



IUPAP

INTERNATIONAL UNION OF PURE AND APPLIED PHYSICS

C14 COMMISSION – PHYSICS EDUCATION - ICPE

REPORT

2018 - 2021

ROBERTO NARDI

C14 Commission (ICPE) Chair (2018-2021)

São Paulo State University – UNESP - School of Sciences - Bauru Campus

Brazilian Society of Physics (BSP)

São Paulo, Brazil

PROF. DEENA NAIDOO

C14 Commission (ICPE) Vice Chair (2018-2021)

University of Witwatersrand, School of Physics

Johannesburg, South Africa

OCTOBER, 2021

INTRODUCTION

This document is a report of the main activities of the C14 Commission – Physics Education, from 2018-2021.

The main subjects of this report are:

1. The C14 Commission and its members
2. International Conferences and events organized/sponsored by the Commission (IUPAP) proposed during this period
3. Presence of the ICPE chair and member in Physics and other Education events held in the period
4. Publications of the ICPE in the period
5. Looking forward – working through the pandemic times
6. Other

C14: PHYSICS EDUCATION COMMISSION

<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 current officers and members (2018-2021) are:

Officers

- Chair: Roberto Nardi**
Brazil
- Vice-Chair: Deena Naidoo**
South Africa
- Secretary: David Sands**
U.K.

Members

- Tetyana Antimirova**
Canada
- Ian G. Bearden**
Denmark
- Julio Benegas**
Argentina
- Jenaro Guisasola**
Spain
- Zuzana Jeskova**
Slovakia
- Nathalie Lebrun**
France
- Eilish McLoughlin**
Ireland
- Manjula Sharma**
Australia
- David R Sokoloff**
U.S.A.
- Naoshi Takahashi**
Japan
- Mayank Vahia**
India

Associate Members (2018-2021):

- Mohammed Usman Degereji**
Nigeria
- Zulma Estela Gangoso**
Argentina
- Pornrat Wattanakasiwich**
Thailand

International Conferences and events

Organized/Sponsored by the IUPAP / C14 Commission (2019-2021)

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

The Commission agreed to jointly host the 2019 International Conference in Physics Education in partnership with GIREP-ICPE-EPEC-MPTL. The conference was supported by IUPAP.

The International Conference on Physics Education (ICPE-GIREP-EPEC-MPTL 2019) Teaching-learning contemporary physics, from research to practice

hosted by Roland Eötvös Physical Society, Budapest – Hungary – 1 - 5 July, 2019



<https://girep2019.hu/>

ICPE - The International Commission on Physics Education (ICPE) of the International Union of Pure and Applied Physics (IUPAP);

GIREP - Groupe International de Recherche sur l'Enseignement de la Physique;

EPS – European Physical Society and

MPTL - The International Conference on Multimedia in Physics Teaching and Learning.

The Eötvös-Year 2019 International Conference was an opportunity not only to present the results of works, but also to communicate and discuss common research topics and best practices with colleagues.

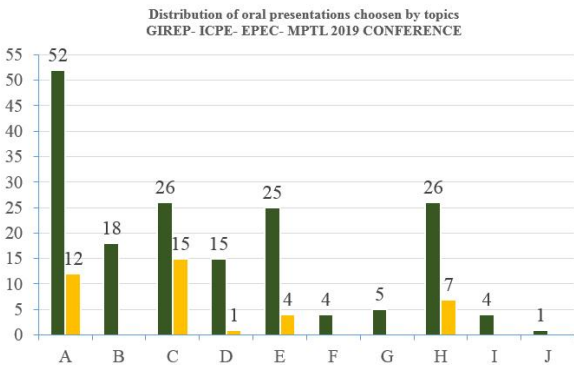
The main theme of the conference was “*Research and practice in physics education to celebrate Eötvös centenary*”. Roland Eötvös (1848-1919) was a famous Hungarian physicist whose main achievement was to demonstrate the strict proportionality between the inertial and gravitational mass with an unprecedented precision. This result became a strong basis of general relativity. UNESCO has declared to be associated to commemorate the centenary of his death in 2019. That is why this conference was also associated to the Eötvös-Year.

The main topics of the conference were:

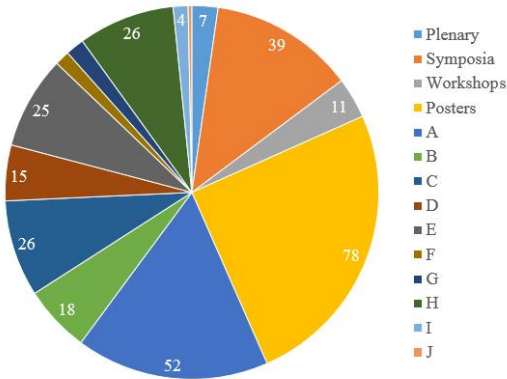
- A. Strategies and methods to improve Physics learning and teaching
- B. Multimedia in Physics Teaching and Learning
- C. Contemporary Physics and Modern Physics in School
- D. Physics Curriculum: Development and Implementation
- E. Experiments in Physics Education
- F. Early Science Learning
- G. Environmental Physics
- H. Teacher Education and postgraduate education
- I. Informal learning and science centres
- J. Outreach of Physics

The Conference featured oral presentations, symposia, workshops and posters. All of them were focused on the different aspects of the essential knowledge, skills and attitudes mainly related to the topics listed above.

The figure below shows the distribution of the presentations according to the topics.



The distribution of the accepted contributions was according to the figure below. The green colours show the number of individual oral presentations are shown in green, and the distribution of the topics within the symposia are indicated by yellow.



Source: <https://girep2019.hu/topics/> (Access in August 8th, 2019)

The Committees involved in the Conference, were the following:

Principal patron of the conference

- **Prof. Dr. Miklós Kásler**
Minister of Human Capacities
Patrons of the conference
- **Prof. Dr. József BÓDIS**
State Secretary for Education
- **István TARLÓS**
Mayor of Budapest, Hungary

Scientific Advisory Committee

- **Ian BEARDEN**
member of EPS-PED Board and C14 commissioner, Niels Bohr Institute, Univ. of Copenhagen, Denmark
- **Leoš DVORÁK**
GIREP and ICPE Committee member, Charles Univ. in Prague, Czech Republic
- **Ton ELLERMEIJER**
President of MPTL Board, Director of CMA Amsterdam, Netherlands
- **Raimund GIRWIDZ**
Member of MPTL Board, University Ludwig-Maximilians, Munich, Germany
- **Claudia HAAGEN-SCHÜTZENHÖFER**
GIREP Vice-President, Univ. of Graz, Austria
- **Tomasz GRECZYLO**
University of Wrocław, Wrocław, Poland Member of MPTL Scientific Advisory Board
- **Antje KOHNLE**
Member of MPTL Advisory Board, University of St. Andrews, UK
- **Peter LÉVAI,**
Director General of Wigner Physics Research Institute, member of the Hungarian Academy of Sciences
- **Marisa MICHELINI**
GIREP President, Univ. of Udine, Italy
- **Cesar Eduardo MORA LEY**
Representing IACPE, LAPEN, IAPS, National Polytechnic Institute, Mexico
- **Roberto NARDI**
Chair IUPAP C14, Sao Paulo State University
- **Wim PEETERS**
GIREP Vice-President, Katholieke Onderwijs Vlaanderen, Belgium
- **David SANDS**
EPS-PED Chair and C14 commissioner, Univ. of Hull, UK

- **Dagmara SOKOLWSKA**
GIREP General Secretary, Jagellonian University, Cracow, Poland
- **Stamatis VOKOS**
Representative of APS, Seattle, Pacific University Seattle, USA

Local Programme Committee

- **Csaba SÜKÖSD Budapest**
Institute of Nuclear Techniques (INT) of the Budapest University of Technology and Economics (BME)
- **Tamás TÉL**
Loránd Eötvös University,
Institute for Theoretical Physics, and von Kármán Laboratory of Environmental Flows, Institute of Physics, MTA-ELTE Theoretical Physics Research Group,
- **Péter TASNÁDI**
Loránd Eötvös University,
Institute of Geography and Earth sciences Department of Meteorology
- **Sándor KATZ**
Loránd Eötvös University,
Department for Theoretical Physics
- **Zoltán TRÓCSÁNYI**
University of Debrecen,
Institute of Physics,
- **Zsuzsanna FARKAS***
University of Szeged
- **János Erostyák**
University of Pécs
Faculty of Sciences, Institute of Physics, Department of Experimental Physics
- **György Mihály**
Department of Physics
Faculty of Natural Sciences,
Budapest University of Technology and Economics (BME)

Local Organising Committee

- **Beata JAROSIEVITZ*** (GIREP representative in Hungary) – **Chair**
Dennis Gabor College
- **Csaba SÜKÖSD**
Budapest University of Technology and Economics (BME) – **Co-Chair**
Institute of Nuclear Techniques (INT) ,

Conference Secretariat

- **Bernadett KOVÁCS***
ELFT Organization Secretariat (ELFT)
- **Melinda PÓNYA***
ELFT Organization Secretariat (ELFT)

IT Committee

- **Gusztáv HENCSEY**
Institute for Computer Science and Control, Hungarian Academy of Sciences (MTA SZTAKI)
- **Zsolt László MÁRKUS**
Institute for Computer Science and Control, Hungarian Academy of Sciences (MTA SZTAKI)
- **György SZÁNTÓ**
Institute for Computer Science and Control, Hungarian Academy of Sciences (MTA SZTAKI)
- **Tibor SZKALICZKI**
Institute for Computer Science and Control, Hungarian Academy of Sciences (MTA SZTAKI)
- **Miklós VERES**
Institute for Computer Science and Control, Hungarian Academy of Sciences (MTA SZTAKI)

Volunteers involved:

- **Hungarian physics teachers, students (PhD)**

Scientific Visits:

The following scientific visits were available for participants:

- **Visit 1:** Nuclear Power Plant
- **Visit 2:** Wigner Research Centre for Physics & Centre for Energy Research
- **Visit 3:** Institute of nuclear Techniques of BME & Institute for Computer Science and Control
- **Visit 4:** ELI-ALPS Research Institute (An international, high-power, short-pulse laser research





- institution, initiative of the European Union).
- **Visit 5:** Low and Medium level Radioactive Waste Management Site


Publication from GIREP-ICPE-EPEC-MPTL 2019, 1 to 5 July, Budapest, Hungary:

- 2021: A book of selected papers is available at <https://link.springer.com/book/10.1007/978-3-030-78720-2>. *Teaching-Learning Contemporary Physics* (2021). Editors Beata Jarosievitz and Csaba Sükösd, Springer: Switzerland. The book (1) Features new approaches to teaching-learning Quantum Physics in schools, (2) Discusses innovative methods in Physics teaching-learning, and (3) Compiles novel thoughts on how to expand the range of academia in which Physics can be taught.
- 2021: Articles published by IOPSCIENCE in the Journal of Physics: Conference Series, Volume 1929, and are available at: <https://iopscience.iop.org/issue/1742-6596/1929/1>: Citation 2021 *J. Phys.: Conf. Ser.* 1929. All papers are Open Access.

INVITED SPEAKERS

The invited lecturers were:

<p>Prof. Dr. Marisa MICHELINI</p>  <p><i>Research Unit in Physics Education, University of Udine, Italy</i></p>	<p>Prof. Dr. Igal GALILI</p>  <p><i>The Hebrew University Jerusalem</i></p>	<p>Prof. Dr. Raimund GIRWIDZ</p>  <p><i>Physics Education at Ludwig-Maximilians-Universität München, Germany</i></p>
<p>Prof. Dr. András PATKÓS</p>  <p><i>Institute of Physics, Eötvös University, Budapest, Hungary</i></p>	<p>Prof. Dr. Manjula Devi SHARMA</p>  <p><i>School of Physics, University of Sydney Australia</i></p>	<p>Prof. Dr. David SOKOLOFF</p>  <p><i>Department of Physics, University of Oregon, Eugene, U.S.A.</i></p>

<p>Dr. Lars-Jochen THOMS</p>  <p><i>Physics Education Ludwig-Maximilians-Universität München, Germany</i></p>	<p>Prof. Dr. Dean ZOLLMAN</p>  <p><i>Center for Research and Innovation in STEM Education & Department of Physics, Kansas State University, Manhattan, Kansas USA</i></p>
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ICPE Medal for the year 2018 was conferred on Marisa Michelini, Professor, Udine University, Italy.



Prof. Marisa Michelini (Italy) and Roberto Nardi (Brazil) – Chair of the C14 Commission
Left – Prof. Csaba Sukosd



Prof. Marisa Michelini (Italy) – ICPE Medal 2018 and Roberto Nardi (Brazil) – ICPE Chair, among members of the Organizing Committee (Csaba Sukosd and Beata Jarosievitz – left) and ICPE commissioners: from left: Naoshi Takahashi (Japan), Zulma Gangozo (Argentina), David Sands (U.K.), Ian Bearden (Denmark), David Sokoloff (U.S.A.), Tetyana Antimirova (Canada) and Dean Zollman (U.S.A.).

About the ICPE 2019 Medal

In 1979 George Marx, a Hungarian researcher in the field of physics education, proposed to institute a medal to recognise “outstanding contributions to physics teaching of a kind that transcends national boundaries”. The Commission succeeded in establishing the award of an ICPE Medal with the following two criteria:

The contributions to physics education should have extended over a considerable number of years;

The contributions should be international in their scope and influence.

The first award of the medal was made in 1980 to Professor Eric M. Roger during the Trieste Conference on Education for Physics Teaching. The list of recipients can be found at <http://iupap.org/commissions/physics-education/awards/>.

The medal (below) was designed by the Hungarian artist Miklós Borsos. The face shows a symbolic picture: the interaction of human beings with forces of nature in the form of the four elements of the ancient Greek philosophers – earth, water, air and fire, the last one being symbolised by powerful rays of sunlight. The human beings capture the essence of physics education, as we seek to understand and share our understandings of nature. The back of the medal bears the text: ‘Awarded to N.N. by the International Commission on Physics Education of IUPAP for long and distinguished service to physics education’.



ICPE medal faces

Submission process for the 2019 medal were concluded last year (2020).

Prof. Alex Mazzolini (Australia) and Prof. Pratibha Jolly (India) were honoured with medals for their relevant work on physics education in their countries and worldwide.



The medals were supposed to be conferred at the World Conference on Physical Education supposed to be held in Vietnam (3rd WCPE) – Hanoi, Vietnam – 2020. The meeting was postponed to December 2021 due to the current pandemic.

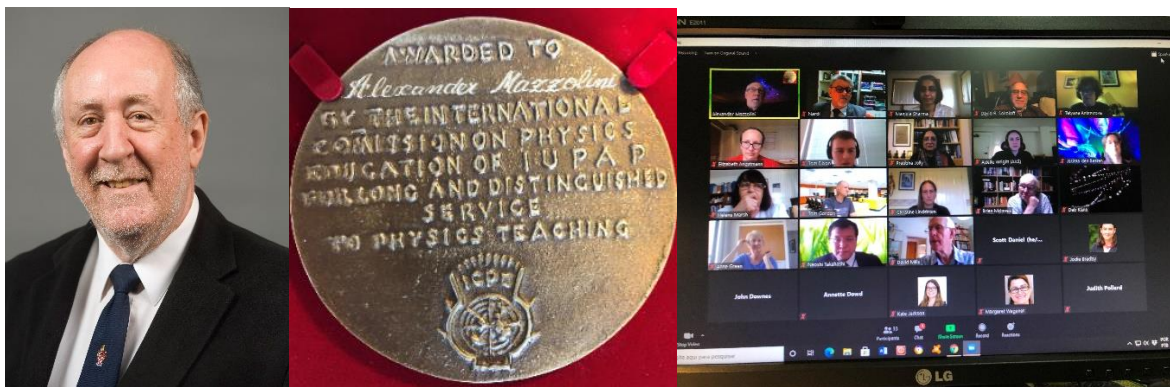
Due to the pandemic restrictions, only Prof. Mazzolini’s medal ceremony was carried out, as described below.

Prof. Alex Mazzolini’s Medal Ceremony

Prof. Mazzolini’s Medal Ceremony was hosted in the **Australian Institute of Physics Meeting and Australian Academy of Science** on 10th December 2020, in Australia. Prof. Alex Mazzolini was presented (virtually) with the ICPE medal for his “outstanding contributions to physics teaching of a kind that transcends national boundaries”. The medal is awarded in recognition of contributions to physics education that have extended over a considerable number of years and are international in their scope and influence. Alex Mazzolini has been working in physics education for more than 40 years. In that time, he has mentored and inspired countless students and educators in the training and workshops he has delivered across 6 continents and more than 40 countries. One of his important contributions has been through the UNESCO Active Learning in Optics and

Photonics (ALOP) program, which he co-founded in 2003. During the meeting, Alex shared highlights from his learning and teaching journey.

Prof. Manjula Sharma, member of ICPE and colleagues from AIP chaired the session and shared memories about Prof. Mazzolini's academic life and his dedication to the physics teaching in Australia and other countries. Prof. Roberto Nardi, chair of the C14 Commission and other members participated in the ceremony. Mazzolini, a copy of the medal and online participants are illustrated in the photos/screenshots below..



Presence of the ICPE chair and members in Physics and other Education events held during the period (*)

(*) In these events, the IUPAP and ICPE objectives and its associated members were exposed to the delegates. Newsletters from IUPAP and ICPE were released and shared with delegates. They were asked to send matters to publish.

XIII INTER AMERICAN CONFERENCE ON PHYSICS EDUCATION “DR. ALBERTO MAIZTEGUI”– Montevideo, Uruguay, July 8-12, 2019

<https://ciaef.edu.uy/>

Inter-American Conferences on Physical Education (IACEF) are organized by the Council for Inter-American Conferences on Physical Education (CIAEF), composed of members from various countries of the Americas. They occur every three years in a South, Central or North American country and have been highly valued by physics teachers as an opportunity to gather and share experiences, contributing to building a community that aims to improve teaching of this subject.

This XIII CIAEF, or Inter-American Conference on Physics Education, was chaired by Professor. Dr. Leda Roldan Santamaría of the University of Costa Rica and as Vice-President Andrea Cabot Echevarría, of the Artigas Teachers Institute, Montevideo, Uruguay. The local committee was made up of teachers from Montevideo's physics institutes and schools.

The event was held from July 8 to 12, 2019, at the “Instituto de Perfeccionamiento y Estudios Superiores in Montevideo”. It aimed to present, discuss and disseminate new ideas that favour the improvement of physics teaching at various levels and the preparation of physics teachers for basic and higher education.

Physicists from several countries, such as Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Jamaica, Mexico, Panama, Peru, United States and Venezuela, participated in the event.



XIII Inter American Conference on Physics Education Group Photograph.

Also, in this event, ICPE Commission Prof. Nardi, Chair of the ICPE was present and brought information about the IUPAP, its commissions and specifically about the C14 Commission, the newsletter and international events sponsored by IUPAP and ICPE.

I Encuentro Virtual de Enseñanza de la Física

VI Encuentro Nacional de Didáctica de la Física 19 al 23 de junio de 2020



Universidad
Central

I Encuentro Virtual de Enseñanza de la Física
VI Encuentro Nacional de Didáctica de la Física
19 al 23 de junio de 2020

PROGRAMA

Universidad Central de Chile, Microsoft Teams

Viernes 19 de Junio		Sala virtual Ms Teams
20:00	Inicio #ENDFI2020 Link Streaming	Salón
20:00 – 20:15	Inauguración ENDFI2020 desde UCENTRAL	Salón
20:15 – 20:40	Presentación #ENDFI2020	Salón
20:40 – 21:40	Conferencia Dr. Roberto Nardi (UNESP – Brasil) "Enseñanza de la Física, Investigación en Enseñanza de la Física y Pos-grado en Enseñanza de la Física en Brasil".	Salón

Sábado 20 de Junio - Jornada Mañana		Sala virtual Ms Teams
9:30	Inicio Jornada 2	Salón
9:45 – 11:00	Ponencias Línea <i>Formación inicial docente en física</i>	Sala 1
	Ponencias Línea <i>Sustentabilidad, cambio climático y ciudadanía</i>	Sala 2
	Ponencias Línea <i>Experiencias, recursos y propuestas didácticas</i>	Sala 3
11:15 – 12:15	Conferencia Dra. Rosa Nidia Tuay (UPN - Colombia) "Modelos y Modelización en la estructura de una Teoría para la Enseñanza de la Física"	Salón
12:15	Cierre Jornada Mañana	Salón

SABADO 20 de JUNIO	TALLER	ENCARGADO
15:10 – 17:10	TALLER 1: <i>Aprendizaje Significativo en Física</i>	Dr. Iván Sánchez (Universidad del Bío Bío)
	TALLER 2: <i>Ciencias para la Ciudadanía</i>	Mg. Paula Urrutia (SOCHEF)
	TALLER 3: <i>Taller de Astronomía: Un Eclipse en tus manos</i>	Mg. Elizabeth Villanueva (Colegio Alberto Pérez Institución Teresiana)
17:30 – 19:30	TALLER 4: <i>Metodologías de Aprendizaje Activo para Enseñar Física en Clases Virtuales</i>	Dra. Carla Hernández (Universidad de Santiago de Chile)
	TALLER 5: <i>Experimentar en casa: Lab4U y los smartphones al servicio de la indagación</i>	Mg. Javier Baeza (Lab4U)
	TALLER 6: <i>Proyectos Experimentales con Arduinos Virtuales</i>	Dr. Nelson Sepúlveda (Universidad Central de Chile)

Sábado 20 de Junio - Jornada Noche		Sala virtual Ms Teams
22:00	Inicio Jornada 2 - Noche	Salón
22:00 – 23:00	Conferencia Dr. Basilio Solís (UCENTRAL – Chile) "Formación de estrellas en otras Galaxias: El Universo Cercano".	Salón



Universidad
Central

I Encuentro Virtual de Enseñanza de la Física
VI Encuentro Nacional de Didáctica de la Física
19 al 23 de junio de 2020

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	TALLER 6: <i>Proyectos Experimentales con Arduinos Virtuales</i>	Dr. Nelson Sepúlveda (Universidad Central de Chile)

Sábado 20 de Junio - Jornada Noche		Sala virtual Ms Teams
22:00	Inicio Jornada 2 - Noche	Salón
22:00 – 23:00	Conferencia Dr. Basilio Solís (UCENTRAL – Chile) "Formación de estrellas en otras Galaxias: El Universo Cercano".	Salón

XIV INTER AMERICAN CONFERENCE ON PHYSICS EDUCATION

Guatemala/Costa Rica, July 5-9, 2021



XIV Conferencia Interamericana
de Educación en Física- CIAEF
Guatemala - Costa Rica 2021

<http://ciaef.edu.uy/index.php/2021/02/20/xiv-ciaef-2021-guatemala-costa-rica/>

<https://multimedia.uned.ac.cr/ecen/ciaef2021/>

The XIV Inter-American Conference on Physics Education was held virtually in Guatemala/Costa Rica with the central theme: Rethinking the teaching of physics in the new scenarios. The *Universidad Estatal a Distancia de Costa Rica* and the *Universidad San Carlos de Guatemala* hosted the event.

The Inter-American Conferences on Physical Education (IACEF) are organized by the Council for Inter-American Conferences on Physical Education (CIAEF), composed by members from various countries of the Americas. CIAEF-IACPE is an academic organization that develops spaces for reflection in physics education since 1963, with which it has managed to strengthen the research work in the Ibero-American region over the years.

In this particular year, the conference main goal was to allow reflecting on the new and challenging teaching-learning scenarios because of the global health alert in which the planet has been plunged since March 2020. Participated in this XIV IACPE more than 100 physicists, among them, researchers, teachers and students from most of the North, Central and South Americas.

The approved papers will be fully published in the *Revista de Enseñanza de la Física*, a journal of the Argentinian Association of Physics Teachers (APFA) [<https://revistas.unc.edu.ar/index.php/revistaEF>].

The current chair of the ICPE/IUPAP is one of the members of the IACPE Council and of the Scientific Committee of this event. During the event, Prof. Nardi provided to all participants general information about IUPAP, its commissions and specifically about the C14 Commission, its Newsletter and international events sponsored by IUPAP and ICPE.

XIV INTER AMERICAN CONFERENCE ON PHYSICS EDUCATION

Organización / Comité Organizador

Coordinador general: Fernando Ureña Elizondo (UNED-Costa Rica)

Coordinadora de logística: Melissa Céspedes Alvarado (UNED- Costa Rica)

Diseñadora gráfica: Raquel Vanessa Badilla Barrientos (UNED-Costa Rica)

Productora académica: Elena Ulate Rojas (UNED- Costa Rica)

Comunicadora: Nancy Vasquez Flores (UNED-Costa Rica)

Comité ejecutivo - Comité Iberoamericano

Argentina: Laura Buteler	lbuteler@famaf.unc.edu.ar
Argentina: Marta Massa	mmassa@fceia.unr.edu.ar
Argentina: Sonia Concar	sconcar@gmail.com
Argentina: Julia Salinas (miembro emérito)	jsalinas@herrera.unt.edu.ar
Brasil: Deise Miranda	deisemv@if.ufrj.br
Brasil: Marco Antonio Moreira	marco.moreira@ufrgs.br
Brasil: Roberto Nardi	robanardi@gmail.com

Colombia: Rodrigo Covaleta	rocovaleta@gmail.com
Costa Rica: Fernando Ureña	furenae@gmail.com
Costa Rica: Natalia Murillo	nmurillo@itcr.ac.cr
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México: César Mora	ceml36@gmail.com
México: Héctor Riveros	riveros@fisica.unam.mx
Panamá: Victoria Moreno	vielmorano@gmail.com
Uruguay: Andrea Cabot	andreacabot@gmail.com
USA: Perry Tompkins	ptompkins@sbuniv.edu
USA: Teodoro Halpern	teddy_halpern@yahoo.com
Venezuela: Celso Luis Ladera	clladera@usb.ve
Venezuela: Maite Andrés	maitea2006@gmail.com



The Physics Education workshop at ICWIP2021

The 7th ICWIP, chaired by the Chief Scientist of Australia, Dr Cathy Foley, was set to occur at The University of Melbourne in 2020. Postponed to 11 to 16 July 2021, ICWIP was delivered virtually through the WHOVA platform and facilitated by the CSIRO consortia 'Future of Meetings'.

The International Conference on Women in Physics (ICWIP) is a flagship conference of the International Union of Pure and Applied Physics (IUPAP). Participation is by invitation, with country representatives sharing posters on the status of women in physics in their countries as well as scientific papers.

Almost 400 participants from 50 countries participated in the conference as well as stimulating social activities such as a PENGUIN PARADE, activities through the GATHER platform, and a session on Male Champions hosted by the President of the Australian Institute of Physics, Prof Sven Rogge. Many members of PEG were involved in the education workshop.

A key aspect of ICWIP is the discussion of hurdles and sharing of experiences, with the explicit aim of generating recommendations around specific topics. One topic was Physics Education, for which Dr Jacinta Den Besten from The University of Melbourne was the Local Organising Committee member and Dr Gillian Butcher from the University of Leicester was the Lead. A flipped approach was used, with participants provided with videos to watch beforehand. The videos were varied in content and style, seeking to seed ideas for discussion on female engagement and participation in physics education.

The first 2-hour workshop session attracted around 35 attendees, who started with a 'warm-up' exercise and then divided into five small groups where they spent 15 minutes with the presenter(s) of each video in a 'world café' format. A wrap-up concluded the session. Quality time was spent sharing individual lived experiences, with a focus on recruitment, participation, and engagement of women in, and through physics education. The idea was to discuss what could be done in our spheres of influence for all women in physics. The video presenters and breakout rooms are listed below:

- Quokka Room - *What can I do individually? What is in my power?* with Assoc/Prof Elizabeth Angstmann and Dr Kate Jackson, both from University of New south Wales
- Sugar Glider Room - *STEMming the tide: Fostering girls to turn to STEM*, in particular Physics with Assoc/Prof Maria Parappilly and Stephanie Mayes, both from Flinders University
- Tiger Quoll Room - *Women in Physics- Sphere IV Making the invisible visible through education* with Dr Yvonne Kavanagh from the Institute of Technology Carlow, Dr Grainne Walshe from the University of Limerick and Dr Gillian Butcher from the University of Leicester.
- Echidna Room - *What can departments, institutions and larger structures do to purposefully increase participation and engagement of female students?* with [Prof. Tetyana Antimirova](#) from Ryerson University, Prof Deena Naidoo from University of the Witwatersrand and Dr Ana Lopes from The University of Sydney.
- Bilby Room - *A conversation: Curriculum to personal experiences* with Assoc/Prof Pornrat Wattanakasiwich from Chiang Mai University and Prof Manjula Sharma from The University of Sydney.

Based on notes from each room, some common themes emerged. Hence, three breakout rooms were created for the second 2-hour workshop session along these themes:

- Kangaroo Paw Room where the sphere of influence is *institutional and societies*.
- Grevillea Room where the sphere of influence is *departmental and outreach*.
- Waratah Room where the sphere of influence is the *individual*.

The 60 attendees were introduced to the objective of the workshop, to generate recommendations, followed by brief summaries by the video presenters on what had unfolded in the first session. They then moved into one of

the three breakout rooms and remained in the room to develop recommendations. The session concluded with each presenter summarizing the recommendations from their room.

The recommendations for IUPAP are captured in the following:

- Increase awareness of imposter syndrome and bias by developing and delivering workshops for academics through conferences. The workshops should provide tips and strategies for countering these [biases](#), going beyond theory.
- IUPAP to give some priority to physics education for females in their policies and projects. For example, gather data, nuanced to different cultures, on why females choose and continue with physics.
- Increase awareness of IUPAP amongst physics educators so that IUPAP's programs gain traction and become visible to future generations.
- Organize the gathering of, and provide guidance on, the quality of data, not restricted to only quantitative, for measuring research output, which is fairer to females.
- Consider ways in which metrics can be developed for parameters associated with teaching and its evaluation, with an eye on the fact that females are more likely to receive inappropriate/irrelevant feedback and critique.
- Set up a working group to consider reinvigorating the curriculum and the teaching of physics, with the objective of providing a contemporary and 'balanced' physics education.

The above recommendations were forwarded to the Chair of the IUPAP Working Group on Women in Physics, Dr Gillian Butcher, for her team to consider for presentation to IUPAP.

In this event, Prof. Deena Naidoo (University of the Witwatersrand) – ICPE Vice Chair, Manjula Sharma (The University of Sydney) and Tetyana Antimirova (Ryerson University) - ICPE members, participated representing the C14 Commission. A more detailed report will be published in the next ICPE Newsletter.

ICPE Newsletter

The C14 Commission publishes its Newsletter with regularity, primarily in electronic form. Professor Manjula Sharma (Australia) is the current editor. The Newsletter is published bimonthly. Issues go back to 1995.

The link to the latest edition (March 2021) is available at:

<https://mailchi.mp/03e16376f3e0/icpe-newsletter-issue-71-march-2021-resent-with-correct-issue-details>

The sections of this edition:

- [Editor's Corner](#)
- [An Active Learning General Physics Course for Pre-service Mathematics and Biology Teachers - the COVID-19 Challenge](#)
- [IT Academy Project in Slovakia is Helping Teachers in Online Teaching](#)
- [Moving Learning Online](#)
- [Prize for Brazilian PhD Thesis in Physics Education](#)
- [International Association for Physics Students \(IAPS\)](#)
- [epiSTEME 8 International Conference to Review Research in Science, Technology and Mathematics Education](#)
- [15th Symposium on Physics Education Research \(SIEF 15\)](#)
- [Oersted Medal - 2020](#)

The January 2019 issue is available in:

<https://mailchi.mp/d19ceefcf17f/icpe-newsletter-68-january-2019?e=abe1926b4b>

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ICPE 2018 PROCEEDINGS

The International Conference on Physics Education - ICPE 2018 (ICPE-SAIP-WITS), Johannesburg, South Africa, October 1-5, 2018

This ICPE 2018 took place in Johannesburg, South Africa. Deena Naidoo was the chair of this Conference
<http://events.saip.org.za/conferenceProgram.py?confId=93>



The International Conference on Physics Education (ICPE-SAIP-WITS-2018)

University of Witwatersrand, Johannesburg, South Africa – October 01 to 05, 2018

<http://events.saip.org.za/conferenceDisplay.py?confId=93>

The proceedings of the ICPE2018 were published recently in the Journal of Physics: Conference Series – IOPscience. Link to access:

<https://iopscience.iop.org/issue/1742-6596/1512/1>

2019 Publications from GIREP-ICPE-EPEC2017, 3 to 7 July in Dublin, Ireland:

- 2019: A book of selected papers is available at <https://link.springer.com/book/10.1007/978-3-030-18137-6>. *Concepts, Strategies and Models to Enhance Physics Teaching and Learning* (2019). Editors Eilish McLoughlin and Paul van Kampen, Springer: Switzerland. The book (1) *shares evidence-based practices for improving physics teaching, learning, and assessment*, (2) *explores innovative approaches to undergraduate physics education*, (3) *discusses curriculum design and methodologies for enhancing physics teachers' professional learning*, and (4) *presents pedagogical strategies to boost students' engagement and motivation*.
- 2019: Articles published by IOPSCIENCE in the Journal of Physics: Conference Series, Volume 1286, and are available at: <https://iopscience.iop.org/issue/1742-6596/1286/1>: Citation 2019 *J. Phys.: Conf. Ser.* 1286. All papers are Open Access.

Looking forward

Upcoming Activities/Events for the period 2021-2022

Future conferences endorsed/supported by ICPE/IUPAP (2019-2021)

International Conference on Physics Education - ICPE 2022 – Australia / Thailand / Indonesia

Participation in the C&CC - Council & Commissions Meetings

- (5rd C&CC Meeting – Online Oct - 2021)

International Association of Physics Students (IAPS)/ICPE Agreements

- The IAPS is about to become an Affiliated Commission of IUPAP. The decision will take place during the IUPAP General Assembly next October 2021. In 2020 and 2021 ICPE chair and IAPS president – Prof. Duarte João da Costa Graça, hold three meetings with IUPAP president in order to fix some compromises between the IAPS and ICPE. IAPS mission and activities were exposed in the last ICPE Newsletter. New meetings are in the IAPS and ICPE agenda for 2021, to continue discussions to plan next steps of cooperation.

Physics Education 'Panorama' in the world (2020-2022)

- a survey to understand physics education in all the countries associated with IUPAP

Preparation for the IUPAP Centenary Celebrations (2022)

- participation and suggestions of activities all over the world

ICPE Publications – Newsletters, books – Upcoming

- Furthermore, Elish McLoughin and Jenaro Guisasola are editing the third in a series of books published by the ICPE on the topic of: *Connecting Research in Physics Education with Teacher Education*.

Workshops endorsed by the International Commission on Physics Education (ICPE) – Upcoming

3rd World Conference on Physics Education – Vietnam – December 2021.



3rd WORLD CONFERENCE ON PHYSICS EDUCATION

**Innovating Physics Education:
From Teacher Education To School Practices**

📅 20 – 24, July, 2020
📍 Hanoi National University of Education, Vietnam

🌐 wcpe2020.hnue.edu.vn
✉ wcpe2020@gmail.com
📘 <https://www.facebook.com/WCPE2020/>

3rd WCPE
World Conference on Physics Education
Hanoi, Vietnam, 20 – 24 July 2020

Roberto Nardi – Chair

Deena Naidoo – Vice Chair

C14 / ICPE / IUPAP

São Paulo/Johannesburg, Oct 1st, 2021.
