in the social-educational inclusion of the communities in which they are located. In a light, informal way, they have been catering to a wide public with diverse origins, characteristics and interests. From the very beginning of the

experimental project that resulted in the creation of the Morphological Science Museum (MSM) at the Federal University of Minas Gerais, one of the goals pursued by the work team, in addition to catering to the educational needs of the communities both internal and external to the university, particularly primary- and secondary-level teachers and students, was to enable the inclusion of peripheral communities, juvenile offenders, chemical-addicted youngsters, and students with special learning needs in the Museum's educational and scientific dissemination projects.

*Speaker: Maria das Graças Ribeiro, Museu de Ciências Morfológicas – UFMG, Brazil*

### **Video Club of the Future: Promoting Social Inclusion Through Audiovisual Language**

This work intend to present the experience and reflexions of the students being translated through a video, in which students express citizenship at the same time they interact with their own environment.

*Speaker: Luciana Sales, Museu da Vida/COC - Fiocruz, Brazil*

*Others authors from Museu da Vida/COC - Fiocruz, Brazil: Luis Fernando Donadio; Jose Alexandre Mota; Maria do Rosário de Assumpção Braga*

### **Room 13 (International Union of Science Communicators Seminar) : "Scientific Temper and Cultural Systems", Part 2**

Traditionally, every society has its own faiths. Some of them are what we may call "blind faiths" (or superstitions). There are some harmless blind faiths, such as believing that the number 13 is inauspicious. However, there are some quite harmful blind faiths such as killing birds or goats to please the gods and so on. For these, scientific communicators have to inform people with those beliefs about the consequences of their actions. Speakers will discuss this subject and inform people about the efforts – either at individual or institutional level - than can be done to meet this problem.

**Chairperson:** Prof. Yash Pal (India)

**Speakers:**

Mariam Addy (Ghana)

J.V. Narlikar (India)

Henrique Lins e Barros (Brazil)

**Wednesday 13th of April 2005**

**Parallel Session E (16h – 17h20) , 13<sup>th</sup> April**

### **Room 1 (Group Discussion E1) : Social inclusion case studies**

Keeping with the main focus of the conference, this panel looks to present case studies from different institutions that demonstrate how science centres and museums approach community education in response to their communities needs. It will also look at the boundaries isolating underserved communities and how we can overcome such barriers.

*Session leader: Virginia Price, National Museum of Science and Industry, United Kingdom*

*Participants:*

*Preeti Gupta, New York Hall of Science, USA*

*Diane Gallinger, Jordan Heritage Resources, Canada*

*Khadija Khan, National Museum of Science and Industry, United Kingdom*

### **Room 2 (Panel E2) : Learning - Experience – Knowledge**

Why the public interest in the growing numbers of science centres and hands-on exhibitions? Does the debate on informal learning show a possible way out of the crisis in education? Will the knowledge society rely on experience-based learning? These and other questions were discussed by occasion of DASA's 10th anniversary in 2003 by experts from science centres and museums of different kinds, leisure researchers, educationalists and experts from other fields. This symposium took place under the same title suggested for the 4scwc 2005 in Rio, and it seems to be worthwhile to present and discuss some of that topics in front of another worldwide audience and in relation to the progress in research and experience up to now.

Convenor: John H. Falk, Institute for Learning Innovation, USA

Speakers:

Karin Kaudelka, German Occupational Safety and Health Exhibition (DASA), Germany

Camille Pisani, Musée de l'Homme, France

Jorge Wagensberg, Director of CosmoCaixa, Spain

### **Room 3 (Group Discussion E3) : People, Profits, Planet: how can Science Centers manage responsibly?**

This roundtable discussion is designed to engage delegates from science centres around the world in a dialog about the role of science centres in practicing and teaching "sustainability" and social and environmental responsibility. The discussion builds upon a keynote address at the 3<sup>rd</sup> Science Centre World Congress, in which we were challenged to use our position of influence to lead the change. As respected educational institutions in our communities, we are uniquely positioned to present basic science information, design solutions, models, and tools to accelerate global sustainability.

*Session leader: Nancy Stueber, Oregon Museum Of Science And Industry, USA*

*Participants:*

*Gillian Thomas, Miami Museum Of Science & Planetarium, USA*

*Joaquin Fargas, Centro Cientifico Tecnologico Interactivo Exploratorio, Argentina*

*Mike Bruton, MTN ScienCentres, South Africa*

*Colin Johnson, formerly Director of Techniquet Science Discovery Centre, Cardiff, Wales, United Kingdom*

### **Room 4 (Group Discussion E4) South: South Campaign**

While the science centre network in Latin America is well developed (over 100 science centres in 18 countries, many travelling exhibitions), the network is poorly developed in Africa (12 science centres in four countries, few travelling displays). The two continents share many characteristics - multi-cultural communities, developing economies, past educational imbalances yet vast natural resources and industrious people. The aim of the session is to formulate recommendations on how the science centre network in Africa can become better developed, using the Latin American model.

*Session leader: Paulo Gadelha, Vice-president of Fiocruz, Brazil*

*Participants:*

*Beverley Damonse, SA Agency for Science & Technology Advancement, South Africa*

*Lebs Mphahlele, Youth & Science Programme, Department of Science & Technology, South Africa*

*Mike Bruton, MTN ScienCentres, South Africa*

*Julia Tagüeña, Director, Red-POP, Mexico*

*Ildeu de Castro Moreira, Ministry of Science and Technology, Brazil*

*Haydeé Domic, Program Explora/Conicyt and Museo Interactivo Mirador, Chile*

### **Room 5 (Group Discussion E5) : Internationalization of Travelling Exhibitions**

This panel will discuss numerous aspects of traveling exhibitions which increasingly are being exchanged internationally. This raises numerous issues of language, measurements, customs and border crossings, national sensitivities to social, environmental and political issues, currency valuations, and specific audience expectations.

*Session leader: Robert "Mac" West, Informal Learning Experiences, USA*

*Participants:*

*Brenton Honeyman, Questacon, Australia*

*Lizzy Cox, The Natural History Museum, United Kingdom*

*Cynthia Yao, Independent Consultant, USA*

*Alan Nursall, Science North, Canada*

*Jennifer Martin, Ontario Science Center, Canada*

### **Room 6 (Group Discussion E6) : Reaching for New Audiences by Innovative Product Packaging**

It is a well-known fact in science centers that, after the first over-crowded years since the opening, the struggle to get the audiences to re-visit is starting. A glance at the long-term development of visitor figures, quite often shows a gradually dropping visitor attendance . What kind of innovative means could we invent to keep the regular and find and attract new audiences? The presenters in this session come from science centers with quite a different operational surrounding. They will share the best practices and most successful recipes they have developed to keep their "regulars", attract first-comers and even find never-seen-before audiences with the other members of the roundtable.

*Session leader: Lea Tuuli, Heureka – The Finnish Science Centre, Finland*

*Other speakers:*

*Erik Jacquemyn, Technopolis, The Flemish Science Center, Belgium*

*James Marchbank, Science North, Canada*

### **Room 7 (Panel E7) : First and Third World Science Centres – Bridging the Gap**

There is a great need for collaboration between science centers in developed and developing countries. This paper seeks to look into problems faced by emerging science centers in developing countries and how developed countries can bridge the gap. After intensive contact meetings between American and African science center leaders, a very comprehensive paper will be presented, highlighting some important observations and coming up with recommendations to narrow this gap.

*Speakers:*

*Alfred Tsipa, Unizul Science Centre, South Africa*

*Terry Hutter, Exploration Place, USA*

### **Room 8 (Group Discussion E8) : Science Centres and natural disasters**

This session provides a forum to reflect on the recent Indian Ocean earthquake and tsunami tragedy. Delegates are invited to comment and share ideas on how science centres and networks can respond to natural disasters. Terrible as it was, this disaster has triggered a desire for knowledge, providing science centres with a great opportunity for engagement and education.

*Session leader: Graham Durant, Director, Questacon, Australia*

*Participants:*

*Herudi Kartowisastro, Science & Technology Centre, Indonesia*

*Thanakorn Palachai, National Science Museum, Thailand*

*Chee-kuen Yip, Hong Kong Science Museum, Hong Kong*

*Yukio Kiuchi, National Science Museum, Japan*

*Tengku Nasariah Ibrahim, Petrosains, Malaysia*

### **Room 9 (Group Discussion E9) : The Meeting of Science, Art & Technology**

Some ancient cultures use one word to mean art, science, culture, and technology. Our lives and our work are related in some way to Art and also to Science and Technology.

Participants will learn about how innovatives technologies are used by the artists, how a piece of art could illustrate a particular scientific principle and more.

*Session Leader: Joaquin Fargas, Centro Cientifico Tecnologico Interactivo Exploratorio, Argentina*

*Other speakers/authors from Centro Científico Tecnológico Interactivo Exploratorio, Argentina: Julieta Fierro; Sérgio de Regules; Peter Richards*

### **Room 10 (Workshop E10) : Elaborating Teaching Materials for Non-Formal Education**

The aim of this workshop is to promote reflection about parameters for the production of teaching material applied to non-formal education contexts, like museums. The theme of science communication has been in evidence in the past years and the area of non-formal science teaching is enlarging. Concomitantly, there has been an increase in researches about education in museums, specially in those dealing with the relation between museum and school. Schools have a noteworthy presence in science museums in Brazil, as in other countries, and teachers from different areas are increasingly interested in knowing these places more deeply in an attempt to make visits more profitable for their students. Parallel to it, educators and researchers from museums have developed activities targeting elaboration and analysis of the educational praxis to assure a still higher quality in their relationship with society.

*Session leader: Martha Marandino, Faculdade de Educação da Universidade de São Paulo, Brazil*

*Other speakers / authors : Maria Julia Chelini, Patrícia Narvaes, Luciana C. Martins, Viviane Aparecida Rachid Garcia, Rodrigo V. M. da Silveira, Alessandra F. Bizerra, Márcia F. Lourenço, José A. Fernandes, Carla G. Carneiro, Judith M. Elazari, Camilo M. Vasconcellos – GEENF - Faculty of Education of São Paulo University- FEUSP.*

### **Room 11 (Science Show E11) Play Clean**

“Play Clean” is a humorous presentation of stories and songs dealing with the environment, exploring the issue of urban waste and its consequences for quality of life. We seek to stimulate discussion on various aspects of garbage and how we can treat it adequately in order to avoid waste. Waste recycling is one of the key topics. “Play Clean” is one of the activities of the Storytellers’ Group at the Museum of Life, using public presentations combining children’s and teenagers’ literature and science based on the key health and environmental themes at the Museum and FIOCRUZ.

*Speaker: Adriana Assumpção, Museu da Vida/COC - Fiocruz, Brazil*

*Other speakers/authors from Museu da Vida/COC - Fiocruz, Brazil : Carla Gruzman; Carolina Salles; Laise Carvalho; Eduardo Koatz*

### **Room 12: Speaker’s Corner Sessions E12 (17h30 – 18h50)**

#### **UFMG Museum Network: an experience of integration of science spaces and museums**

This paper presents the experience of the formation of the UFMG (Federal University of Minas Gerais) Museum Network. Presently there are seven members of the Museum Network, created in 2000, with the aim of establishing ties and enabling joint action between the various spaces involved with scientific exposition in science museums and spaces.

*Speaker: Betânia Figueiredo, Universidade Federal de Minas Gerais, Brazil*

#### **Scientific Literacy in a Formal Educational Context. A Study with Secondary School Students in Santa Catarina**

The present study brings a relevant discussion, which relates science, technology, and society in an indissociable way. It is important for countries such as Brazil to invest on the scientific literacy of its citizens because the knowledge of scientific and technological contents could enable such citizens to understand their situation in society and attain a state of autonomy concerning the use and choice of new technologies that make part of their lives.

*Speaker: Clélia Maria Nascimento-Schulze, Universidade Federal de Santa Catarina, Brazil*

*Others authors: João Fernando Rech Wachelke, Universidade Federal de Santa Catarina, Brazil*

### **Science Museums and Continuing Teacher Training: possible contributions and challenges**

Continuing teacher training is a theme that has been discussed and researched by professionals from the fields of education as a whole and science education, both from the perspective of its concepts and the different strategies used for its development. This study focuses on the meaning teachers ascribe to their experience in visiting museums and identify the contributions to both their continuing education and their social and cultural insertion.

*Speaker: Maria Illoni Seibel, Museu da Vida/COC - Fiocruz, Brazil*

### **Healthy Environment: our space for citizenship**

This interdisciplinary activity allows participants to reflect on the need to develop teaching strategies in the field of health and the environment. Through a set of photographs with an outline for observation, the participants establish a relevant dialogue in this interface. The presentation approaches important aspects involved in the process of transforming a natural environment into an urbanized one. Retrieval of local history for an understanding of the current situation; population growth; human occupation and its impacts; industrial expansion; the reemergence of diseases resulting from environmental changes; and the pursuit of sustainable local development are some examples of the themes raised during the presentation.

*Speaker: Vânia da Rocha, Museu da Vida/COC - Fiocruz, Brazil*

*Other authors: Bianca Santos Silva Reis, Museu da Vida/COC - Fiocruz, Brazil*

### **What museums can do to foster science interest and critical debate among young people? The high school Science and Society Forum experience**

The Science and Society Forum of the Museum of Life (Museu da Vida) at the Oswaldo Cruz Foundation (Fiocruz), in Rio de Janeiro, is a program focusing high school community and proposing networking among research, education, and culture institutions, seeking to introduce young participants to the activities of production and dissemination of scientific knowledge. Discussing the potentialities of museums in promoting social debate and reflection and in networking scientific community to diverse social groups is the main issue that this paper aims to address.

*Speaker: Luciana Sepúlveda, Museu da Vida/COC - Fiocruz, Brazil*

*Other authors: Vânia da Rocha, Museu da Vida/COC - Fiocruz, Brazil; Marcelle Nogueira Pereira, Museu da Vida/COC - Fiocruz, Brazil; Marcus Soares, Fundação Cecierj, Brazil*

### **Room 13 (International Union of Science Communicators Seminar) : "National and International Networking", Part 1**

There are many institutions working in the field of physics, chemistry, astronomy, water and health which are contributing to public education. How is it possible to network all these efforts in order to improve science communication?

**Chairperson:** Prof. Ennio Candotti (Brazil)

**Speakers:**

A.P. Deshpande (India)

Eijiro Hiei (Japan)

A.P. Jayaraman (Singapore)

**Parallel Session F (17h30 – 18h50) , 13<sup>th</sup> April**

**Room 1 (Panel F1) : A Live Scientist: the ultimate exhibit?**

Science centres and museums offer a unique resource: a forum for research scientists to engage with the public. But questions of recompense and motivation are significant. Beyond the practicalities of recruitment and training of scientists, this session will focus on the 'political' pressures that mitigate against sustainable Live Scientist programmes.

*Convenor: Melanie Quin, ECSITE, United Kingdom*

*Speakers:*

*Alan Nursall, Children's Museum, Canada*

*Dietrich Schiel, Experimentoteca CDCC, Brazil*

*Andrea Bandelli, Independent Consultant, The Netherlands*

### **Room 2 (Group Discussion F2) : Global Museum**

Global Museum is an innovative way to connect users of science center web sites to various science centers in real time. Web site visitors can interact with exhibits and museum visitors.

This use of cutting edge technology engage visitors and connect different cultures bringing

*Convenor: Joaquin Fargas, Centro Cientifico Tecnologico Interactivo Exploratorio, Argentina*

*Speakers:*

*Derek Fish, Unizul Science Centre, South Africa*

*Eric Marshall, New York Hall of Science, USA*

*Brenton Honeyman, Questacon, Australia*

*Tengku Nasariah, GM/CEO Petrosains, Malaysia*

### **Room 3 (Group Discussion F3) : Outdoor Science Parks - Promoting Diversity in Science Centres**

As more Outdoor Science Parks continue to be successfully implemented in science centers, operational experience is providing evidence on visitors' reactions and interactions. In this session, representatives from four continents will describe their experience of operating Outdoor Science Parks and address issues such as: What are the advantages and disadvantages of experiencing science in the outdoors? Can Outdoor Science Parks attract additional diverse audiences to science centers? Does going beyond the walls increase inclusion and diversity among our visitors? How do we successfully operate an Outdoor Science Park environment?

*Session leader: Ronen Mir, SciTech Hands on Museum, USA*

*Participants:*

*Mikko Myllykoski, Heureka - The Finnish Science Centre, Finland*

*Antonio Carlos Pavão, Espaço Ciência - UFPE, Brazil*

*Moshe Rishpon, Clore Garden of Science, Israel*

*Ingit K. Mhopadhyay, NCSM Outdoor Science Parks, India*

*Marta Mantovani, Science and Technology Park, Brazil*

### **Room 4 (Panel F4) : Recent Communication Techniques Adopted by Some Science Museums/Centres for Development of Thematic Galleries and Exhibitions**

Science Museums and Science Centres, both old and new, all over the world are keen to communicate scientific message through exhibitions and exhibits to their visitors in most effective way. The session will focus on recent trends in conceptualization, design and development of exhibits for thematic galleries and exhibitions.

*Convenor: Jayanta Sthanapati, Birla Industrial and Technological Museum, India*

*Speakers:*

*Thanakorn Palachai, National Science Museum, Thailand, Thailand*

*Shimada Takuya, National Museum of Emerging Science & Innovation, Japan*

*Clarence Sirisena, Singapore Science Centre, Singapore*

*Paul Shimrath, Otago Museum & Discovery World, New Zealand*

### **Room 5 (Panel F5) : Social inclusion actions in science centres**

In this session, panellists from different countries (Argentina, Brazil and South Africa) will discuss and give examples of social inclusion actions carried out by their institutions, through programmes, digital inclusion projects, new exhibition approaches and visitors services.

*Convenor: Luciana Sepulveda, Museu da Vida – Fiocruz, Brazil*

*Speakers:*

*Claudio Marcelo Abrevaya, Universidad Nacional General Sarmiento, Argentina*

*Dirce Pranzetti, Estacao Ciencia - USP, Brazil*

*Sylvia van Zyl, Bayworld, South Africa*

*José Ribamar Ferreira, Museu da Vida/COC - Fiocruz, Brazil*

### **Room 6 (Group Discussion F6) If We Could Start The Science Centre Field All Over Again, What Would We Do Differently?**

Although collection-based science museums in Europe, the USA and Canada were introducing interactive experiences at earlier moments in the twentieth century, 1969 marked the beginning of a new kind of science museum. Instantly popular, these were characterized by a participatory style of exhibitions and demonstrations, a strong focus of public education and, correspondingly, relatively small artifact collections geared to exhibition as opposed to scholarly research and conservation efforts. In this context, panelists will address the question: If we could start the science centre field all over again, what would we do differently?

*Session leader: Emlyn Koster, Liberty Science Center, USA*

*Participants:*

*Per-Edwin Persson, Heureka - The Finnish Science Centre, Finland*

*Silvia Singer, Espacio Cultural y Educativo Betlemitas, Mexico*

*Nancy Stueber, Oregon Museum of Science and Industry, USA*

### **Room 7 (Panel F7) : Promoting Sustainable Development**

Due to the increasing environmental degradation of the world we are living, the panelists invite science and technology centres and museums to dedicate important spaces to this problem in their exhibitions, workshops, and programmes, with emphasis in new technologies and behaviors and promoting a global culture of sustainable development.

*Convenor: Brani Rozemberg, Instituto de Pesquisa Clínica Evandro Chagas – Fiocruz, Brazil*

*Speakers:*

*Marc Girard, Cité des Sciences et de l'Industrie, France*

*Enrique Fonte, Gota d'Água Museum, Mexico*

*Gillian Watson, Bayworld, South Africa*

*Camille Pisani, Musée de L'homme, France*

### **Room 8 (ABCMC Session – Panel F8) : Informatics Applied to Art, Science and Health Education: Experiences in Rio de Janeiro, Brazil**

The following experiences will be presented in this group discussion about informatics applied to art, science and health education : applications of informatics technology for distance education of health professionals; the spreading of informatics technology for bioscience image database structure and search; real and virtual dengue mosquitos: science and health education based on trough dynamic image created with informatics movie tools; the exhibition Brazilian dinosaurs get life: the modern paleontology reaches the people; and science, art and informatics: teaching science through emotion.

*Convenor: Tania Araújo-Jorge, IOC - Fiocruz, Brazil*

*Speakers:*

*Elomar Castilho-Barilli and Antonio Ivo de Carvalho, National School of Public Health/ENSP - Fiocruz, Brazil*

*Genilton Vieira and Rosane Meirelles, IOC - Fico Cruz, Brazil*

*Sérgio Azevedo, Museu Nacional, UFRJ, Brazil*

*Leopoldo de Meis and Diucênio Rangel, Universidade Federal do Rio de Janeiro, Brazil  
Luiz Tucherman and Helene Barbosa, Portinari Project, Brazil*

### **Room 9 (Group Discussion F9) : Development through Partnership**

"Development through Partnership" is a collaboration between the Vitae Foundation, the British Council and Techniquet, with the objective of contributing to the improvement in the quality of life of the community. Its principal activities in Latin America are focused in Brazil, Argentina and Chile. The purpose of this Panel is to showcase the achievements of Brazilian science centres and their personnel in working with a European partner, and to illustrate the ways in which such a collaboration brings benefits to participating centres and their personnel, host institutions, providing bodies and supporting partners. Panel representatives will provide a coherent case-study which evaluates this project in order to assist similar initiatives to follow or learn from its example.

*Session leader: Colin Johnson, formerly Director of Techniquet Science Discovery Centre, Cardiff, Wales, United Kingdom*

*Participants:*

*David Ellis, formerly Director, Museum of Science, Boston MA, USA*

*Getúlio Carvalho, Vitae Apoio à Cultura, Educação e Promoção Social, Brazil*

*José Ribamar Ferreira, Museu da Vida/COC - Fiocruz, Rio de Janeiro, Brazil*

*Wilson Texeira, Estação Ciência, São Paulo, Brazil*

*Jeter Bertoletti, Museu de Ciências e Tecnologia – PUC/RS, Porto Alegre, Brazil*

*Roberta Kacowicz, British Council, Brazil*

### **Room 10 (Workshop F10) : Bubbles!**

In this workshop, with a maximum audience of 30 people, we will be working the topic of bubbles. An unaware look at nature surprises because of the infinity of shapes and patterns that exist in it. However, a more conscious look tells us that that infinity of shapes is the result of the elaboration and re-elaboration of a few basic designs.

*Session Leader: Julián Betancourt, Museo de la Ciencia y el Juego, Universidad Nacional de Colombia, Colombia*

*Other speakers: Miguel Martínez, Museo de la Ciencia y el Juego, Universidad Nacional de Colombia Colombia*

### **Room 11 (Science Show F11) : Special Relativity in 4 acts**

In the science show we will show the main highlights of the Special theory of Relativity, how it came about and what are the main consequences. The moderator using the public participation explains some counterintuitive physical principles underlying the theory. The presentation will be in a sort of a game with no real exhibits, the actors will play a role of photons, elementary particles and observers. The topic was chosen to mark the 100th anniversary of Einstein's first publication of Special theory of relativity. To celebrate the anniversary UNESCO declared the year 2005 international year of physics.

*Speaker: Orest Jarh, Technical Museum of Slovenia, Slovenia*

### **Room 12: Speaker's Corner Sessions F12 (17h30 – 18h50)**

#### **Recollecting Indigenous Thought in a CD Rom**

The Ticuna evaluation of their own ritual masks, clothes and instruments used during puberty rituals, collected by Curt Nimuendaju in 1941/1942 and stored in the Ethnological Reserve of the Museu Goeldi is an opportunity to look forward to a new perspective of sharing knowledge, and improving anthropological research.

*Priscila Faulhaber, Museu Paraense Emílio Goeldi, Brazil*

#### **Audience Research: before, during and outside the museum**

Audience research studies are a powerful tool for museum planning. Museums perform audience research studies particularly when a great event is being planned, either for opening new premises, new exhibitions or substantial refurbishment of old exhibition areas. In spite of these

important moments to rely on information from audience studies, they should also provide solutions for the everyday management of museums. This presentation will discuss data from three case studies involving audience research in order to contribute with thoughts on how far we should go in the development of audience studies and its practical use.

*Speaker: Pedro Casaleiro, Museu das Ciências da Universidade de Coimbra, Portugal*

### **Upper secondary students : what do they engage in and why?**

Free-choice learning is life-long and happens while watching television, reading books, talking to other people and in museums. Science centres offer a great opportunity for free-choice learning. In this study of the science centre experience in relation to upper secondary students the focus is on engagement rather than cognitive gains. The upper secondary level is rarely in focus at science centres. This study seeks to contribute to the understanding of upper secondary students engagement at science centres. The method used is a combination of multimodal analysis of student's writing, observations of behaviours and underpinning interviews to achieve triangulation of data.

*Speaker: Nana Quistgaard, Experimentarium, Denmark*

### **Preliminary work into the development of an efficient and effective research methodology**

The study reports preliminary work into the development of an efficient and effective research methodology that is especially suitable for studies into the learning taking place in informal contexts. It is the result of a pilot study into the use of a modified version of the Stimulated Recall (SR) technique and was carried out in a science museum. Instead of the use of a video camera to collect data on visitor behaviour, digital pictures were taken instead. Eight interviews based around these still pictures were later carried out with interesting results.

*Speaker: Douglas Falcão, University of Reading, United Kingdom*

### **The Dark Room in the Science Park at FIOCRUZ: representations by visitors**

In the Science Park, Museum of Life, Rio de Janeiro, Brasil, visiting the Dark Room is a twenty minutes experience with diverse information in the areas of history, art, physics, and biology, based on the theme of sight processing This work presents an analysis of visitors' drawings of the eye, before and after visiting the dark room.

*Maria Paula de Oliveira Bonatto, Museu da Vida/COC - Fiocruz, Brazil*

*Other authors from Museu da Vida/COC - Fiocruz : Carla Mahomed; Paulo Colonese*

### **Museum Audiences: where are the data? Production of a Catalogue of Primary and Secondary Data Sources on Museum Audiences in Brazil**

Cultural data are scarce in Brazil and have still not been the object of regular and systematic institutional surveys. This study thus aims to identify and analyze primary and secondary sources on research focused on Brazilian museum audiences that offer mechanisms for the evolution of cultural practices, leisure, and appropriation of science dissemination media, including museum visits, among other highlights.

*Speaker: Marcelle Nogueira Pereira, Museu da Vida/COC - Fiocruz, Brazil*

*Others authors: Luciana Sepulveda, Museu da Vida/COC - Fiocruz, Brazil*

### **Room 13 (International Union of Science Communicators Seminar) : "National and International Networking", Part 2**

There are many institutions working in the field of physics, chemistry, astronomy, water and health which are contributing to public education. How is it possible to network all these efforts in order to improve science communication?

**Chairperson:** Prof. Ennio Candotti (Brazil)

**Speakers:**

A.P. Deshpande (India)

Eijiro Hiei (Japan)

A.P. Jayaraman (Singapore)

**Thursday 14th of April 2005**

**Parallel Session G (16h – 17h20) , 14<sup>th</sup> April**

**Room 1 (Panel G1) : Families in Science Centre: A Collective Learning Experience**

This session will highlight familial learning and ways to provide greater access to and use of resources of the Science Centres by parents and grand parents. It will also discuss and focus on nurturing social and familial values through Science Centres activities and programmes. There are several programmes, which facilitate social encounters and inter-family interactions. Children have become the originator of a new bonding among parents and families thereby strengthening social roles and linkages, thus establishing itself a social platform where social creativity is demonstrated and enhanced regardless of age, gender, culture, religion or education.

*Convenor: G.S. Rautela, Nehru Science Centre, India*

*Speakers:*

*Lynn Dierking, Institute for Learning Innovation, USA*

*Orna Cohen, Cité des Sciences & de l'Industrie, France*

*Denise C. Studart, Museu da Vida / COC - Fiocruz, Brazil*

**Room 2 (Panel G2) : Different Approaches for the Development of Science Exhibitions to Promote Social Engagement of Citizens**

Panelists will analyze our role as science centres in society and our contribution in creating responsible citizens, considering several issues such as: science and society, the relationship between global and local science, as well as diversity and inclusion. Examples of how such issues have been used to guide the process of planning, designing and evaluating exhibits will be presented.

*Convenor: Elaine Reynoso, Universum, Mexico*

*Speakers:*

*Sigrid Falla, Maloka, Colômbia*

*Joaquín Fargas, Exploratorio, Argentina*

*Walter Staveloz, ECSITE, Belgium*

**Room 3 (Group Discussion G3) : Exhibitions for Global Issues/Global Connections/Global Citizens**

Exhibitions, the defining media used by science centers, play a critical role in informing communities about sci-tech issues and demonstrating their connection to the world. This session will review current efforts, research and successes and failures in this area worldwide and discuss what the field has learned through these attempts.

*Session leader: Wayne LaBar, Exhibitions and Theaters, Liberty Science Center, USA*

*Participants:*

*Graham Farmelo, Science Museum, United Kingdom*

*E. Islam, National Council of Science Museums - NCSM, India*

*Benoit Legare, Centre des Sciences de Montréal, Canada*

*Kathleen McLean, Public Programs & Center for Public Exhibition, The Exploratorium, USA*

#### **Room 4 (Panel G4) : Presenting Science Inside and Outside Science Centres**

This session will present examples from Hong Kong, India and Mexico of different science communication strategies used inside and outside science centres.

Convenor: Maria Esther Valente, Museu de Astronomia e Ciências Afins – MAST, Brazil

Speakers:

Chee-Kuen Yip, Hong Kong Science Museum, Hong Kong

Shri.V.S. Ramachandran, Regional Science Centre & Planetarium, India

Rolando Ísita Tornell, Unam, Mexico

#### **Room 5 (Panel G5) : Museums and Media: Content Partnerships**

Museums are engaging broader and more diverse audiences by producing live cable newscasts, webcasts and satellite phone uplinks, and by forming partnerships with news organizations, science journals, documentary producers, broadcasters and research enterprises. The incorporation of new methods of production and distribution of multimedia stories promises to help Museums tackle the interpretation of current science and technology for their audiences, with capacity for frequent updating. This panel represents a wealth of experience in the use of low-cost desktop video production systems, multimedia exhibit labels, live event cablecasting and webcasting, satellite phone links, media partnerships, and even soap opera TV tie-ins.

Convenor: Carol Lynn Alpert, Museum of Science – Boston, USA

Speakers:

Luigi Amodio, Citta della Scienza, Italy

Erik Jacquemyn, Technopolis, The Flemish Science Center, Belgium

Robert Semper, Exploratorium, USA

#### **Room 6 (Panel G6) : If Our Centre could be Expanded...**

Many new science centres have been established in recent years. Some centres have undertaken a substantial program of expansion. Participants are encouraged to share their ideas on what they would include if they had the money and space for expansion. Is expansion the way forward? Is the era of the large centralised institution over? Are we moving to decentralised science centre models?

Convenor: Graham Durant, The National Science and Technology Centre, Australia

Speakers:

Tuan Chiong Chew, Singapore Science Centre, Singapore

Goery Delacote, The Exploratorium, USA

Yukio Kiuchi, National Science Museum, Japan

Per-Edvin Persson, Heureka – The Finnish Science Centre, Finland

#### **Room 7 (Panel G7): The construction of Scientific Knowledge and Science Representation: What to Expect from Museums?**

The museums and the science centers tend to privilege the presentation of the results of the scientific activity, not considering the social contexts of constitution and institutionalization of the knowledge. The science representation is predominant as a established knowledge, the references to the difficulties and controversies that characterize the scientific process are practically absent. Little attention has also been given to the historicity of the science museums and to the distinct relationships that were established between the practice of science and its representation in museological spaces. The board intends to problematize these current images, through sociology approaches and science history. It intends to contribute to the debate on new theoretical and practical possibilities that expand the role of the museums and science centers.

Convenor: José Maurício Domingues, Instituto Universitário de Pesquisas do Rio de Janeiro – IUPERJ, Brazil

Speakers:

Margareth Lopes, Instituto de Geociências - Unicamp, Brazil

Jorge Rivera, Universidade de Évora, Portugal

Myanna Lahsen, University of Colorado, USA

### **Room 8: Open International PCST Network Meeting**

Members of the Public Communication of Science and Technology - PCST Network Scientific Committee from different countries, such as Brazil, China, Colombia, France, Portugal, South Africa, South Korea, Spain, Thailand and the US will convene to present and dialogue about main orientations and activities of the network, and above all, to exchange with participants of the Congress interested in this subject.

### **Room 9 (Group Discussion G9) : A Follow up Discussion about Plenary Session 4 "Science Centres and Museums as Learning Places" : Challenges and Issues**

This session follows the plenary session "Science centres and museums as learning places". Groups share their ideas in response to the plenary session and work through a process to identify the challenges and issues that impact the most on science centres and museums as they seek to be places of learning in their communities, and to consider what institutions and networks could do to address these issues.

*Session leader: Brenton Honeyman, Questacon, Australia*

*Participants:*

*Ennio Candotti, Brazilian Society for Science Progress, Brazil*

*Dennis Bartels, TERC Science and Math Learning, Massachusetts, USA*

*Leonie Rennie, Curtin University of Technology, Australia*

### **Room 10 (Workshop G10) : The Sketchbook as a Science Tool: Picturing the Unseen**

Hands-on workshop introduces you to the possibilities of using sketching and journal keeping in educational programs and on the exhibit floor as a way of enhancing the public understanding of science. Sketching begins with recording observations but progresses to understanding connections among objects and events. No sketching experience required.

*Session Leader: Diane T. Sands, California Academy of Science, USA*

*Other speakers: Lorie Topinka, USA; Roberta Ayres, USA*

### **Room 11 (Science Show G11) : Modernize the Traditional Toys**

Due to insufficient resources, before 1970 most children in Taiwan had to produce their toys by themselves, called "Traditional Toys". With the upcoming of mass production, children seldom produce their own toys and, since the nineties, most of them play with electronic toys (i.e. PC or video games). This science show is aimed at motivating children to produce their own toys and mainly to identify how the traditional toys in Taiwan look like, raw materials used, currently used materials, scientific theories or principles applied to the toy, extended technological products. In the end, the audience will be taught to make a magic straw flute.

*Session leader: Jun-Fu Huang, Technology Education Division of NSTM, Taiwan*

*Other speakers: Cheng-Chin Chen, Technology Education Division of NSTM, Taiwan*

### **Room 12: Speaker's Corner Sessions G12 (16h – 17:20h)**

#### **Vacations with Science Programme**

This presentation introduces one of the activities promoted by the Science Museum of Venezuela, "Vacations with Science", directed to children and teenagers, exposing the basic concepts and goals of the project, the programme, offered courses, recent changes and obtained results.

*Speaker: Hanna Carjevschi, Museo de Ciencias, Venezuela*

#### **Evaluating educational demands in the relationship between museums and schools - The case of the Zoology Museum of the University of São Paulo**

The purpose of this paper is to evaluate the educational actions of a museum thematically directed to Zoology, with the intent of supporting and fomenting the links between museum

institutions and one of their target audiences, the school. The evaluation of these goals shall in general seek a wider reach of patrimonial policies directed, on the one hand, to scientific publishing and, on the other, to the preservation of the musealized zoological patrimony. More specifically, this evaluation shall also aim at providing the bases for elaborating conceptual principles supporting the relationship of the educational action developed in natural science museums with schools.

*Speaker: Luciana Conrado Martins, Universidade de São Paulo, Brazil*

*Others authors: Martha Marandino, Universidade de São Paulo, Brazil*

### **Educating Informal Educators: Roles, Preparation and Methods for Training Science Center Staff**

Learn about the goals and logistics of COSI University, a multi-disciplinary professional development program designed to enhance the abilities of informal educators within our institution and encourage the facilitation of inquiry-based learning in and around our exhibits.

*Andrea Motto, COSI Columbus, USA*

### **What does visiting the Museum of Life mean to teachers ?**

This paper analyzes the reasons leading teachers to visit a museum, that is, what meaning they ascribe to their visit, besides identifying whether their concept of museums changes after visiting the Museum of Life of Oswaldo Cruz Foundation. The current research is being conducted with the Center for Science Education through an activity entitled: Meet the Teachers I: Getting to Know the Museum of Life. A specific questionnaire was developed for analyzing the process of constructing or reconstructing concepts. We sought to identify what kind of preconceived notion the teachers had about museums, what museums meant to them, whether their concept of museums had changed, and whether the Museum of Life had influenced this change at the moment when the teachers ascribed a particular sense to their visit.

*Speaker : Bianca Santos Silva Reis, Museu da Vida/COC - Fiocruz, Brazil*

### **The Itinerant Science Place (CECIERJ)**

This paper describes the different activities carried out by the Itinerant Science Project, a science and culture center conceived and implemented in 1994 based on proposals and discussion of representatives from several Rio de Janeiro institutions, with the perspective of making access to scientific knowledge, through experimentation. In order to awaken more choices in its proposition of demystifying science, it pays special attention to teaching formation programs for students and teachers from first and second periods of basic learning as its target audience.

*Speaker: Oneida Enne, Fundação CECIERJ, Brazil*

### **Room 13 (International Union of Science Communicators Seminar) : "The role of Scientific Communicators in Enhancing Science Education", Part 1**

Science education at school level is relatively recent in many countries. Are teachers good science communicators? How can we improve teacher's communication skills? How can Science Communication or Science Journalism courses help to improve this situation? How can voluntary organisations support school teachers?

**Chairperson:** P.M. Bhargava (India)

#### **Speakers:**

Laxman Londhe (India)

Suhas, Naik-Satam (India)

Ernest Hamburger (Brazil)

Manasi Rajadhyaksha (India)

**Parallel Session H ( 17h30 – 18h50) , 14<sup>th</sup> April**

### **Room 1 (Panel H1) : Science Communication Outside the Science Centre**

The session will discuss projects beyond the science centre's walls. The presentations will be joined in two groups. The first one presents two science communication initiatives that use buses and cereal boxes as vehicles for evoking the curiosity of the public toward science, in Costa Rica and United Kingdom. The second group joins two itinerant initiatives that aims to go to the countryside in China and Brazil, through train and truck, to put science communication activities for people in areas where there are no science centres and science museums.

*Convenor: Órmis Rossi, Fundação Planetário do Rio de Janeiro, Brazil*

*Speakers:*

*Alejandra León Castellá, Fundación Cientec, Costa Rica*

*Frank Burnett, University of the West of England, United Kingdom*

*Jetter Bertoletti, Brazil*

*Haydeé Domic, Explora/Conicyt and Museo Interactivo Mirador, Chile*

### **Room 2 (Panel H2) : Launching Current Science & Technology Projects in Museums: how to make them work**

The pace of scientific discovery and invention has quickened, and science museums have found it difficult to respond to the growing demand to address current research and emerging technologies. How can we help our audiences understand our increasingly complex world and the many new choices made available through science and technology? Traditional museum exhibits can take several years to plan and build and are difficult to update. Some museums have tackled the challenge by launching dedicated current science and technology operations. This session will review some of these new experiments and what their designers have learned from them thus far.

*Convenor: Carol Lynn Alpert, Museum of Science – Boston, USA*

*Speakers:*

*Chee-Kuen Yip, Hong Kong Science Museum, Hong Kong*

*Andrea Bandelli, Independent Consultant, The Netherlands*

*Heather Mayfield, Science Museum, United Kingdom (via DVD)*

### **Room 3 (H3) : Science centres, visitors and research**

There is a lot of research going on within the field of science centres and museums. In this session, audience researches carried out in different countries (Sweden, India, USA, and Brazil) are presented, tackling interesting issues, such as : What image of science is shown in science centres? How can we motivate women / girls to be more involved with science? What can research tell about people's motivation to learn? What efforts can be made by institutions in order to disseminate visitors' studies nationally and internationally?

*Convenor: Denise Studart, Museu da Vida/COC - Fiocruz, Brazil*

*Speakers:*

*Eva Davidsson, Malmö University, Sweden*

*Perumalsamy Navaraj, Yadava college, Madurai, Índia*

*Flavio Azevedo, Centre for Informal Learning and Schools, University of California, Santa Cruz, USA*

*Luciana Sepulveda, Museu da Vida/COC - Fiocruz, Brazil*

### **Room 4 (Panel H4) Increasing Science Centre Margins for a Sustainable Future**

Using examples and strategies, panelists will elaborate on the planning, program or management methods used to empower an institution to develop or deepen a successful organisational secondary spend strategy. The session will create a context of methods participants will take back to their home institutions.

*Convenor: Jim Marchbank, Science North, Canada*

*Speakers:*

*Graham Durant, Questacon, Australia*  
*Therese Andrade, The Americas, Imax Corporation, USA*  
*Tony Sefton, Experience Analyst International, United Kingdom*

### **Room 5 (Group Discussion H5) : Harvesting the benefits of a fruitful exchange between science centres**

The panel will share their experiences and those of their colleagues who participated in an exchange program between Espaço Ciência Viva in Rio de Janeiro and the Exploratorium in San Francisco in the early 1990s. The cross-institutional, cross-cultural learning that occurred may provide a model for similar collaborations in the future.

*Session leader: Jamie Bell, The Exploratorium, CA, USA*

*Other speakers:*

*Maurice Bazin, Instituto de Política Linguística – IPOL, Brazil*

*Robson Coutinho Silva, Instituto de Biofísica Carlos Chagas Filho – UFRJ, Brazil*

*Representative of Espaço Ciência Viva – UFRJ, Brazil*

### **Room 6 (Group Discussion H6) : Education and Science Museums: practical and theoretical challenges**

The history of museums is as old as the concern with their educative aspects. The scientific production and divulgation of educative practices in museums all over the world is continuously growing and so is the volume of publications discussing this issue. In Brazil, the studies concerning the creation of museums of science evidence the rich contribution of these institutions to the consolidation of natural sciences in the country. This roundtable aims to discuss the present situation, with focus on pedagogical search and practice in the museums of science, tendencies, results of studies and experiences that may point to the challenges in developing education in museums.

*Session leader: Martha Marandino, Faculdade de Educação da Universidade de São Paulo, Brazil*

*Other speakers:*

*Maria Esther Valente, Museum of Astronomy and Related Sciences – MAST -, Brazil*

*George Hein, Lesley University, USA*

*Peter van Mensch, Reinwardt Academy, The Netherlands*

### **Room 7 (Panel H7) How Museums Can Play Their Social Role: Heritage, Collections and Communities**

In this session, panelists from UK and Brazil will present their institution's work with specific communities. The Natural History Museum, in London, will present their "Roots and Herbs" project. The Museum of the American Man is a "sui generis" case in Brazil because it is installed in a poor region and far from all urban centers of the country. It was created from a decision taken by a team of researchers who analyzed the data on the natural and cultural potentialities of the area and decided to use its archeological potential and beauty of the nature to seek a way that could generate a new quality of life for the population. The Museu do Índio (Indian Museum) will present its work with the Brazilian indigenous groups.

*Convenor: Adauto José G. de Araújo, National School of Public Health – ENSP, Fiocruz, Brazil*

*Speakers:*

*Saira MacNicol, The Natural History Museum, United Kingdom*

*Niede Guidon, Fundação Museu do Homem Americano, Brazil*

*José Carlos Levinho, Museu do Índio, Brazil*

### **Room 8 (CenDoTec Group Discussion H8) Seminaire franco-bresilien sur la cooperation scientifique**

Open seminar organized by CenDoTec (French-Brazilian Centre of Technical Documentation) where participants will be able to engage in discussions about scientific cooperation between institutions.

*Session leader: Pierre Fayard, Centre Franco-Brésilien de Documentation Technique et Scientifique - CenDoTec*

*Participants:*

*Jean-Paul Lefèvre, Attaché de Coopération et d'Action Culturelle, Consulat Général de France, Rio de Janeiro*

*Philippe Juillard, Chargé de Missions Scientifiques, Consulat Général de France, Rio de Janeiro*

*Halumi T. Takahashi, Infocentre, CenDoTec*

*Antonio Carlos Pavão, Espaço Ciência, Recife, Brazil*

*Fatima Brito, Casa da Ciência, Rio de Janeiro, Brazil*

*José Ribamar Ferreira, Museu da Vida – Fiocruz, Brazil*

*Ernst W. Hamburger, Consultant, Estação Ciência, Brazil*

*José Ballester Jr., Universidade Federal do Espírito Santo - UFES, Brazil*

*Jeter Jorge Bertoletti, Museu de Ciências e Tecnologia – PUC/RS, Brazil*

*Pietro Corsi, Université de Paris I, France*

*Camille Pisani, Musée de l'Homme, France*

*Hugues Dreyse, Université Louis Pasteur, France*

*Brigitte Coutant, La Cité des Sciences et de l'Industrie, France*

## **Room 9: Speaker's Corner Sessions H9 (17h30 – 18h50)**

### **The Role of a Science Center in Teacher Training and Innovation in Science Teaching**

*ABC na Educação Científica – Mão na Massa*, inquiry based science teaching, teacher training sessions have been held in Estação Ciência since 2001. Children like the work and teachers report that 1st to 4th grade pupils progress more rapidly in learning to read and write and in oral expression, especially in classes of children with mental or physical handicaps.

*Speaker: Beatriz A. C. de Castro Athayde, Estação Ciência, Universidade de São Paulo, Brazil*

*Others authors from Estação Ciência - USP: Rafaela Samagaia; Simone Falconi; Ernst W. Hamburger; Amélia Império Hamburger*

### **"Circuito Ciência" Project: advising research and scientific activities for B12 students in the city of São Paulo**

The project "Circuito Ciência" was implemented in six schools located in the west of the city of São Paulo with groups of 6th, 7th and 8th grade B12 students, during nineteen months, between the years 2000 and 2001. In this paper, we discuss the educational process starting from the group formation, the group productions, research methodologies used by the students, the relationship established between the Project participants and the schools day-to-day work, and the obtained results.

*Speaker: Ivo Leite Filho, Estação Ciência - USP, Brazil*

### **Science Centres and Science Museums together towards a more valuable role in the public understanding of Science**

The present communication describes a project of collaboration between the Physics Museum (an university traditional museum) and the Science Centre Exploratório of Coimbra, Portugal, with the following general objectives: the design of interactive exhibits inspired in the instruments of the museum collection, and including written materials, and carrying on research on the comparison between the impact and learning results of the exhibits when shown in both institutions.

*Speaker: Helena Caldeira, Universidade de Coimbra, Portugal*

### **Game, exhibition and communication: a look at educative action**

In this presentation, we seek to understand the different relations based on a game developed by a team of specialists at the House of Oswaldo Cruz, included as a pedagogical strategy in a

science and health exhibit. A maze game, an integral part of the children's module at the Chagas of Brazil Exhibit, approaches aspects in the construction of scientific knowledge, discovery of the disease, and health and environmental aspects. The work was developed in the Center for Science Education at the Museum of Life, responsible for orienting science education activities and reflections on the specificity of museum pedagogy.

*Speaker: Carla Gruzman, Museu da Vida/COC - Fiocruz, Brazil*

### **Other Looks on Science**

This work presents and discusses the experiences developed in the Campinas Dynamic Museum of Sciences since 2001. It is framed as a space for scientific disclosure, whose work includes the formation of a research group, organizing expositions based on interactive discussions, postmodern perspectives of science and focusing a diversified public.

*Speaker: Antonio Carlos Rodrigues De Amorim, Museu Dinâmico de Ciências de Campinas, Brazil*

*Other authors from Brazil: Heloisa Girdi Malavasi; Heloisa Helena Saviani*

### **Room 10 (Workshop H10) : Summer Camps and afterschool Programs from the National Inventors Hall of Fame**

The session will use interactive audience participation to present inquiry-based informal science teaching methods and program funding opportunities. Session activities are from two informal science programs for elementary children developed at the National Inventors Hall of Fame: Camp Invention® and Club Invention®. Both are widely accepted across the United States

*Session leader: Brenda Wojnowsky, National Inventors Hall of Fame, USA*

*Other speakers: Hanna Smith, National Inventors Hall of Fame, USA*

### **Room 11 (Science Show H11) : Portable Optics**

A new proposal for teaching physical optics by experiments is presented. It is based on a few fully portable, self contained and pre-aligned devices for demonstrating to the whole classroom phenomena of interference, diffraction, polarization of light and eventually taking measurements. The phenomena are displayed both on a TV screen and on a computer monitor. The devices have no detachable parts, bustness, few and intuitive moving parts and adjustments, and are contained in small and fully portable bags. The devices are so robust and self-explaining that they have been inserted for years in the Physics Museum of the University of Cagliari as non-attended exhibits. One of such working devices will be shown and demonstrated.

*Session leader: Guido Pegna, Cagliari University - Dipartimento di Fisica, Italy*

*Other speakers/authors from Cagliari University, Italy: Giancarlo Cappellini; Guido Satta, Paola Grosso*

### **Room 12: Speaker's Corner Sessions H12 (17h30 – 18h50)**

#### **How to extract compelling and educative experiences from online museums databases**

##### **compelling and educative experiences from online museums databases**

This communication aims to present two experiments conducted as master and doctoral researches School of Human Informatics, Nagoya University, Japan. The experiments draw from the growing concern on how to extract compelling and educative experiences from online museums databases. The keen and common premise of both researches is understanding online museums as facilitators of a digital experience that construct a meaningful connection between the digital material and its online audience.

*Speaker: Pilar Almeida, IESB – Instituto de Educação Superior de Brasília –, Brazil*

#### **Internet link network of Science Centres and Museums**

##### **Internet link network of Science Centres and Museums**

It is known that over 85% of Internet traffic is driven directly or indirectly by sites dedicated to provide links from query search. Each one of these sites uses a different methodology of indexation, and we can divide them in two categories: directories and search engines. According

to Bowen (2000), the most important reason why museums should have a site in the Internet is to construct a set of virtual visitors. This set must have the same importance as the set of real visitors. Considering that, an analysis of the link network of a website could give some information about this virtual community and the kind of relations the website is constructing. This paper presents an analysis of this methodology applied to a set of world wide science museum websites.

*Speaker: Fabio C. Gouveia, Museu da Vida/COC - Fiocruz, Brazil*

*Others authors: Eleonora Kurtenbach, Espaço Ciência Viva - Universidade Federal do Rio de Janeiro, Brazil*

### **Science goes to the Cinema : science in the Brazilian movies**

This session is about analyses of movies made for educational purposes and to communicate science and technology issues produced between 1936 and 1966 by the Instituto Nacional do Cinema Educativo (INCE). Brainchild of anthropologist Edgar Roquette-Pinto the INCE was the first Brazilian state agency designed to produce and divulge educational movies. It was set up during the Getúlio Vargas administration as a tool both to educate and to convey ideologies, inspired by similar institutions in Europe. Almost one third of INCE's production was dedicated to subjects of scientific education and communication of science and technology.

*Elisandra Galvão, Universidade Federal do Rio de Janeiro, Brazil*

*Other authors: Luisa Massarani, Museu da Vida/COC – Fiocruz; Ildeu Moreira, Ministério de Ciência e Tecnologia, Brazil*

### **Is it possible to increase the quality and effectiveness of science communication towards schools and other visitors by organizing explainers in autonomous teams?**

Experimentarium was searching for a way to increase the quality of science communication towards schools and other visitors, to increase the effectiveness of the daily work and to create a model that will motivate the explainers to a better use of their skills. The solution found was to reorganize its explainers in teams that will focus on specific target groups and specific activities. The teams will have a high degree of autonomy, and they will take part in both creating new ideas for communicational activities and exhibitions, developing the activities, promoting and evaluating them. This paper describes the new system and would like to share the experience with other science centers and museums.

*Speaker: Kim Gladstone Herlev, Experimentarium, Denmark*

### **To whom do science centers belong to: issues that determine the relationship between science centers and communities**

This paper discusses issues of institutional autonomy of both interactive centers and science and technology museums in Venezuela. The discussion pays special attention to management issues that result particularly significant in order to develop and maintain positive relationships of collaboration with both government agencies, and the private sector, as well as to facilitate community participation.

*Speaker: Pía Córdova, Investigador Independiente, Coordinadora Programa Museos/Ministerio de Ciencia y Tecnología, Venezuela*

### **Room 13 (International Union of Science Communicators Seminar) : "The role of Scientific Communicators in Enhancing Science Education", Part 2**

Science education at school level is relatively recent in many countries. Are teachers good science communicators? How can we improve teacher's communication skills? How can Science Communication or Science Journalism courses help to improve this situation? How can voluntary organisations support school teachers?

**Chairperson:** P.M. Bhargava (India)

**Speakers:** Laxman Londhe (India)

Suhas, Naik-Satam (India)

Ernest Hamburguer (Brazil)

Manasi Rajadhyaksha (India)

## POSTER PRESENTATION

### **Theme area: SOCIAL INCLUSION AND ACCESS TO SCIENCE CENTRES AND MUSEUMS**

#### **Espaço Coppe Miguel De Simoni Tecnologia E Desenvolvimento Humano: A Social Interface Among University And Society**

Scientific and technological advances have led to the development of science-technology-society trinomial. Espaço COPPE Miguel de Simoni - Tecnologia e Desenvolvimento Humano intends to be a social interface between university and society providing basic meaningful learning in science and technology subjects as a way to decrease social exclusion.

*First author: Isabel Cristina Moreira Bernardo, Coppe/ Universidade Federal do Rio de Janeiro, Brazil*

*Other authors from Brazil: Nadia Maria Moura; Anderson Gomes de Paula*

#### **Astronomy As Science Diffuser At Brazilian's Northeast Semi-Arid**

The present work presents the stages for the implementation of an astronomical observatory in the northeast of Brazil, at the small town of Itacuruba, which has the intention of being the seed of a future science museum. The area in question has a secular history of poverty, characterized by the lack of water and a population with low educational. The strategy follows an obvious concept, however of difficult implementation, the union of the research, teaching and scientific diffusion.

*First author: Alberto E.P. De Araujo, Unicamp/ Cea-Oajp, Brazil*

*Other authors from Brazil : Lupércio Braga Bezerra; Emerson Peter Da Silva Falcão; Adimilson Urlano Da Silva; Glauce Cantareli*

#### **Science Communication To Young Lawbreakers**

Statistical information reveals that youngsters that have committed crimes or transgressed the law are between 16 and 21 years old and that 54 % of armed robberies were committed by minors as a result of how easy it is to acquire drugs and weapons. In Mexico City and other big cities of the country, more and more children and teenagers who are not being able to satisfy their needs in a suitable and socially accepted form, assume irregular behavior that leads them to transgress the laws. This presentation describes a programme offered by UNIVERSUM within the programme "Assistance to Vulnerable Groups", organizing visits to the museum.

*First author: Letícia Chávez Martínez, Universum Museo De Las Ciencias / Dgdc De La Unam, Mexico*

*Other authors: Maria Gabriela Cisneros, Mexico*

#### **My experience in the Museum Of Life and the Vocational Training For Youth From The Surrounding Community**

This poster shows the experience of Anna Karla, a student who was formed in a course for explainers offered by the Museum of Life, in Rio de Janeiro. The course is dedicated to vocational training among youngsters of low income families of the surrounding communities of the institution.

*First author: Anna Karla Sousa Da Silva, Museu da Vida/Casa de Oswaldo Cruz, Brazil*

*Other authors: Maria Paula De Oliveira Bonatto, Museu da Vida/COC - Fiocruz, Brazil*

#### **The search of talented young by means of science divulgation**

The great mission of the centers and museums of sciences is that of awaking the interest of the young for science and to develop actions in order to invest in the formation of potential

scientists. Seara da Ciência, a scientific divulgation unity of the Federal University of Ceará, is participating of a Brazilian net of public Universities, with a grant of Vitae Foundation, aiming to collaborate in the improvement of secondary public education quality and social inclusion of less favoured students. The work is developed by the means of courses for teachers and their pupils, during school vacations.

*First author: Marcus R. Vale, Universidade Federal Do Ceará, Brazil*

*Other Authors: Pedro Magalhães; Ana Lúcia P. Freitas; Betania Montenegro; Mônica K. Marques; Paulo Roberto L. Santos*

### **The "Biospace for All" Project**

The Science Center BIOESPAÇO (Biospace), sustained by a private university (Fundação de Ensino Octávio Bastos - UNIFEOB), at São João da Boa Vista – an inland city of the São Paulo state, Brazil, has a innovative program called "BIOSPACE FOR ALL" that makes science more accessible to the public through a cultural and scientific event. This paper presents the different activities developed by the programme, which is becoming a traditional happening and continually growing by aggregation of partners, visitors, schools and artists from the region.

*First author: Daniela Jacobucci, Centro de Ciências Bioespaço – UNIFEOB, Brazil*

*Other authors from Bioespaço – UNIFEOB, Brazil: Tiago Duque Estrada; Giuliano Jacobucci; Eliana Chagas; Arthur Guth; Alexander Turra*

## **Theme area: MODELS AND PERSPECTIVES FOR SCIENCE CENTRES**

### **Health and Culture - a Brazilian public health strategy**

Health Cultural Center (CCS) develops a creative type of communication for the public allowing a better understanding of the Brazilian health concerning the historical, social, political and scientific aspects. Trying to enlighten the health historical evolution, the challenges and the achievements, CCS, together with institutions, organizations and social movements encourages the spreading of the knowledge in the health sector.

*First author: Márcia Helena Gonçalves Rollemberg, Coordenação-Geral de Documentação e Informação – CGDI / Ministério da Saúde, Brazil*

*Other authors from Coordenação-Geral de Documentação e Informação – CGDI / Ministério da Saúde, Brazil: Claudia Regina da Silva Lobo; Mônica Isabel Cordeiro Quiroga; Jussara Fernandes Valladares*

### **Science Outreach through Museum Partnership - the SCOPE Project**

This project focuses on the presentation of current University of Chicago science research. University of Chicago physics professor Leo Kadanoff approached the SciTech museum in early 2003 about developing a program that could train graduate students in science communication. Months later, the partners launched SCOPE (SciTech Chicago Outreach Pilot Exploration, mps.uchicago.edu) with funding from the National Science Foundation. The coupling of university scientists with graduate students allows the program to cover both cutting-edge science and accurate fundamental science. The coach acts as a "guide on the side," encouraging students to generate ideas and appreciate the different talents that everyone brings to the table. The program has demonstrated that it can prepare confident science communicators; several SCOPE graduates are now employed in Chicago area museums.

*First author: Debby Mir, University of Chicago and Northeastern Illinois University, USA*

*Other authors: Leo Kadanoff, University of Chicago, USA; Ronen Mir, SciTech Hands on Museum, USA; James Sweitzer, University of Chicago, USA; Brenda Lopez Silva, University of Chicago, USA; Panagiotis Oikonomou, University of Chicago, USA; Stephanie Nelson, University of Chicago, USA; Brent Sackris, University of Chicago, USA; Shenandoah Weiss, University of Chicago, USA; Enrique Sanchez, Northeastern Illinois University, USA; Alessandra Conversi, Northeastern Illinois University, USA*

### **The Centre For The History Of Medicine Of Minas Gerais (Cememor) - New Perspectives For Action**

The Centre for the History of Medicine of Minas Gerais was set up in 1977 with two specific aims:

as a museum for the collection and preservation of archives on the evolution of the history, professional practice and teaching of medicine in Brazil, and as a resource centre for research activities of medical historians, employees and students. However, some of the centre's objectives have not been fully accomplished given that a considerable part of the historical documents was not archived. This paper introduces the new proposals for enabling the CEMEMOR to act as a space for the dissemination of medical science and catalyst for informed public debate about the role of universities in facilitating democratization of scientific knowledge.  
*First author: Anny Jackeline Torres Silveira, Coltec/Cememor - UFMG, Brazil*  
*Other authors: Rita de Cássia Marques, Brazil*

### **The Role Of A Science Museum At Crisis Times**

Six years ago, the Physics Museum of the Universidad Nacional de La Plata (UNLP) was created to preserve the centenary collection of demonstration instruments. In its short life, it has gone through different stages. Founded in times when scientific community had scarce contact with society, from the very beginning of its work, and mostly since the socio economic crisis beat the country, the museum had to revue its objectives. This paper presents the re-direction of tasks and strategies adopted by the Museum to be able to meet the needs of its public, among others through the construction of inexpensive didactical instruments and the initiative named "The Faculty goes to the neighborhood school".

*Author: Cecilia Reichenbach, Museo De Física De La Universidad Nacional De La Plata, Argentina*

## **Theme area: MANAGEMENT AND SUSTAINABILITY**

### **A Survey Of The Museums And Science Centers Operating In The State Of Minas Gerais, Brazil**

A survey of the museums and Science centers operating in the State of Minas Gerais, Brazil, shows that although it is the third largest economy in Brazil, the State is still way behind other states with respect to Science Museums. The Science Park Project, in an attempt to revert this situation, intends to install a group of Science Museums in the State of Minas Gerais. This work discusses the sustainability of the project, taking into account the context of each institution, the possibility of working in team, the importance of the public policies and the role of other agents such as the Vitae Foundation and state enterprises.

*First author: Evandro Passos, Universidade Federal De Viçosa, Brazil*

*Other authors: Maria Das Graças Rodrigues Brant, Secretaria De Estado De Ciência E Tecnologia - SEC, Brazil; Paulo Nascimento, Parque Da Ciência De Ipatinga, Brazil*

### **Management aspects of science museums**

The management characteristics of a science museum derive from the activities and exhibition approaches adopted, the capacity of public attendance and the infrastructure necessities that allows the mission to be accomplished. From these perspectives, the present study ponders, under the filter of different pointers, relative statistical data to the historical performance of the Museum of the Life, together with collected information of other museums and Brazilian science centres, aiming at the formatting and validation of a methodology for periodic collection, storage and analysis of data (synchronous) that can contribute for the taking of relative daily decision and the strategically planning to the management aspects

*Author: Sérgio Damico, Museu da Vida/COC – Fiocruz, Brazil*

## **Theme area: SCIENCE COMMUNICATION, SCIENCE AND SOCIETY**

### **The use of photography on the reconstruction of Cefet de Química – Nilópolis/RJ memory**

This work aims to presenting the chronology based on the analysis of historical photographs of the sixty years of existence of CEFET de Química de Nilópolis/RJ, employing a method previously designed for the image file and analysis. It is a documental research, with a qualitative

approach, supported by institutional documents and observations of photographs. The actors involved are pupils, teachers, ex-pupils, employees and ex-employees from the institution. The work is being developed at the Maracanã Unit of this institution.

*First author: Rosângela Aquino da Rosa, CEFETEQ – Nilópolis/RJ, Brazil*

*Other authors from CEFETEQ – Nilópolis/RJ, Brazil : Suely Pessanha de Almeida; Maria Aparecida Ciavatta Franco; Sidnei Quezada Meireles Leite*

### **The Game “Dengue´s tracking”: A strategy to disease prevention**

Dengue´s tracking” it a tray game made by cloth type canvas where the pins are substituted by participants who walking at the “track” that introduce information of dengue vector, introduction in Brazil and the virus dissemination capacity. The game presents agonistic characteristics (competitive), ludic and diagogic (recreation), which helps in the discussion of the information about the origin and introduction in Brazil of the *Aedes aegypti*, besides the virus dissemination capacity. The initial evaluations realized with the fundamental and high school students have showed that this didactic resource has good acceptance, with single rules and an easy reading of informations during the fulfillment of the activity.

*First author: Izabel C. N. Araújo, Instituto Oswaldo Cruz – Fiocruz, Brazil*

*Other authors from Instituto Oswaldo Cruz – Fiocruz, Brazil : Tânia Araújo-Jorge; Rosane M. S. Meirelles*

### **The experience of collaborative workgroups for health education and dengue prevention**

The present work describes the collaborative experience developed by our team of multi-professionals and the teachers in a public school located in a poor zone of the state of Rio de Janeiro: the Darcílio Ayres Public School situated in Nova Iguaçu city. We created strategies for education aiming dengue prevention and education in local interventions at school between 2002 and 2004. In this city, it was notified 5,491 cases of dengue in 2001 and 3,824 in 2002. Actually, the conditions for disease spreading are still present: environmental conditions favoring the proliferation of the mosquitoes, large poverty areas, a precarious health network, and plastic bottles exposed to rain.

*First author: Lucia Maria Ballester, Instituto Oswaldo Cruz – Fiocruz, Brazil*

*Other authors from Instituto Oswaldo Cruz – Fiocruz, Brazil: Simone S. Monteiro; Rosane M. S. Meirelles; Tânia Araújo-Jorge, Instituto Oswaldo Cruz – Fiocruz, Brazil*

### **Scientific events: a strategy for science popularization**

This study approaches a quantitative and qualitative evaluation capable to characterize the participation of students' who either were or were not PROVOC members of events of scientific popularization in FIOCRUZ, during the years of 2004 and 2005. We identify significant aspects in relation to academic formation of the students as well as the potential of scientific meetings as instruments of scientific popularization.

*Author: Cristiane Braga, Escola Politécnica de Saúde Joaquim Venâncio – Fiocruz, Brazil*

### **Instituto Ciência Hoje (Science Today Institute)**

*Ciência Hoje* ('Science Today') is the first Brazilian science communication magazine, created 23 years ago. Its 213 issues present a complete picture of Brazil's intellectual production. With several illustrations and experiments, *Ciência Hoje for Kids* stimulates children's curiosity and increases their understanding of daily phenomena. This magazine has been adopted by the Brazilian Education Department as a teacher-support material: in the last 15 years, it has been distributed to 107,000 public schools. *Ciência Hoje* Education Support Program was created by the *Ciência Hoje* Institute in order to improve teachers and students' attitude towards science teaching and to help increase Brazilian public school literacy levels. *Ciência Hoje* On-line besides publishing part of the content from *Ciência Hoje* Institute magazines on line, this website is updated daily with stories that cover the latest Brazilian and international science news.

*Author: Renato de Andrade Lessa, Instituto Ciência Hoje, Brazil*

### **Interactive Application of Science Experiments and Tecnologia, in Programs Extrawalls Directed to Vulnerable Population**

The House of the Technology of Campeche, Campeche México, in one of its programs extrawalls participates with the Integral Development of the Family, enabling and giving to pursuit to the activities of the people in charge of the program "Atención to Minors and Adolescents in vulnerable situation" of each one of the 11 municipalities that conform the State.

*Author: Maria Cristina Ojeda Macossay, House of Technology DGETI-SECUD, Mexico*

### **Exhibits For The Fundamental Constants Of Physics**

A complex research program for the construction of non-attended self-explaining exhibits for the measurement of the fundamental constants of Physics is under development in the Museum of Physics of the University of Cagliari. An original apparatus for the determination of the speed of light on a base of 6 meters (3 meters long), an apparatus for the evaluation of Planck's constant by the direct measurement of black body radiation, an apparatus for measurement of the elementary charge based on a new automated version of Millikan's experiment were developed. The above exhibits are completely self contained, and sufficiently small, portable and robust to be used also in classroom demonstration at secondary schools or Universities.

*First author: Guido Pegna, Cagliari University - Dipartimento Di Física, Italy*

*Other authors from Cagliari University - Dipartimento Di Física, Italy :*

*Giancarlo Cappellini; Paola Grosso; and Laura Savona, Design & Moda, Cagliari, Italy*

### **New Medias And Scientific Divuligation: Comics As Science Popularity Vehicle**

Our proposal is to present the Comics New Media as an outstanding scientific divulgation vehicle, based on the comics language as the most suitable communication method, to inform and form a scientific culture, despite of the reader's social and cultural level. That communication method is based on a modern, attractive and informal language and it can be able to introduce complex themes, as science and technology, and improve its divulgation strategies process.

*First author: Enrique Sérgio Blanco, COPPE/UFRJ, Brazil*

*Other authors: Leonardo Bertolossi, Brazil*

### **An Electronic Science Magazine In A Science Center**

The creation of an electronic magazine by the Scientific and Cultural Spreading Center of the University of São Paulo (CDCC) is a viable form to allow the scientific spreading from works developed by students and teachers of the University to a wide public. Moreover, it constitutes a training with respect to the production of appropriate texts for the spreading by undergraduate students. The "Revista Eletrônica de Ciências" (Electronic Magazine of Sciences - <http://www.cdcc.sc.usp.br/ciencias>) has been published since 2001 with monthly regularity and received in the first year 16,000 visits, between pupils, high school teachers and public in general.

*First author: Antônio Carlos Castro, Universidade De São Paulo, Brazil*

*Other authors: Adriana R. Martins Guerreiro, Universidade De São Paulo, Brazil*

### **How Do The Brazilian Phd Students Perceive Science And Contribute For The Public Understanding Of Science?**

This work intends to analyze both how post-graduate students perceive the popularization of science and what is the role of it in their life. This evaluation is important to understand the relationship between science development in Brazil and public access to the knowledge that has been produced. Indirectly, the results will help understand the status of popularization of science in Brazil. The research has been conducted in São Paulo State, responsible for more than 50% of the research produced in the country.

*First author: Juliana Schober, Universidade de Campinas - Unicamp, Brazil*

*Other authors from Brazil: Germana Barata; Carlos Vogt*

### **Primary Schoolchildren's Knowledge Of Dengue Fever: A Contribution To The "Water Game"**

The management characteristics of a science museum derive from the activities and exhibition

approaches adopted, the capacity of public attendance and the infrastructure necessities that allows the mission to be accomplished. From these perspectives, the present study ponders, under the filter of different pointers, relative statistical data to the historical performance of the Museum of the Life, together with collected information of other museums and Brazilian science centres, aiming at the formatting and validation of a methodology for periodic collection, storage and analysis of data (synchronous) that can contribute for the taking of relative daily decision and the strategically planning to the management aspects

*First author: Amanda Meireis de Oliveira e Silva, Museu da Vida/COC - Fiocruz, Brazil*  
*Other authors from Museu da Vida/COC – Fiocruz : Carla Gruzman; Vânia Da Rocha*

### **Communicating Science Communication: Gathering A Database About Research**

The field of non-formal education (NFE) and science communication (SC) has increased significantly in Brazil, which points to the growing relevance of an academic production concerning these subjects, that analyses, reflects on and proposes new paths to overcome faced challenges. Therefore, we consider of vital importance the organisation and availability of this production for professionals or whoever is interested in these subjects. The GEENF group, began surveying bibliography and cataloguing brazilian academic production concerning these topics, using the Bibliography Manager produced by the NEA – nucleus for the study of adult and young people education, at FEUSP. The Manager objective is to provide users with a higher potential of communication in a shared virtual domain.

*Author: Martha Marandino, Faculdade De Educação da Universidade de São Paulo, Brazil*

### **Nanocircus: Scientific Education On Nanoscience And Nanotechnology**

The aim of this project is to reach primarily students - school years from 10 to 12 - and the general public to present fundamental notions in Nanoscience and Nanotechnology, including Nanobiotechnology, joining education, entertainment, immersion and aesthetics. It is based on the successful experience of the Sapiens Circus developed by the CERTI Foundation in Santa Catarina, Brazil (more details can be found in <http://www.sapienscircus.org.br/>). The concept and technology of the project have a huge potential for development and expansion to other disciplines and educational levels. In the poster presentation, a brief summary of the applied methodology, the main goals and some preliminary evaluation of the project will be shown.

*Author: Marcelo Knobel, Unicamp, Brazil*

### **The Reference Center In Historical Cartography Of The Federal University Of Minas Gerais : Studies Concerning Minas Gerais And The History Of Its Cartography**

This presentation describes the efforts of the research group of the Reference Center in Historical Cartography (CRCH) at the Casa da Glória Institute of the Instituto de Geociências of the Federal University of Minas Gerais (UFMG), in Diamantina, MG, aimed at the acquisition of ektachromes and photographic reproduction of original antique maps identified in several archives in Brasil as well as in Portugal, most of them of the 18th century and unique specimen since they are manuscripts.

*First author: Márcia Maria Duarte Dos Santos, Centro De Referência Em Cartografia Histórica, Universidade Federal De Minas Gerais, Brazil*

*Other authors: Antonio Gilberto Costa; Friedrich Ewald Renger*

### **Scientific Inclusion And The Brazilian Olympiad Of Astronomy**

The Brazilian Astronomical Society has been using the Olympiad of Astronomy just to promote the Scientific Inclusion of students and teachers of elementary and high school. The event is a success; in 2003 took part in the Olympiad 76.445 students and 2004 we will have around 100.000 students. In this poster we will present all the details of the evolution of the Brazilian Olympiad of Astronomy since 1998 and also the success that we are getting in the International Olympiad of Astronomy.

*First author: João Batista Garcia Canalle, Instituto De Física - UERJ, Brazil*

*Other authors:*

*Jaime Fernando Villas Da Rocha, Instituto De Física - UERJ, Brazil*  
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*Paulo César Da Rocha Poppe, Universidade Estadual De Feira De Santana, Brazil*  
*Roberto Vieira Martins, Observatório Do Valongo - UFRJ, Brazil*  
*Márcia Pragana Dantas, Universidade Federal Rural De Pernambuco - UFRPE, Brazil*  
*Nuricel Villalonga Aguilera, Universidade Paulista - UNIP, Brazil*  
*Antônio Carlos Rodrigues Da Costa, Universidade Federal Do Piauí - UFPI, Brazil*

### **iThemba LABS - Laboratory for Accelerator Based Sciences - a science centre with a difference!**

Themba LABS – Laboratory for Accelerator Based Sciences - is a working lab, where visitors are encouraged to come and see what we do – real science - and how we do it. This presentation describes in details all the steps of the visit through the different sectors of the lab, usually left by visitors filled with a sense of wonder, amazed and impressed to have seen that South Africa has a real centre that does science at the cutting edge of technology.

*Author: Ginny Stone, Science & Technology Awareness, South Africa*

### **Scientific Diffusion: “CanalCiência” in a presencial practice at schools**

“CanalCiência” – a project of scientific diffusion conducted by the Brazilian Institute of Information on Science and Technology - that makes digital contents available to the society is shown. Following a proposal to enlarge “CanalCiência” field practice taking it through lectures, to high schools in Brasília is presented. It is based on its experience on the first National Week of Science and Technology.

*Author: Márcia Rocha da Silva, Universidade de Brasília – UnB, Brazil*

### **Scientific Divulcation Unity of the Laboratory of Physics of the Federal University of Maranhão (UFMA): An overview of some projects and activities performed by the LDC Ilha da Ciência (Science Island)**

This work presents a set of equipments developed at the LDC IlhaCiência, which deal with stable magnetic levitation and transmission through electromagnetic fields. For stable magnetic levitation, two prototypes were developed: with the first we try to demonstrate how to keep suspended a probe body in stable equilibrium using diamagnetic materials as to limit its borders; with the second, and attempt to keep a rotor suspended in stable equilibrium on magnetic bearings using permanent magnets and a mechanical point. This set is meant to produce energy showing a generator which rotor is magnetically suspended.

*First author: Antonio José Silva Oliveira, Universidade Federal do Maranhão – UFMA, Brazil*

*Other authors from Universidade Federal do Maranhão – UFMA, Brazil: Carlos Eduardo da H. Santos, Geise Marjore F. Mendes, Glaucy de Fátima N. Silva, Paulo Rogério D. Pinheiro, Maria Eliana A. Lima, Michelle Sena R. de Araújo and Ronaldo Neves de Moura*

### **Center for Structural Molecular Biotechnology: a Model of Science Dissemination**

*First author: Leila Beltramini, Instituto de Física de São Carlos – USP, Brazil*

*Other authors from the Instituto de Física de São Carlos – USP, Brazil: Neusa dos Santos; NRS Bossolan*

**Theme area: AUDIENCE RESEARCH IN SCIENCE CENTRES AND MUSEUMS**

### **System Of Continued Evaluation For Visitors Attendance at The Museum Of Life**

To facilitate to citizens access to information that stimulates their knowledge and views about scientific and technological aspects and its daily influences is an essential mission of a Science centre / museum. This responsibility demanded the creation of an evaluation system with the objective to certify the efficiency of the work developed, exhibitions and programmes, and to create a set of data that could be used as a reference to improve the work been done at the museum. The creation of the System of Continued Evaluation has the aim to catch a wider perception of the daily issues of visitors attendance and contribute for the improvement of routines and procedures carried out in the Museum of the Life.

*First author: Denise C. Studart, Museu da Vida/COC - Fiocruz, Brazil*

*Other authors from Museu da Vida/COC - Fiocruz: Sonia Mano; Fabio C. Gouveia; Marcelle Nogueira Pereira*

### **Rediscovering Maths**

Through this poster, I intend to show a non-traditional approach to Maths. The very fact that Maths is part of our lives since we are born and that we deal with it daily explains how we build up our mathematical knowledge. School basically systematises it, specially on primary school years.

*Author: Wanda Ferreira, Fundação CECIERJ, Brazil*

### **Human Anatomy: from didactic collections to the exhibition in Science Museums**

This work points out part of the research accomplished in the context of the masters, from the Educational College, of the University of Brasilia. Initially some relative historical aspects of the Museum of Human Anatomy are approached. Next, the characterization of its visitors is shown and its importance is recognized to make anatomical knowledge popular to the great public.

*First author: Márcia Rocha da Silva, Universidade de Brasília - UnB, Brasil*

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### **Theme area: EXHIBITIONS, COMMUNICATIONS APPROACHES AND EVALUATION**

#### **A Museum is Born. "Museu do Universo" : from conception to inauguration**

In the end of 2003, the Museu do Universo was granted the financial means to implement its own permanent exhibits. Work began in March, 2004 and part of these exhibits will be available to the general audience as early as September 2004. The main goal of the present work is to document thoroughly the birth of a new museum.

*Author: Alexandre Cherman, Fundação Planetário do Rio de Janeiro, Brazil*

#### **The Impact of a Scientific Exhibition on the Social Representations of Environment. A Study with Secondary Students**

The study aims at examining the contribution of social representations theory on the diffusion and adoption of scientific contents respective to environmental questions. The implicit assumption is that both the public as the exhibition organizers adopt shared representations about the thematic of such exhibitions. One topic that has been privileged by science centers concerns the environment. The exhibition was constructed in ways to explicit the contrast between man as excluded or as being part of the environment. Nearly 300 students participated to this research. The results indicate an impact of the scientific exhibition on the social representations of the environment.

*First author: Juliana Mezzomo, Universidade Federal de Santa Catarina, Brazil*

*Other authors: Clélia Maria Nascimento-Schulze, Universidade Federal de Santa Catarina, Brazil*

#### **Amazon Voyage: Vicious Fishes & Other Riches**

The Miami Museum of Science & Planetarium in collaboration with the Science Museum of

Minnesota is currently developing a 5,000 square foot traveling exhibit titled Amazon voyage. Amazon Voyage exhibits a boat journey along the Amazon River stopping at 11 different ports of call. Along the way, exhibit visitors encounter a myriad of amazing creatures including the notorious piranha, endangered caimans, diverse catfish, and mysterious pink dolphins; all interpreted by the scientists and the people who live along the river. Visitors shall receive a realistic picture of life in the Amazon, its incredible aquatic fauna and the relationships that exist between the forest, the river and its fishes, and the people that live there.

*Author: Sean Duran, Miami Museum of Science & Planetarium, USA*

### **The visions of the Historic Museum of Butantan Institute - São Paulo, Brasil. Exhibition Evaluation**

This poster presents an evaluation study with visitors carried out at the Historic Museum of Butantan Institute which aims to understand the image that visitors have about the institution and debate the approaches applied in the museum's exhibitions.

*Author: Suzana Cesar Gouveia Fernandes, Museu de Arqueologia e Etnologia - Universidade de São Paulo, Brazil*

### **"Espaço Ciência" Itinerant Program**

Not always a Center or Museum of Sciences can be visited by those who would like to do it. Distance, socio-economic problems, difficult public transportation can be reasons for this. This paper introduces the itinerant program of "Espaço Ciência", an alternative found for attenuating these difficulties in the formal and informal education for a community, city and/or region, since it not only involves schools (pupils and professors), but necessarily the whole community. The proposal and the methodologies used by the programme as well as already developed exhibits will be presented.

*Author: Paulo Faltay, Espaço Ciência, Brazil*

### **Invent an ET! A strategy to engage the visitor to an interactive exhibition on communication and the five senses**

Efficiency and effectiveness of any interactive science exhibition is strongly dependent on ways to enhance visitor's hands-on and minds-on engagement with the various exhibits. In this paper, we will describe our experience related to the first thematic exhibition for travelling created by Exploratório, the Ciência Viva Centre of Coimbra, Portugal.

*First author: Helena Caldeira, Museu de Física - Universidade de Coimbra, Portugal*

*Other authors from Exploratório - Casa Municipal da Cultura, Portugal: Clara San-Bento; Cristina Pinheiro; Lina Ferreira; Teresa Fonseca; Cristina Monteiro; Dário Fonseca; Luis Bonnet*

## **Theme area: MUSEUM EDUCATION, FORMAL AND INFORMAL LEARNING**

### **New opportunities of scientific education: programs of science non-formal education for students from low income families in the Brazilian Scientific Societies' Meetings**

Brazilian performance in scientific research has greatly increased in the last decades, as judged by the number of papers published in international indexed journals and the proportion of researchers owning PhD degrees. The number of students reaching high school has also been raising during that same period. These factors, among others, help to create a scenario in which there is a significant amount of scientific knowledge being produced locally in association with an increased demand for access to that very same knowledge.

*First author: Cristiane Ribeiro de Souza, Instituto Oswaldo Cruz - Fiocruz, Brazil*

*Other authors: Maurício Roberto Motta Pinto da Luz, Instituto Oswaldo Cruz - Fiocruz, Brazil*

### **Educational Programs Of Museu De Zoologia Da USP**

The primary purpose of the Educational Service Department of the Museu de Zoologia da USP

(MZUSP) is to develop an educational action to support museum programs for students, teachers and the general public. Based on the importance of learning the concepts in Zoology from the patrimonial education and the social interaction theories, the professionals of the MZUSP are responsible in guiding, elaborating and developing research, courses and training programs; all kinds of didactic material for teaching professionals, publish the educational experiences, and assist other projects linked to the area. The MZUSP has been both national and international reference for systematic and evolutionary studies for over 100 years, receives about 60.000 visitors yearly, and has offered a variety of programs to the general public, students and teachers.

*Author: Márcia Fernandes Lourenço, Museu De Zoologia Da Usp, Brazil*

### **Activity: "Make A Cell"**

"Make a cell" is a workshop developed as one of the educational strategies in the Museum of Life, Fundação Oswaldo Cruz, Brasil. The activity aims to show the public some characteristics of life in the microscopic world, organized in cells. The visitor is invited to build a cell model, using homemade materials.

*First author: Cinthia Bernardes Gomes, Museu da Vida/COC - Fiocruz, Brazil*

*Other authors: Maria Paula De Oliveira Bonatto, Museu da Vida/COC - Fiocruz, Brazil*

### **When Limitations Become Possibilities: Surpassing Cognition Frontier In Order To Enhance Human Learning In A Non-Formal Environment**

Nowadays, the multiplication of science centers has become noticeable, so that theories that sustain the pedagogical practices of these institutions are more and more needed. In this scope, psychology turns out to be an important instrument to deal with non-formal learning contexts, since it's capable of making important considerations concerning human's cognitive limits and possibilities. The proposal is to investigate how the thought formation is conditioned by the technology, evidencing the significance of non-formal education in science centers as a manner of spreading culture and citizenship, playing a key role in social inclusion policies.

*First author: André Luis Soares e Silva Pereira, Coppe/Universidade Federal do Rio de Janeiro, Brazil*

*Other authors from Brazil: Nadia Maria Moural; Francisco Marques*

### **Contribution For The Formation Of Teachers In The Natural Sciences Field, The Promotion Of Lectures And Debates And The Production Of Pedagogical Material Of Support To Basic Education**

The high rates of illiteracy and low levels of schooling in Alagoas, especially in the poorest working layers, point to the imperious necessity of mass education, associated with socio-economical structural measures able to lighten social exclusion. The Usina Ciência has been actively participating in the achievement of Teacher Training Courses. One of the major difficulties is the lack of pedagogical resources allowing an education that associates the understanding of concepts with the social, economical, political and cultural reality in Alagoas. Attempting to lessen this predicament, we gathered experts and elementary education teachers, seeking for endowments to the manufacturing of notebooks, CD-ROMs and experimental kits with the purpose of linking curricular knowledge to the socio-cultural specificities. The foremost themes focused are: energy, environment and health.

*First author: Tania Maria Piatti, Usina Ciência Da UFAL, Brazil*

*Other authors: Reinaldo Augusto Ferreira Rodrigues, Brazil; Antônio José Ornellas, Brazil*

### **Biological Material As A Tool For Educational Activities In The Zoos**

The objective of the present investigation performed in a Brazilian Zoo is to understand the Zoo's educational potential based on the use of the biological material, aiming at the answers of the following questions: Do students learn through the activities with biological material? If so, what do they learn? Is it possible to form an environmental conscience through this educational action? What is the biological object role in the learning concepts acquisition? The research methodology is qualitative and it will be developed from the observation, video recording and interview with the young visitors of the Zoo.

*First author: Viviane Aparecida Rachid Garcia, Faculdade De Educação Da USP - Sorocaba Zoo, Brazil*

*Other authors: Martha Marandino, Faculdade De Educação Da USP, Brazil*

### **Storytelling: An Invitation To Reading**

The Project Contação de histórias (Storytelling) was created by Centro de Divulgação Científica e Cultural (Scientific and Cultural Spreading Center) of the São Paulo University library in January 2002 to become a strategy to wake up the interest in reading on children, youngsters and adults. In two years the project reached 43,575 people from São Carlos city and neighbouring regions. As result, it has been confirmed that telling stories is an invitation to reading, as it was widely observed by the interest of the children in having access to the original work being told.

*First author: Adriana R. Martins Guerreiro, Universidade De São Paulo, Brazil*

*Other authors: Maria Silvia Pereira R. Alves, Brazil*

### **Stay Connected: Using Traditional Thai Toys For Public Understanding In Science And Technology**

Discussion of how Thai people using traditional toys as tools for pleasure and learning about science and technology will be the main themes for this poster presentation. Reports on workshop and exhibition will demonstrate how public understanding in science and technology among Thai people is and how informal learning takes place while children playing these toys with their peers and parents. Thus, science and technology in both old and new version will be connected. As well, materials chosen from local environments and communities will illustrate details of how science and technology are interpreted among Thais. In conclusion, examples of traditional Thai toys will be exhibited along the poster and some samples of toy making will be demonstrated.

*Author: Amara Pattapinyoboon, Science Centre For Education, Office Of Non-Formal Education, Ministry Of Education, Thailand*

### **Evaluation Indicators Of Pedagogical Activities Regarding Museal Spaces Integration - The Butantan Institute Case Study**

The Butantan Institute is considered an important cultural and leisure center of São Paulo city, due to its architectural and landscape set, protected by the Defence Coordination of Historic, Archaeological, Architectural, Artistic, and Tourist Heritage. Apart from being a privileged place of the city, it is also one of the biggest research centers of the country, producing mainly hyper immune sera, vaccines, and biopharmaceuticals. In this project, we propose a survey and evaluation methodology of these initiatives, as well as some proposals of new pedagogical practice to help the community and the visitors to notice the integration of the external areas of the institute and the four museum buildings. Our main goal is to achieve the formulation of evaluation indicators for this educational process, as well as of its results.

*First author: Alessandra Fernandes Bizerra, Faculdade De Educação - Universidade de São Paulo, Brazil*

*Other authors: Suzana Cesar Gouveia Fernandes, Museu De Arqueologia E Etnologia - Universidade de São Paulo, Brazil; Myriam E. Velloso Calleffo, Brazil*

### **Destellos: An Experience Of Promotion Of The Youthful Talent At Panamá. Base Of The Innvation And Social Inclusion**

This poster session will initiate presenting DESTELLOS, that it looks for to develop to a culture of social appropriation of science and the technology. The activity base of the program has been the development of the Fair of the Youthful Talent. We will present initiatives born of the Fair to promote teamwork and the formation of microcompanies (Clubs of Science), the stimulation of enterprising capacity of children and young people (JEI and ORIENPRO) and updating of teachers in the interactive and new methodologies (PEACYT and Educational Workshops) at formal and non formal level. Presentation of the webpages of DESTELLOS and other initiatives will conclude this presentation.

*First author: Luis Donderis, Senacyt, Panama*

*Other authors: Lelys de Brugiatti*

### **Production Of Materials For Non-Formal Education**

Created in 2002, the GEENF is a group dedicated to the study and research on non-formal education praxis in science museums and public communication of science, linked to the postgraduate course in the area of Science and Mathematics Education. Today, the GEENF is dedicated to the production of material for non-formal educational purposes. The first step of this project is to analyse existent material from different experiences in non-formal education area - as the ones produced by museums or projects/institutions for health education. Based on this analysis the group intends to define some parameters that will guide the creation and production of new material. In this work, we will present the inventory and analysis of the pedagogical material evaluated, as well as the parameters selected by the GEENF to guide the production of new materials.

*First author: Martha Marandino, Faculdade De Educação Da Universidade de São Paulo, Brazil*

*Other authors: Maria Julia Chelini, Museu Paulista, Brazil*

### **Non-Formal Education Contexts: Criteria For Their Classification**

Scientific education is present in non-formal education spaces and in different branches of the media, thus calling for researches on this subject. The group for the study and research on non-formal education and science communication, at the FEUSP, has tried to understand the meanings of these practices. One of the projects developed by the group was a theoretical research about the definitions of terms such as formal, non-formal and informal education and science communication, carried out simultaneously to a survey done by sending questionnaires electronically to professionals working in these areas. This presentation addresses the analysis of the so obtained data and the conclusions reached by this research.

*First author: Martha Marandino, Faculdade De Educação da Universidade de São Paulo, Brazil*

*Other authors: Alessandra Fernandes Bizerra, Faculdade de Educação da Universidade de São Paulo, Brazil*

### **Lice Game: A Playful Activity To Approach Questions In Health And Science**

The Lice Life Cycle and Lice Game are playful ways to present issues about the relation between human beings and animal parasites, which can be vectors of diseases. These activities approach the subject pediculosis through prevention and control of lice with special emphasis in historical, social and cultural issues. The result are products that deal with demystification of the disease and the prejudice that is involved. These games, created in Parque da Ciência (Science Park - Museum of Life - Fiocruz), are organized to deal with three distinct groups: one dedicated to children aged between 4 and 6 years old, 7 to 10 and above 10 years old. In addition, these strategies are being adapted to a digital version (multimedia and Internet version).

*First author: Sonia Mano, Museu da Vida/COC - Fiocruz, Brazil*

*Other authors from Museu da Vida/COC - Fiocruz : Silvia Regina Dos Santos; Fabio Gouveia; Maria Paula de Oliveira Bonatto; Cida Ramos*

### **"Valdemar Lefevre" Geological Museum Educational Strategy**

The MUGEO - Museu Geológico Valdemar Lefèvre, Geological Museum, is situated at Parque da Água Branca, in São Paulo, is a Reference Centre in Geosciences and Environmental Education in São Paulo State. Its collection is comprises minerals, rocks, fossils and historical pieces. This presentation addresses the way used by the Museum to bring technical-scientific knowledge nearer to the public's everyday life. Silence and simple observation are not required, the static and the old win movement and dynamic, strength and vitality, permitting interaction between the public and the museum. The paper also refers to the regular workshops offered by the Museum and to the establishment of partnerships with private and governmental companies and associations with the purpose of improving and maximising the educational work.

*First author: Fernando Pires, Mugeo, Brazil*

*Other authors from Brazil: Mary Osawa C. Fernandes; Diamani Regina De Paulo; Cleo Toledo Dias*

### **"Little Researcher": A Tool to Promote Interaction Between Museums and Children**

The activity, "Little Researcher" is composed of activities that join together education and recreation; it is offered to children between 6 and 12 years old, which have the opportunity to experience the life of a museum researcher for a 3 hour period. Trained staff work with groups of up to 20 children to stimulate them to make their own 'scientific discoveries'. During their guided visit in the museum they learn the history of life on earth through a range of interactive experiences.

*First author: Cristiane Casar, Museu De Ciências Naturais PUC Minas, Brazil*

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### **Plan Of Expansion Of The Espaço Ciência**

During the last ten years the Espaço Ciência Science Center has developed a creative work in science popularization and educational programs in the State of Pernambuco, Brazil, developing outreach programs involving courses, lectures, meetings, and science fairs around the State. Since April 1996, the Espaço Ciência is occupying a privileged area between the cities of Recife and Olinda. Now this work is being expanded and solidified. New interactive indoor and outdoor exhibits associated with educational facilities are being constructed. The exhibits are integrated with the beautiful landscape in order to permit the use of natural resources, such as the mangrove, sun and wind, in the visit program. This project is supported by VITAE and partially by the Pernambuco State Government.

*First author: Antonio Carlos Pavão, Espaço Ciência, Brazil*

*Other authors: Marianne Frederick, Bireme, Brazil; Paulo Faltay, Espaço Ciência, Brazil Maria Edite Costa Lima, Espaço Ciência, Brazil; Francis Dupuis, Espaço Ciência, Brazil*

### **Life-Long Source Of Education For All In Thailand**

The National Science Museum (NSM), Thailand is a state enterprise under the Ministry of Science and Technology. Its mission is to enhance public understanding of science, technology and environmental issues by developing a range of science museums both in the Technopolis complex and other regions of Thailand. This paper describes the Master Plan of NSM, that foresees four museums to be located in the central part of the country and three more located in regional parts, two of them, the Science Museum and the Natural History Museum, already open to the public. A further initiative is a virtual museum on Internet that will allow serving people living anywhere at any time.

*Author: Sithichai Egoramaiphol, National Science Museum, Thailand*

### **Teaching Experimental Sciences In Primary Schools - An Outreach Program from the Algarve Science Center**

In this poster we will describe the project developed by the Algarve Science Center together with the City Council in primary schools from Faro. The difficulties involved with science teaching in schools and the problem of captivating the pupils' interest are widely known. To arouse interest in science, we have developed some scientific experiments, adapted to the primary science curriculum, with simple materials and completed with some worksheets: water, air, light, magnetism, electricity and simple machines are some of the activities we have developed in this project.

*Author: Isabel Freitas, Centro Ciência Viva Do Algarve, Portugal*

### **Museum Of Microbiology As A Resource Of Microbiology Teaching**

In countries like Brazil the communication channels between Science and population, specially that of lower social level, are not as available as they should. This paper describes the work of the Museum of Microbiology of Institute Butantan of São Paulo aiming to bring the microbes field closer to the public. Using its informal educative spaces and through activities including laboratory experiments based on an "Experiments Kit", case simulation, film discussions, computer interactive activities and game competitions., the Museum stimulates the students'

scientific curiosity, enables teachers for a better teaching performance and improves the High and Elementary School education in Brazil.

*First author: Glauca Inglez, Museu De Microbiologia - Instituto Butantan, Brazil*  
*Other authors from the Museu de Microbiologia - Instituto Butantan, Brazil: Milene Franco; Fábio Pereira; Beatriz Imparato; João Vieira; Karen Casadei; Fernanda Santos*

### **The French-Brazilian Exchange Project "ABC in Science Education"**

This work presents a recent experience of the Oswaldo Cruz Institute (IOC), which in addition to its traditional research mission, has also taken on a social commitment with education. It has launched a graduate Program in Scientific Education in 2000 for a preferred target-audience of school teachers. One of the most critical aspects of this Program is the attempt to join professionals of both areas, natural sciences and education, in addition to the partnerships promoted between scientists and teachers. Under this perspective, we have started to develop a French-Brazilian exchange project named "ABC in Science Education". The big challenge is to create materials and propose activities to promote scientific culture with the purpose of stimulating the development of investigative processes, which will elicit an endless chain of questions rather than answers.

*First author: Danielle Grynszpan, IOC - Fiocruz, Brazil*  
*Other authors: Camilo Pinto De Souza, IOC - Fiocruz, Brazil*

### **The Itinerant Exhibitions Program Of Estação Ciência**

This paper describes the different activities and basic purpose of the Itinerant Exhibitions Project, a program of continuous education through the spreading of scientific and cultural subjects in external spaces, promoted and maintained by Station Science.

*Author: Eneida Rita Rossetti Fausto, Estação Ciência, Brazil*

### **"Mosquitoes: A Microcosmos"**

The project "Mosquitoes a microcosm" is part of a program for development of educational activities for health promotion in Museu da Vida (FIOCRUZ, Brasil), through preparation of a special collection and orientations for educators to act as explainers in an exhibition.

*First author: Raphael Augusto Sims Belleza, Fiocruz, Brazil*  
*Other authors: Teresa Fernandes Silva Do Nascimento, Instituto Oswaldo Cruz - Fiocruz, Brazil ; Maria Paula De Oliveira Bonatto, Museu da Vida/COC - Fiocruz, Brazil*

### **Proposal For Environmental Education Using Projects Developed By Students Of CEFET/RJ High School**

This work is part of a master course study, which is being developed at the Bioscience and Health Education Program - Fiocruz/RJ. It aims at elaborating a proposal for environmental education making use of projects developed by students of CEFET/RJ high school. The purpose was to evaluate the academic and social contribution of projects of environmental education developed by students during 2002 and 2003. These projects, including several scientific and technological works, were presented in the Extension Week of the institution.

*First author: Sidnei Leite, Fiocruz, Brazil*  
*Other authors: Jorge Lemos, CEFET/RJ, Brazil; Marcos Couto, Fiocruz, Brazil*

### **Science Reference Centers In Pernambuco-Brasil**

This presentation describes the Science Reference Centers (SRC) program, involving teacher training and the improvement of biology, physics, mathematics and chemistry laboratories in 27 selected public schools in the State of Pernambuco. Covering strategic regions of the State, the schools already received a set of experiments that, when creatively combined, permit several alternatives of scientific demonstration. About 40,000 students are having immediate benefits from this program, besides 200,000 students of neighboring schools.

*First author: Paulo Faltay, Espaço Ciência, Brazil*  
*Other authors from Espaço Ciência, Brazil: Fábio Cesar Araújo; Maria Edite Costa Lima; Antonio Carlos Pavão*

## **Theme area: VIRTUAL TECHNOLOGY**

### **Virtual Environments To Cultural And Scientific Diffusion. Case: Collection Of A Museum Of Anatomy**

Virtual communication media have great latent power. For websites, we can find a distinctive characteristic: the possibility of user's interaction in real time combined or not with virtual objects handling. However we need to discuss the open construction in cultural-scientific diffusion, computational skills and, to integrate a first tripod for discussion, we must approach the selection and organization of contents to communication through virtual means. Discussion is illustrated by a case study: a museum with collection closely linked to an academic discipline (veterinary anatomy), so with the challenges of calling the public's attention for particularities and comparisons and to present possible generalizations and the interdisciplinary use of the collections, where a high degree of interaction for the visitor seems inappropriate.

*First author: Elisabeth Zolcsak, Zoology Museum/USP, Brazil*

*Other authors: Rodrigo Venturoso Mendes Da Silveira, Brazil*

### **Science, Technology and Innovation**

*First Author: Marianne K. Biben Frederick, BIREME, Brazil*

*Other authors from BIREME, Brazil: Abel Laerte Packer; Marcelo D'Agostino*

## **Theme area: SCIENCE AND ARTS**

### **A Trip For The Skies: Another Version For Physics Teaching**

This paper presents a project for Secondary school (5th to 8th Brazilian grades) in the subject Sciences, made by students, which main idea is the conceptual and hystorical character of science, usually omitted by the current teaching. The main point of the project was a play dramatized by the students, using concepts of Physics and Astronomy, with simple and entertaining language. In the play (performed by 8th grade students), the concepts geocentrism, heliocentrism, Kepler's laws, Newton's gravitation theory and Einstein's relativity theories were worked in a dialogue between the characters who contributed with their ideas and discoveries.

*Author: Silvia Helena Mariano De Carvalho, Universidade de São Paulo, Brazil*

### **Science Visits Art**

This presentation describes the Project Education Action and Art, whose proposal it is to work all aspects of the visit to a Museum, with action in the binomial art-education, through interactive activities, artistic activities, research, visits and others, rescuing the interest for the cultural patrimony of which we are heir to. The objective is to develop the critical sense of the pupils and to supply elements that can stimulate and collaborate with the informal education, through the reflection of the possibilities offered for the use of the perception in the presentation of Science subjects.

*Author: Sueli Pereira Nunes Silva, Universidade de São Paulo, Brazil*