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# IUPAP

INTERNATIONAL UNION OF PURE AND APPLIED PHYSICS  
C<sub>14</sub> COMMISSION – PHYSICS EDUCATION

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# REPORT

2013 -2018

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**PROF. DR. ROBERTO NARDI**  
**C14 Commission – Chair (2018-2020)**  
UNESP – State University of São Paulo, School of Sciences  
Education Department - Bauru Campus

**Brazilian Society of Physics (SBF)**  
São Paulo, 18/04/2018.

## INTRODUCTION

This document is a report of the main activities in which Prof. Dr. Roberto Nardi participated, as a member of the C<sub>14</sub> Commission – Physics Education, representing the Brazilian Society of Physics (SBF) in this Commission.

From 2018-2020 Prof. Nardi was indicated as a chair of the C<sub>14</sub> Commission.

The main subjects of this report are:

1. The C<sub>14</sub> Commission and its members
2. International Conferences and events organized by the Commission and held in this period and the presence of Brazilian researchers and teachers in these events
3. Publication of the ICPE Newsletter
4. Looking forward

# C14: PHYSICS EDUCATION

<http://iupap.org/commissions/>

The C14 Commission is one of the 20 IUPAP's commissions. It was established by the IUPAP in 1960, to promote the exchange of information and views among the members of the international scientific community in Physics Education. The officers in the period considered (2013-2017) were:

**Hideo Nitta** (Chair)  
Tokyo Gakugei University,  
**Japan**

**Leoš Dvorač** (Vice-Chair)  
Department of Physics Education - Charles University - Faculty of Mathematics and Physics  
**Czech Republic**

**Zulma Gangoso** (Secretary)  
Facultad de Matemática, Astronomía y Física - Universidad Nacional de Córdoba  
**Argentina**

**Qiang Chen**  
Department of Physics - Beihang University - Beijing  
**China**

**Jayashree Ramadas**  
Homi Bhabha Centre for Science Education - Tata Institute of Fundamental Research  
**India**

**David Sands**  
Department of Physics and Mathematics - University of Hull  
**United Kingdom**

**Eilish McLoughlin**  
School of Physical Sciences - Dublin City University – Glasnevin - Dublin  
**Ireland**

**Dmitry Khokhlov**  
Physics Department - Lomonosov Moscow State University - Moscow  
**Russian Federation**

**Deena Naidoo**  
School of Physics - University of the Witwatersrand  
**South Africa**

**Roberto Nardi**  
School of Sciences – Education Department – State University of São Paulo (UNESP)  
**Brazil**

**Lotten Glans**  
Mittuniversitetet,  
Sweden

**Priscilla Laws**  
Department of Physics and Astronomy - Dickinson College - Carlisle, Pennsylvania  
**United States**

**Ian Bearden**  
Niels Bohr Institute - University of Copenhagen  
**Denmark**

**Gorazd Planinšič**  
Faculty of Mathematics and Physics - University of Ljubljana  
**Slovenia**

The Associate Members are:

**Sarojiny Saddul-Hauzaree**

Department of Science Education - Mauritius Institute of Education,  
**Mauritius**

**Mehmet Fatih Taşar**

Gazi Üniversitesi - Gazi Eğitim Fakültesi – Ankara  
**Turkey**

**Manjula Sharma**

School of Physics - Faculty of Science - The University of Sydney  
**Australia**

**Alex Mazzolini**

**Australia**

# **International Conferences and events**

Organized by the C<sub>14</sub> Commission (2013-2017)

## **The International Conference on Physics Education (ICPE-EPEC-2013)**

Praga - República Tcheca

<http://www.icpe2013.org/>

## **International Conference on Physics Education - ICPE 2014**

Córdoba – Argentina

[www.icpe2014.org](http://www.icpe2014.org)

## **2nd World Conference on Physics Education – WCPE 2016**

São Paulo – Brazil

<http://www.wcpe2016.org/en/>

## **The International Conference on Physics Education (ICPE-GIREP-EPEC-2017)**

Dublin – Ireland

<http://www.girep2017.org/ehome/index.php?eventid=129432&>

# The International Conference on Physics Education (ICPE-EPEC-2013)

Charles University, Prague, Czech Republic – August 05 to 09, 2013

<http://www.icpe2013.org/>

The purpose of this conference was to bring together people working in physics educational research and in physics education at all types of schools from the whole world to enable us to share and exchange our experiences.

The general conference theme: Active learning – in a changing world of new technologies. Oral presentation, posters, workshops were held, from a broad range of topics aiming help to improve physics teaching and learning (especially active learning) and to extend our understanding of this important area.

The conference was organized by:

- The International Commission on Physics Education (ICPE) - Commission C14 of the International Union of Pure and Applied Physics (IUPAP)
- The European Physical Society Physics Educational Division (EPS PED)
- The Faculty of Mathematics and Physics, Charles University in Prague.

## Scientific Advisory Committee

Leoš Dvořák, Charles University, Czech Republic

Pratibha Jolly, University of Delhi, India

Robert Lambourne, Open University, UK

Priscilla Laws, Dickinson College, USA

Marisa Michelini, University of Udine, Italy

Cesar Mora, Instituto Politécnico Nacional, Mexico

Deena Naidoo, University of the Witwatersrand, South Africa

**Roberto Nardi, State University of São Paulo, Brazil**

Hideo Nitta, Tokyo Gakugei University, Japan

Gorazd Planinšič, University of Ljubljana, Slovenia

Elena Sassi, University of Naples "Federico II", Italy

Laurence Viennot, Université Paris 7 - Denis Diderot, France

Michael Vollmer, Brandenburg University of Applied Sciences, Germany

## ICPE-EPEC 2013 Program Committee

Leoš Dvořák, Charles University, Czech Republic

Robert Lambourne, Open University, UK

Hideo Nitta, Tokyo Gakugei University, Japan

Gorazd Planinšič, University of Ljubljana, Slovenia

Laurence Viennot, Université Paris 7 - Denis Diderot, France

## The Local Organizing and Program Committee

Leoš Dvořák, Irena Dvořáková, Věra Koudelková, Marie Snětinová and Vojtěch Žák,  
Department of Physics Education, Faculty of Mathematics and Physics, Charles University, Czech Republic.

As a member of the IUPAP Physics Teaching Commission (C<sub>14</sub>), we participated of the scientific committee and as chair of one of the sessions (1A).

We also participated as presenter of five oral communications of research works in co-authorship with other researchers (Session 3B and 6C) and with orientations of the PhD of the Graduate Program in Science Education (Session 3B). [See 'Certificate of Attendance' - Annex IV and parts of the 'Conference Program'.

About 150 physicists from different countries of the world participated in the event:

Argentina, Brazil, China, Ecuador, Slovenia, Spain, France, Israel, India, England, Ireland, Italy, Japan, Mexico, Argentina , Pakistan, the Czech Republic, Russia and Sweden.

In addition to our participation as a member of the Scientific Committee and in the presentation of communications related to our ongoing research, we took the opportunity to disseminate the Science & Education journal edited by the UNESP' Science Education Program, as well other Brazilian Physics and Science Education journals . We also maintained contacts with international researchers inviting them to be part of the Editorial and Opinion Board of the Ciência & Educação Journal.

# International Conference on Physics Education - ICPE 2014

Córdoba – Argentina – Universidad Nacional de Córdoba, august 18 to 22, 2014

[www.icpe2014.org](http://www.icpe2014.org)

The International Conference on Physics Education was held from August 18 to 22, 2014, at the Dr. César Carman Hotel Conference Center, in the city of Córdoba, Argentina. It had as central theme: Physics Teaching before a world complex. ICPE 2014 was the first conference of the series to be held in South America.

The main objective was the exchange of scientific information and points of view among members of the international scientific community in the area of Physics Teaching.

Following its tradition, ICPE 2014 was composed of lectures on relevant subjects in Physics Teaching given by prominent representatives of the field, as well as oral contributions and posters in the different areas.

The event was organized by the C<sub>14</sub> Commission of the International Union of Pure and Applied Physics.

Locally, the Conference was organized by the Physics Department of the University of Córdoba (one of the oldest in the Americas) and by the Enrique Gaviola Institute of Physics (CONICET, Argentina), which together constitute an important research centre in physics in this region of Argentina.

Dozens of physicists, including researchers, professors and postgraduate students interested in the subject, from different countries around the world participated in the event. The Scientific Committee was composed of the following researchers:

- Prof. Robert Lambourne (UK) (Chair)
- Marisa Michelini (President of GIREP)
- Prof. Hideo Nitta (Japan)
- Prof. Leos Dvorak (Czech Republic)
- Prof. Zulma Gangoso (Argentina)
- Prof. Julio Benegas (Argentina)
- Prof. Francisco Tamarit (Argentina)
- **Prof. Roberto Nardi (Brazil)**
- Prof. Nianle Wu (China)
- Prof. Gorazd Planinsic (Slovenia)
- Prof. Deena Naido (South Africa)
- Prof. Jayashree Ramadas (India)
- Prof. Dmitry Khokhlov (Russia)
- Prof. Lotten Glans (Sweden)
- Prof. Priscilla Laws (USA)
- Prof. César Mora (México)

The program of the event was constituted of official opening, conferences, symposium, workshops, oral presentations and in the form of poster, as it appears in the program of the event that can be accessed at: <http://www.icpe2014.org/program/>

Also included in the program was a dinner party and there was space for the visitation of the participants to tourist attractions of interest such as museums and cultural centres of the region.

Two of the keynote speakers, indicated by us, were Brazilians:

**Keynote IX: Isabel Martins**

*The potential of curriculum approaches related to socio-scientific issues (SSI) and socially acute questions (SAQs) for promoting scientific literacy*

**Keynote VII: Marcia Cristina Bernardes Barbosa**

*Water a complex fluid*

Our participation, besides the activities as a member of the Scientific Committee, was given as a chair of one of the oral communication sessions (Session II) of the event and in the presentation of works, both in oral and poster form, derived from the project titled: O dialogue between the academic production in Science Teaching and the knowledge and teaching practices in different levels of education and educational spaces. This research project is supported by CNPq and is being developed by the Research Group on Science Teaching (GPEC) linked to the Department of Education and the Postgraduate Program in Science Education of Unesp, Campus of Bauru. The project aims to "Develop articulated investigations that generate a set of subsidies for the reflection on the processes of teacher education in the area of natural science and mathematics education, especially in what concerns to the ways in which the pre and in-service teachers interact with theory (academic production in education and related areas) and how they benefit (or not) from it in their professional practice. "

The report of part of the activities developed resulted in the following communications:

- KUSSUDA, S.R. e NARDI, R. A quantitative study on the teaching of physics in São Paulo State, Brazil: universities, teachers and schools.
- GATTI, S.R.T. e NARDI, R. Contributions of the History and Philosophy of Science to teachers' education: what really arrives to the high school classrooms?
- LIMA, S.C.L. e NARDI, R. A proposal for continuing education for teachers of science early years of basic education.
- SOUZA DE JESUS, A.C. The presence of physics education research outcomes in supervised teaching practice activities.
- CARVALHO, A.V. e NARDI, R. The use of "Student Notebooks" in the Teaching of Physics in the State of São Paulo, Brazil: the official discourse, teaching practice and reality in the classroom.
- CORTELA, B.S.C. e NARDI, R. Relationships between the construction of a curriculum identity and the professional choices of students graduated from a physics teachers' education program.

Our participation in the event also allowed exchanges with researchers from different institutions in Brazil and abroad, such as China, Colombia, Ecuador, United States, Fiji, England, Israel, Japan, Mexico, New Zealand, Russia, Switzerland. These exchanges may in the future be important to the Department of Education of the Faculty of Science and to the Graduate Program in Education for Science. The exchanges allowed:

- Contacts with post-graduate students interested in studying for a PhD or postdoctoral degree in Brazilian programs.
- Dissemination of the Science & Education and other Brazilian journals with other counterparts in the participating countries.
- Invitation to researchers present to join the International Committee and of Evaluators of the Science & Education Journal;
- Possibility of teachers coming from other countries as visiting professors in Brazilian post-graduate programs;
- Dissemination of activities and research in progress in the Department of Education, in the Faculty of Sciences and, particularly, in the Group of Research in Science Teaching, under our coordination.

The wide dissemination of the event with members of the Brazilian Society of Physics, as well as between teachers of basic education and the geographical proximity of Argentina with Brazil contributed to the presence of dozens of Brazilian participants.

## 2nd World Conference on Physics Education – WCPE 2016

São Paulo – Brazil – 11 to 15 July, 2016.

<http://www.wcpe2016.org/en/>

This Conference was sponsored by GIREP and ICPE C<sub>14</sub> Commission. The committee were the following:

### Local Organizing Committee:

Chair: Maurício Pietrocola

Vice-chair: Ivã Gurgel

Review Commission: Cristina Leite and Giselle Watanabe (Coord.)

Lúcio Costa, Erika Mozena, Ivanilda Higa, Renata Ribeiro, Elrismar Auxiliadora, Marta de Souza, Nilva Sales, Nobuko Ueta, Guilherme Brockington, Thaís Forato, Breno Arsioli Moura, Winston Schmiedecke

### International Advisory Committee

Marisa Michelini, Università di Udine, Italy (GIREP)

Dagmara Sokolowska, Institute of Physics, Poland (GIREP)

Claudia Haagen-Schuetzenhoefer, University of Graz, Austria (GIREP)

Wim Peeters, PBDKO vzw (work) and PONTOn vzw (ceo), Belgium (GIREP)

Leoš Dvořák Charles University, Czech Republic, (ICPE/GIREP)

Hideo Nitta, Tokyo (Gakugei University, Japan (ICPE)

Zulma Gangoso, Universidad Nacional de Córdoba, Argentina (ICPE)

Ian Bearden, University of Copenhagen, Denmark (ICPE)

Qiang Chen, Beihang University, China (ICPE)

Lotten Glans, Mittuniversitetet, Sweden (ICPE)

Dmitry Khokhlov, M.V. Lomonosov Moscow State University, Russia (ICPE)

Priscilla Laws, Dickinson College, USA (ICPE)

Eilish McLoughlin, Dublin City University, Ireland (ICPE)

Deena Naidoo, University of Witwatersrand, South Africa (ICPE)

**Roberto Nardi, Universidade Estadual Paulista Julio de Mesquita Filho, Brazil (ICPE)**

Gorazd Planinsic, University of Ljubljana, Slovenia (ICPE)

Jayashree Ramadas, Tata Institute of Fundamental Research,, India (ICPE)

David Sands, University of Hull, United Kingdom (ICPE)

Raimund Girwidz, University Ludwig-Maximilians- (MPTL)

Francisco Esquembre, Universidad de Murcia- (MPTL)

Orlando Aguiar, Federal University of Minas Gerais (SBF)

Maurício Pietrocola, University of São Paulo, Brazil (chair)

### Associate International Committee

Alex Mazzolini, Swinburne University of Technology, Australia

André Ferrer - Federal University of Rio Grande do Norte, Brazil

Anna Maria Pessoa de Carvalho - University of São Paulo, Brazil

Antonia Candela, Centro de Investigación y de Estudios Avanzados del I.P.N, Mexico

Arnaldo Vaz - Federal University of Minas Gerais, Brazil

Cibelle Silva - University of São Paulo, Brazil

Cristiano Mattos, University of São Paulo, Brazil

Costas Constantinou, University of Cyprus, Cyprus

David Sokoloff (AAPT)/University of Oregon, USA

Diane Grayson, Andromeda Science Education, South Africa

Dietmar Höttecke, University of Hamburg Faculty of Education, Germany

Gesh Pospiech - Technical University of Dresden, Germany

Ian Lawrence, Institute of Physics, UK

Ideu Moreira - Federal University of Rio de Janeiro, Brazil

Ives Araujo - Federal University of Rio Grande do Sul, Brazil

Jenaro Guisasola, Universidad del País Vasco, Spain

Jose Custódio Filho - Federal University of Santa Catarina, Brazil

Julio Benegas, University of Sao Louis, Argentina

Olivia Levrini, Università di Bologna, Italy, Brazil

Olival Freire - Federal University of Bahia

M. Fatih Taşar, Gazi Üniversitesi, Turkey

Maarten Pieters, Netherlands Institute for Curriculum Development, Nederland  
Minella Alarcon, University of Manilla, Philippines  
Pratibha Jolly, University of Delhi, India  
Robert Lambourne - Open University, UK  
Ricardo Karam, University of Copenhagen, DK  
Roser Pinto, Universitat Autònoma de Barcelona, Spain  
Wanda Kaminski, University of Paris Denis Diderot, France

The presence of Brazilian researches in the program was important.

A. Plenary Conference:

**1) Dialogic development of children's ideas using computation in the classroom: keeping it simple**

*Ian Laurence, Institute of Physics, UK*

**2) Benefits and Challenges of Technology in Teaching Physics**

*Prof. Ton Ellermeijer, Foundation CMA, Amsterdam, Netherlands*

**3) Thinking Like a Physicist" about Physics Education**

*Prof. Paula Heron, University of Washington, USA*

**4) Simple experiments in physics teaching and learning – do they have any perspectives?**

*Prof. Leoš Dvořák, Dept. of Physics Education, Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic*

**5) Conceptual development and critical attitude in physics education: a pathway in the search for coherence**

*Laurence Viennot, PRES Sorbonne Paris Cité, Université Paris Diderot, LDAR - France*

B. Invited Conference:

**Making of Manga Guide to Physics**

*Hideo Nitta, Tokyo Gakugei University, Japan*

5. Round Tables:

**1- Women in Physics and Physics Education**

**Marcia Barbosa, Federal University of Rio Grande do Sul, Brazil**

**Pratibha Joly, University of Delhi, India**

**2- Physics education and diversity in society**

*Antonia Candela Martin, INP, México*

*Tanja Tajmel, Professional School of Education, Germany*

**Katemari Rosa, State University of Paraíba, Brazil**

**3 - Research-based Alternatives to Traditional Physics Teaching at University and College**

*Jenaro Guisasola, University of the Basque Country (UPV/EHU). Spain*

*Cristiano R. Mattos, University of São Paulo, Brazil*

*Genaro Zabala (Tecnológico de Monterrey, Mexico); Ruben Limaña (Universitat de Alicante, Spain); Marisa Michelini & Alberto Stefanel (University of Udine, Italy) ; M. Kryjevskaja (North Dakota State University, USA)*

**4 - Professional development of Physics teachers**

**Deise Vianna (abstract), Federal University of Rio de Janeiro, Brazil**

*Zulma Gangoso, Universidad De Cordoba, Argentina*

**5 - Cern Masterclass courses and the impact on school physics**

*Uta Bilow, Technological University of Dresden, Germany*

**Marcia Begali, State University of Rio de Janeiro, Brazil**

**6 - Perspectives from WCPE 2016 in physics education: Where have we been and where would we like to be?**

*Chair Ian Lawrence - Institute of Physics, UK*

*Paula Heron - University of Washington, USA*

*Hideo Nitta - Tokyo Gakugei University, Japan*

*Peter Hubber - Deakin University, Australia*

*Prof. Ton Ellermeijer - Foundation CMA, Amsterdam, Netherlands*

*Laurence Viennot - PRES Sorbonne Paris Cité, Université Paris Diderot, LDAR - France*

## Workshops: total of 8

**1) Shaping the interplay of physics and mathematics**

Authors: Gesche Pospiech, Dresden - Technische Universität, Dresden

**2) Simple and Beautiful Experiments IX by LADY CATS and Science Teachers' Group**

Authors: Masako TANEMURA, Kyoko ISHII, Jun-ichiro YASUDA, Naoshi TAKAHASHI, Nobue MASUDA. OKU - Osaka Kyoiku University. JAPAN. Tamagawa University. Machida, Tokyo, JAPAN. Yamagata University. Yamagata, JAPAN. Kagawa University, Saiwaicho, Kagawa, JAPAN. Ochanomizu University Elementary School. Ootsuka, Bunkyo, Tokyo, JAPAN.

**3) Do's and don'ts of large scale curriculum development: exploring the case of physics education in the Netherlands since 1970, and your own cases.**

Authors: Maarten Pieters. Netherlands Institute for Curriculum Development. Netherlands.

**4) coach 7 - New version of Unique Environment for STEM Education and how to integrate Technology in Physics Education ; Role at Examinations.**

Authors: Kedzierska Ewa, Ton Ellermeijer, Pieter Smeets. CMA, Amsterdam (Amsterdam)

**5) Physics Everywhere: Experiments with Smartphones**

Authors: Cecilia Stari, Arturo Marti, UdelaR - Instituto de Fisica, Universidad de la Republica (Uruguay)

**6) Didactic sequence on particle detectors for medium level students in São Paulo state ( high school ) : An interdisciplinary view.**

Authors: Armando Massao Tagiku, Guaraciaba Tetzner, Nobuko Ueta, Lapef - Laboratório de pesquisa em ensino de Física – FEUSP. Brazil

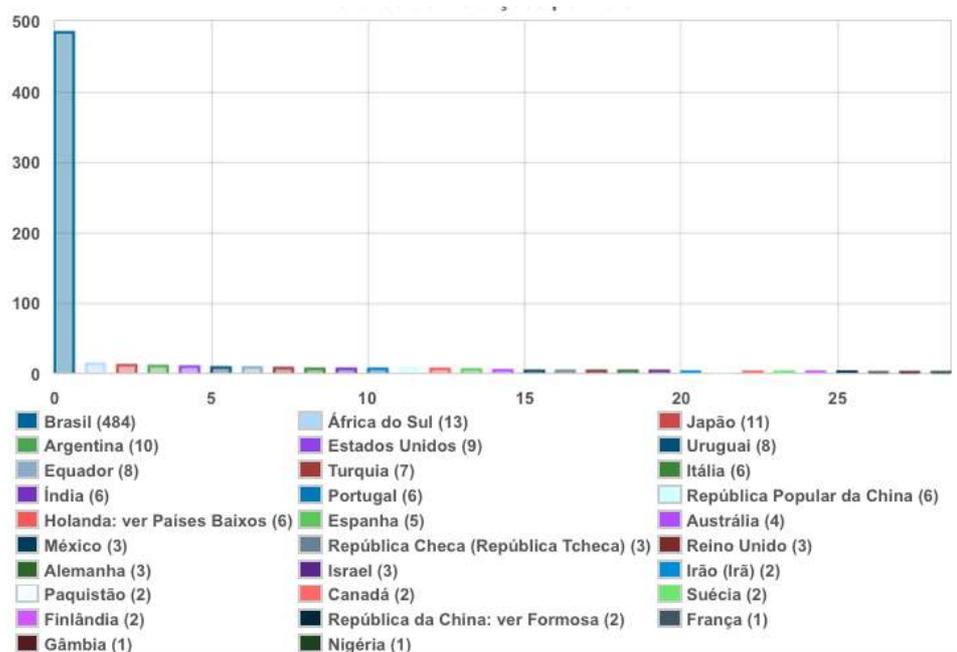
**7) "GUESS THE COLOUR!": A MYSTERY TO APPROACH THE VISION OF COLOURS**

Authors: Marco Giliberti, Sara Roberta Barbieri. Phys Dep. University of Milan (Via Celoria 16, 20133, Milano, Italy)

**8) School Bag Physics Laboratory**

Authors: Vijaykumar Verenkar. V P Goa - Vidnyan Prabodhini. Goa

The communication present in the event were distributed by countries, according this proportion:



# The International Conference on Physics Education (ICPE-GIREP-EPEC-2017)

Dublin – Ireland – 3rd to 7th July, 2017

<http://www.girep2017.org/ehome/index.php?eventid=129432&>

The GIREP-ICPE-EPEC 2017 conference was held in Dublin City University, Ireland. The conference theme was "Bridging Research and Practice in Physics Teaching and Learning".

This conference was hosted by the Centre for the Advancement of Science and Mathematics Teaching and Learning (CASTeL) at Dublin City University (DCU), Ireland and is jointly organised by:

- **The Conference of International Research Group on Physics Teaching (GIREP)**
- **European Physical Society - Physics Education Division (EPS PED) and**
- **International Conference on Physics Education (ICPE) of the Commission C14 of the International Union of Pure and Applied Physics (IUPAP).**

The Organising Committee was chaired by Eilish McLoughlin and Paul van Kampen

The committees were the following:

## Scientific Advisory Committee

Leoš Dvořák, Charles University in Prague, Czech Republic, GIREP and ICPE Committee Member

Ton Ellermeijer, CMA, Amsterdam, The Netherlands, former GIREP President

Zulma Gangoso, Córdoba, Argentina, ICPE Secretary

Claudia Haagen-Schuetzenhoefer, University of Graz, Austria, GIREP Vice-President

Eilish McLoughlin, Dublin City University, Ireland, Chair GIREP-ICPE-EPEC 2017

Marisa Michellini, University of Udine, Italy, GIREP President

Andreas Mueller, University of Geneva, Switzerland, EPS-PED Committee

Hideo Nitta, Tokyo Gakugei University, Japan, ICPE President

Wim Peeters, DKO (vzw) and PONTon vzw, Belgium, GIREP Vice-President

David Sands, University of Hull, United Kingdom, EPS-PED Chair

Dagmara Sokolowska, Jagiellonian University, Cracow, Poland, GIREP Secretary

Dean Zollman, Kansas State University, USA, AAPT Representative

## Local Organising Committee

Eilish McLoughlin, Dublin City University, Ireland, Chair

Paul van Kampen, Dublin City University, Ireland, Co-Chair

Eamonn Cunningham, Dublin City University, Ireland

Arlene O'Neill, Trinity College Dublin, Ireland

Veronica McCauley, National University of Ireland Galway, Ireland

Leah Wallace, Limerick Institute of Technology, Ireland

Shane Bergin, University College Dublin, Ireland

Sheila Gilheany, Institute of Physics in Ireland

Paul Nugent, IOPI Teacher Co-ordinator, Ireland

David Keenahan, IOPI teacher Co-ordinator, Ireland

Siobhan Daly, Dublin Institute of Technology, Ireland

The Plenary speakers were the following researchers:

## Plenary Speakers



### Prof. Dr. Claudia Haagen-Schützenhöfer

Professor at the institute of Physics at the University of Graz. Austria

Austrian national Physics Curriculum for secondary schools.

Vice-President of the GIREP Committee.



**Prof Kevin G. McGuigan**

Director of the RCSI Solar Disinfection Research Group  
Adjunct Professor of Medical Physics with the School of  
Physical Sciences in Dublin City University, Ireland



**Prof. Marco Antonio Moreira**

Emeritus Professor of Physics of the Federal University of Rio  
Grande do Sul (UFRGS), Brazil and Senior Researcher of the  
Brazilian National Research Council. Porto Alegre. Brazil



**Dr. David Sands**

Director of Learning and Teaching for the School of  
Mathematics and Physical Sciences at Hull, United Kingdom.  
IOP Higher Education Group and the Physics Education  
Division of the European Physical Society  
C14 of IUPAP (ICPE).



**Professor Paul van Kampen**

School of Physical Sciences and the Centre for the  
Advancement of STEM Teaching and Learning (CASTeL) at  
Dublin City University, Ireland.



**Dr. Bethany R. Wilcox**

Department of Physics at Colorado School of Mines  
U.S.A.

**ICPE Medal** ICPE Medal for the year 2017 was conferred on Marco Antonio Moreira (above), Professor Emeritus at Federal University of Rio Grande do Sul, Porto Alegre, Brazil. The C14 Commission nominated Prof. Moreira among other professors. Prof. Moreira was the first Latin America research to be honoured with the ICPE Medal.

Some photos of the ceremony are shown below.

Prof. Marco Antonio Moreira (Brazil) and Hideo Nitta (Japan) – Chair of the C14 Commission



Prof. Marco Antonio Moreira (Brazil) – ICPE Medal 2017 among members of the ICPE Commission: left: Eilish McLoughlin (Ireland), Manjula Sharma (Australia); right: Hideo Nitta (Japan) and Roberto Nardi (Brazil),



## Publication of the ICPE Newsletter

The C<sub>14</sub> Commission publishes its newsletter with regularity, twice a year, primarily in electronic form. A small number of copies are printed and distributed at conferences. Professor Manjula Sharma (Australia) is the actual editor. Prof. Zulma Gangoso, University of Cordoba, Argentina was the former editor.

The Newsletter is published twice a year Issues back to 1995. The three last editions are available at:

<http://iupap-icpe.org/publications/newsletters/n64.pdf>

<http://iupap-icpe.org/publications/newsletters/n63.pdf>

<http://iupap-icpe.org/publications/newsletters/n62.pdf>

The # 64 (first link above) May 2013, was the last number edited by Prof. Zulma Gangoso (Argentina).

The number 63 (May 2012) Prof. Ian D. Johnston (University of Sydney, Australia) the Editor, welcome the new members of the C<sub>14</sub> Commission.

**Also, there is a matter, entitled “Physics Education Research in Brazil”, the paper, is adapted from a chapter called “Research in Physics Teaching” written by the authors, members of the Brazilian Society of Physics (SBF) Physics Research Commission, in the following book edited by SBF: S. Nogueira; T. Romero (Orgs.). Física 2011: Estado da Arte, desafios e perspectivas para os próximos anos (Physics 2011: State of art, challenges and perspectives for the next years). Sociedade Brasileira de Física, São Paulo: Chris MCHillard Editora Ltda., 2011, p. 115-126. The authors are ther Brazilian researchers, Anna Maria Pessoa de Carvalho – School of Education - São Paulo University, Deise Miranda Vianna – Physics Institute - Rio de Janeiro Federal University, Laércio Ferracioli – Physics Institute - Espirito Santo Federal University, Maria José P. M. de Almeida – School of Education - Campinas State University and Roberto Nardi – School of Sciences - São Paulo State University.**

# Looking forward

The last C14 Commission' Annual Meeting was held at Dublin, right after the GIREP-EPEC-ICPE Conference, on 7<sup>th</sup> of July 2017.

Below are the minutes of this meeting.

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## International Commission on Physics Education (C14)

**Record of the minutes of the International Commission on Physics Education (C14) Annual Meeting held on Friday, 07 July 2017 from 2:30 to 6:30 PM at the Stokes Building, Dublin City University Campus.**

### PRESENT:

Professor Hideo Nitta (Japan), Chair IUPAP C14 Commission  
David Sands (United Kingdom)  
Eilish McLoughlin (Ireland)  
Ian Beardan (Denmark)  
Leoš Dvořák (Czech Republic)  
Roberto Nardi (Brazil)

### VIA SKYPE

Deena Naidoo (South Africa)  
Jayashree Ramadas (India)  
Zulma Gangoso (Argentina) participated via skype.

### APOLOGIES:

Qiang Chen (China)  
Priscilla Laws (USA)  
Dmitry Khokhlov (Russia)  
Lotten Glans (Sweden)  
Gorazd Planinsic (Slovenia)

The associate members Alexander Mazzolini (Australia), Manjula Sharma (Australia), Mehmet Fatih Taşar (Turkey) and Sarojiny Saddul-Hauzaree (Mauritius) did not participate in the meeting.

### WELCOME:

Professor Nitta welcomed and thanked all present at the meeting and the members who participated via Skype.

### AGENDA:

Professor Nitta presented the agenda and was approved by all participants.

#### 1. Introduction

The following items as per the agenda were discussed.

#### 2. Conferences

##### 2.1 GIREP-ICPE-EPEC 2017

Professors Eilish McLoughlin (Ireland) and David Sands (United Kingdom) gave an account of the GIREP-ICPE-EPEC 2017 conference held during this week at the Dublin City University. The event was jointly organized by the International Research Group on Physics Teaching (GIREP), International Conference on Physics Education (ICPE) of the Commission 14 (C14) of the International Union of Pure and Applied Physics (IUPAP) and The European Physics Society - Physics Education Division (EPS PED). An overview of the various activities that took place during the week, such as keynote speakers, single and symposium oral presentations, poster presentations and workshops were given. Approximately 250 researchers from 21 countries took part in the event, in descending order of number of participants: Ireland, Italy, UK, USA, Czech Republic,

Netherlands, Mexico, Brazil, Germany, Japan, Belgium, Poland, Austria, Hungary, Switzerland, Portugal, Ecuador, France, Israel, Malta and Spain. The chairs (Eilish - ICPE and David - EPEC) will forward a detailed report of the activities for sharing with all interested parties, as shown during the Closing Ceremony. The colleagues wished congratulations to Eilish, the other organizers, and the whole team for organizing a successful GIREP-ICPE-EPEC.

## **2.2 ICPE 2018 (ICPE-SAIP-WITS), Johannesburg, South Africa**

Professor Nitta reported that, during the closing ceremony of the ICPE-GIREP-EPEC, the next International Conference on Physics Education will take place in Johannesburg, South Africa during the period 1-5 October 2018. Professor Deena Naidoo, who will organize the conference thanked Professor Nitta for advertising the conference and informed the committee that a website has been created and necessary information has been enabled. The link for the homepage is: <http://events.saip.org.za/conferenceDisplay.py?confId=93>. The Local Organizing Committee has also been established and an IUPAP Conference sponsorship application has been submitted. The conference will interact with the Working Group on Women in Physics (WG5) and Physics for Development (C13) to be an integral part of the conference and will invite industrial partners. In addition, to the normal mainstream plenary talks, oral and poster presentations, teacher workshops will be one of the main focuses of the conference. The Scientific Advisory Committee will be formulated once the final C14 members are ratified at the IUPAP General Assembly in Brazil during the month of October 2017. A request will be made to previous ICPE and WCPE conference chairs to forward a database of conference attendees. A further call will be made to the current and new C14 committee members for potential invited speakers.

## **2.3 ICPE 2019 and beyond**

Professor Nitta informed the committee that GIREP-ICPE-EPEC 2019 will be held in Budapest, Hungary, 1-5 July; Beata Jarosievitz (GIREP representative) and Csaba Sukosd (Budapest University of Technology and Economics) will chair the event. The Institute for Computer Sciences and Control and Hungarian Academy of Sciences will sponsor the conference. The Commission agreed to endorse GIREP-ICPE-EPEC 2019 as the IUPAP supported conference. It was also reported that the WCPE 2020 will be held in Vietnam. A presentation was made by Professors Jarosievitz and Sukosd at the GIREP-ICPE-EPEC Closing Ceremony in Dublin.

## **3. ICPE MEMBER/OFFICERS 2018-2020 (Appendix A)**

**Professor Nitta suggested the names of Roberto Nardi (Brazil) and Deena Naidoo (South Africa), respectively as Chair and Vice-Chair of the Commission for the next term and David Sands (UK) as Secretary.** He informed the committee that these names were agreed by the current Chair, Vice-Chair and Secretary (Professor Zulma Gangoso - Argentina) and followed IUPAP procedures. This proposal was accepted by the Commission members. He also suggested Manjula Sharma (Australia) for the next Commission. Professor Sharma as Editor of the Newsletter and the name of Professor Gangoso (Argentina) to contribute as an Associated Editor. He recalled the names suggested by the physics societies of several countries (Appendix A). This list includes names that should be replaced with a view to the departure of members who have completed the mandates according to IUPAP rule (Professors Qiang, Jayashree, Zulma, Hideo, Dmitry, Priscilla, Leoš and Gorazd). He also recalled the balance that should exist in the Commission, in terms of gender and countries from different continents. The Commission has examined the names indicated by scientific societies (Appendix A); most of the names were recognized for the significant contribution to Physics Teaching and Research in their respective countries. The names of Zuzana Jeskova (Slovak Republic), Jenaro Guisasola (Spain), Naoshi Takahashi (Japan), Dmitry Bisikalo (Russia), Nathalie Lebrun (France), David Sokoloff (USA), Tjanaana Antimirova (Canada) and others. Professor McLoughlin (Ireland) pointed out the importance that one person linked to the industry could participate as a member. It was decided that the next Commission should examine this possibility. Professor Nitta recalled, however, that the 14 suggested names (Appendix A) will be the object of analysis and decision, during the 29th IUPAP General Assembly, which will be held in Sao Paulo, Brazil, from 11 to 13 October 2017 (<http://iupap.org/general-assembly/29th-general-assembly/>).

#### **4. ICPE MEDAL**

Professor Nitta commented on the ICPE Medal Ceremony held this week for Professor Marco Antônio Moreira, from the Federal University of Rio Grande do Sul, Brazil, during GIREP-ICPE-EPEC in this week. Professor Nitta thanked Professor Nardi (Brazil) for the commitment in the preparation of new 20 medals in a Brazilian industry and for the purchase of the case and the recording of the name of Professor Moreira on the medal. He recalled the need for the members of the Commission to suggest names for the presentation of the next medals. He presented the list of 25 names (Appendix B) that have already been awarded the medal since 1980 (Prof. Eric Rogers) until 2017 (Prof. Marco Antonio Moreira). He recalled that the medal aims to recognize "outstanding contributions to physics teaching of a kind that transcends national boundaries" and that the ICPE medal has fulfilled two criteria: the contributions to physics education must be over considerable number of years, and the contributions should be international in their scope and influence. The winners of the medals between 1980 and 2017 are listed in Appendix B. Members of the Commission have been requested to recommend, at least, one name for the next ICPE Medal award. Professor Nitta suggested that the new C14 Commission take care of this task and mentioned that the end of November, or early December, is the deadline for nomination of the future winner.

#### **5. PUBLICATIONS AND WEBSITE**

Professor Nitta thanked Professor Manjula Sharma (Editor - Australia) and Gabriel Ha Nguyen (Assistant Editor - University of Sydney) for the recent publication of Newsletter number 64. He mentioned that the next issue, which should be completed by December 2017. Professor Nardi informed the committee Professor Sharma conducted an interview with Professor Moreira, winner of the ICPE Medal 2017 in Dublin and this transcript should be published in this next issue of the Newsletter. Professor Nardi also suggested a subject on Physics teaching for blind students, which he may be forwarded, in view of studies at the postdoctoral level, which have been carried out by Professor Éder Camargo (Unesp) in Brazil, under his supervision. Professor Nitta thanked and praised the work done by Professor Leoš Dvořák for the preparation and maintenance of the homepage of the C14 Commission. Professor Dvořák reported that the site was provisionally located at <http://iupap-icpe.org/>, and also on the IUPAP website: <http://iupap.org/commissions/physics-education/>. Also discussed were issues related to funding for editing the homepage and the new newsletter, since IUPAP has funds for these expenses. Professor Dvořák suggested that these issues need to be addressed by the new C14 Commission that will be defined at the IUPAP General Assembly in October 2017, São Paulo.

#### **6. COOPERATION OF ICPE WITH OTHER BODIES/ORGANIZATIONS**

The following organisations were suggested as collaboration with C14.

##### **6.1 Women in Physics (Workshop)**

Professor Nardi suggested that the commission make contact with Professor Katemari Rosa (Federal University of Bahia), who has been developing studies on black women in physics. It has been suggested that she been invited to attend ICPE 2018 in South Africa.

##### **6.2 IoP (Africa Project)**

Professor David Sands briefed the committee on the successful IoP (Africa) meeting held in Dublin. Professor Deena Naidoo requested that a report be circulated and then will evaluate whether South Africa can partner in any new ventures and possibly expand during the ICPE2018 conference. Professor Nitta suggested that African people should be more involved and it was decided that Professor Sands will interact with Professor Naidoo to think more about this subject.

##### **6.3 GIREP**

Professor Nittawondered if the GIREP collaboration/MPTL not would be compete with the conferences of the UNION. It was noted that GIREP-MPTL 2018 in San Sebastian and the ICPE 2018 of South Africa will be held in July and October, respectively. Professor Sands recalled that the GIREP is in Europe, but it is international. Professor Nitta recalled that every two years the Conference should be held in an underdeveloped

country. Professor Naidoo suggested that we have to discuss with GIREP. Professor Nitta recalled that the WCPE 2020 will be in Vietnam, means, outside Europe.

#### **6.4 Other possible cooperations**

Lapen/Aspen and Africa, Professor Naidoo mention there exist AfPEN, a network driven for sharing of information.

#### **7. ACCOUNTING 2015-2017**

Professor Nitta presented an income and outgoing balance spreadsheet (Appendix C), detailing the finances of the Commission, during the period of 26 June 2015, when he assumed the presidency of C14, until 26 September 2016, with expenses incurred until the WCPE in São Paulo. He recorded that in this balance should include expenses for Professor's Moreira travel (2017 medallist), expenses with the preparation of the medal made by Professor Nardi and the dinner with the C14 Commission in Dublin. It was also explained the expenses incurred by Professor Zulma Gangoso, who should be further compensated by IUPAP. On this question, Professor Gangoso reported that, on the occasion of the ICPE 2014 organization, in the City of Cordoba, Argentina, IUPAP granted a subsidy of 5,000 Euros. At that time, there were strong restrictions in Argentina to send or receive money from abroad. One could lose more than 50% of the subsidy when you send and change official. For this reason, it was decided to use this subsidy for expenses incurred abroad. Thus, the ticket of the invited guest Professor Edith Yerushalmi from Israel to Cordoba was paid. To cover the rest, personal subsidies were used by Professor Gangoso. This left a credit in her favour that she would use to attend future meetings. For this reason, in the account of the ICPE there is a balance - a difference of 5,000 euros and the cost of the ticket for Yerushalmi - that will be transferred to the new presidency. Such money will be available to Zulma. Prof. Hideo confirmed these details and the Commission approved the balance.

#### **8. VARIA**

It was also reminded of the YOUNG SCIENTIST AWARD. Professor Nitta questioned the possibility of having candidates for the coming years. Professor Ian Beardan asked about the criteria. It was recalled that the candidate must have up to 8 years after completion of his PhD. Professor Sands gave some suggestions. The question will be taken up by the new Commission, which is due to take place after October. With no further items to discuss, Professor Nitta requested Professor Nardi draft the minutes of the meeting, for appreciation of all the members of the C14 Commission. Professor Nardi asked to all the participants to send him contributions of their speeches, since some parts were lost due to the SKYPE problems.

Dublin, Ireland, July 7<sup>th</sup>. 2017.  
Roberto Nardi

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Prof. Hideo Nitta (Japan), the last chair of the C14 Commission, sent in September 4<sup>th</sup>, to all the members, his report on the C14 activities during the period of 2015-2017, which he prepared for IUPAP General Assembly that will be held in coming October. This report is attached below.

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## **Report on the activities of IUPAP C14**

### **ICPE - International Commission on Physics Education**

#### **2015-2017**

## **The main goals of the Commission**

ICPE promotes the exchange of information and views among the members of the international scientific community in Physics Education including:

1. The collection, evaluation, coordination and distribution of information concerning education in the physical sciences at all levels
2. Information relating to the assessment of standards of physics teaching and learning
3. Suggestions of ways in which the facilities for the study of physics at all levels might be improved, stimulating experiments at all levels, and giving help to physics teachers in all countries in incorporating current knowledge of physics, physics pedagogy, and the results of research in physics education into their courses and curricula.

## **Officers/Members for the term 2015-2017**

Chair: Hideo Nitta (Japan)

Vice-Chair: Leoš Dvorač (Czech Republic)

Secretary: Zulma Gangoso (Argentina)

Members:

Qiang Chen (China)

Ian Bearden (Denmark)

Lotten Glans (Sweden)

Dmitry Khokhlov (Russian Federation)

Priscilla Laws (United States)

Eilish McLoughlin (Ireland)

Deena Naidoo (South Africa)

Roberto Nardi (Brazil)

Gorazd Planinsic (Slovenia)

Jayashree Ramadas (India)

David Sands (United Kingdom)

## **Conferences Organized**

**International Conference on Physics Education (ICPE 2015), Beijing, China, August 10-14, 2015.**

This conference was supported by IUPAP and C14. The conference focused on "Engaging Students in Physics – Research and Practice". More than 300 scientists attended the conference, including about 90 people from outside China. More than one-third of attendees were women.

### **The Second World Conference on Physics Education (2<sup>nd</sup> WCPE 2016) , São Paulo, Brazil, July 10-15, 2016**

2<sup>nd</sup> WCPE was held at the University of São Paulo as the IUPAP supported conference through C14. The conference theme was "Contemporary Science Education and Challenges in the Present Society: perspectives in Physics Teaching and Learning". WCPE is a series of conferences with a four-year periodicity, organized in global cooperation. 2<sup>nd</sup> WCPE was supported by ICPE, GIREP (Groupe International de Recherche sur l'Enseignement de la Physique) and MPTL (the Multimedia in Physics Teaching and Learning group) and endorsed by AAPT (American Association of Physics Teachers), LAPEN (Latin American Physics Education Network) and AsPEN (the Asian Physics Education Network).

### **GIREP-ICPE-EPEC 2017, Dublin, Ireland, July 3-7, 2017**

The 2017 IUPAP supported conference, GIREP-ICPE-EPEC 2017, was held at the Dublin City University. The conference theme was "Bridging Research and Practice in Physics Teaching and Learning". The conference was jointly organized with GIREP and EPEC (European Physical Society - Physics Education Division). Approximately 250 researchers from 21 countries took part in the conference. Eilish McLoughlin chaired the conference.

## **Future Conferences**

### **ICPE 2018 (ICPE-SAIP-WITS), Johannesburg, South Africa, October 1-05, 2018**

The next International Conference on Physics Education will take place in Johannesburg. Deena Naidoo will organize the conference. A website has been created: <http://events.saip.org.za/conferenceDisplay.py?confId=93>

An IUPAP Conference sponsorship application has been submitted.

### **GIREP-ICPE-EPEC 2019, Budapest, Hungary, 1-5 July**

The Commission agreed to endorse GIREP-ICPE-EPEC 2019 as the IUPAP supported conference.

### **Conference endorsed**

The commission endorsed GIREP-MPTL 2018 (July 9-11, San Sebastian, Spain) although this conference will not be financially supported by IUPAP.

## ICPE Medal

The ICPE medal was instituted to recognize “outstanding contributions to physics teaching of a kind that transcends national boundaries”. The ICPE medal recipient should have fulfilled two criteria: (1) the contributions to physics education should have extended over a considerable number of years; and (2) the contributions should be international in their scope and influence. The laureates during the period of report are:

- 2015 ICPE Medal: Kaihua Zhao (China); presented at 2<sup>nd</sup> WCPE in Sao Paulo.
- 2017 ICPE Medal: Marco Antonio Moreira (Brazil); presented at GIREP-ICPE-EPEC 2017 in Dublin.

We had faced the “ICPE Medal using-up” problem: in 2015, only one blank Medal was left. Thanks to Roberto Nardi, the problem was finally resolved. In 2016, Roberto found a factory that could reproduce *20 copies* of the ICPE Medal within the budget IUPAP regularly provides to commissions. I dare to mention this fact with the hope that future C14 will prepare for the same problem well *before 2036*.

## ICPE Newsletter

ICPE Newsletter No. 64 was published in June, 2017. Manjula Sharma (Editor – Associate Member of C14) did a great effort for its publication. The Newsletter is disseminated only in electronic form. The ICPE Newsletters are uploaded at <http://iupap-icpe.org/publications/newsletters/n64a.pdf>

## ICPE Website

The commission’s website is being maintained by Leoš Dvorák at <http://iupap-icpe.org/>. Our reports and publications as well as the list of ICPE Medal laureates are available at this site.

## PHYSWARE

PHYSWARE 2015 was held on January 25 to 30 at the ICTP Trieste. PHYSWARE is a collaborative workshop on low-cost equipment and appropriate technologies that promote active learning in physics throughout the developing world. PHYSWARE 2015 was generously sponsored by ICTP and co-sponsored by IUPAP and EPS. Gorazd Planinsic and Leoš Dvorák took care of this activity. The detail of the workshop has been published in: *Physics Education* **50** (2015) pp.264-267.

## **Annual ICPE face-to-face meeting**

The annual meeting of ICPE is usually held immediately after the closing of the commission supported conference. In the last three years, meetings took place in Beijing in 2015, Sao Paulo in 2016 and Dublin in 2017.

## **Links with other Commission/Organization**

### **Women in Physics (Workshop)**

The IUPAP Working Group on Women in Physics (WIP) and C14 built a link. As a cooperative activity, C14 and WIP organized the symposium on *Global Perspectives of Women in Physics* at the international conference GIREP-ICPE-EPEC 2017. The purpose of the symposium was to review and analyze the initiatives and research into the gender gap observed in physics education and in academia. The symposium was very successful. We plan to organize the next symposium at ICPE 2018.

### **Institute of Physics (IOP)**

Along with the line of the proposal from IOP for Africa proposal to IUPAP, the *Workshop on Physics for Africa* was held at the GIREP-ICPE-EPEC 2017. Right after the workshop, a closed meeting was organized for discussing the outcome of the workshop and possible action among representative members from IOP, ICTP, C14, and some other organizations. In order to determine a plan of action, however, further discussion is necessary. The next ICPE conference in Johannesburg, Africa, will be a nice place for further discussion.

Hideo Nitta

C14 (ICPE) Chair

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Prof. Dr. Roberto Nardi  
UNESP – State University of São Paulo – Bauru Campus  
ICPE Commission Chair  
Brazilian Society of Physics  
Bauru, São Paulo, April 18<sup>th</sup>, 2018.