

Report of WG14 on Accelerator Science 2017 - 2021

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Introduction

IUPAP Working Group 14 (WG14) on Accelerator Science, was created in 2015, in response to a resolution of the XXVIIIth General Assembly of IUPAP to form a new Working Group on Accelerator Science.

The goal of WG14 is to promote the exchange of information and views among the members of the international scientific community in the field of Accelerator Science on topics related, but not limited, to:

- the theory and experiments concerned with the nature and properties of particle accelerators and beam physics
- the improvement of international communication in Accelerator Science through the sponsorship of professional meetings
- the future of accelerator facilities for various fields that benefit science and society
- the industrial, medical, energy production and environmental applications of relevant accelerator technologies
- the accelerator technologies and connection to engineering

The membership of WG14 is given in the Appendix.

Since the last IUPAP General Assembly in October 2017, WG14 held two face-to-face meetings and one virtual meeting. The first meeting was held on November 20, 2017 at the Paul Scherrer Institute, Villigen, Switzerland hosted by WG14 member Lenny Rivkin. The second meeting took place on April 30, 2018 during the IUPAP-sponsored International Particle Accelerator Conference 2018 in Vancouver, Canada. Both meetings made audio facilities available to enable remote participation of members who could not travel to the meetings. The virtual meeting was held on September 17, 2021, after a long hiatus caused by the limited availability of the Working Group Chair and the COVID19 pandemic.

This report to IUPAP highlights progress, updates, and future activities of WG14.

Mission of WG14

There is broad and strong agreement that an importance element of our mission is to promote accelerator science as a distinct discipline in its own right, and to encourage R&D and publications.

It was pointed out that the lack of a publications culture is a major issue in our field, and international recognition for major prizes is weak or lacking due to poor publication record.

Membership Updates

Following the September 2021 virtual meeting of WG14, we extended invitations to the following new members who have agreed to serve:

- Dr. Maher Attal, Technical Director of SESAME, representing collectively the Middle East region, and replacing Rolf Heuer who was in interim capacity.
- Dr. Oliver Kester, Associate Laboratory Director for the Accelerator Division at TRIUMF laboratory in Vancouver, Canada, was added as the Canadian representative.
- Dr. Sekazi Mtingwa, USA, representing the African Light Source Synchrotron Facility.
- Mike Seidel, Large Research Facilities Division Head at PSI and Full Professor at EPFL, representing those institutions.

In addition, Stuart Henderson who is a WG14 member is the Chair of WG1 ICFA and will inform of new Chair of ICFA Beam Dynamics Panel.

Seiya Yamaguchi, KEK, Japan was replaced by Tadashi Koseki, KEK.

Aiming to improve the diversity of WG14, iThemba LABS accelerator physicist Zinhle Buthelezi was nominated. The WG will elaborate on its next meeting.

Regarding connections with IUPAP WG12 on Energy, the panel agreed to reconsider the matter in a future meeting.

Finally, the present Chair of WG14, Lia Merminga has requested to step down after the GA and has nominated Dr. Gianluigi Arduini as new Chair. IUPAP President Prof. Michel Spiro will ask for approval by the next Executive Council and GA in October.

In future meetings, the WG has agreed to undertake the exercise of rebalancing the composition of the panel, with the goal to increase diversity and increase engagement in initiatives that benefit the underrepresented population of our community. We plan to consider members from Thailand & India.

Main lines of activity in the short-medium term

- Education
 - Support education in accelerator science. Re-establish contacts with international schools. Invite CAS, USPAS, JUAS directors.
 - International Joint Accelerator School in Saskatoon, Canada (2022). Use this forum to connect all schools together.

- Conferences:
 - Collaboration with and support of the Joint Accelerator conferences Website (JACoW). This is the international collaboration that publishes the proceedings of most accelerator conferences (e.g. the International Particle Accelerator conference – IPAC) and workshops. CERN is supporting the integration of several features of the JACoW Scientific Programme Management System (SPMS) into Indico in order to secure longer-term reliability and support. Given recent issues in the availability of resources to support JACoW in certain regions, there is a need to establish more clearly a formal collaboration among the stakeholders to guarantee long-term support and resources to this important activity.
 - In parallel, WG14 plans to explore the future of JACoW and different models for how publication of papers can be processed in the future. The old model with many staff members from accelerator labs is not feasible in the long term.
- Promotion of applications of accelerators (with a particular view to less developed countries)
 - Complementary role to ICFA. Especially in less-developed countries, extent membership, and contacts
- Promotion of the advanced technologies underpinning accelerators
- Sustainability of accelerator facilities - Need to clarify interaction with the ICFA panel on sustainable Accelerators and Colliders (Mike Seidel/Thomas Roser)
 - Sustainability is becoming increasingly more important for large accelerators and a primary consideration for new facilities
 - Working with the ICFA panel, strengthen for all facilities (not only HEP)
- We should ask ourselves what the WG and IUPAP can bring to already existing activities:
 - E.g. To the international schools (just moral support? Visibility? funding? Widen the “audience” e.g. by supporting students from poorer countries)
 - How to enhance our field in terms of publications, recognition, awards, grants
 - How to add value via our role
 - To the effort of enhancing the visibility of our publications and of changing our publication habits
- Think of areas not well covered by ICFA Beam Dynamics Panel (organize workshops):
 - Work with the new BD Panel Chair and Stuart to delineate how ICFA and WG14 can work together to complement each other.
 - ICFA focuses on Particle Physics and high energy accelerators. There are other areas best suited for WG14, for example, FELs, medical applications, light sources, neutron sources, accelerators for nuclear physics research.

Working Group or Commission?

At the present time, the consensus is to continue as a Working Group, and later evaluate becoming a Commission. While the commission would reflect the role of Accelerator Science as field in its own right supporting research in several scientific domains, the flexibility of having more than one

member from any IUPAP member serves our mission well at this early stage of the group. We will revisit the subject at the 2021-22 timeframe, and at that time decide if we want to propose a resolution for consideration at the 2023-2024 GA.

Connections with related WGs: ICFA, ICUIL, C12, C16

We identified the following closely connected WGs, and ways to connect:

WG1: ICFA, has a focused mandate on high energy accelerators for particle physics. WG14 mandate is the advancement of accelerator science and education in general, with focus on non-HEP scientific and societal applications of accelerators. ICFA has several panels (<http://icfa.fnal.gov/panels/>) including Panels on Beam Dynamics (BD) and Sustainable Accelerators and Colliders and it is intended to continue to work in synergy and to strengthen the collaboration with ICFA and its Panels through the reciprocal participation of the respective chairs or representatives to the corresponding meetings. Discussions had started with the late chair of the ICFA BD Panel and had identified some possible areas of collaborations that need to be pursued with the new Chair. The ICFA Chair, S. Henderson, is a member of WG14 and the new chairs of the ICFA Beam dynamics Panel and of the ICFA Panel on Sustainable Accelerators and Colliders are being invited to join WG14.

WG7 (ICUIL) has been represented so far by past Co-Chair Chris Barty. For the time being Chris will continue to represent WG7.

C12: Contacts were established with the Commission on Nuclear Physics in 2017. The C12 Chair welcomed the connection with WG14 and the connection needs to be re-established.

C16: Plasma Physics: Minh Quang Tran, EPFL, Switzerland, is the current IUPAP C16: Plasma Physics Chair, and has strong interest in Accelerator Physics. WG14 is fortunate to have his participation as an Associate member representing C16.

International Particle Accelerator Conferences (IPAC) and WG14

The International Particle Accelerator conference is established as the main particle accelerator Conference and it has continued through the COVID19 pandemics with fully remote meetings in 2020 and 2021. WG14 firmly considers to be naturally associated with IPAC and IUPAP has already supported past IPAC conferences. The discussions towards a possible revision of the IPAC MoU are ongoing and initial discussions with the PAC OC (the American regional sponsoring organization for IPAC) have started.

Appendix

WG14 Membership – October 2021

USA

Swapn Chattopadhyay
Stuart Henderson
Lia Merminga (Chair)
Sekazi Mtingwa

Switzerland

Gianluigi Arduini
Lenny Rivkin
Mike Seidel

Spain

Caterina Biscari

UK

Bob Bingham

France

Qing Qin

Sweden

Mats Lindroos

Canada

Oliver Kester

Middle East

Maher Attal (SESAME)

Japan

Tadashi Koseki

China

Michael Moyers

South America

Liu Lin

Africa

Simon Mullins

Australia/New Zealand
Nikolai Lobanov

WG1 (ICFA)
Stuart Henderson

C16 (Plasma Physics)
Minh Quang Tran

WG7 (International Committee on Ultrahigh Intensity Lasers)
Chris Barty

ICFA Beam Dynamics Panel
TBD

ICFA Panel on Sustainable Accelerators and Colliders
TBD

Industrial liaison and Knowledge Transfer
Giovanni Anelli (CERN)