Resolutions of the 29th General Assembly of the International Union of Pure and Applied Physics, Sao Paulo, Brazil, 11-13 October 2017

Resolution 1: *Ratification of the Decisions of Council regarding the Shares of Members*

1.1 Increase in shares

Council accepted two requests from members to increase their shares

19 February 2017
India to increase shares
Council approves the request from India to increase its shares from 8 to 15, subject to ratification by the 29th General Assembly. This increase takes effect in 2017. On ratification, it gives India 5 votes at the General Assembly.

17 March 2017
Singapore to increase shares
The request from Singapore to increase its shares from 1 to 2, received on 23 July 2015 was inadvertently not referred to the October 2015 C&CC meeting. It has now been approved by Council effective from 1/1/2016, subject to ratification by the 29th General Assembly. The number of votes for Singapore will increase from 1 to 2.

The 29th General Assembly RESOLVED to ratify these decisions of Council with immediate effect, so that these members may exercise the votes appropriate for their increased shares at the reminder of this General Assembly

1.2 Readmission of Pakistan as a member

Council received a request from the Pakistan National Centre for Physics for Pakistan to be readmitted as a member with reduced fees in an initial period. Pakistan was a member of IUPAP from 1951 to 1955 and it would be very helpful for IUPAP for them to again be a member.

The 29th General Assembly RESOLVED that Pakistan be admitted as a member of IUPAP, with the Pakistan National Centre for Physics as the adhering body, and that Pakistan be granted all the rights and responsibilities of membership and that its membership dues for the period 2018-2020 be set at 50% of one share.
The Pakistan National Centre for Physics is requested to establish a Liaison Committee to maintain relations between its physics community and the
Union.

1.3 Members with dues outstanding

1.3.1 Members lose right to vote

Countries with more than 3 but less than 6 years unpaid dues continue to receive invoices, with note to say they do not have voting status until past due fees are reduced to 3 years or less. These members are:

- Cuba
- Ethiopia
- Senegal
- Saudi Arabia

The 29th General Assembly RESOLVES to ratify these decisions of Council with immediate effect.

1.3.2 Members transferred to observer status

Countries with more than 6 years unpaid dues will be recorded as past member with observer status. The office will write to advise them on this and to say that if they wish to reinstate their membership status they should make that request. Although, strictly they should pay the past dues to be reinstated, but that may be negotiated. Advise IUPAP-SG to write these outstanding dues off as unrecoverable.

- Cameroon
- Colombia
- Egypt
- Kenya (which was on a extremely reduced 200 EUR pa due rate)
- Mongolia

Some of the members dues for past years are also to be written off as they are unlikely to be received. They are:

- Greece – 2015 and 2016 dues
- Cuba – 2014, 2015 and 2016 dues

The 29th General Assembly RESOLVES to ratify the decisions of Council on Member matters regarding the transfer to observer status and to write off outstanding dues in the accounts.

Resolution 2: *Ratification of Decisions made by Council on retiring commission members*

The 29th General Assembly notes the decisions made by Council, as set out in the minutes of Council available on the IUPAP website, **and RESOLVED to ratify the Council decision of 31 March 2017**

"Ruling on retiring commission members Council approves the ruling that, when a member retires from a Commission during a term and is replaced, if the replacement member serves more than half of the term, they are counted as a member for that term in determining terms of service. If the replacement member serves less than half of the normal term, that service shall be disregarded in determining terms of service."

Resolution 3: *Membership Dues for 2018 to 2020*

As advised to members in a memo distributed on 13 March 2017, on the recommendation of Commission C1: Commission on Finance, and in agreement with the Resolutions of the 27th General Assembly of IUPAP,

The 29th General Assembly of IUPAP RESOLVED that dues for 2018 to 2020 be based on the World Bank annual inflation rate for 2016 of 3.1%, and will be

- for 2018: 2276 EUR
- for 2019: 2347 EUR
- for 2020: 2420 EUR

Resolution 4: *Special Resolution regarding the Chair of C2: SUNAMCO*

For a number of reasons the usual succession arrangements for Commissions did not work to ensure that existing members of C2 have built up the experience necessary to be effective Chairs of the Commission for 2018-2010. It is desirable to appoint a previous Chair of the Commission as the Chair of C2 in this period to bridge this experience problem.

By-Law II.2.2 states that
"Chairs may not be re-elected to any position on the Commission beyond their term as Chair, and Vice-Chairs and Secretaries may not be re-elected to the same positions nor be re-elected as an ordinary member – except in extraordinary circumstances, and, in such circumstances, special approval by the General Assembly is required."

The 29th General Assembly RESOLVED that special approval is given to appoint Peter Mohr, who was Chair of C2 from 2009-2011, as the Chair of C2 from 2018-2022

Resolution 5: *Continuation of Working Groups*

After consideration of the reports of the Working Groups the 29th General Assembly RESOLVED that all working groups except WG5 and Interim WG15 be continued until the 30th General Assembly in 2020, and DELEGATES to the Executive Council the Authority to approve those changes to the membership of Working Groups which it sees as appropriate.

Resolution 6: *Working Group 5, Women in Physics*

6.1 Continuation of the Working Group

Noting that:

- The problem which this Working Group addresses is unlikely to be solved within 3 years. An element of continuity would be very helpful in sustaining and growing the influence that the WG is exerting.

- The difficulty that the Working Group faces in managing the next ICWP conference when it will happen outside its agreed term of existence

- In addition, the ICSU Collaborative Gender Gap project runs 2016-2019. It is likely that the WG will wish to undertake implementation of the findings. The IUPAP

Working Group in fact wrote the first draft of this project, and 4 WG members are on the project executive.

Guaranteeing its existence to 2023 will give the working group the confidence to plan that implementation.

The 29th General Assembly RESOLVED that WG5 be continued for 6 years until the 31st General Assembly of 2023

6.2 Charge WG5 to organise the 7th ICWIP

The Conference every 3 years has become an implement of change and of inspiration. Countries were expressing interest in bidding for the 7th WCIP well before the 6th ICWIP.

The 29th General Assembly RESOLVED to charge the working group to organise the 7th ICWIP

6.3 Diversity and inclusion in Physics

It has been demonstrated that discussions on gender issues can be one of the most important actions in bringing about positive change in a community. IUPAP supported conferences are an important venue to facilitate these discussions among physicists, not just women physicists.

The 29th General Assembly RESOLVED to encourage IUPAP-sponsored conferences to have a session for all participants on diversity and inclusion in Physics, together with IUPAP values.

6.4 Female plenary speakers

The reports of the IUPAP Gender Champion refer specifically to low numbers of women as invited or plenary speakers. This provides a negative impact in terms of career role models, professional development of leading women, and leadership in physics.

The 29th General Assembly RESOLVED to encourage IUPAP-sponsored conferences to include more female plenary speakers, and asks that the number of male and female plenary and invited speakers at the conference be reported in the conference report to IUPAP

Resolution 7: *Neutrino Physics Panel*

Council was pleased to endorse the initiative to create a Neutrino Panel as a combined effort under the supervision of the C4, C11 and C12 Commissions together with the WG1, WG9 and WG10 Working Groups. The C11 Commission will take the role as the coordinating Commission of the action. The suggested mission of the Neutrino Panel is:

'*to promote international cooperation in the development of an experimental program to study the properties of neutrinos and to promote international collaboration in the development of future neutrino experiments to establish the properties of neutrinos*.'

The 29th General Assembly RESOLVED to establish the Neutrino Panel, composed of nominees of C4, C11, C12, WG1, WG9 and WG10, under the supervision of those Commissions and Working Groups and coordinated by C11

The 29th General Assembly DELEGATED to the Executive Council the authority to approve the mission of the Neutrino Panel and the membership of the Panel

Resolution 8: *Working Group 15, Soft Matter*

Having received the report of the Interim Working Group on Soft Matter Physics (Interim WG15) the **29th General Assembly RESOLVED to establish the Working Group on Soft Matter Physics, WG15, with the mandate:**

1. **To organize or assist in the organization of an International Conference "Soft Matter Around the World" which rotates every 3 years to each geographic region (Europe- Africa, the Americas, and Asia-Pacific).**
2. **To coordinate soft-matter-related regional, national & local conferences, meetings & workshops**
3. **To coordinate soft matter education, such as summer and winter schools and short courses and help organize them if a need appears**
4. **To promote soft matter research through information exchange, publicity, prizes, publications, etc.**
5. **To strengthen the connections between academic and industrial soft matter research and development through outreach events, short courses, etc.**
6. **To advise the 30th General Assembly in 2022 on the best way to ensure that IUPAP continues to nurture soft matter physics.**

The 29th General Assembly delegates to the Executive Council the authority to approve the membership of the Working Group on Soft Matter Physics.
The term of the Working group in the first instance shall be until the 30th General Assembly

Resolution 9: *Terms of Office for new Commissions*

Statute IV. C states that:
C. The term of office of Councillors normally begins and ends at the end of each General Assembly. In exceptional circumstances the General Assembly may extend the term of office.
However, nothing in the Statues or By-Laws, states the starting and ending dates for members of Commissions. Looking at the recorded dates for previous commission demonstrates a confusion on this. By-Law II.2 now states: Terms of Office

1. All elections are for a term of three years.
2. Chairs may not be re-elected to any position on the Commission beyond their term as Chair, and Vice-Chairs and Secretaries may not be re-elected to the same positions nor be re-elected as an ordinary member – except in extraordinary circumstances, and, in such circumstances, special approval by the General Assembly is required. Ordinary members may be elected twice.
3. Normally the Secretary, Vice-Chair and Chair are to be chosen from among those who have served at least one term on the Commission.
4. Service in all capacities shall not exceed three terms.

The 29th General Assembly RESOLVED that By-Law II.2 be amended

1. **by the insertion of a new clause 2 that states:**
   The term of office of members of Commissions normally begins 1 January of the year after each General Assembly, and ends on 31 December of the year of the next General Assembly. In exceptional circumstances the General Assembly may extend the term of office.
2. **by the appropriate renumbering of the following clauses**

Resolution 10: *New Mandate for C17*

C17 requests and Council recommends that the 29th General Assembly APPROVES the revision of Article 1 of the C17 Mandate to read as follows:
Article 1
To promote the exchange of information and views among the members of the international scientific community in the general field of Laser Physics and Photonics including:

1. the physics of coherent and/or high brightness electromagnetic energy generation and transmission;
2. the physics of interactions of laser or high brightness electromagnetic radiation with matter;
3. the application of lasers and other high brightness electromagnetic radiation sources to science and technology.

The 29th General Assembly RESOLVED to revise Article 1 of the C17 mandate as recommended.

Resolution 11: *The International Year of Basic Science for Development*

Having received the document *19.1 IYBSD* describing the proposed International Year of Basic Science for Development

The 29th General Assembly RESOLVED to pursue and strongly support the plan to establish 2022 as the International Year of Basic Sciences for Development, along the guidelines outlined in the document 16.2 IYBSD

Resolution 12: *The ICSU-ISSC merger*

After receiving and discussing reports from the Treasurer of ICSU, Barbara Erazmus and the President regarding the proposed merger of ICSU and ISSC,

The 29th General Assembly of IUPAP RESOLVED that IUPAP casts its vote at the ICSU General Assembly in favour of the proposal to merge ICSU and ISSC.

Resolution 13: *To establish a Working Group on Physics and Industry*

The mission of IUPAP is *to assist in the worldwide development of physics, to foster international cooperation in physics, and to help in the application of physics toward solving problems of concern to humanity.*

It is becoming clear that, without good connections with the majority of physicists, who work in industry and on the applications of physics, IUPAP is hampered in achieving this

mission. While IUPAP has always professed that it works for "pure and applied physics" structurally many of the IUPAP members are societies and academies which do not have strong connections with their local industries or with their local industrial physicists. That may be the underlying reason why, in spite of many attempts to improve the IUPAP connections with Industrial physicists and with physics industries, very little progress has been made.

Council recommends that IUPAP establish a Working Group on Physics and Industry

This working group will be charged to report to the 30th General Assembly with recommendations on how IUPAP can strengthen its connections with physicists working in industry, and with industries which make strong use of physics to develop and deliver their products.

It will consider, among other options,

1. The possibility of creating a Commission on Physics in Industry
2. The continuation of the Working Group on Physics in Industry with a specific mandate
3. Identifying particular commissions and working groups which would benefit from close involvement with industry, and guiding that involvement
4. Identifying particular tasks undertaken by IUPAP which would benefit from close involvement with industry, and guiding that involvement
5. How physics industries may be closely connected to IUPAP, for example through a corporate membership structure.

The Executive Council will receive reports from the Working Group on Physics in Industry in 2018 and 2019 and it is requested that the General Assembly authorises the Executive Council to act on recommendations in those reports except for recommendations which prolong the Working Group, transform it to a Commission, or change the membership structure of IUPAP.

The 29th General Assembly RESOLVED

1. **To establish a Working Group on Physics in Industry to serve until the close of the 30th General Assembly**
2. **To charge the Working Group on Physics in Industry to report to the 30th General Assembly with recommendations on how IUPAP can strengthen its connections with physicists working in industry, and with industries which make strong use of physics to develop and deliver their products.**
3. **To delegate to the Executive Council the responsibility of appointing the Chair and the members of the Working Group on Physics in Industry.**

Resolution 14: *To establish a Working Group on the Centenary of IUPAP*

At its first meeting since the 28th General Assembly the Council asked Kennedy Reed to advise it on options for ways in which IUPAP should commemorate and celebrate its Centenary. Options considered have included the production of both a scholarly book on the history of IUPAP, which is regarded as desirable because IUPAP does not have extensive archives, producing a glossy, popular account of the past and future of IUPAP, and running various celebratory functions in 2022 (the centenary of the foundation of IUPAP) and in 2023 (the centenary of the first IUPAP General Assembly)

To assist in the development of these plans the Council in October 2016 agreed that one of the Vice Presidents at large should have responsibility for the Centenary, and it also agreed to recommend that the 29th General Assembly should establish and Working Group on the Centenary of IUPAP, which should continue in existence at least until the 31st General Assembly in 2023, and advice Council and the 30th General Assembly in 2020 on how to commemorate and celebrate the centenary of the creation of IUPAP in 2022 and the centenary of the first General Assembly in 2023.

The 29th General Assembly RESOLVED

1. **To establish a Working Group on the Centenary of IUPAP to serve until the close of the 31st General Assembly**
2. **To charge the Working Group on the Centenary of IUPAP to advise Council and the 30th General Assembly on how to commemorate and celebrate the centenary of the creation of IUPAP in 2022 and the centenary of the first General Assembly in 2023**
3. **To delegate to the Executive Council the responsibility of appointing the Chair and the members of the Working Group on the Centenary of IUPAP.**

Resolution 15: *Resolution regarding SESAME*

Having received a report from Sandro Scandolo, who represented IUPAP at the opening of SESAME:

The 29th General Assembly congratulates the Council, Director and management on the successful opening of SESAME, and RESOLVES that IUPAP will continue its support of the SESAME travel program at the existing level until the 30th General Assembly, and DELEGATES to the Executive Council the Authority to conclude any agreement necessary to formalise this resolution.

Resolution 16: *Redefinition of SI Proposed by the Chair and Vice Chair of C2*

Noting that:
The SI came into being in 1960 with IUPAP providing important impetus for that international adoption of a complete and coherent system of units. It is fitting that IUPAP continue its role in support of internationally agreed-upon units by supporting the current plans for redefinition.

The most immediate need for redefinition arises from the problem of the kilogram. Today, the kilogram is defined as the mass of the International Prototype

Kilogram (IPK), a platinum- iridium cylinder kept in a vault at the International Bureau of Weights and Measures (the BIPM). For some time, and most especially in recent years, it has become clear that the mass of IPK has been drifting and changing with respect to other mass standards manufactured at the same time as IPK, and subsequent to that time. The circumstance of having the standard of mass itself subject to changes in, for example, the surface contamination of an artifact, is unacceptable in the modern era. It is akin to the situation when the unit of time, the second, was defined as a fraction of the mean solar day,

a time interval known to be changing due to the variability of the rotation rate of the earth. That problem was solved by defining the hyperfine interval in atomic cesium to be a fixed and exact frequency. The electric unit, the ampere, is now defined in terms of the forces between current-carrying wires. Because the realization of that definition is so difficult, a parallel system of electrical units based on conventional (but not Si) values for the Josephson ratio 2e/h and the quantum Hall resistance, h/e2, is commonly used instead of the SI. The redefinition will join the SI and this parallel system of practical units, removing ambiguity and allowing the highest possible accuracy realization of SI electrical units.

The redefinition of the kelvin, the unit of temperature, will resolve issues with the difficulty of realizing the current definition, which is based on defining the triple point of water. The redefinition of the mole represents a major simplification and a democratization relative to the element chosen to define it.

The SI redefinition will modernize the SI, eliminate drifts and uncertainties in the definitions of four base units, and reduce the uncertainties in the values of the fundamental constants.

Further information about the introduction of the new definitions of the units is available from the website of the Bureau International de Poids et Mesures,

www.bipm.org/utils/common/pdf/24_CGPM_Resolutions.pdf
and
http://www.bipm.org/cc/CCU/Allowed/23/CCU_Final_Recommendation_U1__2017.pdf
or for the definitive recommendation in French
http://www.bipm.org/cc/CCU/Allowed/23/CCU_Final_Recommendation_U1_2017_FR.pdf

The 29th General Assembly RESOLVED that the International Union of Pure and Applied Physics strongly supports the proposed revision of the International System of Units (Système International d'Unités, the SI) in which the current definitions of four of the base units of the SI will be replaced with definitions involving the specification of fixed and exact values of four of the fundamental constants of nature. Specifically, the current definitions of the kilogram, the ampere, the kelvin, and the mole will be replaced with definitions that fix the values of the Planck constant, the elementary electric charge, the Boltzmann constant, and the Avogadro constant. IUPAP supports the institution of the redefined SI on the timescale recommended by the Consultative Committee on Units (CCU) so that it takes official effect on World Metrology Day, 20 May 2019.

Resolution 17: *Funding of Science, especially in Brazil*

The funding of science research and education is under significant threat in many countries. Budget cuts of 5-10% have been common and are to be deplored. Higher cuts, particularly in developing countries, are of even more concern. The disruptive effects of such cuts can delay and diminish education, research and development for many years after an improved economic situation allows their restoration. When IUPAP can make a positive contribution that should be brought to the attention of Council for action.

In Brazil, the budget for research of the Ministry of Science, Technology, Innovations, and Communications had a cut of 44% in 2017, and a new cut of 15.5% is expected for 2018. This will damage the country for many years, with the dismantling of internationally renowned research groups and a brain drain involving its best scientists.

The 29th General Assembly RESOLVED to write to the President of Brazil and the Minister of Science Technology, Innovations, and Communications to explain that the effects that this large cut will have, and that they will seriously jeopardize the economic future of the country, and to publish that letter on its website.

Resolution 18: *Physics in Africa*

The African Union target of 1% of Gross Domestic Product for the Science and Technology budget in each member state has not been reached, except in very few the 54 countries in Africa. Basic Sciences, including Physics, support human capital development, knowledge generation, and the building of research capacities, all of which contribute to vital economic development. Expanded IUPAP membership in Africa is desirable in terms of the IUPAP mandate of fostering the worldwide development of physics, international cooperation, and the application of physics toward solving problems of concern to humanity.

The 29th General Assembly RESOLVED to mandate Council to write to the Chair of the African Union Commission, appealing for support for Basic Sciences in Africa, continuation of the AU effort to bring at least 1% of GDP to the budget of Science and Technology in each African state, and empowerment of Women in Science in Africa.

Resolution 19: *Resolution regarding MOU with UNESCO*

The 29th General Assembly DELEGATES to the Executive Council the authority to conclude a Memorandum of co-operation in pure and applied physics between the International Union of Pure and Applied Physics (IUPAP) and the International Basic Sciences Programme (IBSP) of UNESCO's Sector of Natural Sciences.

Resolution 20: *Resolution regarding the International Year of Basic Science for Development (IYBSD)*

Having received the document 16.2 IYBSD describing the proposed International Year of Basic Science for Development, the 29th General Assembly RESOLVES to pursue and strongly support the plan to establish 2022 as the International Year of Basic Sciences for Development, along the guidelines outlined in the document 16.2 IYBSD.