Counterbalancing Globalization

Gediz Akdeniz, the President of the Balkan Physical Union, outlines the Union's role in promoting vital scientific and cultural traditions.

The globalization process that started when the Cold War ended will affect the physics community. According to the *Tokyo Declaration of Physical Societies* made at the *World Congress of Physical Societies* (RACIP-2; 18–22 September 1995) in Tokyo [see *EN* **26** (1995) 114]: *"The physics community will exploit [these] new tools to improve inter-personal contacts and dissemination of knowledge through electronic publishing, communication, research and education."* In my opinion, one of the most important conclusions of the congress was that in the golden age of communications, globalization in science can be exploited by the major powers through high-cost international scientific collaboration, standardization in physics education and electronic publications, *etc.* to foster their own economic and cultural interests. Only by establishing regional scientific and cultural collaborations coordinated by non-governmental organizations will developing countries possibly succeed in preserving their own scientific and cultural traditions.

Such regional organizations can also help initiate a period of everlasting peace for the people of regions who share a common culture across many nations. The Balkans is an important example of such a region. In the ancient Turco-Bulgarian language, "balkan" was defined as a wild, rocky and mountainous region, so the word was used to denote the mountains crossing Bulgaria from east to west. Later on, geographers began to apply it to Europe's south-eastern peninsula. People lived together in this region for many years under the Byzantine and the Ottoman authorities – an historical fact that led to the creation of a common Balkan culture. The French Revolution then influenced the region, and new countries were born. Changes in the Balkans have continued from the end of World War I to this day. Moreover, during the Cold War the region's people were kept apart in two different worlds by centralized political aims. With the end of Cold War they gained the opportunity to recapture their cultural inheritance. Unfortunately, in spite of recent improvements towards peace in the Balkans, the dangers from the political, religious and ethnic conflicts still prevail.

One of the most active non-governmental organizations in the Balkans is the Balkan Physical Union (BPU). In 1985, A. Milojevich, a man of great humanity, invited representatives from the Balkan countries to a conference in Pristine to promote his idea of a Union. The outcome of the meeting was a protocol for establishing the BPU. The final formal agreement came at a subsequent meeting in Bucharest in 1987, and I. Ursu was elected as the first BPU President.

Today, the BPU's members are the nationaL physical societies in Albania, Bosnia-Herzegovina, Bulgaria, Greece, Macedonia, Romania, Turkey, and Serbia. The region covered by BPU members encompasses about 15 000 physicists, 200 universities and 20 large facility-based national research centres in physics. Until the *Tirana Declaration* which was endorsed by BPU members in Tirana in 1990, BPU member countries had little direct knowledge of each other's scientific potential in physics owing to centralized governments whose political strategy it was to keep countries apart. The *Declaration* announced the intention to promote and improve science, as well as the exchange of knowledge and information, through links to be established among scientists which would lead to joint research projects and common programmes in the Balkan countries.

The stimulus provided by the Declaration led to the first major activity of the BPU, the *1st Balkan School of Physics* (on accelerator physics research and applications held in Istanbul in September 1991). Most of the funding was provided by local Turkish sponsors with CERN, DESY and the International Centre for Theoretical Physics (ICTP), Trieste, as scientific contributors. During the school, a round-table discussion reviewed the status of physics in the Balkan countries and looked at ways of encouraging further collaboration, including the creation of regional centres of excellence.

Another important activity was the *General Physics Conference of the BPU*, the first of which was held in Thessaloniki, Greece, in September 1991 where more than 600 physicists from the Balkans came together for the first time in the history of science. There followed the 2nd BPU *Balkan School of Physics* (on condensed matter physics in Tirana, Albania, in September 1992) and the 2nd BPU general conference (Izmir, Turkey; September 1994) at which 800 physicists from the Balkans participated. The 3rd *Balkan School Physics* was held in October 1996 in Antalya, Turkey, and Balkan physicists will meet again at BPU-3 in September 1997 in Cluj-Napoca, Romania.

In 1993, the BPU Physics Students Branch (BPU-SB) was established to promote friendship among the Balkan physics

BALKAN PHYSICAL UNION COOPERATION ACTIVITIES

- Balkan physics research institutes and research groups
  - Bogazici University Turkish Balkan Research and Application Centre (CTBP), Istanbul (1993)
  - University of Thessaloniki Balkan Environmental Research and Development Institution (BERDI), Thessaloniki (1994)
  - University of Thessaloniki Balkan Solid State Physics Research Centre, Thessaloniki (1994)
  - Balkan High Energy and Nuclear Physics Study Group (1991)
  - Balkan Space Science Study Group (1992)
  - Balkan Theoretical Physics Research Group (1993)
- Balkan physics projects
  - Balkan Group in ATLAS (CERN): CERN; ICTP; Thessaloniki University; CTBP; Athens University; Athens Polytechnics
  - Balkan Group in CHORUS (CERN): CERN; TUBITAK; CTBP; Sofia University (SU)
  - Balkan Group in SMC (CERN): CERN; TUBITAK; CTBP; SU
  - Balkan Nuclear Physics Group: CNREC; CTB; SU; Bulgarian Academy of Sciences; IFA; IKD
  - Balkan Solid State Group: Thessaloniki University; CTBP; SU
  - Balkan Theoretical Physics Group: CERN, ICTP, CTBP, Tirana University, Sarajevo University, Skopje University and SU.
  - Balkan Space Science Group: ICTP-Radiopropagation Lab; BERDI; CTBP; Rojen Observatory

students. Last year they met for their 3rd BPU-SB Conference in Bansko. The BPU Balkan Physics Student Training Programme has been started in Italy, with funding is provided via an agreement between the ICTP and the Union.

As a result of these initiatives, Balkan physicists obtained much information about each other's scientific activities. One also notes that these initiatives motivated them to make independent visits to each other's universities and national research centres, and to participate in other activities in the region beside the BPU's through private and national sponsorship. Under BPU coordination, Balkan-wide physics research institutes and research groups started to form. Several Balkan projects with collaboration involving these institutions and groups are now coordinated by the Union (see table). Involving about 70 Balkan physicists, they are supported by national institutions and research centres. The ICTP and CERN provide laboratories, computers, and library facilities under special agreements; living and travel expenses are covered by Balkan funding from several sources.

The BPU also started to publish a quarterly scientific journal in 1993 entitled *Balkan Physics Letters* (BPL). Partly devoted to the publications of Balkan cooperation projects and the presentations at the BPU conferences and schools, it aims to integrate publications published by universities and national laboratories.

In its short history, the Balkan Physical Union has been able to stimulate an effective collaboration between Balkan scientists through the joint publication of scientific papers and the preparation of theses. It is significant that one can find among these works the first article, realized within a Balkan co-project, by Greek and Turkish physicists (from Thessaloniki and Istanbul). Within such projects, Balkan physicists have started to supervise the theses of students from other Balkan countries, and many publications have resulted from this type of collaboration.

Many will probably appreciate that Balkan scientists need more help in order to preserve their scientific and cultural traditions and to promote lasting Balkan-wide collaboration so as to ensure peace in the region. Finally, on behalf of all Balkan physicists, I would like to thank CERN, ICTP, the many sponsoring international and national organizations, societies, foundations, and especially friends throughout the Balkans for their contributions to the Union's efforts and activities.

An International Centre Founded

Seven scientific and medical institutions in Yugoslavia (Serbia and Montenegro) and one from Bulgaria founded in Belgrade on 17 July 1996 the TESLA Scientific Centre (TSC), a regional centre for fundamental and applied research in physics, chemistry, biology, materials science, nuclear medicine, and radiology based at Belgrade's VINČA Institute of Nuclear Sciences. The Centre is organized as an association of institutions from southeastern Europe interested in using and developing its principal facility, the TESLA Accelerator Installation. Another task is to provide additional training opportunities for talented young scientists, engineers and physicists in a number of new and modern disciplines within the selected fields.

The installation is an ion-accelerator complex consisting of three machines, and a number of low-and high-energy experimental channels (see figure). The building was completed in May 1992 and construction of the accelerator started shortly after. The TESLA Advisory Committee responsible for overseeing the construction is chaired by G. Plass (CERN) and the TESLA Programme Committee is chaired by Yu. Organessian (JINR, Dubna). The first experiments with the ion beams are planned for 1997. Meanwhile, user programmes are being prepared (see insert).

TESLA Experimental Programmes

- Excitation of ions by electrons.
- Modification and analysis of the physical properties of materials by ion beams.
- Radiation physics with light and heavy ions.
- Physics of thin crystals.
- Nuclear reactions with heavy ions at low and intermediate energies.
- Radiolysis in condensed systems induced by light and heavy ions.
- Three-dimensional distribution of radiation defects induced by light and heavy ions.
- Biological effects induced by irradiation with light and heavy ions.
- Production of radioisotopes and radiopharmaceuticals.

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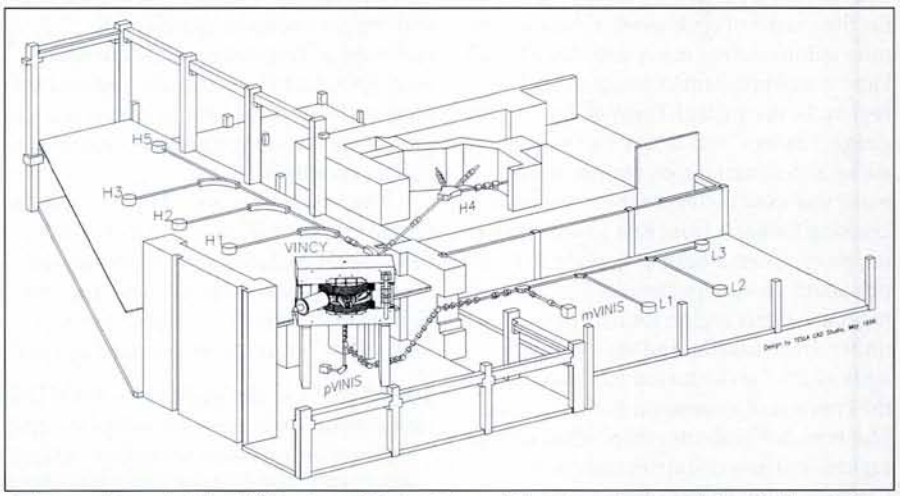

A photograph (upper) of the VINČA Institute of Nuclear Sciences, Belgrade., and a schematic drawing (lower) of VINČA's TESLA accelerator facility. The facility comprises a compact isochronous cyclotron, the VINCY Cyclotron, an electron cyclotron resonance heavy-ion source, the mVINIS Ion Source, and a volume light-ion source, the pVINIS Ion Source. The low-energy experimental channels from mVINIS are indicated as L1-3 and the high-energy channels from VINCY as H1-H5. VINCY will deliver, for example, N, Ar and Xe ions as well as protons (2 μA at 66 MeV; 60 μA at 11-16 MeV), and deuterons (20 μA at 43-73 MeV). The first beam to be extracted will comprise 30 MeV protons at 40 μA obtained using a H^{2+} ion beam extracted from pVINIS; it will initially be used in early-1998 to produce radioisotopes. In delivering, for example, 40 μA of 150 keV N^{6+} ions and 40 μA of 500 keV Xe^{20+} ions, the mVINIS source will be able to produce ions of gaseous and solid substances as well as heavy ions of lower energies above 10 keV. The first ion beam extracted from mVINIS will be a 40 μA beam beam of Xe^{20+} ions at 200 keV; it will initially be used in September 1997 for modifiying of materials. Finally, the pVINIS source will be able to deliver H^-, D^-, H^{2+}, H^{3+}, D^{2+}, and D^{3+} light ions.