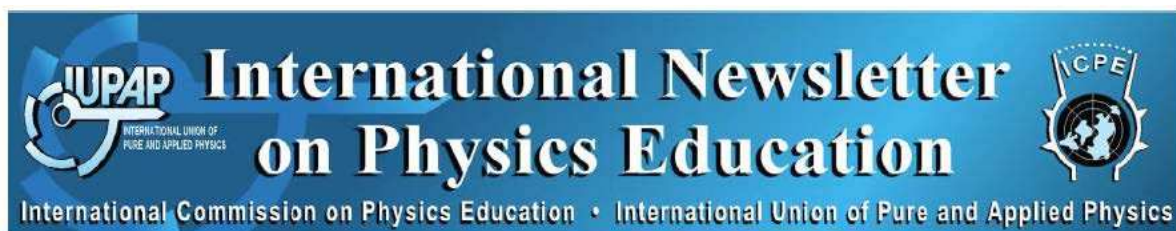


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## Editor's Corner

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Hello All,

As we publish the second issue of 2021, I am sombre yet hopeful; striving to find the 'new normal'. Activities are constrained and teaching ricochets between online, blended and face-face with emerging descriptors such as hybrid. The demands and needs to do more and adjust are relentless. Nevertheless, we persist. Upon reflection, what physics educators are achieving is remarkable; demonstrating resilience and sheer commitment to improving student engagement and learning as well as supporting peers and our community. In this newsletter we provide updates on conferences, celebrate achievements, share publication notices, and commemorate esteemed colleagues who are no longer with us. We invite you to share your stories so we can include them in **Issue 73**. Please send your stories to Dr Vicky Tzioumis at [vicky.tzioumis@sydney.edu.au](mailto:vicky.tzioumis@sydney.edu.au)

In issue 71, I had said that I had taken a new role, Director of the STEM Teacher Enrichment Academy. I am thrilled that Dr Vicky Tzioumis

When I stepped into the role in the midst of COVID-19 health restrictions in August 2021, STEM Academy programs had been paused. Since then, a total of 116 teachers from 20 secondary schools and 100 teachers from 19 primary schools have completed their respective programs. We are currently planning and deploying a new 'booster' program on integrated STEM assessment for those schools that have completed the core program. And of course, we are being agile by building in the capability to switch delivery modes while staying true to the required accreditation protocols. Since some schools are in regional or remote areas, we need to incorporate multiple levels of switching; between modes, numbers of schools, points in the program as well as parts of the program.

Together with Deena Naidoo, Tetyana Antimirova and Pornrat Wattanakasiwich, I had the pleasure of contributing to the IUPAP, 7th International Conference on Women in Physics (ICWIP) which was hosted by the Chief Scientist of Australia, Dr Cathy Foley; described in more detail later in this newsletter. This was particularly interesting and poignant for me as I had represented Australia in the 1st ICWIP in Paris and 2nd in Rio de Janeiro. Broadly speaking, the structure of the conference has been retained, with country representatives and extended focused workshops designed to generate recommendations which lead to action items. Finally, I am delighted to report that one of my research students is revising his thesis, another has just submitted hers, and I have had a few papers published.

That is all for now. I hope you and yours are doing well.

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schools. In brief, here are a few details about the programs as well as what we are currently doing. The STEM Academy has been running since 2014; to date 229 primary and secondary schools have participated with a total of 1200 teachers. The STEM Academy requires Principals' support for a team of teachers from their school to participate in an extensive program consisting of residentials, changing school curriculum plans, implementation, evaluation and reporting back of an integrated STEM project across year cohorts. Each program runs for around 9 months with 5 to 6 teachers from around 12 schools, which results in around 65 teachers per program. A mix of schools from a region is invited which means that there are commonalities and a 'sense of community'. Multiple programs are run in parallel. In short, it is a massive enterprise.

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*Professor Manjula Sharma*

#### In this Issue:

- [Editor's Corner](#)
- [Updates on conferences with IUPAP affiliation](#)
- [Celebrate Achievements](#)
- [Publication Notice](#)
- [Obituaries](#)
- [Physics education conferences with IUPAP connections](#)
- [Conferences where presence of IUPAP and C14 acknowledged and materials distributed](#)

## Updates on conferences with IUPAP affiliation

### 3<sup>rd</sup> World Conference on Physics Education (WCPE)

**Hanoi, Vietnam, 13-17 December 2021**



ORGANIZED BY



The 3rd World Conference on Physics Education (WCPE) allows for remote and in-person participation. The primary host is Hanoi National University of Education, Hanoi, Vietnam. In parallel, partners from Wroclaw,

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The deadline for abstract submission is October 15, 2021. Please submit and disseminate widely.

## ICPE 2022

Virtual 18-23 July 2022

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The flagship conference of Commission 14 of the International Union for Pure and Applied Physics (IUPAP), International Conference on Physics Education (ICPE) will be hosted online virtually, with Australia as the primary host and satellite hosts Thailand and Indonesia. The theme of the conference is: 'Physics education: Preparing for the future', sub-themes are being developed.

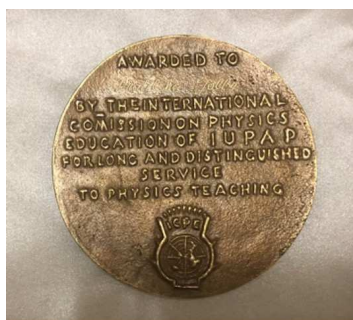
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## Celebrate Achievements

### Award of the ICPE 2019 Medal

The ICPE Medal recognises outstanding contributions to physics teaching of a kind that transcends national boundaries as well as contributions to physics education which extend over a considerable number of years. The contributions should be international in their scope and influence. 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'.



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 to be conferred at the 3rd WCPE in Hanoi, Vietnam in 2020. However, because WCPE was postponed Prof. Mazzolini's medal ceremony was carried out, as described below.

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### Prof. Alex Mazzolini's Citation and Medal Ceremony

Prof. Mazzolini's Medal Ceremony was hosted in the Australian Institute of Physics and Australian Academy of Science Meeting on 10 December 2020, in Australia. Prof. Alex Mazzolini was

### Professor Pratibha Jolly's contributions

Prof. Jolly's Medal will be presented during the World Conference in Physics Education in Vietnam, possibly virtually. Pratibha Jolly was Chairperson of the International Commission on

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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. Prof. Mazzolini, a copy of the medal and online participants are illustrated in the photos/screenshots below. Alex gave a talk, the script will be published in the next issue.



## Professor Roberto Nardi celebrated

first from 2002 to 2005. She was also Vice President of IUPAP from 2005-2008. The high point of her tenure was the launch of the **Physware** series of active learning **Educate the Educator** workshops to strengthen teaching of physics, especially in the developing world. She co-directed the first two workshops. Prof. Jolly is an elected Fellow of the National Academy of Sciences of India (NASI) with wide ranging synergetic contributions. Prof. Jolly has been the Principal of her alma mater Miranda House, University of Delhi since 2005 where she has been instrumental in spearheading education for girls for nearly two decades as well as establishing the **D S Kothari Centre for Research and Innovation in Science Education**. Currently, she is contributing to a transformative policy initiative supported by the government for advancing gender equity in institutes of higher education and research.



The photos show the first group of eight physicists who graduated in 1972 (Nardi - the first at left) and the medal (trophy) and the diploma



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by the School of Sciences and Physics Department of São Paulo State University in Brazil. During the Ceremony Prof. Nardi was honoured to belong to the first group that initiated the undergraduate physics program at UNESP in 1969.



Golden Jubilee of the School of Sciences.



## Publication Notice

The ICPE conferences are supported by grants from the IUPAP which require the publication of Proceedings as well as formal publications of selected papers in the form of an international peer reviewed book or special issue of a journal. I have great pleasure in announcing the following final publications from recent ICPE conferences.

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

- 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.

### Forthcoming ICPE publication:

I am delighted to announce the upcoming ICPE publication, which is the third in a series. The Handbook '**Connecting Research in Physics Education with Teacher Education vol.3**' will be published in the first quarter of 2022 by the International Commission of Physics Education (ICPE-C14-IUPAP). Editors: Jenaro Guisasola and Eilish McLoughin.

The publication was approved by the C14-ICPE at the meeting of September 16, 2020 and the Commission has provided financial support for the publication of this volume, so it can be made freely available through open access. The editors are grateful for the support provided by the C14-ICPE commission members, all of whom are leading physics education researchers from around the world with extensive experience in the field. In particular, we thank the chair of the committee, Roberto Nardi, for writing the foreword of this handbook. The editors invited a broad spectrum of researchers with international

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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.

Publication from ICPE2018, 1 to 5 October, Johannesburg, South Africa:

- Articles published by IOPSCIENCE in the Journal of Physics: Conference Series, Volume 1512, and are available at:  
<https://iopscience.iop.org/issue/1742-6596/1512/1>: Citation 2020 *J. Phys.: Conf. Ser.* 1512. All papers are Open Access.

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

- 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*.
- 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.

contributions in this handbook will a) share findings from research in physics education with teacher educators; b) discuss frontiers of Research in Physics and Physics Education; c) highlight new approaches to enhancing physics teacher professional learning and links to practice in the classroom; d) examine the role of students' knowledge in learning and teaching Physics; e) explore innovative approaches to teaching and learning physics in the laboratory and using multimedia tools; and f) promote teaching and learning Physics in out of school contexts.

#### **Fee waivers available for PRPER Publications - by Paula Heron, Associate Editor**

*Physical Review Physics Education Research* (PRPER) covers an array of experimental and theoretical research relating to the teaching and learning of physics and astronomy. PRPER is a fully open access journal for physics education research. Because it is published as fully open access, the journal does not receive funds from libraries to support publication costs. Thus, it is necessary for journal authors to pay an article processing charge (APC) in order to publish their articles.

We realize that current APCs are prohibitive for some authors. Thus, PRPER has a procedure for authors to request full or partial fee waivers. Once your article is accepted for publication, you will receive an email from PRPER with information about how to request a fee waiver. Fee waiver requests are not processed by the PRPER Editors and the Editors are not informed about who has requested or received fee waivers. Having fee waiver requests after acceptance and hidden from the Editorial staff is done to avoid financial considerations having any impact on publication decisions.

Fee waivers may be requested by authors who are unable to pay the full APCs. We do ask authors to consider all possible sources of funding available prior to requesting a fee waiver. Many institutions have such funds available. In requesting a fee waiver, you will need to explain why a waiver is needed and what steps you have taken to seek funding. Authors from countries for which APS offers free online access to its subscription journals are automatically eligible for fee waivers. A list of such countries can be found at <http://ejds.ictp.it/ejds/>.

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## Professor Florencio Ramon Pinela Contreras, Ecuador

Professor Florencio Ramon Pinela Contreras is considered by many to be one of the best professionals in the area of Physics in Ecuador, with a unique charisma, inspiring, virtuous teacher, admirable colleague and unconditional friend. Florencio Ramon Pinela Contreras was born in 1955 in Vinces, Ecuador. He began his teaching career at ESPOL in 1981, after graduating as a Mechanical Engineer from the same University. He obtained a Master of Science (Physics) from the Florida Institute of Technology in 1987. For a decade, he was a member of the Ecuadorian Atomic Energy Commission.

One of the most significant achievements of Florencio Pinela in the educational field, has been as the promoter, at a national and international level, of the Peer Project Learning (PPL) methodology, created by him during his fallow year at Harvard in 2014, to encourage students have a greater participation in classrooms.



*By Prof. Eduardo Montero (ESPOL-Ecuador)*

## Professor Ian Johnston, The University of Sydney, Australia

Vale A/Prof Ian Johnston has had a significant presence in physics education in Australia and internationally through his contributions to the M.U.P.P.E.T. project in computational physics in the 1980s, creation of the science and mathematics education community in higher education in Australia in the 1990s, establishing the precursor of an international journal, the International Journal of Science and Mathematics Education and contributions to IUPAP Commission C14. Amongst his outstanding achievements are:

- classic citation for his work in nuclear physics
- creation of computational physics as a subject within physics - kick starting programming within physics
- contributions and scholarly work in sound and music of physics and its links with education
- supporting research students such as Dr Derek Muller creator of YouTube channel [Veritasium](#)





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## Physics education conferences with IUPAP connections

### The International Conference on Women in Physics (IUPAP ICWIP)



#### The Physics Education workshop at ICWIP2021

*Published with permission from the Australian Institute of Physics, Physics Education Newsletter, Aug2021 issue.*

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. The 7<sup>th</sup> 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

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



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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:

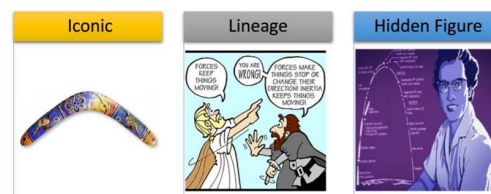
- Quokka Room - *What can I do individually? What is in my power?* with Assoc/Prof Elizabeth Angstmann and Dr Kate Jackson, both from University of New south Wales
- Sugar Glider Room - *STEMming the tide: Fostering girls to turn to STEM*, in particular Physics with Assoc/Prof Maria Parappilly and Stephanie 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,*

*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.



*By Jacinta Den Besten (The University of Melbourne) and Elizabeth Angstmann (University of New South Wales)*

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*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.



## Conferences where presence of IUPAP and C14 acknowledged and materials distributed

### 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.

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

## **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), with members from various countries of the Americas. CIAEF-IACPE is an academic organization that has been developing spaces for reflection on physics education since 1963, strengthening research (in this area) in the Ibero-American region over the years.

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

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.

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**PHYSICS DIDACTICS****June 19-23, 2020****Central University of Chile (Universidad Central de Chile)**

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