

Would Einstein Have Approved?

A Discussion About the International Year of Physics*

Minella Alarcon's interview with Judy Franz, Martial Ducloy, Francis Allotey, and Masno Ginting

How successful was the International Year of Physics? In celebrating the 100th anniversary of Einstein's *annus mirabilis* in 1905, the Year was intended to serve as a rallying point for the public by recalling the important benefits physics has brought society over the past century.

Four leading physicists speak frankly about their individual experiences with the Year: Prof. Judy Franz from the USA is secretary general of the International Union of Pure and Applied Physics (IUPAP) and executive officer of the American Physical Society; Prof. Martial Ducloy from France chaired the International Steering Committee for the Year and is former president of the European Physical Society; Prof. Francis Allotey from Ghana is president of the Society of African Physicists and Mathematicians; and Prof. Masno Ginting from Indonesia is president of the Indonesian Physical Society.

What did the physics community you represent hope to gain from the Year and how did it go about achieving this goal?

Judy Franz (J.F.) We wanted to make nonscientists more excited about physics. We helped organize national events and many local ones and provided a website, which listed over 600 events, so that

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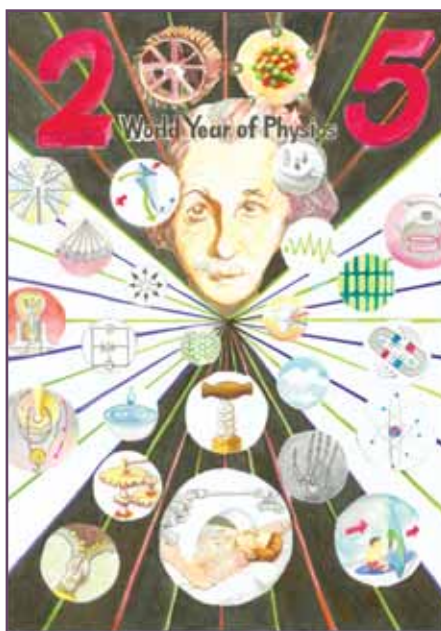


people across the country could see what was happening in their region. We also organized programs that were carried out in approximately 10 000 school classrooms. Overall, I think the international physics community did an excellent job of promoting the public understanding of physics. Of course, in some countries, physicists achieved much more than in others.

Martial Ducloy (M.D.) The goal of the Year was to improve communication between the physics community and society at large, including young people, in order to narrow the gap and recall the importance of physics in solving the societal problems of the 21st century. There was a large mobilization of physicists worldwide.

Francis Allotey (F.A.) The aim was to motivate more young people, including girls, to study physics and choose physics as a career. We hoped to make decisionmakers, and the general public in our part of the world, more aware of the important role physics plays in our daily lives and in industrial development. We informed the Minister for Environment and Science and Minister for Education and Sports about the aims of the Year. A national planning committee with various stakeholders was formed. We received financial support for local activities

from the government and from industry. The media was invited to our activities. We organized a series of lectures and physics exhibitions for students, teachers, and the general public on science in general and physics in particular, including topics such as Physics and Health Care, Physics for Wealth Creation, and Physics for Development. A physics outreach program was started: A Physics Talent Search and Physics Quiz



First prize poster in the age 13-16 category of Science Across the World's Year of Physics poster competition. The artist is Stephanie Dorothy Yu of Hong Kong.



were organized for young people throughout Ghana. The hour-long award ceremony for the winner of the Physics Quiz was televised live nationwide. Ghanaian young scientists participated in the International Junior Science Olympiads in Indonesia in 2004 and 2005, the Year's launch conference in Paris, and in the Young Physics Ambassador Symposium in Taipei from 30 December 2005 to 4 January 2006.

Masno Ginting (M.G.) We introduced competitions like the National Olympiad in Physics for junior and senior secondary school pupils and the International Junior Science Olympiad, in which pupils and the general public were invited to participate. The Indonesian Physical Society, in cooperation with the Indonesian Institute of Sciences (LIPI), organized a two-day seminar to which Nobel Laureate for Physics Prof. Douglas Dean Osheroff was invited as the keynote speaker. LIPI invited young scientists from all over Indonesia who had received science awards for their work, either in Indonesia or abroad, to attend this event. All of them presented their work during the seminar.

How important was it for UNESCO to lend its support to the Year?

J.F. Very important. For instance, in many countries the local government would not have given any funding without the official declaration by the United Nations and UNESCO. In all countries, this United Nations support helped attract media attention.

M.D. The support of international organizations, and of the United Nations in particular, gave an official seal to the Year and was essential for mobilizing the physics community in many countries. One may regret the absence of financial support.

F.A. UNESCO's support was critical. It showed the Ghanaian public that the Year was an important world event. This enabled us to receive financial support and full participation from the Ministry of Education and the Ministry of Science. Donations were also received from some local private organizations.

M.G. In my opinion, the United Nations/UNESCO support for the Year was very important for scientists all over the world and especially for physicists. The declaration of 2005 as the International Year of Physics stressed the importance of young people studying physics.

UNESCO supported the proclamation of the International Year of Physics 2005 as requested by the 58th session of the UN General Assembly. UNESCO organized activities for the celebration in close collaboration with the International Union of Pure and Applied Physics, the European Physical Society, and other regional and national physics societies all over the world. Approximately 90 countries implemented various activities. The Year provided UNESCO with a significant opportunity for international collaboration and networking among physics communities around the world. Worldwide, the activities of the International Year of Physics have developed a great momentum for physicists to reach out to the public at large.

Through its Physics Programme, under the Division of Basic and Engineering Sciences of the Natural Sciences Sector, UNESCO provided technical and financial assistance to the preparatory conferences and was fully involved in organizing two of the major events of the Year. The first was the launching conference, Physics for Tomorrow, held from 13–15 January 2005 at UNESCO Headquarters. This launch event, attended by more than 1 000 participants, brought together young people, the public at large, and distinguished scientists and Nobel laureates. It provided a rare opportunity for discussion and sharing of ideas on the role of physics in society and its impact on everyday life, the influence of Einstein on the science of the 20th and 21st centuries, physics teaching, and its links with other disciplines. UNESCO was also involved in the World Conference on Physics and Sustainable Development, held in Durban, South Africa, from 31 October to 2 November 2005. The conference offered a unique opportunity for the international physics community to come together and focus on how physics can bring more benefits to the developing world.

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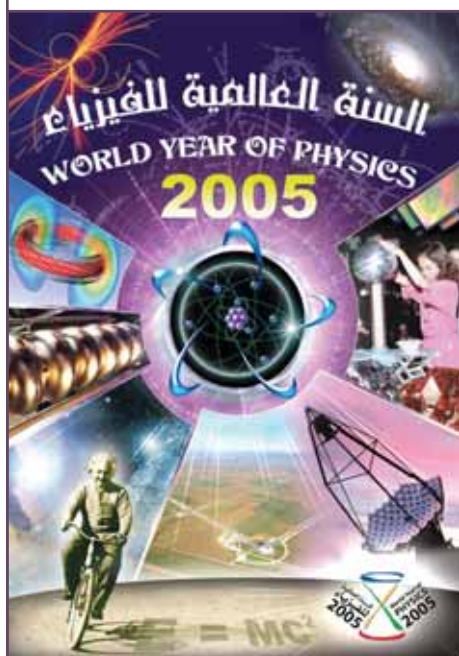
Wasn't the declining number of young people studying physics one of the issues highlighted by the Year? Are countries taking any policy measures to redress the situation?

J.F. In the USA, we ran a very successful program for secondary-level pupils in which more than 700 schools participated. In the USA, the American Institute of Physics keeps very good statistics about the number of pupils taking physics in secondary school and the number of undergraduate physics degrees awarded, as well as a great deal of additional data. The number of physics degrees awarded to undergraduates has been rising for the past five years or so, so it may be difficult to see the effect of the Year on top of this background increase. We shall nevertheless try to do so.

M.D. Many activities have sought to attract the attention of young people, but it is still too early to assess

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the impact of these. In some countries, like France, there has already been an increase in the number of students enrolling in science at the university level, as observed



First prize poster in the age 13-16 category of SAW's poster competition. The artist is Asma Mimouni of Algeria.

active part in mobilizing physics teachers and pupils. More female pupils are getting involved in science at school. This is evident in the number of females (40 percent) who attended the Year launch ceremonies and took part in the Physics Talent Search and physics competitions we organized. Over 6 000 students and pupils took part in the talent search, which was organized at the district level right through to the regional and national levels. It is too early to talk about policy or to have data, but the Ghanaian Minister of Education and Sports has indicated in the media that he will be instituting financial incentives to motivate more pupils to take science in secondary school and at university.

M.G. Yes, that was the idea behind the Year. I am convinced that secondary-level physics will be more interesting for pupils from now on. But I am not so sure these same pupils will go on to study physics at university and take up a career in physics. The main problem is that, while they may find physics an interesting subject to study, many bright students think there is no future for them in physics. It may be a good idea to invite physical societies around the world to gather this information. The Indonesian Physical Society has encouraged

last September. The need to change teaching methods in science has already been felt in France and has led to the *La main à la pâte* program in primary schools, which is being extended to a number of European countries and beyond. Similar approaches are now being developed for physics teaching in secondary schools.

F.A. Yes, the declining number of physics students was one of the motivations behind the Year. The Ghana Institute of Physics is taking an

students to enroll in physics at university. For example, we already have an agreement with the dean of the Faculty of Mathematics and Science at the University of Indonesia to allow admission without sitting the regular university entrance test for students taking part in any international physics competitions. We are also exploring support from local governments and private companies for scholarships for bright pupils planning to enroll in physics at university.

Do you think the Year has succeeded in generating a durable interest in physics among the general public and the media in your country?

J.F. In the USA, there is no durable interest in almost anything. We shall have to maintain our efforts for the interest to survive. However, we have learned a lot about what efforts are most successful. I believe there were articles in most major newspapers. Science-oriented magazines and newsletters all gave the Year excellent coverage. It would be interesting to learn how many countries had at least one major public outreach event—we know this was the case for about 90 countries and perhaps more—and how many of these organized events they had never tried before. From the enthusiastic responses I have seen, many countries and physical societies will be continuing some of their more successful activities now that the Year is over. I know that the American Physical Society has added a staff person to continue our Physics Quest as an annual activity. This is aimed at middle school students (years 6-9 of schooling), an age group for which the American Physical Society has never had programs before. Activities during the Year depended heavily on national and international physical organizations and key individuals who volunteered a tremendous amount of their time. In fact, the large portion of volunteer time is a good measure of the importance of the Year for the international physics community. In addition, many organizations and governments contributed funding. Working together, IUPAP, UNESCO, and its Abdus Salam International Centre for Theoretical Physics were able to raise almost USD 500 000 for the World Conference on Physics and Sustainable Development in Durban last October, with contributions from more than 25 different organizations.

M.D. In France, and more generally in Europe, the impact on science communication has been tremendous: More than 500 public events were held in 2005 in France, 700 in Germany, 200 in Poland, etc. Throughout Europe, 37 countries participated actively in the Year, 18 of which received grants from the European Union. Public inter-

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est in physics has definitely been raised. Our concern now is the durability of this interest. The tremendous momentum given to science communication should be carried on. On the media side, there has been a noteworthy interest, although this was more focused on Einstein himself than on physics. This has demonstrated that collaboration between science and communication can be done on a large scale.

F.A. The Year was very successful. Five commemorative stamps were issued. A weekly one-hour science program was initiated by a national radio station. Activities of the Ghana Institute of Physics have increased. Moreover, the Ghana Association of Science Teachers has requested that the outreach programs of Science on Wheels and the Physics Talent Search continue, which they are doing. With financial support from the Ministry of Science and Technology and the Ministry of Education and Sports, Science on Wheels visited various schools and colleges. Physicists from the Ghana Institute of Physics arranged science demonstration equipment on a van, both of which were provided by the Ghana Education Service. As for the talent search, it has raised awareness among students, parents, education planners, and the government of the importance of physics. As a result, for the first time, Ghanaian media and secondary school pupils are showing great interest in the solar eclipse we shall be able to observe in Ghana on 29 March 2006. On this occasion, the Ghana Institute of Physics and the Society of African Physicists and Mathematicians are organizing a conference at the University of Cape Coast. This will be webcast around the world and will showcase Ghanaian science.

M.G. The media—television, newspapers, and radio—gave all the events enthusiastic coverage, making the Year more popular. I was interviewed on a very good radio show along with teachers, parents, and others from different islands, among them Aceh, Kalimantan, and Bali. The show was broadcast all over Indonesia. There is a program called *Pesona Fisika*, or *Physics Edutainment*, which has been broadcast every Sunday evening for two years now on *Televisi Republik Indonesia* to very good viewer ratings. I think the Year was very suc-

cessful. Pictures of Einstein and of the Year's logo could be seen everywhere. People talked about the Year. Many pupils became more interested in physics than before. In my opinion, the International Physics Young Ambassadors' Symposium in Taipei, mentioned earlier by Prof. Allotey, was one of the Year's biggest achievements because it captured the spirit of solidarity. Many countries participated in the culminating event for the Year's Physics Talent Search, which targeted girls and boys ages 10–18 who were not enrolled in university. The symposium provided these gifted pupils with an authentic scientific and international experience, which enabled them to share their interests, work on experiments together, and create lasting friendships. 🌐

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About the Illustrations

The Science Across the World competition to mark the World Year of Physics 2005 was an overwhelming success, with nearly 2 000 entries—many of very high quality—from 34 countries, ranging from Algeria, Croatia, Iran, Mexico, Romania, Singapore, UK, to the USA. Winners were selected by members of the European Physical Society's Executive Committee at their General Meeting in Bern, Switzerland. Posters reprinted with permission. For more details see <www.scienceacross.org>.



First prize poster in the age 8–12 category of SAW's poster competition. The artist is Nikita Herfet-Jones of the UK.