INTERNATIONAL PHYSICS OLYMPIADS (IPhO): THEIR HISTORY, STRUCTURE AND FUTURE[1]

By

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1. Short history of the IPhO

The International Physics Olympiad (IPhO) is an international physics competition for secondary school students. The first such competition was organised by *Prof. Czesław Ścisłowski* in Warsaw (Poland) in 1967. Since that time the International Physics Olympiads have been organised, with few exceptions that will be discussed later, in a different country every year.

The possibility of organising the International Physics Olympiads was suggested before 1967. It was clear that the International Physics Olympiads should be an annual event like the International Mathematics Olympiad, which was already in existence; organised in 1959. The success of the International Mathematics Olympiads, and the positive experience gained from its organisation, greatly stimulated physicists involved in physics education and interested in comparison of knowledge of the best students from different countries. The hard work and dedication of three Professors deserves particular praise: *Czesław Ścisłowski* from Poland, *Rostislav Kostial* from Czechoslovakia and *Rudolf Kunfalvi* from Hungary. Each of them investigated various possibilities of organising the first International Physics Olympiad in his country. It was concluded that Poland offered the best conditions and the most favourable atmosphere for such an event. This, together with a great personal contribution by Prof. *Czesław Ścisłowski*, resulted in the first international physics competition that took place in Warsaw in 1967.

One should underline here an essential difference between the International Mathematics Olympiads and the International Physics Olympiads. At the International Physics Olympiads the participants solve not only theoretical problems but also the experimental problems. For this reason the organisation of the competition in physics is more complicated and more expensive.

Several months before the first IPhO took place, invitations were sent to all the Central European countries. The invitations were accepted by Bulgaria, Czechoslovakia, Hungary and Romania (five countries including Poland, the organiser of the competition). Each team consisted of three secondary school students accompanied by one supervisor. The competition was arranged along the lines of the final stage of the Polish Physics Olympiad: one day for theoretical problems and one day for carrying out an experiment. One obvious difference was that the participants had to wait for the scripts to be marked.

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During the waiting period the organisers arranged two excursions by plane to Kraków and to Gdańsk. At the first IPhO the students had to solve four theoretical problems and one experimental problem.

The second Olympiad was organised by *Prof. Rudolf Kunfalvi* in Budapest, Hungary, in 1968. Eight countries took part in that competition – The German Democratic Republic, the Soviet Union and Yugoslavia joined the participating countries. Again, each country was represented by three high school students and one supervisor. Some time before the second IPhO a preliminary version of the Statutes and the Syllabus were produced. Later the International Board consisting of the supervisors of the teams that participated in the competition officially accepted these documents. This took place during a special meeting organised in Brno, Czechoslovakia, several months after the second IPhO. It is proper to underline that, in spite of various changes made later, all the basic features of the first Statutes remain valid to this day.

The third IPhO was arranged by *Prof. Rostislav Kostial* in Brno, Czechoslovakia, in 1969. On that occasion each team consisted of five students and two supervisors. The competition in Brno was organised according to the official Statutes accepted earlier.

The next Olympiad took place in Moscow, Soviet Union, in 1970. Each country was represented by six students and two supervisors. During that Olympiad several small changes were introduced into the Statutes.

Since the fifth IPhO, held in Sofia, Bulgaria, in 1971, each team has consisted of five pupils and two supervisors.

The sixth IPhO was held in Bucharest, Romania, in 1972. It was an important event because among the participants there were present for the first time, the first non-European country (Cuba) and the first Western country (France). At this Olympiad the International Board decided to introduce several changes into the Statutes (however, no written proposal of the changes was produced).

Unfortunately, in 1973 there was no Olympiad as no country was willing to organise it, although the number of participating countries exceeded the number of the past Olympiads. When it seemed likely that the International Physics Olympiads would die, Poland took the initiative of reviving the international competition and organised the seventh IPhO in Warsaw in 1974 (for the second time). On this occasion the Federal Republic of Germany was invited to attend the competition for the first time. This fact certainly had a symbolic significance.

Before the competition, the Organising Committee introduced into the Statutes the verbal changes discussed and accepted in Bucharest. The new version of the Statutes was sent to all the countries invited to the competition for acceptance or comments. The wording suggested by the Organising Committee was accepted (with only one voice against). The most important changes were as follows:

a) the number of theoretical problems was reduced from four to three

b) the number of working languages (previously Russian, English, German and French was reduced to two, English and Russian

c) there should be one rest day between the two examination days

d) the criteria for prizes should be expressed in percentages with respect to the highest score received in a given competition (formerly range of mark for prizes had been determined with respect to the highest theoretically possible score).

In 1975, 1976 and 1977 the International Physics Olympiads took place in the German Democratic Republic for the first time, Hungary, for the second time, and Czechoslovakia, for the second time, respectively.

In spring 1977 in Ulan-Bator, Mongolia, there was a Conference of the Ministers of Education of the, so-called, Socialist Countries. The Conference decided that the socialist countries would organise the

International Chemistry, Mathematics and Physics Olympiads every two years. Some people treated this decision as a political one, aiming to reduce contacts between pupils from East and West. This aspect should not be ignored, but certainly the decision was a consequence of the increasing number of participating countries and rapidly increasing organisational costs. Regardless of real reasons, according to common interpretation the above decision was commonly interpreted as an implicit invitation to other countries to take charge of the international scientific Olympiads. This explains why in 1978 and in 1980 there were no Olympiads; no non-socialist country was ready to organise the competition without a prior, necessary long-time preparation effort. The first IPhO organised by non-socialist country was the XIII IPhO that took place in Malente, FRG, in 1982. It was due to very efficient work done by *Dr. Gunter Lind*. Then, for the first time, the participants solved, under agreement of the International Board, two experimental problems in place of one, previously set.

In 1983 the IPhO was organised, for the second time, in Bucharest, Romania. Here the number of problems prepared by the organisers for the pupils much exceeded the number of problems mentioned in the Statutes, and the International Board spent a lot of time discussing the Statutes and the Syllabus and the future of the Olympiads.

As regards the future of the International Physics Olympiads, there was only one important decision made in Bucharest. It was decided that the next competition would take place in Sweden in 1984. Unfortunately, there were no volunteers to organise the Olympiads in 1985, 1986 and 1987. In such a situation, upon suggestion of *Dr. Gunter Lind* (FRG), the International Board decided to establish a permanent Secretariat (consisting of one person: *Dr. Waldemar Gorzkowski*) for co-ordination of the long-term work of the International Physics Olympiads and for popularising the Olympiads. At the same time it was decided that the Secretariat together with *Prof. Lars Silverberg* (Sweden), the organiser of the next competition in Sigtuna, Sweden, in 1984, should prepare a new version of the Statutes.

The project of revising the Statutes was completed and the new Statutes were accepted at the ninth IPhO. There are, in fact, only minor differences between the old and new versions. The most essential difference is that the new version legalised the existence of the Secretariat of the International Physics Olympiad, consisting of two persons (in terminology used recently: President and Secretary - *Dr. Waldemar Gorzkowski* and *Dr. Andrzej Kotlicki*[2]). Another change instituted was that at the experimental part of the competition the participants could be set one or two experimental tasks, earlier only one was allowed. One can say that the new version differed from the old one primarily in wording. The new version was much more precise.

The delegation heads, consisting of two persons from each participating country, form the, so-called, International Board, which is the highest authority of the International Physics Olympiads. The International Board does not change significantly from year to year. The majority of members know each other very well. In the International Board there is a very pleasant, friendly atmosphere. Thanks to this attitude, and good will, many difficult problems can be solved without great effort. This is why the Secretariat was able, for instance, to solve the problem of organisation of the International Physics Olympiads in 1985, 1986 and 1987. In 1985 the International Physics Olympiad took place in Portoroż (Yugoslavia), in 1986 - in London-Harrow (Great Britain) and in 1987 - in Jena (GDR).

Here we would like to emphasise that the United Kingdom organised the XVII IPhO in London-Harrow within only two years from its entry into the competition! It was made possible through hard work and great enthusiasm *of Dr. Cyril Isenberg*, *Dr. Guy Bagnall* and *Mr. William Jarvis*.

Due to joint efforts of the Secretariat and the organisers of the competitions in 1985 (*Prof. Anton Moljk* and *Dr. Bojan Golli*) and in 1986 (*Dr. Guy Bagnall* and *Dr. Cyril Isenberg*) a new version of the Syllabus was produced. Its theoretical part was accepted in Portoroż in 1985 and first applied in London-

[2] *Dr. Andrzej Kotlicki* (Poland - Canada) after three five years' terms (1984 - 1999) resigned from his function. In 1999 *Dr. Maija Ahtee* (Finland) was elected as the Secretary.

Harrow in 1986. Later, following a suggestion of the International Board, the Secretariat prepared a new, so called, *column version* of the Syllabus. This version shows not only the *breadth* of the physics contents but also the *depth* of approach required. The Syllabus of the International Physics Olympiads is indeed very modern. Nevertheless, the International Board is always ready to introduce improvements in the Statutes and Syllabus and does this when necessary.

The competition has run every year subsequently - the list of participating and organising countries is shown in Tables 1 and 2.

Following suggestion of *Dr. Rodney Jory* (Australia) in 1996 the International Board has decided to create an Advisory Committee convened at the President. At present the Advisory Committee consists of 14 persons with great experience in the "Olympiad work".

Every year some changes in the Statutes are made. Usually they are minor changes. Nevertheless, sometimes the changes are major. The last such change was made in 1999. The Statutes have been split into two parts; proper Statutes, and Regulations. Changes in the part called "Statutes" require qualified majority when voting, while changes in the part called "Regulations" require a simple majority only. In this way the most important points of the "Olympiad law" have been separated from the points that are of less importance. The operation of splitting the Statutes was the most important change since 1984 and was taken with care. The idea of splitting, formulated by *Dr. Rodney Jory* (Australia) in 1997, after preliminary discussion (almost only by e-mail) in 1997/8 was accepted by the International Board in 1998 in Reykjavik, Iceland. Then a subcommission consisting of four persons was created: *Dr. Gunter Lind*, *Dr. Cyril Isenberg*, *Dr. Vidar Agustsson* and *Dr. Waldemar Gorzkowski*. The subcommission prepared, mainly due to work of *Dr. Gunter Lind,* a version of the split Statutes, which later was discussed at a special meeting of the Advisory Committee in Warsaw in March 1999. After that the version accepted by the Advisory Committee was accepted by the International Board at the thirtieth IPhO in Padova, Italy.

The last versions of the Statutes, Regulations, Syllabus and other Olympiad documents may be downloaded from the Olympic home page http://www.jyu.fi/ipho localized in Finland and maintained by Prof. Maija Ahtee.

Here we would like to highlight the efficient functioning of the Secretariat due to not only to personal efforts of its members but also to the assistance of the members of the International Board. It is proper to mention here the help of *Dr. Gunter Lind* (FRG), *Prof. Helmuth Mayr* (Austria), *Prof. Lars Silverberg* (Sweden), *Prof. Lars Gislen* (Sweden), *Mr. Nicola Velchev* (Bulgaria), *Dr. Hans Jordens* (The Netherlands), *Dr. Dwight Neuenschwander* (USA), and others.

2. Structure of the competition

The competition lasts for two days. One day is devoted to theoretical problems (three problems involving at least four areas of physics taught in secondary schools). Another day is devoted to experimental problems (one or two problems). These two days are separated by at least one day of rest. On both occasions the time allotted for solving the problems is five hours. Each team consists of students from general or technical secondary schools (not colleges or universities). Typically each team consists of five students (pupils) and two supervisors. The latter form the International Board. It would make no sense to repeat here the description of the competition as it may be found in the Statutes of the International Physics Olympiads.

We would like to underline several important features:

1. The problems are given to the pupils in their national languages and the pupils solve the problems in their mother tongues; IPhO is a competition in physics, not in foreign languages.

2. The marks awarded by the organisers are compared with the marks awarded by the delegation heads, and discussed by the organisers and delegation heads until an agreed mark has been reached. In this way justice of classification is ensured.

3. For a long time the winners were classified into categories according to the following rules:

The mean value of points accumulated by the three best participants is considered normalised to 100%.

The contestants who obtain more than 90% of the above-mentioned mean value receive first prizes. The contestants who obtain between 78% and 90% receive second prizes. The contestants who obtain between 65% and 78% receive third prizes. The contestants who obtained between 50% and 65% receive commendations called honourable mentions. All other participants receive certificates of participation. The participant with the highest score (Absoloute Winner) receives an additional prize.

Some special prizes can also be awarded.

We would like to emphasise that the number of prizes in each category was not limited. Due to that changes of some scores, following, for example, a discussion between the heads of the delegations and the markers, resulting in a "shift" of some participants from, for example, the group of second prize-winners to the group of first prize-winners, the category of the prize of any other participants does not change. Thus, the delegation leaders representing different countries do not compete against each other. This was a very important point.

Unfortunately, the above system of awarding prizes led to great fluctuation in the numbers of trophies of different categories. To make life of the organizers easier and to ensure reasonable number of prizes the system of awarding prizes was changed. It is described in the Statutes (see the Olympic home page).

You may ask: what about a team classification? The answer is very simple: such a classification does not exist. The IPhO is a competition between individuals only. There is no team result. Nevertheless, some people try to establish a kind of unofficial team classification. Some of them take a direct sum of scores as the result of the team. Some of them take the sum of scores of the three best participants in each team. Some of them take, for each team, the tree best results in each problem independently and so on, and so on. Of course, the final table depends on the method of calculating the team results, and probably one can always find some strange system of counting the team results that will show a team to be the best or one of the best ones. Non-existence of team classification is important. We do not wish to introduce rivalry between nations.

The financial principles of the organisation of the competition are the following:

* the country which sends the team pays for the return travel costs (to and from the place of the competition) of the pupils and the accompanying persons;
* from the moment of arrival until the moment of departure all the costs are covered by the organising country. In particular, this concerns the costs of local travels, lodging, excursions, awards, etc.

Recently the International Board considered several times different proposals aiming to introduce certain participation fee. Taking into account different financial possibilities of different countries, in 1997 a voluntary fee was introduced. It seems, however, that in the future the voluntary fee will be converted into an obligatory fee.

The number of participating countries is, however, continually increasing – see Table 1. In 2006 82 countries sent their teams to the 37th IPhO in Singapore. Every year new countries join the competition and organisation of the competition becomes more and more expensive. Moreover, it is more and more difficult to organise the experimental part of the competition so that all the students have the same experimental conditions of work.

We can ask: what will be the maximum number of countries? How long can the number of participating countries increase without any changes (assuming the same structure of the competition)? Should we start thinking about "Olympiad Villages"?

Until now the organisers were always able to solve all the organisational problems related to the increasing number of participants. Some time ago I was sure that the maximum number of countries present at a given Olympiad would not exceed sixty. But in the meantime certain political processes took place, such as the break up of the Soviet Union, the break up of Yugoslavia, etc. In consequence of them many new countries were created. Most of them are interested in participation in the IPhO. Now it seems that the number of countries really interested in the IPhO every year shall not exceed eighty or ninety. Eighty countries with five students from each country, comes to 400 experimental stands. This is a very great number. Some countries, however, are able to provide such a number of identical experimental stands. Other countries can organise the experimental problem in two groups.

Can this number, i.e. about 90, be reached? Theoretically, yes. But practically, probably not. The travel expenses (and possible participation fee that may be introduced in the future) can limit the number of participants. Many countries may not be able to send their teams to the competition every year for financial reasons. The number of participating countries will probably oscillate around eighty, depending on where the organising country is situated. This will not require "Olympiad Villages".

Organisation of the IPhO is becoming increasingly very difficult. The difficulties are diverse. I am not going to describe all of them. Nevertheless, I would like to give one simple example: languages. The marking of the solutions (written in national languages) is performed by the Organising Committee which is responsible for correct translation. For the languages spoken by a number of countries, such as English, German, French or Spanish, there are no serious difficulties. Also there are no difficulties in the case of nations or countries with a great diaspora (e.g. Poland). But in the case of certain minority languages (e.g. Finnish, Icelandic, etc.) the organisers sometimes face great problems. Fortunately, all the possible mistakes made during the marking procedure can be corrected at the verification sessions with the delegation leaders, although sometimes this is time consuming. Nevertheless, the problem of languages seems to be very difficult and probably some changes in the Statutes will be necessary.

In the context of the above mentioned "saturation" effects related to limited possibilities of the organisers (financial and technical) and limited possibilities of the participants (travel expenses, possible participation fee in the future) it makes sense to consider an idea of regional physics Olympiads. This idea is not new. Some time ago the *Balkan Physics Olympiad* was created. It involved the, so-called, Balkan countries in Europe. As far as I know at least three such Olympiads were conducted. In 1992 the first *Iberoamerican Physics Olympiad* was organised (in Colombia). It is a Physics Olympiad for countries speaking Spanish or Portuguese. Unfortunately, for other reasons (insufficient international co-operation, certain financial and organisational problems) the second such Olympiad was organised only in 1997 (in Mexico). Shortly before the Gulf War the *Gulf Physics Olympiad* (for the Arab countries situated at the Arab Gulf) was organised. As far as I know, until now four such Olympiads were conducted.

Recently the Asian region is very active in the Olympic movement. In 2000 the 1st *Asian Physics Olympiad* (APhO) was created. Since that time it is organized every year. Its scientific level and organizational level are very high. It seems that existence of the APhO substantially affects the results of the Asian countries at the International Physics Olympiads.

3. Degree of difficulty of the Olympiad problems

The competition tasks of several initial International Physics Olympiads were not overly difficult. They were similar to more difficult school tasks. Later the difficulty of the competition tasks was

increased. It is not easy to measure difficulty of the competition tasks. I know two approaches to this problem.

First of them was made by *G. S. Tarasiuk* [1]. She defined a coefficient of difficulty *k* of the task as a quantity proportional to the ratio of the maximum possible score to the mean score gained by the participants. In a similar way she defined a degree of difficulty of a whole Olympiad. Her statistics involved ten first competitions. The quantity introduced by *Tarasiuk* seems to be quite good. It, however, cannot be applied to recent Olympiads since the International Board has decided that the results of the participants who have not received any prize or honourable mention cannot be presented publicly. In consequence the mean value of the scores gained by the participants is not known.

The second approach is due to *Barbara* and *Rudolf Gau* [2]. They introduced another parameter *A* as a measure of the, so-called, *requirement level*. The definition of this parameter is too sophisticated to quote it here. Nevertheless, it seems quite interesting to show how the parameter *A* changes in time - Fig. 1 shows the dependence of *A* for twenty first International Physics Olympiads. Note the rapid increase in the period 1986 - 1989. (Unfortunately, nobody investigated *A* for more recent competitions.)

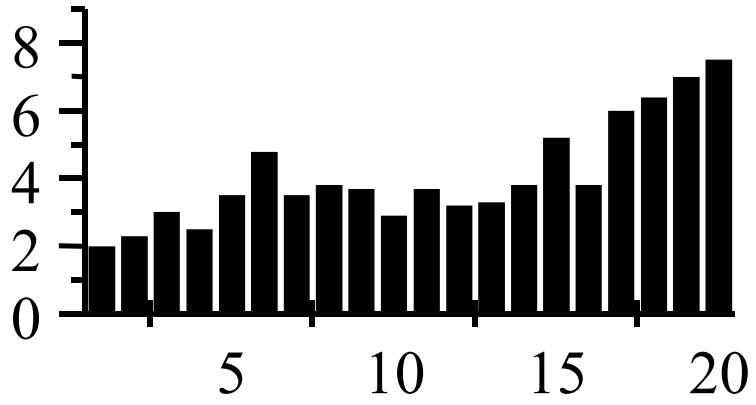

Fig. 1. *Requirement level A* (vertical axis) vs. no. of the Olympiad (horizontal axis).

One should realise that any way of measuring the "difficulty" of the Olympiads has only an approximate character. The best measure should involve such "parameters" as: formulation of the problem, length of the texts of the problems (sic! - some problems are unexpectedly long), possibilities of solving the problems in different ways, creativity of the problems, spectrum of knowledge tested by the problems, etc., etc. Each of these "parameters" in general is not well defined. Moreover, each of them should be taken with some weight, which is not well defined either.

4. Efficiency of participation of different countries in the competition

As we have already mentioned, there is no official team classification - the Statutes of the Olympiads do not define any team results. Nevertheless, many countries participating in the International Physics Olympiads are interested in some measure of success of their teams over the years. Sometimes such a measure is necessary for them in order to estimate the efficiency of different forms of work. Of

course, one may introduce different parameters describing "efficiency" of participation. Proper measure should involve difficulty of the competition problems, quality of grading, quality of translations, etc., etc. In general it is a very difficult problem. This is why we suggest to use the parameter defined below the Table 3 [4, 5]. The Table contains the statistical data for thirty seven International Physics Olympiads organised until now (see also Tables 4 and 5). Of course, in case of countries that participate infrequently in the competition, this parameter is not good for fluctuations.

5. Interpretation and role of results obtained at the competition

The results of the competition are treated in different countries in different ways. In some countries, in some periods, they are or were treated as a kind of great national achievement: the participants pass a special, very intensive, training before the competition and later the winners receive great privileges. But it seems that such an approach is rather not typical. Most of countries treat the Olympiad as a kind of measuring instrument that measures the state of physics education. Of course, one success or lack of success has no special meaning. It may be a fluctuation. But successes or lack of successes for several years should be treated seriously. This is why the results of the competitions are analysed seriously. The same refers to the competition problems, the Syllabus, etc. In consequence of these analyses some countries improved their national syllabuses on physics by introducing new approaches (e.g. in *thermodynamics*), new topics (e.g. *relativity*, *quantum physics*), or by reducing some parts of too traditional character (e.g. *geometric optics*). Such changes are an additional result of the International Physics Olympiads, additional with respect to the tables of the competition winners. Certainly in a long-term scale this result is more important than the names of the winners, as any improvements in the physics education affect all the pupils.

It is obvious that the existence of the International Physics Olympiads itself is a result of certain international co-operation. More important is a long-term international co-operation between the members of the International Board. This kind of co-operation has existed since the very beginning, i.e. since the first IPhO. The members of the International Board exchange physics problems, books, journals, articles, they discuss their experience gained during organisation of the national physics competitions etc., etc. Due to such permanent, or semi-permanent, contacts and due to existence of the International Physics Olympiads some countries have organised national physics Olympiads or, at least, smaller scale competitions for selecting the teams to attend the international competition.

Nearly all the participating countries in the IPhO provide special training for the participants. Of course, too intensive training may deform the results. (After a long and intensive training even an elephant may dance to the tune of the piper, but certainly that has nothing to do with the natural abilities of the elephant and one may suspect that the elephant would not be too happy at that!). In consequence of an extra intensive training the results may not reflect real abilities of the students. Also they do not reflect the true state of the physics education. One should say, however, that most of the countries approaches to the problem in a rational way. The training periods etc. in different countries is presented in Table 6.

6. Final remarks

The impact of the International Physics Olympiads is continually growing. The role of the International Physics Olympiads is recognised also by such international organisations as UNESCO and the EPS (European Physical Society).

The first contacts with UNESCO took place way back, in 1968, but more extensive co-operation began in 1984. In the period 1984 - 1991 UNESCO supported financially the publication of the proceedings of the subsequent Olympiads. The proceedings were distributed to all the countries-members of UNESCO. It gave us favourable publicity. In addition, UNESCO has published several books on the physics Olympiads in various languages.

The help of UNESCO was very valuable, especially in propaganda. Unfortunately, its financial contribution to organising the competitions was negligible.

One should realise, however, that the purposes of UNESCO and other international organisations are not identical with the purposes of the International Physics Olympiads (although often many points are common). For example, by forced increasing the number of participating countries one can cause very serious organisational problems. The organisers of the recent Olympiads encounter many difficulties of technical and financial character. To make the work of the organisers somewhat easier, in 1997 a voluntary fee paid by the participants was introduced. This fee covers part of the organisational expenses and is a good starting point for raising money from possible sponsors. In order to ensure smooth organisation, the increase in the number of participants in the International Physics Olympiad should be controlled. Otherwise organisation of the IPhO could collapse.

Like UNESCO, the EPS gives us very strong moral support as well as favourable publicity, and propagates our achievements among the countries-members of the EPS. It was the EPS that inspired us in preparation and publication of the booklet entitled *Procedures for Selecting Teams to the International Physics Olympiads* [3]. The booklet comprises a compilation of reports of different delegations and is very important and helpful for the countries wishing to join the competition. The booklet was prepared by the Secretariat together with Prof. *Lars Silverberg* and published by him privately in Lund (Sweden). In 1989 the EPS created a special prize for the winner of the Olympiad, who reached the best equilibrium between the theoretical and experimental parts of the competition. This prize was awarded until 1998.

References

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[2] **Barbara Gau**, **Rudolf Gau**, *On Alternations in the Structure and Requirement Level of Theoretical Problems Set in IPhO*, „International Physics Olympiads - vol. I" (ed. by W. Gorzkowski), World Scientific Publishing Company, Singapore 1990, pp. 53 - 71

[3] **Waldemar Gorzkowski**, **Andrzej Kotlicki**, **Lars Silverberg**, *Procedures for Selecting Teams to the International Physics Olympiads,* publ. by L. Silverberg, Lund 1986

[4] *International Physics Olympiads*. - *vol. I*, ed. by **Waldemar Gorzkowski**, World Scientific Publishing Company, Singapore 1990, pp. 126 – 127

[5] **Waldemar Gorzkowski**, *On "Efficiency of Participation" in the International Physics Olympiads*, Physics Competitions, **3/1** (2001), pp. 33 – 36

Warsaw; 20 August, 2006

TABLE 1

PARTICIPATION IN THE INTERNATIONAL PHYSICS OLYMPIADS

State on July 25, 2006

	Olympiad	1...										2...										3...							
		1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8
	Year	196...			197...							198...										199...								200...	
		7	8	9	0	1	2	4	5	6	7	9	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
	Participants:																																						
1	Albania	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	-	#	-	#			
2	Argentina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	-	-	#	#	#	
3	Armenia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	O	#	#	#	#	#	#	#		
4	Australia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	H	#	#	#	#	#	#	#	#	#		
5	Austria	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	H	#	#	#	#	#	#	#	#	#	#	#	#	#	-	#	#	#		
6	Azerbaijan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	#	#	#	#	#	#	#		
7	Bahrain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	-	-		
8	Belarus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	#	#	#		
9	Belgium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#		
10	Bolivia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#		
11	Bosnia & Herc.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	#	#		
12	Brazil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#		
13	Brunei Darus.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#		
14	Bulgaria	#	#	#	#	H	#	#	#	#	#	#	H	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#		
15	Canmbodia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#		
16	Canada	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	#	#	#	H	#	#	#	#	#	#	#	#		
17	China	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	O	#	#	#	#	#	#	#	#	H	#	#	#	#	#	#	-	#	#	#		
18	Colombia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#		
19	Croatia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	#	#	#	#	#	#		
20	Cuba	-	-	-	-	-	#	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	H	#	#	#	#	#	#	#	-	#	#	#	#	#	#		
21	Cyprus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	#	#	#	#	#	#	-	#	#	#		
22	Czechlands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	#	#	#	#	#		
23	Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	-	-	-	-	#	#	#	#	#	#	#	#	#	#	#		
24	Ecuador	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-		
25	Estonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	#	#	#	#	#		
26	Finland	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	#	#	#	#	#	H	#	#	#	#	#	#	#	#	#	#	#	#	#		
27	France	-	-	-	-	-	#	-	#	#	#	-	#	#	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	
28	FRG	-	-	-	-	-	-	#	#	#	#	#	#	H	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#		
29	Georgia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	#	#	#		
30	Ghana	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#		
31	Great Britain	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	H	#	#	#	#	#	#	#	#	#	#	#	#	#	#	H	#	#	-	#	#	#
32	Greece	-	-	-	-	-	-	-	-	-	-	-	-	#	-	-	-	-	O	-	O	-	#	#	#	#	#	-	-	#	-	-	-	-	-	#	#	#	
33	Hong Kong	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	
34	Hungary	#	H	#	#	#	#	#	#	H	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#		
35	Iceland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	#	#	#	#	#	#	H	#	#	#	#	#	#	#		
36	India	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#		
37	Indonesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	#	H	#	#	#		
38	Iran	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	U	#	#	#	#	#	#	#	#	#	#	#	#	#	H
39	Ireland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#		
40	Israel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	-	#	#	#		
41	Italy	-	-	-	-	-	-	-	-	-	-	-	#	#	-	-	O	-	#	#	#	#	#	#	#	#	#	#	#	#	#	H	#	#	#	#	#		
42	Japan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	O	O	#	

43	Jordan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#
44	Kazakhstan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	#	#
45	Kenya	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	-	-	-	-	-
46	Kuwait	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	-	#	#	#	#	#	#	-	#	#	#	#	#	#	#	#
47	Kyrgyzstan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#
48	Laos	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#
49	Latvia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	#	#	#
50	Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#
51	Lithuania	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	O	-	#	#	#	#	#	#	#	#	#	#	#	-	#	#	#
52	Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	-	-	-	-	-	-
53	Macau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#
54	Macedonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	-	#	#	#
55	Malaysia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	-	#	#	#
56	Mexico	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	#	#	-	#	#	#
57	Moldova	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	#	#	#	#
58	Mongolia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	O	#	#	#	#	#	#	#	#
59	Myanmar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O
60	Nepal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O
61	Netherlands	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	H	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
62	New Zealand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	-	-	-	-	-	-	-
63	Nigeria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	-	#
64	Norway	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	#	#	#	#	H	#	#	#	#	#	#	#	#	#	#
65	Pakistan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	#	#	#	#	#	#
66	Peru	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	-
67	Philippines	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	-	#	-	-	#	#	-	-	#
68	Poland	H	#	#	#	#	#	H	#	#	#	#	#	#	#	#	#	#	#	#	H	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
69	Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	#	#	#	#	#
70	Puerto Rico	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O
71	Romania	#	#	#	#	#	H	#	#	#	#	#	#	#	H	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
72	Russia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
73	Saudi Arabia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	-	#	#	#
74	Serbia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#
75	Singapore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	H
76	Slovakia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	#	#	#	#	#	#
77	Slovenia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	#	#	#	-	#	#	#
78	South Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	-	-	-
79	South Korea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	#	#	#	#	H	#	#
80	Spain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	O	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	H	#
81	Sri Lanka	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#
82	Suriname	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	-	-	-	#	-	-	#	#
83	Sweden	-	-	-	-	-	O	-	-	#	#	#	#	#	#	H	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	-	#	#	#
84	Switzerland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	#	#	#	#
85	Taiwan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	U	#	#	#	#	#	#	#	#	H	#	#	#
86	Tajikistan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#
87	Thailand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
88	Turkey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	-	#	#	#	#	#	#	#	#	#	#	#	#	H	#	#	#	#	#
89	Turkmenistan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	#	#	#	#	-	#	#	#
90	UAE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
91	Ukraine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
92	USA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	#	#	#	#	#	#	#	H	#	#	#	#	#	#	#	#	-	#	#	#	#
93	Vietnam	-	-	-	-	-	-	-	-	-	-	-	#	#	#	#	#	-	#	#	-	#	-	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#
Former Participants (countries that already do not exist):																																						
1	Czechoslovakia	#	#	H	#	#	#	#	#	#	H	#	#	#	#	#	#	#	#	#	#	#	#	#	*dissolved*													

2	GDR	- # # # # # # H # #	# # # # # # # H # #	#	*joined to FRG*	
3	Soviet Union	- # # H # # # # # #	H # # # # # # # # #	# #	*dissolved*	
4	SFR Yugoslavia	- # # # - - - - - #	# # # # # H # # # #	# #	*dissolved*	
5	Serbia & Mont.	- - - - - - - - - -	- - - - - - - - - -	- - S S I # # # # #	# # # # # #	*dis*
	International Organizations:					
1	EPS	- - - - - - - - - -	- - - - O O O O O O	O O O O O O O O O -	- - - - - - -	
2	UNESCO	- O - - - - - - - -	- O - - - - O O O -	- O - - O - - - - -	- - - - - - -	

Explanation:

- **#** : participation
- **-** : no participation
- **H** : host country
- **O** : observer
- **U** : unofficial participation (guest of the organisers)
- **S** : no participation for sanctions of the UN
- **I** : unofficial participation of individual pupils (they did not represent their country)

TABLE 2

ORGANIZERS OF THE INTERNATIONAL PHYSICS OLYMPIADS

PAST:

No. of the Olympiad	Year	Place	Country	Date (length in days)
I	1967	Warsaw	Poland	25th June - 1st July (7)
II	1968	Budapest	Hungary	23rd - 29th June (7)
III	1969	Brno	Czechoslovakia	23rd June - 2nd July (10)
IV	1970	Moscow	Soviet Union	5th - 15th July (11)
V	1971	Sofia	Bulgaria	2nd - 11th July (10)
VI	1972	Bucharest	Romania	8th - 18th July (11)
VII	1974	Warsaw	Poland	8th - 20th July (13)
VIII	1975	Guestrow	GDR	7th - 17th July (11)
IX	1976	Budapest	Hungary	1st - 8th July (8)
X	1977	Hradec Kralove	Czechoslovakia	7th - 17th July (11)
XI	1979	Moscow	Soviet Union	2nd - 10th July (9)
XII	1981	Varna	Bulgaria	1st - 10th July (10)
XIII	1982	Malente	FRG	19th - 29th June (11)
XIV	1983	Bucharest	Romania	5th - 14th July (10)
XV	1984	Sigtuna	Sweden	24th June - 1st July (8)
XVI	1985	Portoroz	SFR Yugoslavia	23rd - 30th June (8)
XVII	1986	London-Harrow	Great Britain	13th - 20th July (8)
XVIII	1987	Jena	GDR	5th - 13th July (9)
XIX	1988	Bad Ischl	Austria	23rd June - 2nd July (10)
XX	1989	Warsaw	Poland	16th - 24th July (9)
XXI	1990	Groningen	The Netherlands	5th - 13 July (9)
XXII	1991	Havana	Cuba	1st - 9th July (9)
XXIII	1992	Helsinki-Espoo	Finland	5th - 13th July (9)
XXIV	1993	Williamsburg	USA	10th - 18th July (9)
XXV	1994	Beijing	China	11th - 19th July (9)
XXVI	1995	Canberra	Australia	5th - 12th July (8)
XXVII	1996	Oslo	Norway	30th June - 7th July (8)
XXVIII	1997	Sudbury	Canada	13th - 21st July (9)
XXIX	1998	Reykjavik	Iceland	2nd - 10th July (9)
XXX	1999	Padova	Italy	18th - 27th July (10)
XXXI	2000	Leicester	Great Britain	8th - 16th July (9)
XXXII	2001	Antalya	Turkey	28th June - 6th July (9)
XXXIII	2002	Nusa Dua	Indonesia	21st - 30th July (10)
XXXIV	2003	Taipei	Taiwan	2nd - 11th August (10)
XXXV	2004	Pohang	South Korea	15th - 23rd July (9)
XXXVI	2005	Salamanca	Spain	3rd - 12th July (10)
XXXVII	2006	Singapore	Singapore	8th - 17th July (10)

FUTURE:

No. of the Olympiad	Year	Place	Country	Status
XXXVIII	2007	Isfahan	Iran	preliminary date: 13th - 21th July (9)
XXXIX	2008	Hanoi	Vietnam	confirmed
XL	2009	Merida	Mexico	11 - 20 July (10)
XLI	2010	*not decided yet*	Croatia	confirmed
XLII	2011	*not decided yet*	Belgium	confirmed
XLIII	2012	*not decided yet*	Estonia	declaration of intent received; accepted

XLIV	2013	*not decided yet*	Denmark	declaration of intent received; accepted
XLV	2014	*not decided yet*	Slovenia	declaration of intent received; accepted
XLVI	2015	Dublin	Ireland	declaration of intent received; accepted
XLVII	2016	*not decided yet*	Switzerland + Liechtenstein	declaration of intent received; accepted
XLVIII	2017	*not decided yet*	Moldova	declaration of intent received; accepted
XLIX	2018	*not decided yet*	Portugal	declaration of intent received; accepted
L	2019	*not decided yet*	Israel	declaration of intent received; accepted
LI	2020	*not decided yet*	Lithuania	declaration of intent received; accepted
LII	2021	*not decided yet*	Indonesia	declaration of intent received; accepted
LIII	2022	*not decided yet*	Thailand	declaration of intent received; accepted
Copies of the letters with confirmation or declaration of intend have been disseminated to all the delegations				
State on July 25, 2006				

Comment:

Organization of the event by two countries in 2016 exceptionally accepted by the International Board in 2005.

TABLE 3

DISTRIBUTION OF PRIZES IN THIRTY SEVEN INTERNATIONAL PHYSICS OLYMPIADS

No.	Country	28th - 37th IPhO (last ten Olympiads)									1st - 37th IPhOs (all Olympiads)								
		A	1	2	3	H	S	T	V	%	A	1	2	3	H	S	T	V	%
1	Albania	0	0	0	1	7	1	8	30	7,5	0	0	0	1	7	1	8	30	7,5
2	Argentina	0	0	3	9	12	1	24	40	24,4	0	0	3	9	15	1	27	55	19,1
3	Armenia	0	0	0	7	10	1	17	35	17,1	0	0	0	7	10	1	17	35	17,1
4	Australia	0	6	16	18	9	2	49	50	58,5	0	6	19	33	30	5	88	100	44,3
5	Austria	0	2	3	4	11	0	20	45	20,0	0	2	5	12	33	6	52	120	16,7
6	Azerbaijan	0	5	5	5	5	2	20	40	31,3	0	5	5	5	5	2	20	40	31,3
7	Belarus	1	4	10	18	14	1	46	50	48,0	1	4	11	20	17	1	52	60	44,2
8	Belgium	0	0	0	1	9	0	10	50	5,5	0	0	0	3	15	1	18	95	5,5
9	Bolivia	0	0	0	0	2	0	2	25	2,0	0	0	0	0	2	0	2	30	1,7
10	Bosnia & Herc.	0	0	0	1	5	0	6	50	3,5	0	0	0	1	5	0	6	55	3,2
11	Brazil	0	0	0	2	10	0	12	35	10,0	0	0	0	2	10	0	12	35	10,0
12	Brunei Darus.	0	0	0	0	1	0	1	5	-----	0	0	0	0	1	0	1	5	-----
13	Bulgaria	0	1	8	12	12	0	33	50	32,0	1	11	20	39	53	9	123	182	32,3
14	Cambodia	0	0	0	0	1	0	1	5	-----	0	0	0	0	1	0	1	5	-----
15	Canada	0	4	6	15	17	0	42	50	40,5	0	5	8	27	30	4	70	110	29,1
16	China	2	38	7	0	0	15	45	45	96,1	7	67	20	9	2	39	98	100	87,0
17	Colombia	0	0	1	1	5	0	7	50	5,0	0	0	1	2	7	1	10	95	3,7
18	Croatia	0	0	1	6	12	0	19	50	13,5	0	0	1	7	19	4	27	75	12,0
19	Cuba	0	0	1	3	6	0	10	45	8,3	0	0	2	6	9	7	17	120	5,6
20	Cyprus	0	0	1	0	4	0	5	45	3,9	0	0	1	1	8	2	10	90	3,6
21	Czechlands	0	3	9	17	17	1	46	50	45,0	0	5	12	23	24	5	64	70	45,0
22	Denmark	0	0	0	2	19	0	21	50	11,5	0	0	0	2	19	0	21	55	10,5
23	Estonia	0	1	3	12	21	0	37	50	29,0	0	1	3	16	24	2	44	75	23,0
24	Finland	0	0	1	8	20	0	29	50	19,5	0	1	2	19	51	2	73	140	17,7
25	France	0	0	2	8	0	1	10	15	-----	0	2	7	17	14	5	40	50	38,5
26	Georgia	0	2	6	5	8	1	21	50	22,0	0	2	6	6	8	2	22	55	20,9
27	Germany	0	7	13	19	10	2	49	50	57,5	2	21	40	56	24	24	141	155	54,8
28	Ghana	0	0	0	0	0	0	0	5	-----	0	0	0	0	0	0	0	5	-----
29	Great Britain	0	1	9	21	7	2	38	45	44,4	2	9	23	40	19	17	91	110	46,4
30	Greece	0	0	0	1	4	0	5	20	-----	0	0	0	2	5	1	7	50	4,5
31	Hong Kong	0	2	5	4	3	1	14	15	-----	0	2	5	4	3	1	14	15	-----
32	Hungary	1	12	15	19	4	4	50	50	67,5	3	33	37	68	33	17	171	182	56,6
33	Iceland	0	0	0	1	9	0	10	50	5,5	0	0	0	2	15	4	17	115	4,1
34	India	0	13	15	11	6	4	45	45	69,4	0	13	15	11	6	4	45	45	69,4
35	Indonesia	1	12	8	19	7	4	46	50	58,5	1	12	9	22	15	5	58	70	47,9
36	Iran	1	21	21	8	0	5	50	50	81,5	1	25	28	17	10	11	80	90	63,3
37	Ireland	0	0	0	4	7	0	11	45	8,3	0	0	0	4	7	0	11	45	8,3
38	Israel	0	1	6	16	16	0	39	45	38,9	0	1	8	20	22	5	51	60	37,5
39	Italy	0	0	4	11	20	2	35	50	27,0	0	1	6	18	32	4	57	110	20,5
40	Japan	0	0	1	3	1	1	5	5	-----	0	0	1	3	1	1	5	5	-----
41	Jordan	0	0	0	0	0	0	0	5	-----	0	0	0	0	0	0	0	5	-----
42	Kazakhstan	0	2	4	11	14	1	31	50	28,0	0	2	4	11	14	1	31	50	28,0
43	Kenya	0	0	0	0	0	0	0	5	-----	0	0	0	0	0	0	0	5	-----
44	Kuwait	0	0	0	0	0	0	0	45	0,0	0	0	0	0	0	1	0	90	0,0
45	Kyrgyzstan	0	0	1	3	3	1	7	25	12,0	0	0	1	3	3	1	7	25	12,0
46	Laos	0	0	0	0	0	0	0	5	-----	0	0	0	0	0	0	0	5	-----
47	Latvia	0	1	1	7	14	0	23	50	17,5	0	1	1	8	14	0	24	55	16,8

48	Liechtenstein	0	0	0	1	1	0	2	40	1,9	0	0	0	1	1	0	2	40	1,9
49	Lithuania	0	0	1	13	14	1	28	45	23,9	0	0	1	18	21	3	40	75	20,0
50	Luxembourg	0	0	0	0	0	0	0	5	-----	0	0	0	0	0	0	0	5	-----
51	Macau	0	0	0	1	1	0	2	5	-----	0	0	0	1	1	0	2	5	-----
52	Macedonia	0	0	0	1	3	0	4	45	2,8	0	0	0	1	4	0	5	50	3,0
53	Malaysia	0	0	0	2	11	0	13	20	-----	0	0	0	2	11	0	13	20	-----
54	Mexico	0	0	0	0	4	0	4	45	2,2	0	0	0	0	4	1	4	65	1,5
55	Moldova	0	0	3	7	12	0	22	50	17,5	0	0	3	7	15	0	25	60	15,8
56	Mongolia	0	0	1	3	8	0	12	40	10,6	0	0	1	3	8	0	12	40	10,6
57	Netherlands	0	0	3	15	19	0	37	50	29,0	1	4	11	31	43	6	89	125	30,8
58	New Zealand	0	0	0	0	4	0	4	15	-----	0	0	0	1	6	1	7	25	8,0
59	Nigeria	0	0	0	0	0	1	0	10	-----	0	0	0	0	0	1	0	10	-----
60	Norway	0	0	0	1	4	0	5	50	3,0	0	1	0	4	16	2	21	115	6,1
61	Pakistan	0	0	0	3	11	2	14	30	14,2	0	0	0	3	11	2	14	30	14,2
62	Peru	0	0	0	0	0	0	0	5	-----	0	0	0	0	0	0	0	5	-----
63	Philippines	0	0	1	1	4	0	6	25	9,0	0	0	1	1	4	1	6	45	5,0
64	Poland	0	4	8	17	15	0	44	50	44,5	4	18	31	51	52	16	152	182	43,8
65	Portugal	0	0	1	3	3	0	7	50	6,0	0	0	1	3	3	0	7	65	4,6
66	Romania	0	7	18	10	10	1	45	50	56,0	2	28	51	49	29	18	157	182	53,8
67	Russia	2	26	20	3	1	11	50	50	85,5	2	35	28	7	3	17	73	75	80,3
68	Saudi Arabia	0	0	0	0	0	0	0	20	-----	0	0	0	0	0	0	0	20	-----
69	Serbia	0	0	1	1	1	0	3	5	-----	0	0	1	1	1	0	3	5	-----
70	Singapore	0	9	8	16	13	3	46	50	52,5	0	10	10	23	25	6	68	90	39,2
71	Slovakia	0	2	6	11	21	0	40	50	34,5	0	2	9	15	29	4	55	70	33,6
72	Slovenia	0	1	1	7	22	1	31	45	23,9	0	1	2	11	27	4	41	70	21,1
73	South Korea	0	20	11	15	3	0	49	50	73,0	0	22	15	22	7	5	66	75	61,3
74	Spain	0	0	1	2	14	1	17	50	10,5	0	0	1	2	17	3	20	85	7,1
75	Sri Lanka	0	0	0	0	3	1	3	10	-----	0	0	0	0	3	1	3	10	-----
76	Suriname	0	0	0	0	0	0	0	25	0,0	0	0	0	0	0	2	0	55	0,0
77	Sweden	0	0	1	1	9	1	11	45	7,8	0	1	9	13	41	13	64	140	17,5
78	Switzerland	0	2	2	7	14	2	25	50	21,0	0	2	2	9	17	2	30	60	20,4
79	Taiwan	1	21	12	13	4	4	50	50	75,0	1	23	15	16	8	5	62	65	68,1
80	Tajikistan	0	0	0	0	0	0	0	5	-----	0	0	0	0	0	0	0	5	-----
81	Thailand	0	6	10	7	14	2	37	50	41,0	0	6	10	9	17	3	42	85	26,2
82	Turkey	0	4	10	15	14	1	43	50	45,0	0	6	11	25	24	7	66	105	31,2
83	Turkmenistan	0	0	1	3	7	2	11	35	11,4	0	0	1	3	7	2	11	35	11,4
84	Ukraine	0	10	14	17	7	0	48	50	61,5	0	13	21	25	11	6	70	75	58,7
85	USA	1	18	14	10	2	7	44	45	75,6	2	30	21	27	11	16	89	100	62,0
86	Vietnam	1	3	15	25	4	2	47	50	55,5	1	5	21	37	17	8	80	115	37,8
	SUBTOTAL	11	271	349	544	639	96	1803	3185	30,3	31	438	581	977	1136	352	3132	5658	29,1
F1	Czechoslovakia	-	-	-	-	-	-	-	-	-	4	15	24	29	27	7	95	112	48,4
F2	GDR	-	-	-	-	-	-	-	-	-	0	8	14	35	27	10	84	99	43,2
F3	Soviet Union	-	-	-	-	-	-	-	-	-	6	41	26	22	12	24	101	104	71,6
F4	SFR Yugoslavia	-	-	-	-	-	-	-	-	-	0	1	7	14	10	3	32	79	19,9
F5	Serbia & Mont.	0	1	7	11	20	1	39	45	37,2	0	1	7	13	26	1	47	55	35,0
	TOTAL	11	272	356	555	659	97	1842	3230	30,4	41	504	659	1090	1238	397	3491	6107	30,3

Explanation:

A - number of **A**bsolute winners
1 - number of **1**st prizes
2 - number of **2**nd prizes
3 - number of **3**rd prizes
S - number od **S**pecial prizes

H - number of **H**onourable mentions
T - **T**otal number of regular prizes and honourable mentions
V - possible number of participants ("participation **V**olume")
% - ***"Efficiency of participation"*** expressed in percents as

$$(\mathbf{1}+0{,}75*\mathbf{2}+0{,}5*\mathbf{3}+0{,}25*\mathbf{H})/\mathbf{V}$$

Comments:

1. Countries that already do not exist are enumerated at the end of the Table.
2. In case of a country sending always a full team the value of **V** equals to the total number of its participants in the Olympiads in which the country took part. Some countries, however, sometimes send a smaller number of pupils than it is allowed or sometimes do not participate. Then, of course, the real total numbers of their participants are smaller than the corresponding values of **V**. Unfortunately, the official list of the prize-winners do not allow to reconstruct the real total numbers of participants from each country (the lists do not contain those who have not obtained any prize or honourable mention).
3. The total number of the Absolute Winners (list line in the Table) is not equal the number of the Olympiads as at four Olympiads two students were classified *ex aequo* in the first position.
4. In the 1st IPhO there were 7 prize winners classified linearly. As their scores were very high and very close to each other, in the above Table all the winners of the 1st IPhO are treated as the I prize winners.
5. Lithuania at the XX IPhO (1989), Iran at the XIV IPhO (1993) and Taiwan at the XXV IPhO (1994) participated unofficially. Their results are included in this Table.
6. Five pupils from the New Yugoslavia participated in 1994. They participated as individuals and did not represent any country for the sanctions of the UN against Yugoslavia. They are not included in this statistics.
7. The “Efficiency of participation” has not been counted for countries that participated less than 5 times in the competition in considered periods (to avoid great fluctuations).

TABLE 4

PROBLEMS AND THEIR MARKING

State on July 25, 2006

Olympiad	C	T	E	MT	ME	M	MS	MS/M
I	L	4	1	10;10;10;6	10	40	39,00	97,5
II	A	3	1	10;10;10	10	40	35,00	87,5
III	A	4	1	8;8;8;8	16	48	48,00	100,0
IV	A	4	1	10;10;10;10	20	60	57,00	95,0
V	A	4	1	10;10;10;10	20	60	48,60	81,0
VI	A	4	1	10;10;10;10	20	60	57,00	95,0
VII	R	3	1	10;10;10	20	50	46,00	92,0
VIII	R	3	1	10;10;10	20	50	43,00	86,0
IX	R	3	1	10;10;10	20	50	47,50	95,0
X	R	3	1	10;10;10	20	50	49,00	98,0
XI	R	3	1	10;10;10	20	50	43,00	86,0
XII	R	3	1	10;10;10	20	50	47,00	94,0
XIII	R	3	2	10;10;10	10;10	50	43,00	86,0
XIV	R	4+1	1	8;8;7;7	20	50	43,75	87,5
XV	R	3	2	10;10;10	10;10	50	43,00	86,0
XVI	R	3	2	10;10;10	10;10	50	42,50	85,0
XVII	R	3	2	10;10;10	10;10	50	37,90	75,8
XVIII	R	3	1	10;10;10	20	50	49,00	98,0
XIX	R	3	2	10;10;10	10;10	50	39,38	78,8
XX	R3	3	1	10;10;10	20	50	46,33	92,7
XXI	R3	3	2	10;10;10	10;10	50	45,70	91,4
XXII	R3	3	1	10;10;10	20	50	48,20	96,4
XXIII	R3	3	2	10;10;10	10;10	50	44,00	88,0
XXIV	R3	3	2	10;10;10	10;10	50	40,65	81,3
XXV	R3	3	2	10;10;10	10;10	50	44,30	88,6
XXVI	R3	3	2	20;20;20	20;20	100	95,00	95,0
XXVII	R3	3	1	10;10;10	20	50	47,50	95,0
XXVIII	R3	3	1	10;10;10	20	50	47,25	94,5
XXIX	R3	3	1	10;10;10	20	50	47,50	95,0
XXX	R3	3	1	10;10;10	20	50	49,80	99,6
XXXI	R3	3	2	10;10;10	10;10	50	43,40	86,8
XXXII	R3	3	1	10;10;10	20	50	47,55	95,1
XXXIII	P	3	2	10;10;10	20	50	45,40	90,8
XXXIV	P	3	1	10;10;10	20	50	42,30	84,6
XXXV	P	3	1	10;10;10	20	50	47,70	95,4
XXXVI	P	3	1	10;10;10	20	50	49,50	99,0
XXXVII	P	3	1	10,10,10	20	50	47,20	94,4
XXXVIII	P							

Explanation:

C - **C**lassification system:

L - **L**inear ordering of the winners according to the total number of points obtained
A - **A**bsolute scale: three groups of the prize winners and one group of those who obtained the honourable mentions - the minima for each group were calculated with respect to the theoretically possible highest score
R - **R**elative scale: as **A**, but the minima were calculated with respect to the best score reached at a given Olympiad
R3 - as **A**, but the minima were calculated with respect to the mean value of the **3** best scores reached at a given Olympiad
P - minima for the Gold, Silver and Bronze Medals and Honourable Mentions are expressed in points after preliminary grading by the Organizers - the numbers of the Olympic trophies of different categories should corresponds to the **P**ercents with respect to the number of participants, defined in the Statutes (6%, 18, 36% and 60%, respectively).

T - number of the **T**heoretical Problems
E - number of the **E**xperimental problems
MT - possible **M**aximum scores for each of the **T**heoretical problems
ME - possible **M**aximum scores for each of the **E**xperimental problems
M - theoretically possible **M**aximum total score at a given Olympiad
MS - **M**aximum **S**core reached at a given Olympiad
MS/M - the ratio of **MS** to **M**; it may be treated as a degree of difficulty of a given Olympiad

Comments:

1. The data concerning the IV, V and VI IPhOs were reconstructed due to kind help of Ms. G. S. Tarasyuk.
2. At the I IPhO the pupils were required to solve three theoretical problems (of their choice).
3. All the results were multiplied by 1.2 prior to awarding the prizes (in the absolute scale the best score was 47.5 points; it corresponds to **MS**/**M** = 79.2%).
4. At the XIV IPhO the pupils got four "regular" problems and one additional problem (for special prize only).

TABLE 5

NUMBERS OF PRIZES IN SUBSEQUENT INTERNATIONAL PHYSICS OLYMPIADS											PARTIAL SUMS FROM 1st TO nth OLYMPIAD						
Olympiad	P	C	I	II	III	H	S	N	V	N/V	I	II	III	H	S	N	V
I	3	5	7	0	0	4	0	11	15	73,3	7	0	0	4	0	11	15
II	3	8	2	1	3	2	1	8	24	33,3	9	1	3	6	1	19	39
III	5	8	13	10	9	5	0	37	40	92,5	22	11	12	11	1	56	79
IV	6	8	4	7	10	13	2	34	48	70,8	26	18	22	24	3	90	127
V	5	7	5	6	12	7	0	30	35	85,7	31	24	34	31	3	120	162
VI	5	9	2	3	14	15	7	34	45	75,6	33	27	48	46	10	154	207
VII	5	8	3	0	8	7	2	18	40	45,0	36	27	56	53	12	172	247
VIII	5	9	7	9	12	8	1	36	45	80,0	43	36	68	61	13	208	292
IX	5	10	7	7	12	13	11	39	50	78,0	50	43	80	74	24	247	342
X	5	12	7	16	16	12	7	51	60	85,0	57	59	96	86	31	298	402
XI	5	11	8	5	13	15	4	41	55	74,5	65	64	109	101	35	339	457
XII	5	14	7	19	18	16	4	60	70	85,7	72	83	127	117	39	399	527
XIII	5	17	14	19	23	10	7	66	85	77,6	86	102	150	127	46	465	612
XIV	5	16	7	9	16	17	20	49	80	61,3	93	111	166	144	66	514	692
XV	5	18	9	5	16	17	15	47	90	52,2	102	116	182	161	81	561	782
XVI	5	20	5	6	17	25	7	53	100	53,0	107	122	199	186	88	614	882
XVII	5	21	4	5	22	27	8	58	105	55,2	111	127	221	213	96	672	987
XVIII	5	25	3	10	29	30	4	72	125	57,6	114	137	250	243	100	744	1112
XIX	5	27	7	23	29	27	6	86	135	63,7	121	160	279	270	106	830	1247
XX	5	30	10	26	31	34	12	101	150	67,3	131	186	310	304	118	931	1397
XXI	5	32	6	12	25	24	6	67	160	41,9	137	198	335	328	124	998	1557
XXII	5	31	13	10	31	21	4	75	155	48,4	150	208	366	349	128	1073	1712
XXIII	5	38	13	20	24	35	15	92	190	48,4	163	228	390	384	143	1165	1902
XXIV	5	42	18	16	33	41	51	108	210	51,4	181	244	423	425	194	1273	2112
XXV	5	46	6	5	22	37	90	70	230	30,4	187	249	445	462	284	1343	2342
XXVI	5	51	25	29	43	54	9	151	255	59,2	212	278	488	516	293	1494	2597
XXVII	5	55	20	25	47	63	7	155	275	56,4	232	303	535	579	300	1649	2872
XXVIII	5	56	18	33	54	55	6	160	280	57,1	250	336	589	634	306	1809	3152
XXIX	5	56	11	15	43	55	23	124	280	44,3	261	351	632	689	329	1933	3432
XXX	5	62	30	71	54	57	16	212	310	68,4	291	422	686	746	345	2145	3742
XXXI	5	63	15	11	42	62	8	130	315	41,3	306	433	728	808	353	2275	4057
XXXII	5	65	22	40	53	47	5	162	325	49,8	328	473	781	855	358	2437	4382
XXXIII	5	66	42	37	58	68	5	205	330	62,1	370	510	839	923	363	2642	4712
XXXIV	5	54	20	39	38	56	6	153	270	56,7	390	549	877	979	369	2795	4982
XXXV	5	71	31	35	68	82	6	216	355	60,8	421	584	945	1061	375	3011	5337
XXXVI	5	72	46	26	63	96	13	231	360	64,2	467	610	1008	1157	388	3242	5697
XXXVII	5	82	37	49	82	81	9	249	410	60,7	504	659	1090	1238	397	3491	6107
XXXVIII	5																
TOTAL			504	659	1090	1238	397	3491		70,1							

Explanation:

P - allowed number of **P**upils in each team
C - number of participating **C**ountries
I - number of the **I** prize winners
II - number of the **II** prize winners

III - number of the **III** prize winners
HM - number of the participants who obtained the **H**onourable **M**entions
S - number of **S**pecial prizes awarded
N - number of the participants who passed the competition successfully (**I**+**II**+**III**+**HM**)
V - "**V**olume of the Olympiad", i.e. the total possible number of participants in a given competition (= **P** × **C**)
N/**V** - index of successful passes per one participant at a given Olympiad

Comments:

1. **V** is practically equal to the total number of participants in a given Olympiad since usually all the countries send full teams to the competition. (Few exceptions, however, happen sometimes.) Thus, the quantity **N**/**V** may be treated as certain index of successful passes per one participant at a given Olympiad.
2. In the 1st IPhO there were 7 prize -winners classified linearly. As their scores were very high and very close to each other, in the above Table all the winners of the 1st IPhO are treated as winners of the I prize.
3. Unofficial participations of Lithuania at the XX IPhO, Iran at the XXIV IPhO and Taiwan at the XXV IPhO are included.
4. Very often the special prizes are awarded for quite incompatible merits.

5. TABLE 6

TRAINING SYSTEMS IN DIFFERENT COUNTRIES

(the data were collected for the last time in 1989)

Country	**Number of participants**	**Length of the training**	**Character of the training**	**Final selection**
Austria	5	3 days	theor. only	yes
Bulgaria	10	20-30 days	exp.+theor.	yes
Canada	12	5 days	exp.+theor.	yes
China	15	60 days	exp.+theor.	yes
Colombia	30	45 days	exp.+theor.	yes
Cyprus	10	50 days	exp.+theor.	yes
Finland	5	4 days	exp. only	yes
F. R. Germany	5	3 days	exp. only	no
Great Britain		*no training*		
Hungary	60	15 days	exp.+theor.	yes
Iran	7	50 days	exp.+theor.	yes
Italy	10	5 days	exp.+theor.	yes
The Netherlands	5	5 days	exp. only	no
Norway	5	5 days	exp.+theor.	no
Poland	6-10	10 days	exp.+theor	no
Sweden	5	3 days	exp.+theor.	no
Turkey	17-20	45 days	exp.+theor.	yes

(„yes" means that the final selection of the team is made after the training; „no" means that the team was selected prior to the training)