Impact of the 10 year National Teacher Programmes (NTP) organised for Hungarian physics teachers at CERN

The popularity of natural sciences and techniques and the interest in those fields in schools have declined worldwide from year to year. This problem is complex, but one of the major stakeholders to the solution is the high school physics teacher.

Recognizing these problems, the world's largest high-energy physics research institute CERN (Geneva) has offered to the member countries a program, where a group of teachers (25-40 people) can attend a one-week training program at CERN in their national language. This allows the teachers to improve their knowledge in modern physics without language difficulties. Hungary was the very first country to accept the invitation to this "National Teachers' Programmes" in 2006.

During 10 years we have been organizing such an event every year on behalf of the Roland Eötvös Physical Society in Hungary. During a summer week the participants could learn about particle physics, cosmology, and accelerators formally and informally. Almost 400 teachers have already participated.

This program had four main elements: lectures, laboratory visits, work in small groups and also individual work. After our first pioneering course several other countries also organized such kind of training courses, but our course had always some particularities. We expanded the CERN visit with an excursion to the Aiguille du Midi (3842 m) of the Mont Blanc, but the teachers had a task: during the travel and also up in the mountain they had to perform some "basic" physics experiments. Those kind of experiments were selected, where either the different geological or the different meteorological conditions could be exploited, and results of "ground" measurements could be compared to results of the high mountain measurements.

The list of these experiments is the following:

- Torricelli's experiment with water (and with wine)
- Dependence of the boiling point of water on the air pressure
- Measuring the radon concentration in air using a vacuum cleaner (in a cellar)
- Measuring the radiation background (effect of the cosmic radiation)
- Dependence of the speed of sound on the temperature of the air (measurement made with smart phone)
- Geo-location using the Sun (at different places during the travel).

Reports of the measurements were also prepared by the teams before the publication on a DVD summarizing the results of the training. The teachers also reported us that their students enjoyed these experiments a lot when they repeated them in their school. We think that this teacher training event has led to a growing community of Hungarian teachers who visited CERN.