

IUPAP COMMISSION ON NUCLEAR PHYSICS – C12

Report to IUPAP Executive Committee and Commission Chairs

September 2021

Claes Fahlander, Chair of C12

Annual general meeting of C12 2020

The annual general meeting of C12 was held on Saturday June 12 2021. It was organized on the Blue Jean Network across the globe thanks to TRIUMF and Iris Dillmann. The meeting was organised back to back with the meetings of IUPAP's Working Group 9, International Cooperation in Nuclear Physics, on Thursday and Friday of June 10, 11. The members of WG9 are welcomed as observers to the meeting of C12, and vice versa. Matters of forefront nuclear science research and status reports on the large-scale accelerator facilities for nuclear physics around the world were being addressed.

IUPAC Division of Inorganic Chemistry

Since 2019 the Chair of the IUPAC Division of Inorganic Chemistry and the Chair of C12 meet to discuss matters of common interest, and we take part and report at each others annual meetings. This year Professor Ani Aprahamian, the new chair of C12 from 2022, presented the activities of C12 to the IUPAC Div II annual meeting, which took place, virtually, on Monday August 9. In particular we have common interests on issues related to the discovery of new elements of the periodic table of elements and of new isotopes of the nuclear chart.

IUPAP sponsorship of nuclear physics conferences in 2020, 2021 and 2022

In 2019 IUPAP decided at its C&CC meeting to support three conferences on nuclear physics to be held during 2020:

- ARIS2020: 27th International Nuclear Physics Conference, to be held in Glasgow in Scotland.
- Hadron Physics 2020: XV Hadron Physics Conference, to be held in Brazil.
- NIC2020: International Symposium on Nuclei in the Cosmos to be held in Chengdu in China.

Due to the ongoing pandemic Hadron Physics 2020 and NIC2020 was postponed until 2021 and ARIS2020 is postponed until 2023.

In 2020 IUPAP decided to support one conference on nuclear physics to be held during 2021:

- NN21: 14th International Conference on Nucleus – Nucleus Collision to be held in Canada.

Due to the pandemic it was decided to postpone this conference until 2024. Because of the long delay IUPAP decided that they were not allowed to keep the support and they were asked to resubmit their application in 2023.

This year there are four conferences on nuclear physics asking for IUPAP support for 2022. The chairs of the organizing committees presented their conferences at our C12 meeting in June 2021. They are:

- SQM2022: Strangeness in Quark Matter to be held in Busan, Korea on June 13-18, 2022.
- INPC2022: International Nuclear Physics Conference to be held September 11-16, 2022 in Cape Town, South Africa.
- QNP2022: 9th International Conference on Quarks and Nuclei to be held at Bonn in Germany on September 5-9, 2022.
- DREB2020: 11th International Conference on Direct Nuclear Reactions with Exotic beams to be held in June 2022 at Santiago de Compostella in Spain.

Change of name of "Internal Conversion Electrons"

In 2019 the C12 Commission received an e-mail from Professor Heinz-Eberhard Mahnke of Freie Universität Berlin with the suggestion to make recognition of Lise Meitner. He proposed to change the name of the well-known process of "internal conversion electrons" to a more personalized name, namely to "Meitner-Ellis electrons", in recognition of the pioneering work done by Lise Meitner and Charles Drummond Ellis during the 1920's.

IUPAP is the likely body to deal with these kind of matters. C12 was asked by the President of IUPAP to discuss the matter, and to involve in the discussions also the C2 Commission on Symbols, Units, Nomenclature, Atomic Masses and Fundamental Constants.

We discussed the proposition at length during 2020 and we decided to recommend to the President of IUPAP that it was not a good idea to change the name of this particular process. This decision was subsequently approved by the President.

IUPAP Centenary

The Working Group of the IUPAP Centenary has asked each commission to recommend two prominent speakers to the celebration conference. This was a topic that engaged the members of the C12 Commission as well as members of the WG9, and many suggestions were made for speakers within the field of nuclear physics. The names of those speakers have been presented to the Working Group of the Centenary.

Associate Memberships to other commissions and working groups

One of the members of C12, Eugenio Nappi, is an associate member to C11.

At the moment there are no associate members from other commissions in the C12 commission.

This was discussed at our annual C12 meeting this year and it was found that it would be beneficial to the work of C12 to have an associate member from some of the other commissions taking part in our meetings. It was noted that Astrophysics has great relevance to Nuclear

Physics. We also discussed Biological Physics, and of course Particle Physics. Therefore it was decided that we would like to invite one member from each of the following three commissions:

- C-6 Biological Physics
- C-11 Particles and Fields
- C-19 Astrophysics

Data Bases of Nuclear Reaction Rates of importance to Astrophysics

At the annual meeting of C12 in June Fanny Farget presented the status of various data bases that employ nuclear physics input, in particular those that are used for various astrophysics applications. She proposed that C12 and IUPAP should make a concerted effort to unify and get support for the evaluation of data. She suggested that prioritization and quantification of the most important reaction rates and most critical nuclear properties can perhaps be coordinated through IUPAP in gathering the critical information with or without IAEA. She also proposed an action plan to engage national and regional physics societies in this work. The effort would result in unifying the many data bases related to nuclear physics.

Year of Basic Science

Next year is the "Year of Basic Science". It was discussed at our C12 meeting how we in nuclear physics can contribute to make this year remembered to the public in a similar way that C12 and nuclear physicists around the world were engaged in promoting physics during the Year of the Periodic Table a couple of years ago. At that time we tried to get the message through that nuclear physics is important for the periodic table, and we did a good job with that. We will again try and spread the message to the public that basic nuclear physics research is of importance for many other reasons by getting involved in events that will be of interest to the public. It is also a good year to open up the accelerator facilities around the world to the public for a day or two in so called "Open days".

IUPAP Young Scientist Prize for Nuclear Physics

The IUPAP Young Scientist Prize for Nuclear Physics is being awarded to three young scientists every third year. The process to find the next prize winners has been started. The deadline for receiving nominations is by November 1 2021. The three prizes will be awarded at the next International Nuclear Physics Conference, INPC2022, September 11 – 16, 2022, in Cape Town, South Africa.

New Chair of C12

At the C12 meeting in Glasgow in July 2019, it was unanimously decided to suggest to IUPAP that the next C12 chair should be Professor Ani Aprahamian of Notre Dame University, USA. It is pending the approval of the 2021 General Assembly.

At the C12 meeting this year Maria José Garcia Borge was nominated as the next Vice-Chair of C12 and she was subsequently unanimously suggested.

The decision of Secretary of C12 is postponed until the new members of C12 has been appointed.

New Members of C12

The C12 commission consists of 14 members, presently seven women and seven men. We cover, both in experiment and theory, all fields of nuclear physics such as nuclear reactions, nuclear structure, nuclear astrophysics, nuclear instrumentation, hadron physics, QCD matter physics, applied nuclear physics. Six of the C12 members will have to be replaced next year.

We have received 14 nominations to choose among to replace the six members leaving C12. The ones that C12 recommends has been sent to the General Assembly.

Annual general meeting of C12 2022

The next annual general meeting of C12 will take place in Cape Town in South Africa in connection to the INPC2022 meeting in September 11-16, 2022.