

IUPAP COMMISSION ON NUCLEAR PHYSICS C12

Report to IUPAP Executive Committee and Commission Chairs

September 2018

Claes Fahlander, Chair of C12

Annual meeting of C12 September 7 2018

The latest annual meeting of C12 took place in Bologna in Italy on September 7 2018. It was held in connection to the European Nuclear Physics Conference, EuNPC2018. The C12 meeting was held on the premises of the Academy of Sciences of Bologna, and it was followed the day after by the annual meeting of the IUPAP Working Group 9 on International Collaboration in Nuclear Physics. The participants of WG9 were invited, as usual, to participate in the C12 meeting as observers, and vice versa. All 14 members of C12 were present.

The major discussions and decisions of the C12 meeting is reported here.

IUPAP Young Scientist Prize in Nuclear Physics

The IUPAP Young Scientist Prize in Nuclear Physics is awarded every third year. The award ceremony takes place at the International Nuclear Physics Conference, INPC, a tri-annual conference, the largest in nuclear physics, which until now have been sponsored by IUPAP as category A. The last time the Young Scientist Prize was awarded was at the INPC meeting in Adelaide in Australia in 2016. Next time will be at the INPC conference in Glasgow in Scotland in 2019, where three prize winners will be presented.

The deadline for nominations was September 1 2018. Thirty nominations were received at that date. Five nominees are women, 25 are men. They represent most fields of nuclear physics: nuclear reactions, nuclear structure, nuclear astrophysics, nuclear instrumentation, hadron physics and QCD matter physics. The geographical distribution of the nominees are: 6 from Asia, 6 from North America, and 18 from Europe.

The evaluation will be performed by the C12 members.

The timetable is as follows:

- a) March 2018: call for nominations via relevant e-mail lists. **Finished.**
- b) September 1 2018: deadline to receive nominations. **Thirty nominations received.**
- c) September 7 2018: first discussion of incoming nominations at the C12 meeting in Bologna. **Finished.**
- d) September 7 2018: discussion of the evaluation procedure at the C12 meeting in Bologna. **Decided.**
- e) September – December 2018: evaluation of the nominees. **By the C12 members.**
- f) Spring 2019: IUPAP Secretary-General to approve the suggested winners and the citations.
- g) Spring 2019: inform the winners.
- h) July 2018: award of the prize to the winners at the INPC conference in Glasgow.

IUPAP Neutrino Panel

A report of the status of the neutrino panel was delivered. Nigel Smith, who has been appointed as one of the co-chairs of the panel, was present at the C12 meeting. He reported that the full list of members of the panel will be presented to the C&CC meeting in October 2018 in Vilnius.

Issues related to the discovery of new superheavy elements

The new document "*IUPAC and IUPAP Procedures for Validating Claims for the Discovery of New Elements and Naming those Elements*" was discussed. It was found that there are many important changes that will make the process more transparent. It is also obvious from the document that the C12 commission of IUPAP will be involved as an expert committee to a larger extent than before, which is much appreciated by the C12 members.

The new document "*On the Discovery of New Elements*" by the 2017 Joint Working Group of IUPAC and IUPAP was also mentioned. It has recently been accepted as a publication in "Pure and Applied Chemistry". C12 is looking forward to its immediate publication.

International Year of the Periodic Table – IYPT

IYPT will give us the possibility to increase the visibility of nuclear physics when it comes to superheavy elements; to clarify the notion of these very heavy elements and the production and identification of them, which mainly is by means of nuclear physics methods and techniques.

Actions how to increase the visibility was discussed such as:

- Advertise the IYPT at nuclear physics conference webpages.
- Organize public lectures at nuclear physics conferences.
- Encourage nuclear physicists to make public lectures on the subject.
- Encourage nuclear physicists to write popular science articles on the subject.
- Suitable nuclear physics events in 2019 should be linked to the IYPT.
- Set up of activities, such as exhibitions, possibly jointly with chemists.

IUPAP sponsorship of nuclear physics conferences

Requests for IUPAP sponsorship from five conferences in nuclear physics were reviewed. Two of the conferences ask for category A support, two ask for category B support, and one conference ask for endorsement. Representatives from the local organising committees were given 10 minutes each to make their case. They were:

- **INPC2019**: 27th International Nuclear Physics Conference, to be held in Glasgow in Scotland, July 29 – August 2 2019. Presented by David Ireland, chair of the organising committee. Asking for category A support.
- **Quark Matter 2019**: XXVIII International Conference on Ultrarelativistic Nucleus-Nucleus Collisions, to be held in Wuhan in China, November 3-9 2019. Presented by Joachim Stroth representing the organising committee. Asking for category A support.
- **LASNPA2019**: XIII Latin American Symposium on Nuclear Physics and Applications, to be held in Costa Rica, October 14–19 2019. Presented by Débora Menezes, representing the organising committee. Asking for category B support.

- **SQM2019**: International Conference on Strangeness in Quark Matter to be held in Bari in Italy, June 10–15 2019. Presented by Domenico Elia, chair organising committee. Asking for category B support.
- **TAN19**: 6th International Conference on the Chemistry and Physics of the Transactinide Elements, to be held in Wilhelmshafen, Germany August 25– 30 2019. Presented by Claes Fahlander representing the organising committee. Asking for endorsement.

The C12 Commission decided to recommend that IUPAP support be granted as follows.

INPC 2016 – category A support

The INPC 2019 conference is the next in the series of international conferences in nuclear physics which brings together some 700 participants from around the world on a three year cycle. It is the only international conference covering all the subfields of nuclear physics both at the experimental and theoretical level. It is the main conference in the field of nuclear physics and has been rotating amongst the various continents, INPC2007 in Tokyo, INPC2010 in Vancouver, INPC 2013 in Firenze, INPC2016 in Adelaide, INPC2019 in Glasgow. It is the venue at which the three IUPAP young scientist prizes in Nuclear Physics are awarded every three years.

The local program committee and the international advisory committee will both have almost 30% female members. Registration fee will be set at £480, and for students £370.

The C12 commission reviewed the plans and budgets as submitted by the organising committee and is satisfied that they meet the requirements set by IUPAP, in particular with regards to open access, participation of women on committees, targets for female invited speakers and participation of young investigators and students.

It has received IUPAP support as category A conference in the past. The C12 commission recommendation is that INPC 2019 be given **category A support** with highest priority.

Quark Matter 2019 – category A support

This is the major international conference on ultrarelativistic heavy-ion collisions and will take place in November 2019 in Wuhan, China. This conference takes place on a 1.5 year cycle and it rotates amongst the continents, 2014 in Darmstadt, 2015 in Kobe, 2017 in Chicago, 2018 in Venice, 2019 in Wuhan. This will be the 28th edition of this major conference which attracted more than 750 participants in its last two instances. The aim of this conference is to bring together theoretical and experimental physicists from around the world to discuss new developments in high energy heavy-ion physics. The focus of the discussions is on fundamental understanding of strongly interacting matter at the extreme conditions formed in ultra-relativistic heavy-ion collisions, which relates to the state of the early universe.

The local program committee and the international advisory committee will both have about 20% female members, and the number of female speakers is targeted to more than 30%. Registration fee will be set at \$650, which will cover lunches, coffee breaks, reception, conference dinner and conference proceedings.

Quark Matter has received IUPAP support as category A conference in the past. However, for 2018 they only received endorsement. It was discussed at the C12 meeting in 2017 in Tokyo that it was difficult to recommend category A support to QM every time considering the fact that it takes place more frequent than most other conferences. It was suggested that we alternately should suggest category A and endorsement every second time.

Therefore, the C12 commission recommendation is that Quark Matter 2019 should be given **category A support** with high priority.

We are aware that it may be difficult for IUPAP to support two category A conferences to one and the same commission, but we considered that it was particularly pressing this year within C12, and we therefore ask for support in category A for both INPC2019 and QM2019.

LASNPA2019 – category B support

This is a regional conference that brings together a large segment of the nuclear physics community from South America and it has attracted participation also from North America, Europe, and Asia. The invited speakers have a broad international distribution. It moves around South America with a two year cycle and for the first time it will be held in San José in Costa Rica. It attracts ~300 participants from all over South America and is seen as a key promotional event for the rapidly developing countries on the continent. The program has a strong component of applications of nuclear techniques. It was supported as a category B topical conference in 2015 and 2017. It is an important element for the growth of the nuclear physics community in South America.

The local program committee and the international advisory committee will both reach the IUPAP target of 20% female members. Expected number of participants is between 250 and 300. Registration fee will be set at \$250, and covers conference proceedings, coffee breaks, welcome reception, and the conference dinner.

The C12 commission recommendation is that LASNPA 2017 be given **category B support** with high priority.

SQM2019 – category B support

This is a topical conference that brings together a large segment of the strange quark gluon plasma community. The main topic of the conference is concerned with strangeness and heavy flavour production in heavy-ion collisions. Of particular interest are heavy-quark production and hadronic interactions, hadron resonances in the strongly-coupled quark-gluon plasma, bulk matter phenomena associated with strange and heavy quarks, the QCD phase structure, and strangeness in astrophysics. SQM is among the main and largest conferences on heavy ion physics after QuarkMatter. The first edition of SQM was held in Aarhus Denmark in 1991, and since then it has taken place all over the world on a 1.5 year cycle. The most recent editions are SQM2013 in Birmingham, SQM2015 in Dubna, SQM2016 in Berkeley, and SQM2017 in Utrecht. From now on it has been decided that the 1.5 year cycle should be changed to a 2 year cycle.

The local program committee and the international advisory committee will both reach the IUPAP target of 20% female members. Expected number of participants is between 250 and 300.

Registration fee will be set at €380 for senior participants, and to €300 for students. The fee covers conference proceedings, coffee breaks, lunches, the conference dinner and an excursion.

The C12 commission recommendation is that SQM2019 be given **category B support** with high priority.

TAN19 – endorsement

This is a topical conference that brings together nuclear physicists and nuclear chemists involved in the search of new superheavy elements. It is the main conference series in the field of superheavy element research. The scope of the conference will cover experimental and theory aspects of the heaviest-element synthesis. It will cover the topics of nuclear reaction studies, nuclear structure and spectroscopy, atomic physics studies, chemical properties of transactinide elements, and it will also discuss new technical developments and present and upcoming large-scale facilities in the field of superheavy element research. The first TAN conference took place in 1999 in Seeheim near Darmstadt, Germany. Since then the meetings of this series have been organised every 4 years. In 2003 in Napa in USA, in 2007 in Davos in Switzerland, in 2011 in Sochi in Russia, and in 2015 in Urabandai in Japan.

The local program committee reach the IUPAP target of 20% female members. The number of invited female speakers come to 17 %. However, for the international advisory committee there is a problem with only one women among the 17 members, which thus only come to 6 % female participation in this committee. I have asked the organisers to add at least one more woman to the international advisory committee.

Expected number of participants is between 100 and 120. Registration fee will be set at €500, and covers coffee breaks, lunches, dinners, and a social program. The fee for students will be reduced by 50%.

A few more important aspects on this conference.

TAN19 is a regular conference dealing with the search and discoveries of superheavy elements. It is a conference that over the years has been endorsed by IUPAC, and they endorse it also for TAN2019. Thus the IUPAC logo is already on the TAN19 website. During the conference there will a special focus on the periodic table since 2019 is the International Year of the Periodic Table, and both the President of IUPAC and the President of IUPAP has ben invited, and they will attend the conference to give welcome addresses. From that point of view it would be desirable to have both unions logo on the TAN19 webpage. It is maybe also the only conference where it would be fitted to have both logos on a conference website signalling the friendship between the two unions.

Special events at TAN19 recognising the International Year of the Periodic Table in 2019 will be a special public lecture by Professor Gisela Boeck from the University of Rostock on the history of the Periodic Table, and there will be talks by living discoverers on the discoveries of elements 112, 113, 114, 115, 116, 117, 118. And as mentioned above, both the presidents of IUPAC and IUPAP will attend TAN19 to give welcome addresses. This will give also IUPAP visibility at this important conference dealing with new elements of the periodic table, and we believe that it is important for IUPAP to be represented there considering the recent debate about chemists contra physicists in the hunt for new elements.

Since the conference organisers do not reach the minimum women participation in the international advisory committee the C12 felt that they could not recommend endorsement, although some of the members of C12 considered it very important to maybe overrule that particular IUPAP requirement in the present case. We will leave it to IUPAP to decide whether it finds the present other circumstances outlined above important enough such that the gender requirement of the international advisory committee could be relaxed somewhat in this particular case.

Associate members to other commissions and working groups

C12's commitment to other commissions and working groups were discussed. The present engagement of C12 commission members is in the following groups:

C11 Particle Physics – Eugenio Nappi.

C13 Physics for development – Claes Fahlander.

C19 Astrophysics – Weiping Liu.

WG10 – Astroparticle Physics International Committee – Ani Aprahamian.

It was decided that it would be most valuable for C12 to remain as associate to C11 and C19, but instead of C13 and WG10, it would be more valuable to get associated with C14 – Physics Education and WG14 – Accelerator Science. We have more interests in common with both of them, and we believe we can be of help and collaborate with them on many common matters.

The new appointments for associate membership that we would like to suggest to the IUPAP Council in October 2018 are thus:

- C11 - Particle Physics - Eugenio Nappi.
- C14 - Physics Education - Yanlin Ye.
- C19 - Astrophysics - Iris Dillman.
- WG14 – Accelerator Science – Ani Aprahamian.

A separate report is sent to the IUPAP secretariat about this topic.