

## IUPAP sets goal to increase female participation in Physics meetings

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The 29th General Assembly of the International Union of Pure and Applied Physics, held at the USP campus, establishes a minimum percentage of 20% for the presence of women in their conferences and commissions ( photo: University of Nebraska - Lincoln )

**José Tadeu Arantes | Agência FAPESP** - The International Union of Pure and Applied Physics (IUPAP), at its [29th General Assembly](#) , held for the first time in Latin America, paid special attention to the disproportion between female and male participation in international conferences held under his seal.

IUPAP also set a minimum target of 20% for the presence of women among the participants in the advisory committees (program and conference organizers) and asked the organizers to ensure the increase in the female ratio of invited speakers. The assembly took place at the University of São Paulo (USP), from October 8 to 13, 2017, with the support of FAPESP.

In the triennium 2015-2017, the global average of female participation in the institution's events was 17% among conference members, 18% among committee participants and 17% among invited speakers. These and other numbers were obtained in a survey by [Alinka Lépine-Szily](#) , senior lecturer at the Institute of Physics at USP (IFUSP) and vice president of IUPAP.

"I analyzed data from 65 international conferences held between 2015 and 2017 in the 18 Physics areas covered by IUPAP and compared five regions: North America, South America, Europe, Asia Pacific and Africa. The results were quite surprising. I always thought Europe was the best placed on gender equity, but it was the worst in the 'proportion of women in committees' and 'guest speakers' categories. While the

numbers in South America were above 22%, European percentages were in the range of 13%, 15% and 17%, "Lépine-Szily told **FAPESP**.

Over the three years, there were 31 IUPAP-sponsored conferences in Europe and 34 in the rest of the world. That is, the number of European conferences was almost equal to that of all the other regions together. What pressed the percentages of Europe down were relatively small conferences with about 100 participants, in which there were no women in the committees and very few among the participants and speakers.

"It was as if IUPAP sponsored club meetings. I do not believe that this corresponds to the real situation, to the number of women working in Physics. For this reason, the 29th General Assembly established, as a recommendation for all affiliated national institutions, that the 20% target be achieved. And it has been defined, as the hardest rule, that meetings with female participation of less than 10% are not accepted. The organizers will have a deadline of a few weeks to make the correct corrections," said Lepine-Szily.

So far, reference research on gender imbalance in the physics community has been the global survey conducted in 2011 by Rachel Ivie and Casey Langer Tesfaye of the American Institute of Physics's Center for Statistical Research (AIP) published in February 2012 in *Physics Today*, entitled [Women in Physics: a tale of limits](#). The survey questionnaire, available in eight languages, was answered by 14,932 physicists, men and women, from 130 countries. And among its results, the most expressive of inequality was the one related to the impact exerted on the trajectory of young physicists by the birth of children.

In the least developed countries, 65% of women and 20% of men had significant outages or interruptions in schooling due to the birth of their children during the doctoral period. In highly developed countries, the percentages were 55% for women and 15% for men.

Since 2011, much has changed. Therefore, a new research, entitled "Gender Gap in Science", is being designed within the framework of the International Council for Science (ICSU), which brings together national and international entities dedicated to various scientific activities, among them IUPAP.

The survey aims to reach 45,000 scientists, men and women, from more than 130 countries, using at least 10 languages. And it will also make an exhaustive survey of the material published by more than 500 thousand scientists, since 1970.

Igle Gledhill, a professor at the School of Mechanical, Industrial and Aeronautical Engineering at the University of the Witwatersrand in South Africa, is the IUPAP representative on the initiative. Former chair of the South African Institute of Physics, Gledhill currently chairs IUPAP's Working Group 5, which focuses on women's participation in Physics.

"We are holding workshops in various regions of the world to define the questions that should be included in the new questionnaire," he told **FAPESP**. "It is very important to base our actions on evidence. We need to act in a logical way so that we can formulate the best recommendations. Inclusion is the fundamental principle. Men can not be excluded. Instead, they need to be considered an integral part of the change to be achieved. "

According to Gledhill, the research should detect contrasts and similarities, considering the different regions and cultures, the distinction between more and less developed countries and the different disciplines sheltered under the umbrella of science.

"The initiative will be attended by the regional offices of ICSU and also by UNESCO [United Nations Educational, Scientific and Cultural Organization]. We hope the research will be consistent with the 2011 survey and, at the same time, incorporate the recent social-political changes and detect the main trends, "he said.

### **Nobel Prizes and the new challenges in Physics**

With the participation of two winners of the Nobel Prize in Physics - William Phillips (1997) and David Wineland (2012) - a workshop was held, together with the 29th General Assembly of IUPAP, entitled "New Challenges in Pure and Applied Physics" (" New Challenges in Pure and Applied Physics ").

According to the Australian physicist Bruce McKellar, president of IUPAP, the choice of such a generic topic was the form found to integrate the different commissions of the association, working in the most diverse areas of Physics. "The presidents of IUPAP's 18 commissions, covering all modern areas of physics, were present at the

General Assembly. And we decided to take advantage of this rare opportunity to give them the floor," he said.

"In the past, IUPAP meetings dealt exclusively with administrative matters. At this 29th General Assembly, we also seek to add workshops. Physics is an extremely broad discipline, which is subdivided into many areas. Instead of creating an institution for each area, what we did was create commissions, all of them grouped together in the same institution. The idea that led us to adopt such a broad theme was to enable each commission to communicate to others what is being done in their area," he added.

Asked what would be, in his view, the greatest of the "new challenges in pure and applied physics," McKellar highlighted two major fields of inquiry: that of dark matter and dark energy; and that of the small-scale structure of matter

"All of the physics produced to date is based on only 5% of the content of the Universe. Understanding the other 95%, which we identify through the expressions 'dark matter' and 'dark energy', is a huge challenge. Another challenge is to investigate the structure of matter on a very small scale. It is a more applied field, which makes it possible to create new materials and new technological solutions, but also involves fundamental knowledge," he said.

Throughout his half-century research and co-ordinator activity, McKellar has accumulated extensive international experience, beginning with his participation in the Institute for Advanced Studies at Princeton University in the United States at the invitation of Robert Oppenheimer (1904-1967). In Australia, he played an important role both in the institutionalization of research and in the collaboration of Australian physicists with colleagues from other countries. In 2014, he became president of IUPAP.