Physics in US-Cuba Relations

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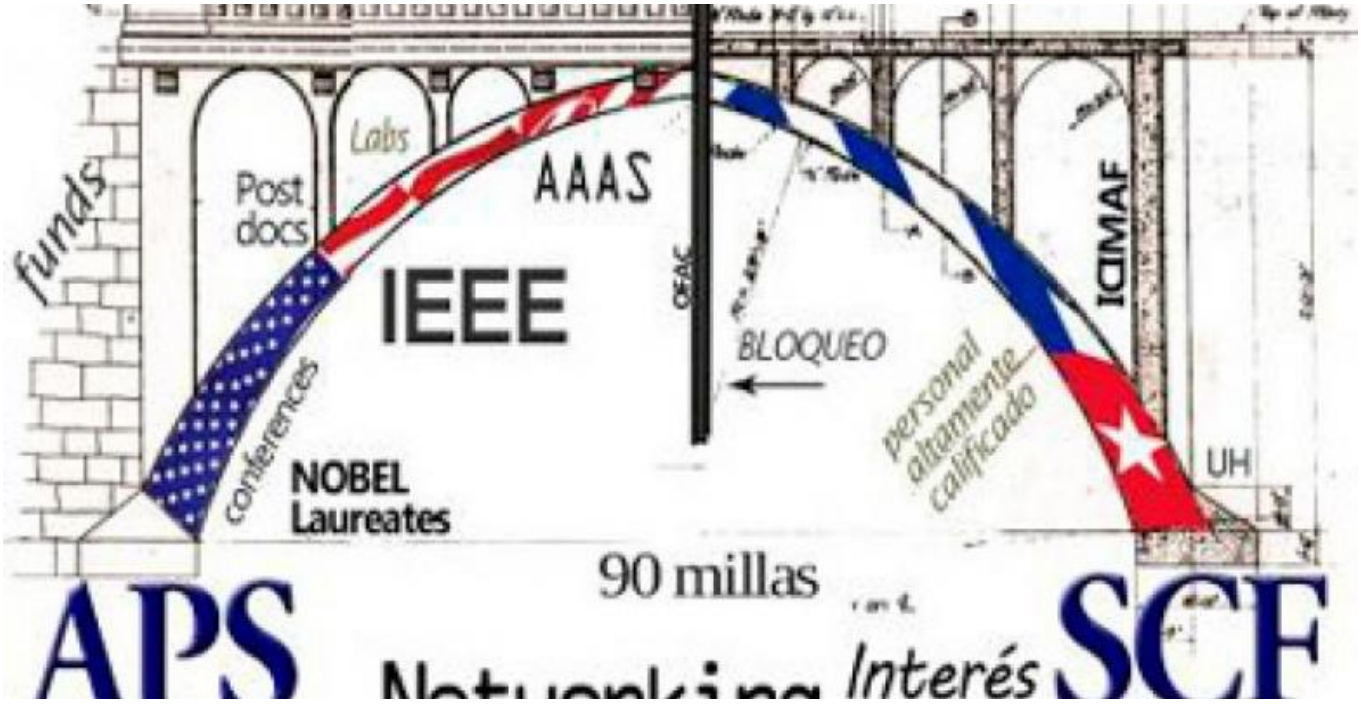

“Building Bridges in Physics” is the name that the Cuban Physics Society (SCF) intends on giving to a conference that will take place in 2015 to strengthen relations with its colleagues in the USA.

“We are inviting members from the American Physical Society and from different universities with whom we have managed to keep relationships in spite of all the obstacles we have faced”, said Dr. María Sanchez Colina, current President of the SCF. “It is not going to be a scientific event where papers are presented, but rather an opportunity for us to get closer to representatives from institutions with which we have worked and with others that we would like to work with, and take advantage of the opportunity this new situation has given us.”

Sanchez refers to the environment created by the announcements made on December 17th that could have an important impact on the field of science on both sides of the Florida Strait.

The SCF –an NGO made up of not only highly qualified professors and researchers but also of high school physics teachers from all over the country- wants to “break the ice” with this event, said Sánchez Colina.

However, the story of the thaw in Cuba-U.S. relations in the field of physics actually began a long time ago, through contacts whom she describes as “discrete” and which has essentially involved professionals visiting one country or the other.

Cuba has welcomed many winners of the Nobel Prize for Physics, such as León Lederman (1988) and Murray Gel-Mann (1969); as well as Walter Kohn, a theoretical physicist who won the Chemistry Nobel Prize in 1998; María Tamargo, professor at City University of New York (CUNY), just to mention a few. These American scholars have given conferences in the Department of Physics at the University de La Habana (UH) and they have met with other Cuban scientific institutions.

But two or three isolated visits, subject to waiting and doubts regarding approval, don't add up to cooperation: "There are many professors and researchers who are not even willing to take the risk and ask for a permit. I am sure that they will want to come in flocks now", said Sánchez Colina.

The SCF has also coordinated work exchanges with the American Physical Society (APS). Myriam Sarachik, one of their presidents, visited Havana, met with the Cuban Academy of Science (ACC) and gave a conference about her organization. Leo Kadanoff, Emeritus Professor at Chicago University, who was also the APS president in 2007, visited Havana in 2012.

With regard to making closer ties with the APS, Sánchez Colina said it is important not to lose sight of the fact that, although being a very influential and prestigious organization, it is still only the society of one country, and that their relationship would not overcome the importance of belonging to other regional and international bodies, such as the Latin American Physics Centre (CLAF), the Latin American Physics Society (SLF), The Ibero-American Physics Society (SIF) and the International Union of Applied Physics (IUPAP). Nevertheless, given the proximity and the APS' standing, having more contact would of course be an objective.

"Many times we have been offered membership", explained Sánchez Colina. "We have had many professors who have been invited to become members. I know that Carlos Trallero Giner –the current director of CLAF– is, just like Ernesto Altshuler, who, despite the obstacles, did a PhD in the United States. Víctor Fajer, who was president of the SCF three terms ago, signed agreements with the APS and also attended one of their conferences."

For those physicists who are residents in Cuba, paying the US organization's annual membership fees is not going to be a simple task, firstly because of the price ($145 for Regular members and Fellows; $73 for Early Career and Senior members; $36 for Graduate Student members; $25 for Undergraduate Students), far exceeds the salary of Cuban professionals, and secondly, because of the lack of ways to make payments to the US from the island.

According to the APS website, benefits of membership include the use of its extensive membership directory, attendance at the organization's events, participating in training and scholarship programs, and access to a great deal of up-to-date information, via free publications and paid scientific magazines/articles which affiliates can purchase at a discounted rate.

IEEE

Dr. María Sánchez Colina thinks that re-establishing relations could encourage the resumption of Cuban representation at the Institute of Electric and Electronic Engineers (IEEE), the largest association of technical professionals in the world. The Cuban chapter was discontinued in 2001, after the attack on the Twin Towers.

"Many professors and researchers from the Department of Physics had become Senior

Members of this organization," she said. "Our chapter, created in 1998, included 12 professors. We organized events; I traveled to San Francisco for a meeting in 2000. We were also given annual funding which we used to spend wholly on the payment of our memberships and on our subscription to two scientific magazines which we would choose as a group."

The IEEE brings together professionals from all over the world, but their headquarters are in New York, and therefore the international policies established by the US after the events of 9/11 led the organization's Board of Directors to expel the Cuban chapter, Cuba being a country that already appeared on the list of countries that sponsor terrorism.

"When they announced our exclusion, we received a lot of support from other Latin American countries that were against the decision, claiming that the IEEE was an international institution."

The incident did not leave any hard feelings on the Cuban part. Far from it, according to the president it is one of the connections that need to be re-established: "We haven't suffered any negative effects from the separation. We would like to strengthen these ties. In fact, there are people in Mexico City that have already been in contact with us telling us that they think this is the perfect time to reopen Cuban representation at the IEEE."

Besides ties with organizations, rapprochement with the United States could give Cuba access to laboratories, the opportunity to buy equipment and to establish cooperation on research projects.

"Since the crisis [in the '90s] our way of working has changed," explains the doctor. Before that, it was different, thanks to our ties with the Soviet Union, but when that dissolved, we had to look for new markets and today, most of our research findings are due to our international collaboration with Latin America and Europe. Our researchers and professors travel to these countries, make use of the equipment there, take their measurements and then return to Cuba to analyse their findings. The same thing happens with PhD dissertations: there is not one PhD here that is 100% "Made in Cuba". We do not have the necessary equipment to do so. Therefore, having the opportunity to cooperate more closely and at a high level would of course benefit us."

In Dr. Sanchez's office at the Institute of Material Science and Technology (IMRE) where we met for this interview, there is some lab equipment which has the Soviet stamp clearly visible on huge pieces of equipment, resistant as a tank from the Second World War. This out-dated equipment is the reason that the experimental part of training Cuban physicists is currently their weakness.

There is also an US-manufactured oscilloscope which, as the story goes, somebody acquired second hand in Mexico for $2000, first defying America's embargo law against Cuba and second local custom checks, where in order to avoid problems, the traveller declared that the machine was in fact "a printer."

"When laboratories in the First World renew their technology," explained the president, "they donate or sell their used equipment for a cheaper price. You can purchase them on websites, and it is easier to bring them from nearby. This would get rid of a number of the obstacles that we face to order to continue our work".

Sánchez Colina, who was also the Dean of the Physics Department at Havana University until July 2014, pointed out the need for change on our behalf in order to facilitate exchanges: "In

order for an American professor to come to the university, we have to ask for a permit three months beforehand, and that is not always possible in today's world. Of course we know we have to be careful to some degree because somebody could come under the disguise of science in order to achieve other ends, but we cannot be irrational when having to comply with the regulations in place. I have personally experienced this when my application for a visitor was denied just because the obligatory time period was not fulfilled, which was absurd because the person had already visited us [with permission] in the past".

The United States, a country where every possible field of research is developed and explored within physics, is also a leading host of meetings and conferences. "Scientific events are essential for training", highlighted Sánchez Colina. "Writing an article is not the same thing, you might form a connection with two or three jury members and receive some feedback, however important they may be. Being able to have face-to-face contact with professionals from your field is irreplaceable."

She also added that closer ties to the United States would reduce travel costs significantly in comparison with what they currently pay to fly to Europe (when they can), as the expensive registration costs "which have increased from $150-$200 to an average of 500 euros," have practically eliminated all Cuban presence within these forums.

However, the US embargo, still in force, remains a great obstacle in their path: "Paying a Cuban resident in Cuba goes against embargo regulations", she said, "This prevents our professors from studying part of their PhD abroad whilst receiving a scholarship. Somebody managed it once, but it is tricky business."

Likewise, she explained, Cubans cannot receive economic rewards for their knowledge: "There is a website where businesses post their problems so that the public can offer solutions. Anyone from any country can take part. If a Cuban resident wants to send their proposal, there would be no way of paying them."

Colina feels that any support that a relationship with the US could bring about to her field would be purely theoretical, as she considers the education given to physics students at Havana University to be on the par with the world's best universities.

"It is not that we do not have anything to envy about these universities", she said smiling. "Yes, we envy their equipment. But the education our students receive is that of the highest international level. Limits on our careers have to do with experimentation. Our equipment is out-of-date, but the training they receive gives them the tools they need to handle the most up-to-date equipment. This has been proved because our students travel all over the world and are successful. Our graduates are not going to be handicapped. In fact, it would be very advantageous for a US professor to be a co-tutor with any of our graduates.

As to the fields of research that both countries could work on together, she said: "We are a small community here in Cuba. Our discipline has been widely developed in the field of Solid state and Condensed Matter Physics; this is where our department truly excels. The El ICIMAF (Institute of Cybernetics, Mathematics and Physics) has a Theoretical Physics Group, which has had very good results; it is a small group, of about 10 people. In the central region of the country they work in Cosmology, and in the east in Medical Physics has been better developed".

"We are waiting to see what happens", she summed up, "anxious for it to happen; so that more US professors can come and visit us and be able to continue receiving great figures within the

world of physics.”