

## **Panel 1 – IBSE as a key approach**

**Ana SERRADOR**  
**Senior policy officer**  
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### **Background**

Graduate in Sociology from the Universidade Nova de Lisboa. Post-graduate research at the Technical University of Berlin.

**Luisa PRISTA**  
**Head of Unit L4 "Scientific Culture and Gender Issues"**  
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### **Biography**

As from 16th March 2009, Luisa Prista has been appointed as Head of Unit "Scientific Culture and Gender Issues" in the European Commission, DG Research managing the Science in Society Programme within FP7.

Luisa Prista holds a degree of Mechanical engineering in Applied Thermodynamics from the IST - Instituto Superior Tecnico de Lisboa followed by Energy Policy and Management & Business Administration from Italy. She worked at the University as a scientific researcher, as a lecturer and in industry in different industrial sectors. From 1986, she was working in Switzerland as an industrial engineer from. Before joining the Commission, she was working for the Swiss Federal Government as Head of the Office Infoenergy.

She joined the Commission in Brussels in 1994 working at Directorate General for Research as Head of Sector on "Processes and Organization of Production". In 1999, she became Head of Unit "Materials, Nanotechnology and Steel Research". In 2002, she became Head of Unit "Policy and Strategy" unit for the Directorate "Space and Transport". In May 2004, she has been appointed as Head of the Unit "Surface Transport", responsible for the implementation and management of part of the 7th Research Framework Programme (FP7) dealing with road, rail and maritime sectors. In parallel, she is also the responsible for the Marine and Maritime Research Strategy within the new European Maritime Policy.

During her whole career as a researcher, as a teacher, as engineer and international officer she has been engaged in women related issues in particular gender equality in science and engineering, member of relevant networks and working groups.

### **Abstract**

#### **The strategic importance for Europe of science education in the Lisbon framework**

The Lisbon (2000) and Barcelona (2002) summits have highlighted the need for investing more in research and development, specially in human resources, to foster a knowledge-based society in Europe. It is therefore vitally important to promote education and training and to address the issue of young people's lack of interest in science. The presentation looks at the actions that the European Commission is carrying out under the "Science in Society" part of the 7th Framework Programme and identifies some of the challenges for the science education area in the near future.

**Prof. Pierre Léna**  
**Academy of sciences, France**  
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### **Biography**

Pierre Léna, born 1937, is an astrophysicist, Emeritus Professor at the Université Paris Diderot, associated with the Observatoire de Paris. After a career in University teaching and research, he currently holds the position of Delegate for education at the French Académie des sciences. This Academy is concerned with the quality of science education at all levels: primary, secondary and tertiary education, especially regarding natural sciences. Since 1996, jointly with Georges Charpak (Nobel Prize in physics 1992) and Yves Quéré, former co-chair of InterAcademy Panel (IAP), Pierre Léna has been a co-founder of the La main à la pâte movement, which aims at introducing inquiry pedagogy in primary education, improving teachers training and providing resources for them. Along with successful developments in France, this movement collaborates with a large number of countries in the world and in Europe (over 50 in total) to improve their primary or compulsory education and benefit from exchanges on good practices.

## Abstract

### **A long-term model for IBSE in primary school : the French case**

The European Grenoble Conference « Science education in a European society of knowledge », held in October 2008 in Grenoble, formulated a number of recommendations directed to the ministers of education within EU, and to the policy makers at the EU Commission. A number of successful pilot projects in science education have emerged in Europe in recent years : Pollen is one of them, its achievements and lessons being presented in this meeting ; others are being carried in various countries. In every of them, success factors seem to be : the universality of science and commonality of most didactic concepts (IBSE), the involvement of the scientific community at high level, a re-thinking of professional development for science teachers (primary and secondary schools), modest resources but quick and positive assessment of results. Building upon these pilot projects, can one create large-scale changes in each country, knowing that EU subsidiarity in primary and secondary education implies then a deep involvement of national education authorities ? This point will be addressed with a number of propositions to be discussed.

**Prof. Mark HACKLING**  
**Edith Cowan University, Australia**  
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## Biography

Mark Hackling is Professor of Science and Technology Education and Director of the Institute for Educational Research and Development at Edith Cowan University, in Perth, Western Australia. He has provided leadership to the conceptualisation and evaluation of a number of national science education projects in Australia. These include: a national review of the status and quality of science education in Australian schools; curriculum development and teacher professional learning programs to improve inquiry-based science education in primary (Primary Connections) and secondary schools (Science by Doing); the development of national primary scientific literacy testing programs; and, the development of an online science assessment resource bank.

Hackling represented Australia at the IAP IBSE conference held in Stockholm and reported on the early evaluations of the Primary Connections program, and in 2008, presented a keynote address on Primary Connections at an international education research conference in the Netherlands. Hackling also co-authored the Australian report on the 1999TIMSS video study.

## Abstract

### **An Australian innovation in IBSE in primary school**

Primary Connections is an innovative professional learning program supported with exemplary curriculum materials which aims to improve science teaching and learning in Australian primary schools. The project is based on an inquiry-based science teaching and learning model that integrates the teaching of science and literacy, the 5Es inquiry model, student planned investigations, assessment used for diagnostic, formative and summative purposes and the explicit teaching of conventional forms of representing scientific data. Evaluations of the program reveal significant improvements in teachers' confidence and self-efficacy for teaching science and their science teaching pedagogy, and significant improvements in students' scientific literacy. The program is an initiative of the Australian Academy of Science and is funded by the Australian Government.

**Prof. Wynne Harlen**  
**University of Bristol, UK**  
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## Biography

Professor Wynne Harlen was Sydney Jones Professor of Science Education at Liverpool University 1985-1990 and then Director of the Scottish Council for Research in Education until 1999. She now has an honorary position as Visiting Professor at the University of Bristol. She acts as consultant to various overseas primary/elementary school science projects and chairs the International Oversight Committee of the IAP (InterAcademies Panel) Science Education Programme on the development of inquiry-based science education in pre-secondary schools. In 2008 she was one of the two international winners of the Purkwa prize for science education and is the 2009 President of the ASE.

## Abstract

### **Evaluation of inquiry-based science education pedagogy and programs**

This presentation considers different purposes of evaluation of IBSE in action and focuses primarily on a formative purpose, addressing questions such as 'Are teachers using IBSE pedagogy' 'Are students given the experiences that enable them to learn through inquiry?' Brief attention is given to the types of information needed for this purpose and how they can be gathered. Once obtained the data have to be interpreted and for this step it is necessary to be clear about the criteria and standards to be met in effective implementation of IBSE. Do we share such standards? Some examples will be given to illustrate their use in evaluation.

## **Panel 2 – Community participation and support for dissemination**

**Pierre-Antoine ULLMO**  
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### **Background**

Pierre-Antoine Ullmo founded P.A.U. Education and develops an original methodology of work in the social and education fields based on participatory techniques and aiming at reinforcing community building processes. This approach is not technology-based but relies on an on-going assessment of people's needs for dialog. Social changes are seen as the result of this participatory process.

P.A.U. Education is a European entity based in Barcelona with an international staff of 50 people that specialize in the design and implementation of educational and social development projects for public institutions and private foundations and companies as part of their mission of social responsibility. P.A.U. Education develops and operates some of the most innovative European Commission platforms for the exchange of good practices in the fields of elearning, e-government, road safety, health education.

**Dr. Ana NORONHA**  
Ciência Viva, Portugal  
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### **Biography**

Ana Noronha was born in 3/5/1957, studied Physics at the Faculty of Sciences of the University of Lisbon, where she graduated in 1980. She obtained her PhD on Physics (Non-Linear Dynamics), at Instituto Superior Técnico in 1987.

Assistant professor at Instituto Superior Técnico from 1986 until 1997, she was invited into the Ciência Viva team in 1998, where she has been responsible for the design and coordination of projects related to Physics and to Earth Science. As a member of Ciência Viva, she belongs to the Advisory Committee on Education of the European Space Agency (ESA).

Ana Noronha is a member of the direction of the Ciência Viva Agency since 1999.

### **Abstract**

#### **The role of science centers in the community : a meeting point for scientists, teachers and the public**

Since 1996 Ciência Viva has been creating a network interactive science centers involving local authorities, universities and other local actors. These centers are strongly connected to the community, providing a meeting place for scientists, schools and the public. Acting as resource centers for schools, the Ciência Viva Centers also develop science education projects, workshops and, in some cases, certify teacher training courses.

**Prof. Derek BELL, Head of Education**  
The Wellcome Trust, UK  
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### **Biography**

Professor Derek Bell is Head of Education at The Wellcome Trust and has extensive experience not only of teaching and learning in science but also of the wider range of education issues including teacher education, higher education, subject leadership in schools, research, project management and network development. He was Chief Executive of the Association for Science Education for six and a half years, has taught in schools and higher education institutions and been involved in science education research and development including the coordination of a major curriculum project. In addition he has undertaken a wide range of consultancies in the UK and overseas and been a member of several advisory / expert panels including the STEM High Level Strategy Group, National Co-ordinators Group for the National Network of Science Learning Centres, the WISE National Co-ordinating Committee and the Astra-Zeneca Science Education Forum. From 2002 -2004 Derek was Chair of the Wellcome Trust Society Awards Panel. He was a member of the Board of the Science Council and currently is a board member of the Engineering Technology Board (ETB) and STEMNET. He was awarded his professorship by the College of Teachers in July 2007.

### **Abstract**

#### **Not just funding: contributions from charitable foundations**

Charitable foundations are more than potential sources of funding, as important as that role is. Their unique position of independence from governments and the pressures of providing returns for shareholders means they can often make significant contributions, both large and small, to a range of enterprises. This short presentation will, using

examples from the UK, illustrate ways in which primary science education has and is being supported by such organisations. The question is what more might they do.

**Prof. Sven-Olof HOLMGREN**  
**Stockholm University and Royal Swedish Academy of sciences, Sweden**  
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### Biography

Sven-Olof Holmgren obtained his PhD in 1970 and a chair in physics in 1992 at the University of Stockholm. His field of research is accelerator-based experiments in elementary particle physics. He has been engaged in several big experiments at CERN and responsible for detector hardware development as well as physics analysis. He has served as head of the Physics Department, most recently for six years ending in December 2004 and he retired in 2007. As member of RSAS he is engaged in NTA (Natural science and Technology for All) a program for supporting teachers and municipalities to introduce Inquiry Based Science Education in primary and secondary schools.

### Abstract

#### **Twelve years of adapting the NSRC approach in Sweden: a model for scaling up**

STC in the US became NTA in Sweden. The initiative came through a direct cooperation between Science academies in the two countries. The long tradition of developing units and the experience in disseminating them in the US had no counterpart in Sweden. There are differences in school cultures that were crucially important to acknowledge and handle in the implementation. Most important, the basic quality of the material is high and the centre pillars of the dissemination strategy was possible adapt to Swedish conditions. The latter contains contract with local school authorities, organized material support, compulsory teacher training for each unit, central training of experienced teachers to become trainers and improved contacts with the local community. It all started in the town of Linköping in 1997. NTA has contracted more than 80 of Sweden's 290 municipalities plus private schools and the national agency for special pedagogy. NTA now engages some 80 000 students, some 6000 teachers and is steadily increasing. So far no contracted municipality has left NTA. NTA is a school development program and is itself continuously under development.

NSRC: US National Science Resource Centre

STC: Science and Technology for Children

NTA: Natural science and Technology for All

**Dr. Petra Skiebe-Corrette,**  
**Freie Universität Berlin, Germany**  
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### Biography

Petra Skiebe-Corrette holds a doctorate in neurobiology and completed her habilitation (German equivalent of associate professor) in 2002. She is director of NatLab, an informal science laboratory at the Freie Universität Berlin which offers both primary school pupils and high school students the opportunity to perform up-to-date inquiry-based experiments in biology and chemistry which have been conceived by scientists. She also initiated a network of the informal science laboratories in Berlin and Brandenburg ("GenaU"). She has been the German representative for the EU-grant "Scienceduc" in 2003 and for the EU grant "POLLEN" in 2004. In order to extend "POLLEN" to a larger number of schools and to sustain the program long term, "TuWas!" (Technik und Naturwissenschaften an Schulen, Technology and Science in Schools) was founded in 2007 as a cooperation between the Freie Universität Berlin and the Berlin Brandenburg Academy of Sciences and Humanities.

### Abstract

#### **Strategy for dissemination of Pollen in Germany**

The number of schools interested to participate in Pollen has always been high. In order to extend "POLLEN" to a larger number of schools and to sustain the program longterm, "TuWas!" was founded, a cooperation project of both the Freie Universität Berlin and the Berlin-Brandenburgische Akademie der Wissenschaften. Due to the support of the Senate Department for Education of Berlin, TuWas! was able to start inquiry-based science education in 36 schools in Berlin. With the support of the Chambers of Industry and Commerce in Köln and in Bonn, 16 TuWas! Schools were able to be added to the program in Nordrhein-Westfalen and with help of the Association of the regional employers' associations in the German metal and electrical industry, the number of TuWas! schools in Brandenburg will be increased from one to five.

## **Panel 3 – Involvement of the scientific community**

**Yves QUÉRÉ**  
Physicist, French Academy of sciences  
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### **Background**

A solid-state physicist, Yves Quéré has been working mainly on particle/matter interactions. He has been the President of the Department of Physics and of the Senate of Professors at Ecole polytechnique (Paris).

He is a member of the french Académie des sciences and was elected (2000-2006) as co-Chair of the InterAcademy Panel (IAP) which is the Assembly of the Science Academies worldwide.

Together with Georges Charpak and Pierre Léna, he launched the renovation of science education, in French schools, called La main à la pâte.

**Dr. David JASMIN, Director**  
*La main à la pâte, France*  
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### **Biography**

David Jasmin, a Phd in physics, has been working in science education and science popularization since 1995. He has been a research engineer at INRP (National Institute of Pedagogical Research) since 2000 and Head of La main à la pâte since 2005. He is the author and the editor of various books on primary science education. He is the scientific coordinator of the POLLEN Project (2006-2009, 6th Framework Programme).

### **Abstract**

#### **Supporting teachers through scientists' involvement**

Stimulating observation of tangible objects and phenomena, encouraging relevant questions about the world, promoting argumentation and experimentation, implementing a scientific approach so that pupils can acquire new knowledge while developing oral and written expression : these are the goals of teaching based on investigation. Providing support by scientists (in activity or retired) or science students can considerably help primary school teachers reach these goals. For the last 15 years, in the aftermath of La main à la pâte and POLLEN, a new form of partnership between scientists and teachers in primary schools has taken shape called Supporting teachers through scientists' involvement in primary education (ASTEPI). It is particularly illustrated by the presence in the classroom, alongside the teacher, of scientists who are generally also still students. This collaboration is governed by principles and characteristics which will be presented and illustrated during this communication.

**Dr. Justin DILLON**  
King's College London  
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### **Biography**

Dr Justin Dillon is a Senior Lecturer in Science and Environmental Education and Head of the Science and Technology Group at King's College London. After training as a science teacher he taught in London schools for 9 years and joined King's in 1989. Dr Dillon is President of the European Science Education Research Association (ESERA) in 2007 and an editor of the International Journal of Science Education.

### **Abstract**

#### **Practical work in schools: What does the research tell us?**

It is often argued that practical work is central to teaching and learning in science and that good quality practical work helps develop pupils' understanding of scientific processes and concepts. The UK has a long tradition of practical work in school science and of valuing fieldwork, particularly in biology. However, there are, and have been for some time, concerns about practical work in school science. For example, Ofsted, the agency that inspects schools in England, is of the opinion that scientific enquiry in primary schools is both variable and vulnerable and that, at secondary level, the range of investigations is narrow and is dominated by the perceived demands of assessed coursework beyond Year 8. This talk will examine the research literature relevant to the topic of the conference.

**Hugo MAREÉ**  
**Head, Policy and Coordination Unit**  
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### Biography

In 1992, he became first Head of the Education Service of the Euro Space Centre (Redu, Belgium), an educational facility on the theme of space, then Deputy-Director (95) and finally Director (95/99). In 1999, he joined the European Space Agency's Headquarters (Paris, France) as Communications Officer for the Science Programme and then Head (acting) of the Science Programme Communication Service. Late 2004, he was seconded part-time to the newly created Education Office to implement the 'European Space Education Resource Office' project. He is the Head of the Policy and Coordination Unit in the Education Office since the 1 September 2005.

### Abstract

#### **The European Spatial Agency's involvement in science and technology education: a must to build tomorrow's "space workforce"**

The European Space Agency, as other actors in the space sector, is experiencing difficulties to recruit an adequate qualified workforce. The wider problem posed by the disinterest of young generation in a STEM career is putting at risk, on one hand the transfer of knowledge in critical areas, on the other hand is threatening the flawless development of future ESA missions.

The ESA Education Office has devised a strategy that participates to the Agency's endeavour in attracting, recruiting and retaining a highly qualified workforce to make possible the implementation of its programmes.

Confronted with a complex cultural framework given by the different European educational systems and by an uneven development of competencies in the different European countries, the ESA Education Office is also developing tailored programs addressing the different countries needs.

The presentation, after providing an brief overview of the problems faced by ESA in the development of a qualified space workforce, will report on best practices developed over the years by the ESA Education Office with an assessment of the future educational strategy to be pursued at European level.

## **Panel 4 – Science and cross-disciplinary teaching**

**Prof. Ana GOSTINČAR BLAGOTINŠEK**  
Faculty of Education, Ljubljana, SLOVENIA  
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### **Background**

Prof. Blagotinsek is employed at The Department of Physics and Technology Education at the Faculty of Education in Ljubljana as a lecturer and research associate. She works with future and in-service kindergarten and primary teachers, and also with future physics teachers.

She is specialized in (physics part) of early and primary science and didactics of physics. Her research field is also optics of the liquid crystals.

**Prof. Tina JARVIS**  
University of Leicester, United Kingdom  
[jar@leicester.ac.uk](mailto:jar@leicester.ac.uk)

### **Biography**

Professor Tina Jarvis is Director of Research in the School of Education at the University of Leicester. She has a well established reputation for research in primary science and is currently coordinating the research on primary teachers in the 'Pollen' Project. She set up a National Centre for Initial Teacher Training in Primary Science in 1996; established the Regional Science Learning Centre East Midlands in 2003; and coordinates the UK element of the EU 'Pollen: Seed cities for science. She has published two books, many curriculum booklets, research articles and videos.

### **Abstract**

#### **Cross-disciplinary Science**

Primary teachers from the City of Leicester have trialled creative cross-disciplinary investigative activities over the past 3 years. Good links were made between science and literacy, history, geography, physical education and art. Teachers often worked with people or organisations from outside the school. Strategies needed to be slightly different for linking science with literacy and mathematics compared to subjects like history, geography and physical education. Making whole-school curricular changes is taking several years as teachers need time to build up expertise and as whole-school plans are usually only addressed once a year.

**Prof. Peter BAPTIST**  
University of Bayreuth, Germany  
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### **Biography**

Peter Baptist, born in Bad Kissingen in 1948, studied mathematics and physics. Diploma in mathematics, PhD and Habilitation at Würzburg University.

He worked as a teacher at a Gymnasium in Bayreuth and at a comprehensive school in Hollfeld. He got professorship/chair at Erlangen University and at Technical University Dresden. Since 1994 he has held the Chair of Mathematics and Mathematics Education at Bayreuth University.

Research activities: Optimization Theory, Elementary Geometry, History of Mathematics, Teaching and Learning of Mathematics, Dynamic Mathematics Software GEONExT, Development of Dynamic Worksheets and Learning Environments.

He was responsible for the improvement of teaching and learning of mathematics in SINUS and SINUS-Transfer (more than 1800 schools in Germany were involved in these nation-wide projects).

### **Abstract**

#### **Stimulating acts – teach mathematics as an experimental science**

If learning is to be successful students must get the chance to go individual ways in their learning process. Therefore we introduce mathematics in the context of carefully chosen problems. In the process of trying to solve such problems the students develop mathematics. We follow my American colleague Paul Halmos who demands: "Don't preach facts, stimulate acts." That means: The teacher is not an entertainer, the student is not only a consumer. We foster an experimental access to mathematics. If there actually is a formula or a rule then it is at the end of the learning process, not at the beginning.

**Dr. Michael Klentschy**  
**San Diego State University**  
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### Biography

Michael Klentschy is a member of the research staff at San Diego State University conducting research on the longitudinal effects of IBSE on diverse student groups. He has published numerous papers and written several books including *Using Science Notebooks in Elementary Classrooms* and *Linking Science and Literacy in the K-8 Classroom*. Dr. Klentschy was named co-laureate for the *Purkwa Prize* in 2004.

### Abstract

#### **The Science and Literacy Connection: Myth or Reality?**

One of the major goals of IBSE is for students to develop a deep understanding of science content. In order to develop this deep understanding of content, language and literacy play an important role. Talk through group and class discussions and the use of student science notebooks are integral to this process. Relevant research and specific strategies for optimal use of science notebooks will be provided.

**Prof. Jan DE LANGE**  
**VTB / Curious Minds, Netherlands**  
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### Biography

Jan de Lange was educated as a mathematician at Leiden University and Wayne State University. After ten years of teaching he became a researcher at the Freudenthal institute for Mathematics Education at Utrecht University. He led the institute for more than 24 years. He also served on many international committees like the Mathematical Sciences Education Board of the National Research Council (USA), and is chairman of the International Expert Group for Mathematics of OECD/PISA. Three years ago he was one of the founders of the Curious Minds project which already has quite excited responses from very different corners in dutch society.

### Abstract

#### **Curious minds cross disciplinary borders**

The presenter is, along with other people from six universities in the Netherlands, involved in a program called "Curious Minds" (TalentenKracht.nl). This program aims at helping young children make more of their, quite often, hidden reasoning talents. Young kids (3-5 years) exhibit a wide range of remarkable talents and capabilities regarding the way in which they explain the world around them. Curious Minds is linked with two other important projects: a 3 year professionalization program for 5 000 primary teachers en 5 000 student teachers, as well with a project that consists of a network of 2 550 primary schools that promotes science and technology. A Manifest for the period 2011-2017 has been accepted by the Ministry of Education as a base for further plans.