Statutes of the International Physics Olympiads

Version accepted in 1999 in Padova (*Italy*)
Changes: 2000 - Leicester (*Great Britain*)
2001 - Antalya (*Turkey*)
2002 - Bali (*Indonesia*)
2004 - Pohang (*Korea*)
2006 - Singapore
2008 - Hanoi (*Vietnam*)
2013 - Copenhagen (*Denmark*)
2014 - Astana (*Kazakhstan*)
2015 - Mumbai (*India*)

§1

In recognition of the growing significance of physics in all fields of science and technology, and in the general education of young people, and with the aim of enhancing the development of international contacts in the field of school education in physics, an annual physics competition has been organized for secondary school students. The competition is called the International Physics Olympiad and is a competition between individuals.

§2

The competition is organized by the Ministry of Education, the Physical Society or another appropriate institution of one of the participating countries on whose territory the competition is to be conducted. The organizing country is obliged to ensure equal participation of all the delegations, and to invite teams from all those countries that participated during the last three years. Additionally, it has the right to invite other countries. The list of such new countries must be presented to Secretariat of the IPhOs (**§** 8) at least six months prior to the competition. Within two months the Secretariat has the right to remove, after consultations with the Advisory Committee (# 8), from the suggested list the teams that in opinion of Secretariat or Advisory Committee do not meet the criteria of participation in the IPhOs. The new countries not accepted by the Secretariat or Advisory Committee may, however, participate as "guest teams" but such participation does not create any commitments with respect to inviting these countries to the next competition(s).
No country may have its team excluded from participation on any political reasons resulting from political tensions, lack of diplomatic relations, lack of recognition of some country by the government of the organizing country, imposed embargoes and similar reasons. When difficulties preclude formal invitation of the team representing

a country, students from such a country should be invited to participate as individuals.
The competition is conducted in the friendly atmosphere designed to promote future collaborations and to encourage the formation of friendship in the scientific community. Therefore all possible political tensions between the participants should not be reflected in any activity during the competition. Any political activity directed against any individuals or countries is strictly prohibited.

§3

Each participating country shall send a delegation, normally consisting of five students (contestants) and two accompanying persons (delegation leaders) at most. The contestants shall be students of general or technical secondary schools i.e. schools which cannot be considered technical colleges. Students who have finished their school examinations in the year of the competition can be members of the team as long as they have not commenced their university studies. The age of the contestants should not exceed twenty years on June 30th of the year of the competition.
The delegation leaders must be specialists in physics or physics teachers, capable of solving the problems of the competition competently. Each of them should be able to speak English.

§4

The Organizers of the Olympiad determine in accordance to the program the day of arrival and the day of departure as well as the place in their country from which the delegations are supposed to arrive and depart. The costs for each delegation as a result of activities connected to the Olympiad from the day of arrival till the day of departure are covered by the Organizing Committee.

§5

The competition shall be conducted over two days, one for the theoretical examination and one for the experimental examination. There will be at least one full day of rest between the examinations.
The theoretical examination shall consist of three theoretical problems and shall be of five hours total duration.
The experimental examination shall consist of one or two problems and shall be of five hours total duration.

Contestants may bring into the examination drawing instruments and approved calculators. No other aids may be brought into the examination.
The theoretical problems should involve at least four areas of physics taught at secondary school level, (see Syllabus). Secondary school students should be able to solve the competition problems with standard high school mathematics and without extensive numerical calculation.
The competition tasks are chosen and prepared by the host country and have to be accepted by the International Board (**§** 7).
The host country has to prepare at least one spare problem, which will be presented to the International Board if one of the first three theoretical problems is rejected by two thirds of members of the International Board. The rejected problem cannot be considered again.

§6

The total number of marks awarded for the theoretical examination shall be 30 and for the experimental examination 20. The competition organizer shall determine how the marks are allocated within the examinations.
After preliminary grading (prior to discussion of the grading with the delegation leaders) the organizers establish minima (expressed in points) for Gold Medals, Silver Medals, Bronze Medals, and Honorable Mentions according to the following rules:

(a)Gold Medals should be awarded to 8% of the contestants (rounded up the nearest integer).

(b)Gold or Silver Medals should be awarded to 25% of the contestants (rounded up the nearest integer).

(c)Gold, Silver or Bronze Medals should be awarded to 50% of the contestants (rounded up the nearest integer).

(d)An Olympic Medal or Honorable Mention should be awarded to 67% of the contestants (rounded up the nearest integer).

The minima corresponding to the above percentages should be expressed without rounding. The suggested minima shall be considered carried if one half or more of the number of the Members of the International Board cast their vote in the affirmative.
Results of those candidates who only receive a certificate of participation should

strictly remain to the knowledge of the Members of the International Board and persons allowed to attend its meetings.

§7

The governing body of the IPhO is the International Board, which consists of the delegation leaders from each country attending the IPhO.
The chairman of the International Board shall be a representative of the organizing country when tasks, solutions and evaluation guidelines are discussed and the President of the IPhO in all other topics.
A proposal placed to the International Board, except Statutes, Regulations and Syllabus (see **§**10), shall be considered carried if more than 50% of all delegation leaders present at the meeting vote in the affirmative. Each delegation leader is entitled to one vote. In the case of equal number of votes for and against, the chairman has the casting vote. The quorum for a meeting of the International Board shall be one half of those eligible to vote.
The International Board has the following responsibilities:

(a)to direct the competition and supervise that it is conducted according to the regulations;

(b)to ascertain, after the arrival of the competing teams, that all their members meet the requirements of the competition in all aspects. The Board will disqualify those contestants who do not meet the stipulated conditions;

(c)to discuss the Organizers' choice of tasks, their solutions and the suggested evaluation guidelines before each part of the competition. The Board is authorized to change or reject suggested tasks but not to propose new ones. Changes may not affect experimental equipment. There will be a final decision on the formulation of tasks and on the evaluation guidelines. The participants in the meeting of the International Board are bound to preserve secrecy concerning the tasks and to be of no assistance to any of the participants;

(d)to ensure correct and just classification of the students. All grading has to be accepted by the International Board;

(e)to establish the winners of the competition and make a decision concerning presentation of the medals and honorable mentions. The decision of the International Board is final;

(f)to review the results of the competition;

(g)to select the countries which will be assigned the organization of future competitions;

(h)to elect the members of the Secretariat of the IPhO.

§8

The long-term work involved in organizing the Olympiads is coordinated by a Secretariat for the International Physics Olympiads. This Secretariat consists of the President, the Secretary and the Treasurer. They are elected by the International Board for a period of five years when the chairs become vacant.
The members of the Secretariat of the IPhO should be invited to the Olympiads as the members and heads of the International Board; their relevant expenses should be paid by the organizers of the competition. The members of the Secretariat should not be leaders of any national team.
There shall be an Advisory Committee convened by the President of the IPhOs. The Advisory Committee consists of:
1. The President,
2. The Secretary,
3. The Treasurer,
4. The host of the past Olympiad,
5. The hosts of the next two Olympiads,
6. Such other persons appointed by the President.

§9

The working language of the IPhO is English.
The competition problems should be presented to the International Board in English, Russian, German, French and Spanish.
The solutions to the problems should be presented in English.
It is the responsibility of the delegation leaders to translate the problems into languages required by their students.
These statutes and other IPhO-documents shall be written in English.
Meetings of the International Board shall be held in English.

§10

These statutes are supplemented by

- Regulations concerning the details of the organization
- the Syllabus mentioned in **§** 5.

Proposals for amendment to these Statutes and the supplementing documents may be submitted to the president or his nominee no later than December 15th prior to consideration.
The President shall circulate, no later than March 15th, all such proposals together with the recommendation of the President's Advisory Committee, to the last recorded address of each delegation leader who attended at the last IPhO.
Such proposals shall be considered by a meeting of the International Board at the next IPhO and shall be considered carried if

- in case of Statutes and Syllabus two thirds or more and
- in case of Regulations more than one half

of the number of the members of the International Board present at the meeting cast their vote in the affirmative. Such changes shall take effect from the end of the current IPhO and cannot affect the operation of the competition in progress. The vote can only take place if at least 2/3 of the all leaders are present at the meeting.

§11

Participation in an International Physics Olympiad signifies acceptance of the present Statutes by the Ministry of Education or other institution responsible for sending the delegation.

Regulations Associated with the Statutes of the International Physics Olympiads

Regulations to §2

The Ministry of Education, or the institution organizing the competition, allots the task of preparation and execution of the Competition to an appropriate body.
Official invitations to the participating countries should be sent at least six months before the Olympiad. They normally are sent to the national institution that sent the delegation to the previous Olympiad. Copies of the invitation are also sent to the previous years' delegation leaders. The invitation should specify the place and time of the Competition plus the address of the organizing secretariat.
Countries wishing to attend the current IPhO must reply to the invitation before March 15, nominating a contact person. Each participating country must in addition supply the host country with the contestants' personal data (surname, given name, sex, address, date of birth and address of school) by May 15 or as soon as possible. The host country is only obliged to invite delegations from countries that participated in one of the last three competitions. It may refuse

- applications for participation from any other country
- applications from participating countries not belonging to the delegation as defined in **§**3 (observers, guests).

Each country should, within five years of entry, declare its intention to host for a future Olympiad, suggesting possible years. A country that is unable to organize the competition may be prevented from participating in IPhOs by decision of the International Board.

Regulations to §3

The accompanying persons are considered by the organizers of the next Olympiad and by the Secretariat of the IPhOs (**§** 8) as contact persons until the next Olympiad (unless new accompanying persons or other contact persons are nominated by the participating country).
Each participating country must ensure that the contestants are all secondary school pupils when they announce the names of the members of their delegations. In addition to the delegations, teams may be accompanied by observers and guests.

Observers may attend all Olympiad meetings, including the meetings of the International Board. However they may not vote or take part in the discussions. Guests do not attend the meetings of the International Board.
If possible, the host country should accept as observers any of the following persons:

- the organizer(s), or nominee(s), from the host country in the subsequent three years
- a representative of any country expressing an intention to participate in the following IPhO.

Regulations to §4

The host country must pay for organization of IPhO, food, lodging, transport and excursions of the delegations plus prizes.
However it is not responsible for medical costs and sundry expenses of the participants. Observers and guests may be asked to pay the full cost of their stay plus an attendance fee.
The host country may ask the delegations for a contribution to the obligatory costs. Delegations with economic difficulties may ask waving this fee by sending a motivated appeal to the Secretariat of the IPhO.

Regulations to §5

It is recommended that the Competition should last 10 days (including arrival and departure days).
The host country is obliged to ensure that the Competition is conducted according to the Statutes. It should provide full information for participating countries, prior to their arrival, concerning venue, dates, accommodation, transport from airports, ports and railway stations. The addresses, telephone, fax, e-mail of all IPhO officers should be provided, together with information concerning relevant laws and customs of the host country.
A program of events during the IPhO should be prepared for the leaders and contestants. It should be sent to the participating countries, prior to the Olympiad.
The organizers of the IPhO are responsible for devising all the problems. They must be presented in English and the other official languages of the Olympiad as indicated in **§** 9. The examination topics should require creative thinking and knowledge contained within the Syllabus. Factual knowledge from outside the Syllabus may be introduced provided it is explained using concepts within the Syllabus.

Everyone participating in the preparation of the competition problems must not divulge their content.
The standard of problems should attempt to ensure that approximately half the students obtain over half marks.
All problems should be presented simultaneously and the board should have at least one hour (exact time to be determined by the organizers) to read them carefully and suggest changes. Changes should be suggested to the organizers during this period. Changes accepted by the organizers will not require a vote: they will form a new text of the problems. After this period, the organizers will present the modified problem set. The International Board shall be given time to consider the examination papers. It may change, or reject, problems. IB Members should not be allowed to suggest the cuts in the problems unless the part contains wrong or poor physics. They can suggest that the whole set of problems is too long and ask for a vote on this. If accepted, it will be up to the organisers to suggest the cuts. The next vote can decide if the cuts are sufficient or not and this procedure acan be repeated until the IB decides that the length of the problems is correct.
If a problem is rejected, the alternative problem must be accepted. The host country will be responsible for grading the examination papers. The delegation leaders shall have an opportunity to discuss with the examiners the grading of their students' papers. If an agreement, between graders and leaders, to the final marks cannot be reached, the International Board has to decide.
A calculator shall be an approved calculator if it is not a graphical calculator, its display has no more than three lines, and if its user memory is completely cleared immediately prior to each examination.
The host country may provide calculators to students which are approved calculators. If the country chooses to do this then the team leaders of the countries attending IPhO must be advised of the exact model at least two months in advance of the competition. Students who bring their own approved calculators shall be permitted to use them.
The organizers shall provide the delegation leaders with copies of their students' scripts and allow at least 12 hours for them to mark the scripts.
The host country shall provide medals and certificates in accordance with the Statutes. They must also produce a list of all contestants receiving awards with their marks and associated award. The awards are presented at the Closing Ceremony.
The host country is obliged to publish the Proceedings of the Competition electronically, in English, within the subsequent year.

Regulations to §6

Special prizes may be awarded. The participant who obtains the highest score should receive a special prize.

Regulations to §7

During the meeting of the graders where the final and most detailed version of the grading scheme is set, 3 members of the International Board will be present. They have the right to give advice to the group of graders in order to keep the grading scheme within the tradition of the IPhOs.
If it is found that leaders, observers or students from a country have been in collusion to cheat in one of the International Olympiad examinations, the students concerned should be disqualified from that Olympiad. In addition, the leaders, observers and students involved should not be allowed to return to any future Olympiad. Appropriate decisions are taken by the International Board.

Regulations to §8

Election of the members of the Secretariat

a. All members of the Secretariat have to have been for the five years prior to the nomination
   - a member of the International Board for at least three of these years,
   - or an observer or member of the International Board, who has attended all these five IPhOs.

b. All members of the Secretariat will hold office for a period of five years commencing at the conclusion of the final meeting of the International Board at which the concerned person has been chosen.

c. The members of the Secretariat must be appointed at different IPhOs. If this is the case, however, the period of the Secretary and/or the Treasurer will have to be shortened in such a way that the elections can be held at different IPhOs.

d. The members of the Secretariat must come from different delegations.

e. If the term of one of the members of the Secretariat comes to an end, the International Board has to be informed one year in advance that there will be the ballots of a new member of the Secretariat during the following IPhO. In addition to that, the Secretariat is responsible to send a letter to all leaders of

the last three IPhOs with this information and with the question if any leader will be ready to run for these positions for the coming period by 31st January. This is normally done by e-mail.

f. If someone is willing to be a candidate for the ballot, he or she will have to tell this to the current Secretary by 31st March, normally by e-mail. A nominee has to send his/her curriculum vitae up to 31st March. A nomination may not be made by a person from the same country as one of the current members of the Secretariat who holds chair on another position than the one that becomes vacant.

g. The Secretariat is responsible to collect all these answers and has to make a list with all the names.
If the current members of the Secretariat are willing to continue his/her term, he or she has to enter his/her name in this list and has to follow the same rules as all the other candidates.
If the current secretary is willing to continue his/her activity as secretary, he or she has to enter his/her name in this list and has to follow the same rules as all the other candidates.

h. The list with the candidates for the new member of the Secretariat has to be published on the IPhO-home-page and the home page of the IPhO during which the ballot will be held.

i. If there is just one candidate for the vacant position of the Secretariat, the current Secretary has to inform the current President about that. In that case this candidate is accepted as the elected one.

j. The Secretariat and the organizers of the IPhO during which the election will be held are responsible for a democratic, secret ballot of the member of the Secretariat during the last meeting of the International Board:

k. If the current member of the Secretariat resigns or becomes incapable of continuing his/her work, the remaining members of the Secretariat shall appoint a replacement to act as provisional President, Secretary or Treasurer up to the next IPhO. The ballot of the new one has to be made as soon as possible.

Accepted in 2011 in Bangkok, Thailand

Appendix I : Voting rules

(The following voting rules are the same as those stated in the Statutes, but are summarized in the appendix for convenient purpose.)

1.1 Subjects: The suggested minima for awards (Statutes §6)

Classification of the students (Statutes §7)

To establish the winners (Statutes §7)

Medals and honourable mentions (Statutes §7)

Quorum: one half of those eligible to vote (Statutes §7)

A proposal is carried: more than one half of the members of the International Board present at the meeting cast their vote in the affirmative; in the case of equal number of votes for and against, the chairman has the casting vote

1.2 Subjects: Changes in the text of a problem (Statutes §7)

Quorum: one half of those eligible to vote (Statutes §7)

A proposal is carried: more than one half of the members of the International Board participating in the vote cast their vote in the affirmative; in the case of equal number of votes for and against, the chairman has the casting vote

1.3 Subjects: Rejection of one of the first three theoretical problems (Statutes §5)

Selection of future organisers (Statutes §7)

Election of the president (Statutes §8)

Election of the secretary (Statutes & Regulations §8)

A country unable to organise the competition may be prevented from participating (Regulations §8)

Disqualification of participants, leaders, teams in collusion to cheat (Regulations §7)

Quorum: one half of those eligible to vote (Statutes §7)

A proposal is carried: two thirds or more of the number of the members of the International Board present at the meeting cast their vote in the affirmative

1.4 Subjects: Change in the Regulations (Statutes §10)

Quorum: 2/3 of those eligible to vote

A proposal is carried: more than one half of the members of the International Board present at the meeting cast their vote in the affirmative; in the case of equal number of votes for and against, the chairman has the casting vote

1.5 Subjects: Change in the Statutes (Statutes §10)

Change in the Syllabus (Statutes §10)

Quorum: 2/3 of those eligible to vote

A proposal is carried: two thirds or more of the number of the members of the International Board present at the meeting cast their vote in the affirmative

Appendix II: Marking Rules

1. Establishing the Marks

1.1 In §6 of the Statutes it is stated that: ”The total number of marks awarded for the theoretical examination shall be 30 and for the experimental examination 20. The competition organiser shall determine how the marks are allocated within the examinations. ”

1.2. During the meeting of the International Board (IB) of the IPhO where the problems are discussed, a detailed marking scheme has to be provided which will be approved by the IB, if more than 50% of all delegation leaders present at the meeting vote in the affirmative.

1.3. The number of marks should reflect the required performance of the contestant. This performance can have different features:

a. knowledge and physical understanding
b. algebraic evaluation (mathematical formulation)
c. numerical evaluation and units
d. problem solving strategy and knowledge on how to draw conclusions
e. collecting data (from measurements)
f. representing data (plotting data curve)
g. data analysis and uncertainty (error) estimation

1.3. In the detailed marking scheme it is indicated which of the above is required.

2. Detailed requirements

2.1. All results per (sub)question need to be presented with it's correct unit. Within a numerical or algebraic evaluation units are not demanded unless this is specifically asked for.

2.2. Drawings need to be completed with the necessary labels (i.e. numbers, letters, titles, …)

2.3. Tables need to indicate:

- a title or number
- per column the quantity
- the unit of the quantity
- the uncertainty (error) of the quantity (by measurement or by calculated uncertainty (error) estimation. *(remark: numerical values of single data without an uncertainty are always useless since no comparison with other measurements or theoretical predictions can be made, unless the data are part of a series from which, by using statistics, an error estimation (or spread) can be calculated.)*

2.4. Graphs need to fulfil:

- a title, a number or a name of the graph
- minimum sizes (i.e. at least half A4) and proper aspect ratio
- axes with the quantity and unit
- visible dots representing the coordinates of the data
- error bars when asked for in the question
- quality of the curve

2.5 Unless specified otherwise in the question, the student needs to state how they derived their uncertainty (error) estimations, equally acceptable either by graphical or theoretical methods.

3. The marking

3.1. The leading principle to mark is to award the contestant in accordance to the extent in which the required performance is met. Therefore marks will be added for every correct intermediate or final result; this in contrast to a system in which marks are subtracted for every error.

3.2. Per (sub)question the maximum of marks allotted has to be in accordance with the marking scheme.

3.3. The allotted marks will reflect to what extent the contestant has fulfilled the task.

3.4. Partial marks (0 – maximum) will be given when the performance is incomplete. This includes evaluations where for instance the final result is incorrect.

3.5. In case an error propagates in subsequent results, full marks will be given per intermediate and final result when no extra errors are made, unless the error

clearly simplifies the calculations or the algebraic manipulations. In the latter case the degree of simplification should be reflected in the marks allotted.

3.6. At any stage the contestant should – if possible - reflect on the physical meaning of a(n) (intermediate) result. In case of wrong results only partial marks, if any, will be given. The reflection will regard:

1. the unit of a quantity,
2. the order of magnitude of a numerical result in accordance with the unit used,
3. when in the case of error propagation the student remarks that the order (with respect to the unit) is wrong or that the unit is wrong, but when the student is unable to correct the error, no more than 2/3 of the marks should be allotted.

4. The Moderation

4.1 In the Regulation to §5 of the Statutes it is stated that: “The organisers shall provide the delegation leaders with copies of their students' scripts and allow at least 12 hours for them to mark the scripts.” The time allotted for the preliminary marking should be long enough to achieve a high quality of grading. This benefits the moderations, assures more fair results and increases the predictability of the number of awards.

4.2. The markers in the moderation should have excellent knowledge on the problem they moderate. It is preferred that these markers are the same as the ones that marked the papers of the contestants who are discussed with the team leaders.

4.3. The markers master English to the extent that a quick discussion on their marking is assured. In case the markers need translations the time for the moderation will be doubled.

4.4. In §3 of the Statutes it is stated that: “The delegation leaders must be specialists in physics or physics teachers, capable of solving the problems of the competition competently. Each of them should be able to speak English.” When the moderation is slowed down due to the fact that the delegation leaders do not meet these requirements, there will be no extra time allotted for the moderation.

4.5. In the Regulations to §7 of the Statutes it is stated that: “During the meeting of the graders where the final and most detailed version of the grading scheme is set, 3 members of the International Board will be present. They have the right to give advice to the group of graders in order to keep the grading scheme within the tradition of the IPhOs.” Since these members are elected by the International Board, which is the governing body of the Olympiad (see §7 of the Statutes), their advise is decisive.

4.6. After the leaders and graders accept the moderation results, the marks of the concerned contestants should be final. If there is any special reason for changing the grades, it has to obtain consent from the three representatives of the International Board.

(Remark: This is to avoid unnecessary competing by some leaders for the highest grade.)