



IUPAP
INTERNATIONAL UNION OF PURE AND APPLIED PHYSICS
C14 COMMISSION – PHYSICS EDUCATION - ICPE
REPORT
October 2021- October 2024

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This document is a report of the main activities of the C14 Commission – Physics Education, from 2021-2024.

The main subjects of this report are:

1. The C14 Commission and its members
2. Commission's Meetings and Communications
3. Resources Development and Publishing
4. C14-ICPE Newsletters
5. ICPE-C14 Medals
6. C14 Webpage on IUPAP website
7. Participation in the IUPAP Centenary Celebrations
8. International Conferences and events organized/sponsored by the C14 Commission/IUPAP held during the reporting period.

1. C14: PHYSICS EDUCATION COMMISSION

The C14 Commission 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 (2021-2024) are:

Officers:

Chair

Tetyana Antimirova (2017) (2021)

Email: antimiro@ryerson.ca

Vice–Chair

Manjula Sharma (2017) (2021)

Email: manjula.sharma@sydney.edu.au

Secretary

Naoshi Takahashi (2017)(2021)

Email: naoshi@ed.kagawa-u.ac.jp

Members

Julio Benegas (2017) (2021)

Email: jbenegas@unsl.edu.ar

Jenaro Guisasola (2017) (2021)

Email: Jenaro.guisasola@ehu.es

Zuzana Jeskova (2017) (2021)

Email: zuzana.jeskova@upjs.sk

David Sokoloff (2017) (2021)

Email: sokoloff@uoregon.edu

Angela Foesel (2021)

Email: angela.foesel@fau.de

Arun Grover (2021)

Email: arungrover@gmail.com

Chih-Ta Chia (2021)
Email: chiact@ntnu.edu.tw

Cristiano Mattos (2021)
Email: crmattos@usp.br

Denis Gratias (2021)
Email: denis.gratias@chimieparistech.psl.eu

Nam-Hwa Kang (2021)
Email: nama.kang@gmail.com

Nnditshedzeni Eric Maluta (2021)
Email: Eric.Maluta@univen.ac.za

2. Commission's Meetings and Communications

Current C14 Commission held seven meetings (six virtual and one hybrid) over the duration of the 2021-2024 mandate. The online meetings were held on Zoom, while a hybrid meeting was held in person by the C14 members attending 4th World Conference on Physics Education (4WCPE) (Krakow, Poland), while the rest of the members had an opportunity to connect on Zoom.

3. Resources Development and Publishing

A new ICPE Handbook: "*Connecting Research in Physics Education with Teacher Education 3*" edited by a current (second-term) C14 member Dr. Jenaro Guisasola and a former C14 member Dr. Eilish McLoughlin was published in 2022. The book includes contributions from several former and current C14 members.
(ISBN 978-1-911669-33-3
DOI: 10.5281/zenodo.5792068)

4. C14-ICPE Newsletters

Three new issues of ICPE newsletters (#73, #74 and #75) were circulated in 2022-2024. The newsletters ##73 and 74 introduced the profiles of current C14 Commissioners. Newsletter #73 also introduced then-new Chair of the C14 Commission. The final newsletter, summarizing the work of the current Commission, is expected in October. The Newsletters can be found at

<https://iupap.org/who-we-are/internal-organization/commissions/c14-physics-education/c14-news/> .

5. ICPE-C14 Medal



The ICPE-C14 Medal is awarded for the following two criteria: The contributions to physics education should have extended over a considerable number of years and, the contributions should demonstrate international scope and influence. Medals will be awarded only if worthy candidates are identified. ICPE Medal rules were slightly revised in 2023 in order to strengthen ethics standards. Current C14 Commission members are no longer eligible to be nominated to avoid the conflict of interest (while no restrictions are imposed for past members nominations).

The ICPE Medal process was disrupted by the pandemic. The 2020 and 2021 ICPE Medals were awarded during the mandate of the current commission. The 2020 ICPE Medal was awarded to Dr. Roberto Nardi of Brazil, former Chair of C14 in November 2022: https://icpe2022physicseducation.com/icpe_medal/. The Medal was conferred to Dr. Nardi in the online awards ceremony held during the online ICPE 2022 conference titled Physics Education: Planning for the Future. Dr. Nardi gave his Medal award talk titled: **Considerations About the Developments in Physics Education Research Over the Last Decades.**

The 2021 ICPE Medal was awarded to Dr. Paula R. L. Heron of the United States of America: <https://iupap.org/wp-content/uploads/2024/03/Citation-Paula-Heron-C14-ICPE-Medal-2021.pdf>. The Medal was conferred to Dr. Heron on August 27, 2024 during the 4WCPE held in Krakow, Poland. Dr. Heron delivered the keynote lecture titled: **Does How We Teach Match How Students Learn? The Evolving Relationships Among Theory, Experiment, and Teaching Practice in PER.**

6. C14 Webpage on IUPAP website.

At the beginning of its mandate the C14 concluded that their webpage on IUPAP site needed to be revised and updated, as many materials were missing (with some posted on previous ICPE sites that existed outside of IUPAP website, while others not available altogether). The Commission's members Dr. Jenaro Guisasola and Dr. Cristiano Mattos reviewed the website and identified the content that needed to be revised. Their revision proposal was approved by the entire C14 Commission. It was decided that the C14 materials (newsletters and other publication) will be uploaded to the zenodo platform hosted by CERN. Changes were implemented with the assistance of the IUPAP's Communication staff. Some old newsletters are still missing, as they were hosted on the sites outside of IUPAP. The Commission is in the process of locating missing materials with the assistance of several former members of the Commission. Further maintenance and improvement of the C14 page is an ongoing process.

7. Participation in the IUPAP Centenary Celebrations.

The current Commission had the privilege to witness and participate in the IUPAP Centenary celebrations that took place over a one-year period (July 2022 - December 2023). The celebrations coincided with the UNESCO-endorsed the **International Year of Basic Sciences for Sustainable Development (IYBSSD)**. The C14 Commissioners took active role in raising awareness about both campaigns and took a lead in the celebrations for each in their respective countries. For example, C14 Chair Tetyana Antimirova shared information with Canadian National International Liaison Committee (CNILC) and delivered an invited talk about IUPAP and its C14 Commission at the Division of Physics Education (DPE) session of the Canadian Association of Physicists Congress that took place June 5-9, 2022, at McMaster University in Hamilton, Ontario, Canada.

The IUPAP's Centennial Symposium was held at the Institute of Theoretical Physics (ICTP) in Trieste, Italy, on 11-13 July 2022. It was held in a hybrid format and was attended by 310 participants, of which 110 were in person and 200 online. The Symposium included plenary talks by keynote speakers and other activities, with an emphasis on the IUPAP history, physics in developing countries, collaborations among countries, physics education, and many other items consistent with the IUPAP mission. The C14 contribution to the Symposium was an invited [Education Panel](#) titled: **The Trajectory of Physics Curriculum and Its Impact on Society**. The panel was held on July 13 and featured three panellists (two C14 members, Dr. Jenaro Guisasola (Spain) and Dr. Nam-Hwa Kang (South Korea), as well Dr. Chandralekha Singh

(Pennsylvania, US) who is a renowned physics educator and former AAPT President. The C14 Chair, Dr. Tetyana Antimirova (Canada) served as a convenor and moderator.

8. Contributions to and Participation in the International Conferences Sponsored by the IUPAP/C14 (2021-2024)

8.1 Conference Sponsorship

In 2022 the C14 voted in favor of recommending the International Conference on Physics Education ICPE2023 (planned to be held in India in December 2023) for IUPAP support. The conference was deferred to 2025 and did not use the funds. The organizers re-applied for sponsorship of the postponed event.

In 2023 the Commission voted in favor of supporting the 4th World Conference on Physics Education (4WCPE). The conference took place August 26-30, 2024. It was hosted by Jagellonian University in Krakow, Poland, and the organizers are waiting for the allocated funds transfer from IUPAP.

In 2024 the C14 recommended to support the ICPE2025 (previously postponed). Note that the conference has a new team of local organizers. Also, the C14 recommended to support the Interamerican Conference on Physics Education planned for 2025 in Chile.

8.2 Conferences Participation



The IUPAP-sponsored International Regional Conference on Physics Education (ICPE 2022) titled: **Physics Education: Planning for the Future** was held in Australia, Indonesia and Thailand on December 5-9, 2022. The conference offered a regional hybrid participation, while the delegates from other regions of the world connected virtually <https://icpe2022physicseducation.com/>. The C14 Vice-Chair Manjula Sharma and Associate Member Elizabeth Angstmann were instrumental in organizing this conference. The C14 was well-represented at the conference with Commission members Drs. David Sokoloff, Tetyana Antimirova, and Manjula Sharma presenting the workshops, and Nam-Hwa Kang delivering the keynote. IJISME Special Issue: ICPE 2022 was edited by C14 member Dr. Angela Fösel.

The Fourth World Conference on Physics Education (4WCPE) took place August 26-30, 2024 in Krakow, Poland.



The **4th WCPE** is organized by the Faculty of Physics, Astronomy and Applied Computer Science, Jagiellonian University, Kraków, Poland, in cooperation with the International Research Group on Physics Teaching (GIREP), the International Committee on Physics Education (ICPE-C14), and the Faculty of Physics and Astronomy, University of Wrocław, Poland. The theme of the 4th WCPE was **Embracing changes together**. The idea of the conference was to gather participants involved in physics education from different perspectives and, at different levels, and to combine them in a general discussion on various aspects of education, in a world of rapid changes and new challenges.

The C14 played an instrumental role in planning the conference. Several members of C14 served on the conference's program committee. The C14 contributed to the programming of the conference. Dr. Jenaro Guisasola put together a Symposium titled **Physics Education: Approaches from ICPE-IUPAP C14 Community** that took place on August 27, 2024. The Symposium featured the physics outreach and educational activities undertaken by members of the International Commission of Physics Education, (ICPE- C14). A unifying theme was that the problems investigated by ICPE-C14 arise from the teaching and learning of physics, including its concepts, principles, epistemology and culture.

The Symposium presented four types of actions developed by ICPE- C14 with the aim of disseminating and sharing with the physics education community the results and advances in research and innovation in Physics Education. This symposium also was designed to be a call for members of the community to collaborate and make proposals to the commission.

In the first contribution Angela Fössel discussed the objectives and characteristics of the Conferences organised in recent years by the International Commission on Physics Education of IUPAP (C14). In particular, she focused on the recent ICPE 2022 mentioned above. Jenaro Guisasola and Eilish McLoughlin, in the second contribution, summarized the tradition of IUPAP - C14 in publishing and disseminating handbooks on research and innovation in

teaching and learning physics. In the third contribution, Elizabeth Angstmann and Manjula D. Sharma described contributions and changes of the ICPE newsletter over the years. The ICPE Newsletter is the main medium used by the IUPAP education commission (C14) to share activities and calls on Physics Education. The Chair of the Commission, Tetyana Antimirova reported on the initiatives and actions undertaken by the Commission's members during the current Commission's mandate (2021- 2024). Her presentation also outlined the future directions that are suggested by the current Commission.

David Sokoloff presented the C14-endorsed workshop on active learning using multimedia. In addition, several C14 members presented their individual contributed talks. The C14 members who attended the conference in person held the C14 meeting, while the rest of the commission connected remotely.

The conference's opening ceremony included the address of C14 Chair Tetyana Antimirova to the conference delegates delivered on behalf of C14 and IUPAP. As mentioned before, the latest ICPE Medal award ceremony also took place during the conference. The C14 sponsored the keynote lecture delivered by the Medal winner Dr. Paula Heron, as was mentioned before.

Ensuring Continuity

To ensure continuity between the Commissions, the transfer of the C14 materials from Dr. Roberto Nardi, the former C14 Chair to the current C14 executive team was completed at the beginning of current C14 mandate. Currently the C14 materials from the previous and the current commissions are stored on google drive and shared with current C14 commissioners. The practice will continue for the transition between the current and next C14 Commissions. The new commission that will take over after IUPAP's next General Assembly will hopefully combine the second-term members ensuring the continuity and the new members ensuring the renewal and the influx of new ideas.