

ICFP2012

1st International Conference on
New Frontiers in Physics

10-16 June 2012
Kolymbari
Crete, Greece



LUISA CIFARELLI — European Physical Society

University & INFN, Bologna (IT) — CERN, Geneva (CH) — Centro Fermi, Rome (IT)

- The European Physical Society provides and **INTERNATIONAL FORUM** for physicists and acts as a **FEDERATION** of physical societies.
- The EPS works to **PROMOTE** the interests of **physicists & physics** in Europe and the world over
- EPS activities revolve around the themes of:
 - promoting **EXCELLENT PHYSICS RESEARCH**
 - supplying a **EUROPEAN VIEW** on important questions relating to physics
 - acting as a **CATALYST** bringing together physicists in different countries
 - acting as a **LIAISON** between physicists working in different fields



The European Physical Society encompasses

- 41 MEMBER SOCIETIES
- > 30 ASSOCIATE MEMBERS (CERN, INFN, ESRF, JINR, GSI, ...)
- \approx 3000 INDIVIDUAL MEMBERS
- EPS represents as a whole a community of **over 10^5 physicists**

Most **EPS Divisions (11)** and **Groups (7)** are very active at levels of real excellency

- Nuclear Physics Division
- High Energy Particle Physics Division
- Physics Education Division ...
 - Accelerator Group
 - Energy Group
 - Technology & Innovation Group
 - History of Physics Group ...

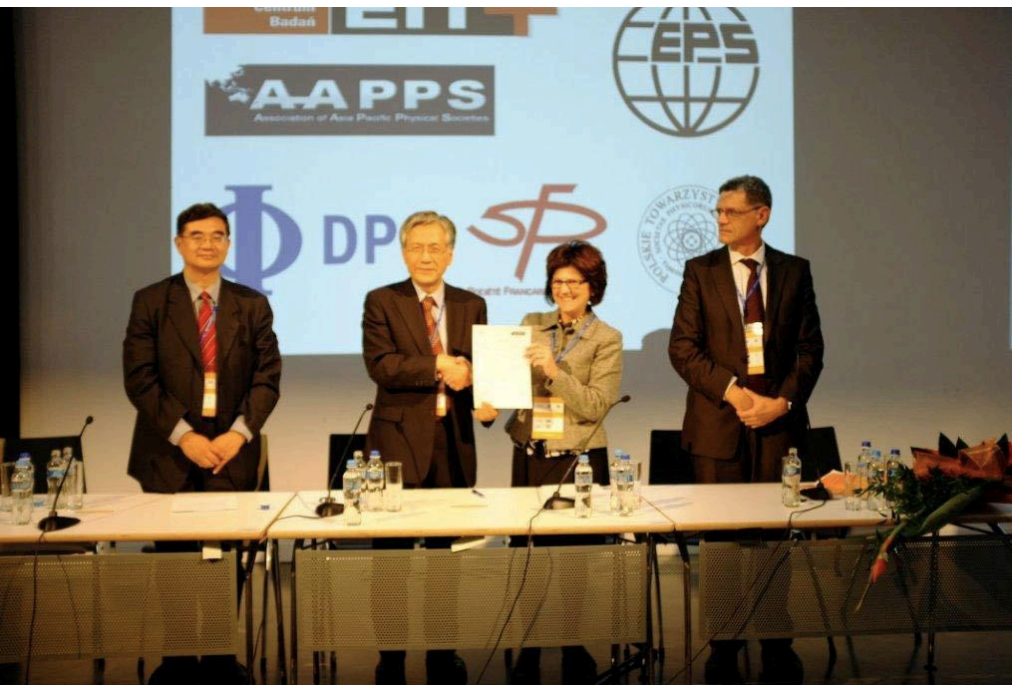


- The renown of EPS prizes & conferences & workshops is very high: these EPS meetings remain as model meetings for the whole international physics community (several thousands of attendants/year)
- The role and position of EPS with respect to other International societies & research/institutional organisations inside Europe (CERN, ESRF ... ESF, Science Europe ...) and outside (APS, AAPPS, AfPS ... IUPAP, ICSU, UNESCO ...) is important
- The opening of EPS relationships towards far Asian countries – e.g. ASEPS (Asia-Europe Physics Summit) on 'Excellence through Cooperation' – is indeed an interesting and promising effort



- **ASEPS2** was successfully held in Wroclaw, Poland, on 26-29 October 2011
(ASEPS1, Tsukuba, Japan, March 2010)
- The representatives of **EPS & AAPPS** had the opportunity to meet, discuss joint research projects and international contacts, and to examine together a number of relevant issues based on individual and collective excellence through cooperation:
 - Cooperation between industry and academia
 - Energy and sustainable development
 - Improved education for science and industry
 - **Large scale infrastructures and networks** ←
 - Mobility of scientists, exchange programmes and job opportunities

- The summit led to the two presidents signing the [Wroclaw Statement](#), which recognizes *"the need for continued cooperation in the future among learned societies in Asia and Europe addressing scientific and societal issues"*
- A [series of recommendations](#) were also produced. Both are [available for download](#) from the EPS web site
 - The ASEPS Task Force is now proceeding to the planning of [ASEPS3, which will take place in Japan, in July 2013](#) (inside APPC)
 - A stronger participation from Asia-Pacific countries, such as [India, Australia, New Zealand](#), is desired



view from the top luisa cifarelli

Where physicists lead, policy makers should follow

In a global economy, scientists need to see strong international collaboration not as an option but as a means of survival: there's no other choice.

International cooperation contributes to the advancement of scientific research and discovery by mixing researchers from different backgrounds to create an environment where diverse solutions can be tried and tested. For scientists in Europe and Asia, that has come to mean collaboration with the United States. But, so far, collaboration between scientists in Europe and Asia has been less well developed. That needs to change.

This need to create a more balanced relationship between the three regions led the European Physical Society and the Association of Asia Pacific Physical Societies—which together have members in 60 countries, from Iceland to Australia—to organise the first Asia-Europe Physics Summit, ASEPS 1, in Tsukuba, Japan, in March 2010. The second meeting, ASEPS 2, took place in Wroclaw, Poland, at the end of Poland's Presidency of the Council of the EU in 2011. The meetings brought together scientists, research institutions

the spring of 2013 [<http://rsrch.co/zbN30u>].

One indicator of success will be whether policy makers follow up the proposals made by the ASEPS task force. By ASEPS 3, for instance, we will know whether the Horizon 2020 funding programme will include European cooperation with Asia in scientific research. We also hope that more policy makers, including those from the OECD, Unesco and the EU will take part. Increasing the participation from the EPS and AAPS member societies in Horizon 2020 is another task force specific recommendation.

Working group 2, focusing on energy and sustainable development, is one example of ASEPS in action. Physicists make important contributions to a stable, environmentally responsible and safe energy supply. Investments are urgently needed for research in energy conversion and storage technologies. This should be an international undertaking, as there are very diverse geographical and environment-related boundary conditions, and all viable options need to be considered.

Given the long-term nature of physics-related energy research, high quality physics education is essential



Thanks
John Dwyer Ed.

- Activities & studies & surveys of EPS and relative **POSITION STATEMENTS** concerning not only the physicists' community but also the **whole society**, on topics such as:

**EDUCATION – ENERGY – CLIMATE – ENVIRONMENT
GENDER – CAREERS – COMMUNICATION
TECHNOLOGY TRANSFER – ECONOMY ...**

are **needed** & may be **relevant**

- Some targeted EPS activities:

- ✓ EPS Forum on Physics & Society
- ✓ European Conference on Energy / EPS-SIF Energy School
- ✓ EPS "Bologna Process" survey
- ✓ EPS Young Minds Project
- ✓ EPS Physics for Development Group (SESAME, ICTP ...)
- ✓ etc.



EPS Position Statements/Papers

OPEN ACCESS

A position paper of the EPS



European Physical Society

more than ideas

ENERGY AND ENVIRONMENT

The Intimate Link

A position paper of the EPS
Environmental Physics Division



European Physical Society

more than ideas

EPS actions & reactions

- **Prompt** reactions from EPS:

- ✓ **Japan earthquake**

EPS initiative

M. Kolwas

President up to March 2011

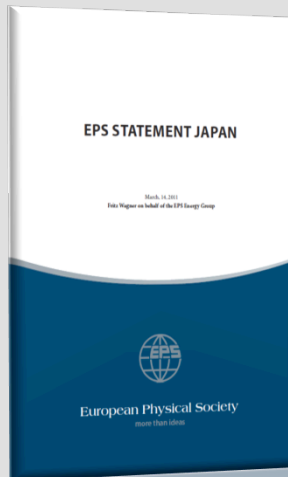


Earthquake in Japan

M. Kolwas, the EPS President has sent letters of support to the physical societies in Japan, as well as the Japanese Embassy in Poland following the earthquake and tsunami.

EPS Energy Group initiative

F. Wagner – Chair



“This catastrophe shows once more, how important energy supply is for all of us and, therefore, how urgent it is to pursue research and development of a wide portfolio of power sources – renewable, conventional and nuclear.

The European Physical Society as an independent organization is aware of the potential and specific risks of these technologies and supports the scientific and technological development of the best options.”



EPS input to EU Science Policy

- European Physical Society Response to the ERA Framework Public Consultation:
'Areas of untapped potential for the development of the European Research Area'
- Replies from the European Physical Society to the consultation on the European Commission Green Paper:
'Towards a Common Strategic Framework for EU Research and Innovation Funding'
- Online survey on: 'Scientific information in the digital age'



EPS Position Statements/Papers

ON THE USE OF BIBLIOMETRIC INDICES DURING ASSESSMENT

A statement of the EPS

NEXT: ON HORIZON 2020



European Physical Society
more than ideas

PHYSICS EDUCATION

A position paper of the
EPS Physics Education Division



European Physical Society
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EPS worldwide initiatives for dissemination

■ IYoL 2015

– Light is an immediate and fascinating topic, but also inter- and multi-disciplinary in all its numerous forms

– It is ideal to be chosen for the declaration of an 'International Year' under the auspices of the United Nations

– Already endorsed by IUPAP, etc.

– October 2012:

Presented by Ghana, Mexico & France at UNESCO Executive Board



PROSPECTUS

An International
Year of Light



Science of Light – Tools for the Future – Pioneers of Light – Light for Development



European Physical Society

more than ideas

EPS HISTORIC SITES

The **EPS Historic Sites Award** commemorates places in Europe important for the development and the history of physics

Sites with national or European/international significance to **physics** and its **history** can be considered for the Historic Site distinction from the EPS

i.e.

places (laboratories, buildings, institutions, universities, towns etc...) associated with an event, discovery, research or body of work, by one or more individuals, that made important contributions to physics

EPS HISTORIC SITES

EPS Historic Sites Committee:

Martin Huber

Maciej Kolwas

Peter Maria Schuster (Chair of HoP Group)

Ove Poulsen

Fritz Wagner

and LC

Nominations are open throughout the year from the EPS website (NB: THE AWARD IS A RECOGNITION NOT A PRIZE!!!)

The EPS will work with the nominators to obtain local authorisations for placing a plaque and in organising the commemorative ceremony

→ 16 proposals in 1 year (since April 2011)



"Hoża 69" – Warsaw, Poland

EPS Historic Site

2011

<<This site is of outstanding importance for Polish physics. Generations of Polish physicists were raised here and here a number of basic discoveries in various branches of experimental and theoretical physics were made.

In the 1930s "Hoża 69" was a renowned centre for research on fluorescence where the Jabłoński diagram, a fundamental concept in molecular physics, was invented. Later it housed the laboratory where Marian Danysz and Jerzy Pniewski discovered the hypernucleus in 1952, then the double hypernucleus in 1962, with deep implications for nuclear and particle physics.

This plaque is dedicated to the founders and researchers of "Hoża 69", among others to Stefan Pieńkowski, Leonard Sosnowski, Marian Danysz, Jerzy Pniewski, Andrzej Sołtan, Czesław Biało-brzeski, Wojciech Rubinowicz and Leopold Infeld. >>

Rome, Italy

EPS Historic Site

2012

EUROPEAN PHYSICAL SOCIETY – EPS Historic Site

THE GOLDFISH FOUNTAIN OF THE PHYSICS INSTITUTE OF PANISPERNA STREET
FERMI CENTRE – ROME

USING THE WATER OF THE GOLDFISH FOUNTAIN OF HIS INSTITUTE, ENRICO FERMI ESTABLISHED FOR THE FIRST TIME, IN THE AFTERNOON OF **22 OCTOBER 1934**, THE CRUCIAL ROLE OF HYDROGENOUS SUBSTANCES ON NEUTRON INDUCED RADIOACTIVITY, THUS OPENING THE WAY TO THE USE OF SLOW NEUTRONS IN NUCLEAR FISSION CHAIN REACTIONS.

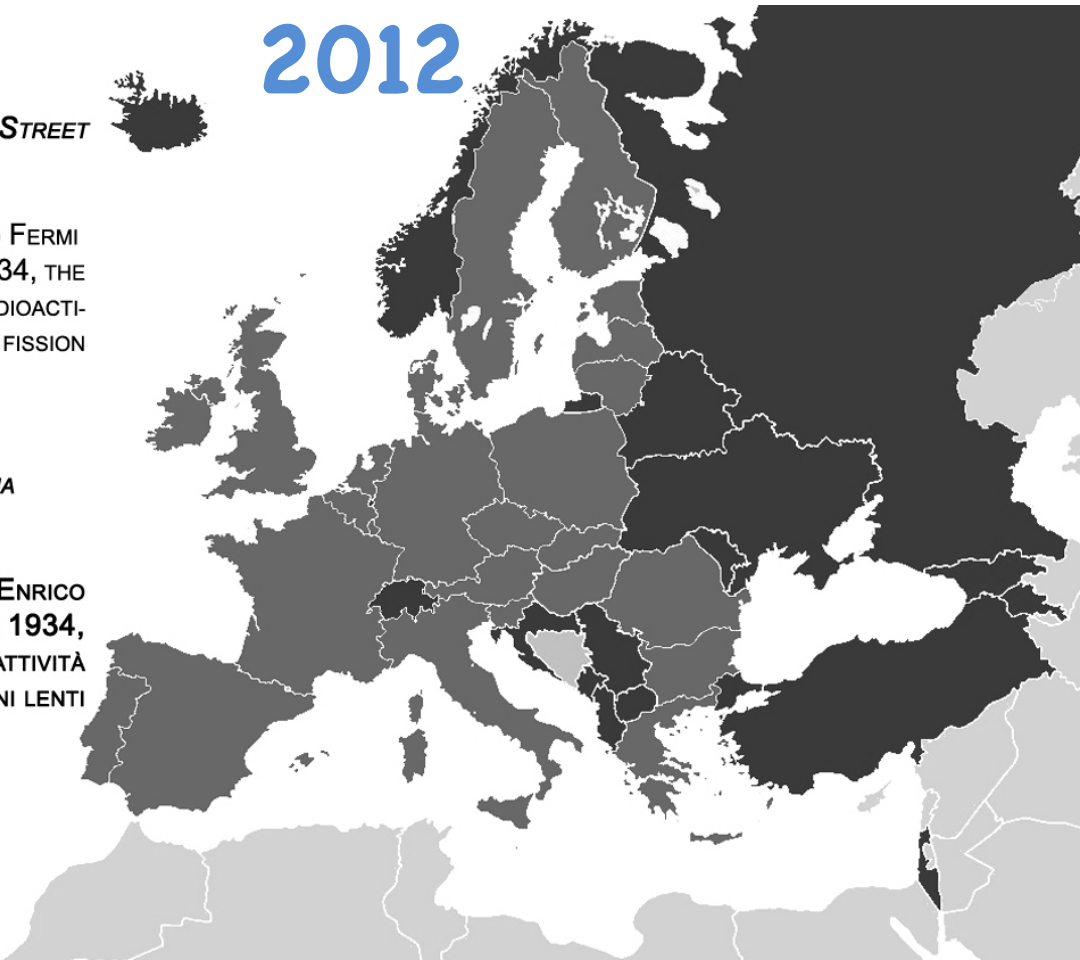
SITO STORICO DELLA SOCIETÀ EUROPEA DI FISICA – EPS

LA FONTANA DEI PESCI ROSSI DELL'ISTITUTO FISICO DI VIA PANISPERNA
CENTRO FERMI – ROMA

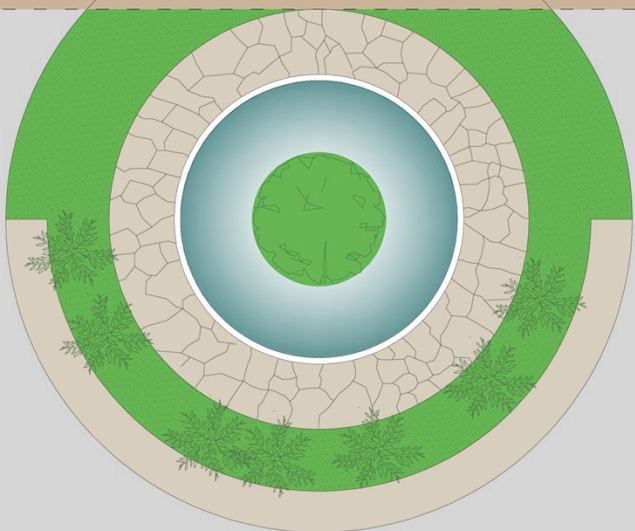
USANDO L'ACQUA DELLA FONTANA DEI PESCI ROSSI DEL SUO ISTITUTO, ENRICO FERMI STABILÌ PER LA PRIMA VOLTA, NEL POMERIGGIO DEL **22 OTTOBRE 1934**, IL RUOLO CRUCIALE DELLE SOSTANZE IDROGENATE NELLA RADIOATTIVITÀ INDOTTA DA NEUTRONI, APRENDO COSÌ LA STRADA ALL'USO DEI NEUTRONI LENTI NELLE REAZIONI DI FISSIONE NUCLEARE A CATENA.



→ Unveiling of EPS Historic Site plaque on 20 April 2012
in the presence of the President of the Italian Republic



SCAVO

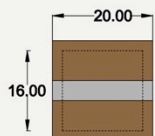


POSSIBILE UBICAZIONE

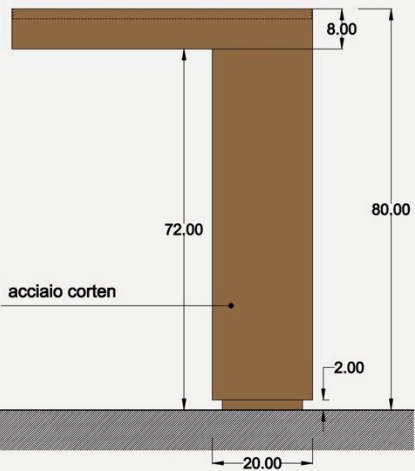
lastra di marmo tipo biancone vicentino con incisione



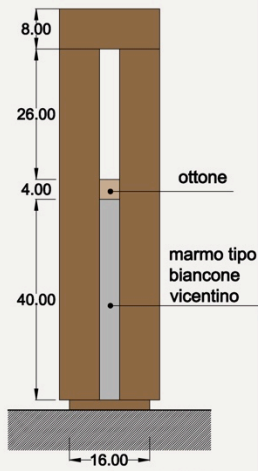
VISTA DALL'ALTO



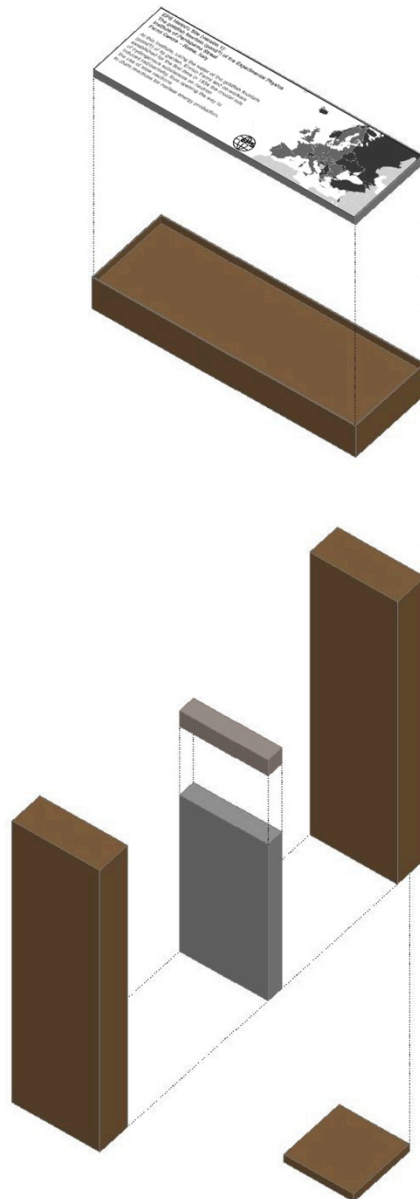
SEZIONE



VISTA FRONTALE

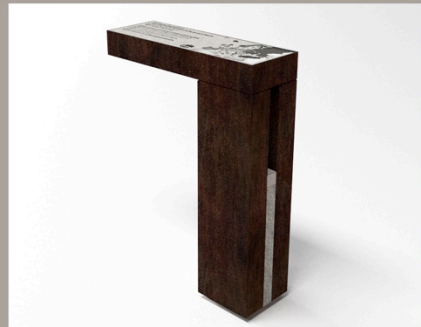


VISTA LATERALE



ESPLOSO

PROGETTO DI MASSIMA PER LA REALIZZAZIONE DEL LEGGIO CON TARGA INCISA





EPS HISTORIC SITES – Proposals

2012

Centenary of cosmic rays discovery by Victor F. Hess

- EPS Historic Site in [Vienna \(Austria\)](#) at the 'Radiuminstitut' where young Hess had worked out the plans for his crucial balloon ride
or
- EPS Historic Site at [Mt Hafelekar, Innsbruck \(Austria\)](#) at the first high altitude cosmic rays laboratory set by Hess
- EPS Historic Site at [Mt Blanc, Argentière \(France\)](#) where the Laboratoire des Cosmiques of Louis Leprince-Ringuet was located

EPS HISTORIC SITES – Proposals

2013

Centenary of Bruno Pontecorvo

→ EPS Historic Site at JINR in **Dubna (Russia)**: the office of Pontecorvo which has been preserved as it was

2014

60th Anniversary of CERN

→ EPS Historic Site in **Geneva (Switzerland)**: the CERN SC (The plaque could be positioned in the Council Chamber where the EPS Constitution was signed by 62 individual members and 20 national societies, academies and research institutions, including CERN, on 26 September 1968)

→ ... and more

- But still ... how can physicists convince politicians about physics' importance for the EUROPEAN ECONOMY ?
- The EPS is interested in better understanding the impact of physics on the **ECONOMY, INDUSTRY & SOCIETY AT LARGE**
- From Europe the message is clear (**HORIZON 2020** etc.): the collaboration between **RESEARCH & INDUSTRY** is a must for **INNOVATION**
- The EPS has decided to launch a **BOTTOM-UP study** on the impact of physics in the economy & welfare of European countries
- Will this be a way to reach out to policy makers?



For sure the question is open & challenging ...

- In parallel the CERN Council has proposed in 2011 to the OECD Global Science Forum (GSF) a study on 'The Social and Economic Impacts of CERN' (TOP-DOWN approach)
- Study approved also including Fermilab (US) & KEK (Japan)
- In the past (2008) the OECD GSF has produced a nice report on 'Mathematics in Industry'
- The EPS study on 'The importance of Physics in the Economies of Europe' is different: it's a **COMMUNITY-BASED INITIATIVE**

"... I am reasonably confident that the delegates of the OECD GSF (who represent funding agencies) would wish to be associated in some way with a bottom-up project originating in the community and would certainly be interested in the results"

(S. Michalowski, OECD GSF Executive Secretary)



EPS Study:

THE IMPORTANCE OF PHYSICS IN THE ECONOMIES OF EUROPE

Study modelled after the study by the IoP 'Physics and the UK Economy' produced every 5 years

GOAL

- Explain to policy makers that physics makes an important contribution to the economy and is not limited to academic research



Physics and the UK Economy

A report prepared for the Institute of Physics by the Centre for Economics and Business Research Ltd
September 2007



UK study (20 pages)

1: Introduction and summary

2: Jobs, turnover and value added

3: Businesses and their survival

4: Indirect impacts

5: International trade, investment, and research and development

6: A wider assessment

7: Appendices

1: Measuring physics in the economy

2: Sectors analysed

3: Comparison with the 2003 study

4: Spillover and indirect effects

METHOD

- Perform an **objective statistical analysis** of the contribution of physics to industry in Europe
- Use an **independent consultancy firm**, specialised in the treatment of business data (**CEBR – Centre for Economics & Business Research, London, UK**)
- Statistics mainly coming from **EUROSTAT**, the statistical office of the EU gathering statistics from the EU Members States in different fields to compare countries & regions
- Use the **NACE classification scheme (Nomenclature Générale des Activités Economiques dans les Communautés Européennes)** as framework (identical to the United Nations ISIC system)
 - Use also other information from bodies such as World Trade Organisation, United Nations, US Census Bureau, Japan Customs ...



- Within NACE codes (35–40) identify physics-related sectors of industry where there is critical use of physics in terms of
 - TECHNOLOGY
 - EXPERTISE & KNOWHOW

- Just a few examples:

- ✓ Extraction of petroleum & natural gas
- ✓ Processing of nuclear fuel
- ✓ Manufacture of electronic components
- ✓ Manufacture of optical instruments & photographic equipment
- ✓ Manufacture of engines / electric motors
- ✓ Manufacture of television / telephony apparatus
- ✓ Manufacture of medical & surgical equipment
- ✓ Telecommunications
- ✓ Production & transmission of electricity
- ✓ Manufacture of aircraft and space craft
- ✓ Defence activities
- ✓ etc.



TARGET AUDIENCE

- ✓ EU policy makers
- ✓ European Parliament
- ✓ European Institutions (EC, EESC, ERAB ...)
- ✓ National policy makers... but also Global policy makers
- ✓ EPS Member Societies
- ✓ EPS Associate Members (scientific/academic institutions, but also enterprises, corporations & industries)

EPS WORKING GROUP

(established, meeting in London few times with CEBR)

- ✓ Coordinate the work needed in terms of milestones & schedule
- ✓ Choose **NACE codes**, define the **contours** of the study, the EU **countries** to be investigated
- ✓ Which Europe? **Europe-27** or **Europe-15**? (**EPS-41 MSs!**)
- ✓ **Retrospective** analysis? **Prospective** analysis? Both?
- ✓ **Critically analyse the outcome**



EPS Study:

THE IMPORTANCE OF PHYSICS IN THE ECONOMIES OF EUROPE

- Europe-27 + UK, Norway, Switzerland
- EUROSTAT data available for 2008-2010
- Analysis & assessment & recommendations
- Study ready in August 2012

→ Hopefully an efficient way to reach out to policy makers

(Study presented in Brussels at EC, in Paris at OECD GSF, etc.)



MORE THAN IDEAS



Thank you for your attention

UK study (20 pages)

1: Introduction and summary

2: Jobs, turnover and value added

3: Businesses and their survival

4: Indirect impacts

5: International trade, investment, and research and development

6: A wider assessment

7: Appendices

1: Measuring physics in the economy

2: Sectors analysed

3: Comparison with the 2003 study

4: Spillover and indirect effects



1: Introduction and summary

This report examines the contribution of physics to the UK and how the use of physics in the UK economy between 2000 and 2005 has changed. This research highlights the value generated by physics-based sectors¹ for the economic prosperity of the UK.

It updates and extends *The Importance of Physics to the UK Economy 2003*. The definition of physics-based sectors has been extended to include a wider range of sectors involved in physics-based activities in the UK economy – and not just within the manufacturing sector – to take account of the rapidly changing structure of business. For example, this would include companies ranging from consultancies to engineering sectors.

Physics-based sectors currently play a large role in the UK economy

In 2005 there were just over a million employee jobs in sectors where the use of physics-based technologies or expertise was critical to the existence of the sector. This is equivalent to the total number of employees in the construction sector and to about 5% of all jobs in the UK. In 2005, employment in physics-based sectors was concentrated in approximately 32 000 businesses where the use of physics-based expertise or technologies was critical to the existence of the sector. This is equivalent to approximately 2% of all registered businesses in the UK.

Physics-based sectors are highly productive

This report shows that physics-based sectors are typically more productive relative to the UK average. The economic activity of physics-based sectors, measured in terms of gross value added (GVA), stood at £70 billion in 2005.

Physics-based sectors also support the wider economy

The activity in physics-based sectors also helps to support jobs and growth in the wider economy. For example, an indirect or multiplier effect is created by the physics-based sectors as they support activity in upstream markets. In 2005, physics-based sectors supported an additional 3.7 million jobs upstream and £53.4 billion of GVA – equivalent to 5% of the UK's economic activity.

Turnover is not rising as fast as in the UK and employment is falling

Although physics-based sectors make a significant contribution to the economy, the sector is in decline. Turnover in physics-based sectors rose by just 4% between 2000 and 2005 – significantly less than the 25% growth in the UK as a whole. Although physics-based sectors are becoming more productive, they are generating less in turnover relative to the rest of the UK. The turnover generated by the physics sectors in 2005 amounted to £180 billion – 9% of the economy's total turnover.

The UK has seen fast growth in employment – particularly from finance and business services, and the public sector. Physics-based sectors, however, have seen a significant decline in employment in recent years. In 2000–2005, employment in physics-based sectors declined by about 16%.

Export performance of physics-based sectors is weaker than other exporting countries

In 2005, physics-based sectors exported £92.9 billion and imported £109.8 billion worth of goods and services. This accounted for 20% of the total value of UK exports and

