CONCLUSION
20th International Conference of Neutrino Physics and Astrophysics

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The first International Neutrino Conference was held in Hungary, at the lakeside of Balaton just 30 years ago. That time neutrinos became interesting for both, theoretical and experimental particle physicists. That time made it already possible for the researchers from the East and West, to meet in Hungary, which was the most Western spot of the Eastern Block. Among the participants we welcomed Ettore Fiorini, Richard Feynman, T.D. Lee, Bruno Pontecorvo, Fred Reines, Victor Weisskopf, Jacob Zeldovich, and so on. This success of the conference initiated a regular sequence of conferences, hosted by three continents. The first 20 neutrino conferences were:

’72, Balaton (Hungary)	’82 Nordkirchen (Germany)
’74 Philadelphia (USA)	’86 Sendai (Japan)
’75 Balaton (Hungary)	’88 Massachusetts (USA)
’76 Aachen (Germany)	’90 CERN (Switzerland)
’77 Caucasus (Russia)	’92 Granada (Spain)
’78 Purdue (USA)	’94 Eilat (Israel)
’79 Bergen (Norway)	’96 Helsinki (Finland)
’80 Sicily (Italy)	’98 Takayama (Japan)
’81 Hawaii (USA)	’2000 Sudbury (Canada)
’82 Balaton (Hungary)	’2002 Munich (Germany)

I had the chance to attend all these conferences, and that offered me not only touristic joy, but a chance to see the increasing interest in our favourite tiny particles, thus these conferences (organised now in each even year) became a part of the history of physics of the 20th century.

There was also a sequence of odd events, namely the Weak Interaction and Neutrino Workshops organised in the odd years (initiated and overviewed by Herbert Pietschmann). These workshops have a limited number of participants, as a rule, in order to focus on discussions.

WIN’73 Skövde (Sweden)	WIN’85 Savonlinna (Finland)
WIN’74 Strobl (Austria)	WIN’87 Santa Fe (USA)
WIN’75 Columbus (USA)	WIN’89 Ginosar (Israel)
WIN’76 Trieste (Italy)	WIN’91 Gran Sasso (Italy)
WIN’77 Kobe (Japan)	WIN’93 Seoul (Korea)
WIN’78 Ames, Iowa (USA)	WIN’95 Talloires (France)
WIN’80 Balaton (Hungary)	WIN’97 Anacapri (Italy)
WIN’82 Javea (Spain)	WIN’99 Cape Town (South Africa)
WIN’83 Talloires (France)	WIN’2001 Cristchurch (New Zealand)

Now we have entered the 21st century, and the last conferences presented results, which show neutrinos not only as curiosities of particle physics, but they bring the neutrinos into the focus of science. Let us quote the Holy Book:

"? and God said: Let there be light! And there was light." But there were three kinds of neutrinos created as well at the Hot Big Bang. And this has made the neutrinos the most abundant known particles: hundreds of them are in each cm^3 of the whole Universe. If they had mass, they might easily contribute significantly to the gravitating mass of the World.

The Sun radiates P=4?10^{26} watts of light. According to nuclear astrophysicists this originates from the fusion of hydrogen into helium:

$$2\ e^- + 4\ H^+ \ ?\ He^{++} + 2\ ? + Q.$$

Dividing the power P of sunshine by the Q=25 MeV reaction heat of a He formation we can calculate, how many helium nuclei are formed inside the Sun each second. The formation of each He nucleus is associated by the emission of two neutrinos. This easy estimate indicates that the Earth is reached by an intensive neutrino shower: many millions of energetic neutrinos / m^2 sec. In the 20th century this was only theoretical speculation, but now scientist have measured this neutrino radiation, by shielding other kinds of particles by the planet Earth. One sees now clearly that neutrinos come from the direction of the Sun (Superkamiokande), and the overall number of (three kinds) of neutrinos does agree with the Standard Solar Model, up to a few percent of accuracy (Sudbury Neutrino Observatory). *This means that at this turn of the century, we do see the centre of the Sun and we observe the nuclear fusion reactions there producing the solar energy.* The theoretical statement, that the source of sunshine is nuclear fusion, has become a direct empirical fact, as presented at the last two Neutrino Conferences. This is a result what we have to tell the people, what we have to teach in high schools, because it has become an essential part of our world picture. (It may help to solve the power plant controversy of the society psychologically.)

But young physicists should not be unhappy: 20th century left them an other great problem to be solved: that is the puzzle of the Dark Matter. It has turned out that we do not know, what is the main constituent of our World. The difficulty is that it is not dark (does not cast a shade) but it is rather completely transparent. Are the neutrinos somehow connected with this puzzle?

Anyway, it is time to enter our exciting 21st century. The first Neutrino Conference of the new century was hosted by Munich (Europe). It is appropriate to express the thanks of 500 participants to our hosts: Franz von Feilitzsch, Norbert Schmitz and Michael Altman. Congratulation for your successful achievement!

The next neutrino event will be the WIN'2003 workshop at Fermilab, to be organised by Jorge Morfin.

The papers published on neutrinos now approaches the number of the papers published on quarks, which were the favourites in the late 20th century. Seeing the sharply increasing interest on neutrinos, there is a long queue waiting for the chance to organise the coming International Neutrino Conferences. The International Neutrino Commission has decided, where the next neutrino conferences will be:

'2004: Paris, College de France, 14−19 June (EUROPE)

(Daniel Vignaud, Francois Vanucci)
The College was founded in 1530. Radioactivity was discovered in France.

’2006 Santa Fe, New Mexico (AMERICA)
(Tom Bowles, Steve Elliott, Los Alamos NL)
This year will be the semicentenary of the Reines−Cowan experiment.

’2008 Christchurch (NEW ZEALAND)
(Jenni Adams, Stephen Parke, AMANDA collaboration)
Centenary year of Rutherford’s Nobel Prize. (He was born in Christchurch.)

’2010 and so on: to be decided by the International Commission. Applicants:
Cape Town, South Africa (AFRICA, Raoul Viollier)
Gran Sasso, Italy (EUROPE, Alessandro Bettini)
Athens, Greece (EUROPE, George Tzanakos)
Malorca, Spain (EUROPE, Angel Morales)

The International Neutrino Commission will decide the time order of the International Neutrino Conferences beyond 2008 in 2004. The new elected chairman of the Commission is Jacob Schneps (US); co−chairman is Franz von Feilitzsch (EU).

I thank for your co−operation in the past 30 years. I wish good work for the new chairmen. And anyway, see you again at WIN’2003 in Chicago and at ’2004 in Paris!