

International Physicists' Tournament 2015

Rules

October 2014

The International Physicists' Tournament (IPT) is a competition between teams of university students from different countries. The teams solve challenging scientific problems and defend their solutions in scientific discussions during the Physics Fights (PF)

1 Organizational rules

1.1 General provisions

1. The main guiding body of the IPT is the International Organizing Committee (IOC). It is elected from representatives of the countries participating in the tournament. Each country is represented by only one person in the IOC.
2. The head of the IPT is the president. He/She is elected for 2 years in a simple majority vote by the members of IOC. The president's duties are: inviting teams to participate in the IPT, cooperation with the Local Organizing Committee (LOC), resolving urgent/unforeseen situations and coordination of jury work. The IPT President is assisted by the IPT Secretary. The IPT Secretary's duties are: organizing the problem selection, updating the www.ipt.info site and helping the president with their duties. Every official IPT document should be signed by the IPT President and stamped with the IPT seal which is kept by the secretary.
3. The IOC is responsible for selection of a country hosting the IPT next year. The IOC cooperates with the LOC in deciding on the dates of the IPT.
4. The official language of the tournament is English. This applies to all official documentation, the Physics Fights and tournament ceremonies. The official website of the tournament is ipt.info.
5. The amount of the entry fee is decided upon by the LOC, but it must not exceed 1000 euro per team. The LOC may provide a discount for selected countries. The LOC is responsible for covering the accommodation expenses of teams and team leaders.

1.2 The IPT problems

1. The 17 problems are formulated by the IOC.
2. The person responsible for the problem selection is the IPT Secretary. He/She collects problem suggestions during the month and a half after tournament (and at any time between the selection of the problems and the tournament). Then, a special committee formed by the IPT Secretary moderates this list within two weeks. The moderated problems are then sent to all of the previous year's participants (members of IOC) and other requesting countries. The person receiving the problems distributes them to all people involved in their country, gathers scores for the problems and reports them back to the IOC (every country can divide 100 points between the problems if it is represented in the IOC and 50 points otherwise). The IOC sums the scores from all the countries and formulates the final list consisting of the 17 problems with the highest sum of points received. The problems may be moderated and improved by the IOC. The final list of problems can be modified at the discretion of the IOC President and Secretary. The IOC must publish the final list of problems no later than 2 and a half months after the previous tournament.

1.3 Organization of the tournament

1. The LOC must announce the exact date, place and entry fee for the IPT no later than 5 months before it. The LOC is responsible for sending the official invitation letters, signed by the President and stamped with the IPT seal, to all requesting countries. The letter is published on the official IPT website.
2. All countries should confirm their participation no later than 3 months before the tournament.
3. The LOC must distribute the information necessary to pay the entry fee no later than 2 months before the tournament.
4. The participating countries must pay the entry fee no later than 30 days before the tournament. The deadline for paying the entry fee is fixed by the LOC, and participation of a team that fails to observe the deadline is at the discretion of the LOC.

1.4 Registration and preselection

1. IOC members represent the IPT in their own country. Each IOC representative is responsible for the national selection in its own country and for the registration of a national team to the international tournament. Teams from countries with active IOC representative submit their applications directly to him/her. The IOC representative should do his/her best to ensure the equal judgement of all applying teams from his country and is encouraged to organize a national tournament. Any problem with an IOC representative should be reported to the President as soon as possible.
2. Registration from teams without an active IOC representative are submitted to the IOC Secretary and LOC.
3. Only one team per country can register. Exception is made for the host university, see 4.10.
4. The maximum number of participating teams is determined by the LOC before the registration deadline, and cannot exceed 15. If more than 15 teams apply, the IOC will engage a preselection process to select the participating countries/team.
5. When more than 15 teams apply, the teams representing the countries that took part in the final of the last edition are automatically qualified, as well as the first team from the host university. All the other teams, whether selected through a national selection or applying directly, must complete a written report outlining the solution to one problem selected from a possible three that will be taken from the official list selected by the IOC. The three selected problems will be announced by the IOC directly after the registration deadline.
6. The teams have 4 weeks after the registration deadline to send their written report. The report must have a .pdf format and cannot exceed 5 pages (except the title page). The team is free to enclose his own experimental material (videos, photos, computer programmes - smaller than 10 mb in total) and to cite it properly in the report.
7. Each report will be judged on the basis of three main criteria: 1) does it give a plausible physical answer to the initial question, 2) is the approach innovative, and is it supported by experiment and/or theory, 3) has the problem been explored in sufficient depth, i.e. have all the possible approaches been considered. The form of the report (layout, phrasing, presentation) is also important. It should be written in a clear and concise manner.
8. The reports will be anonymized before being judged by the IOC and an IOC appointed external jury. The list of participating teams will be announced no more than two weeks after the report submission deadline.
9. If more than one team from a country (without an active IOC representative) wishes to participate, the selection of the team from that country will be performed by the IOC, prior to any international preselection process, but following the same criterias used for the preselection process. Only the best report from each country will be considered for the international preselection process.
10. The host country can register two teams to the tournament. If a team from the host country was amongst the finalists of the previous edition, it is qualified by default, and the second team qualified is the winner of the national selection. Otherwise, the two best teams from the national selection are qualified.

2 Tournament procedure rules

2.1 General provisions

1. Every team consists of up to 6 students and up to 2 team-leaders.
2. The tournament is composed of selective Physics Fights (PFs), leading to the final PF.

2.2 The jury

1. The jury is nominated and organized by the LOC in cooperation with IOC. The jury consists of at least five members, preferably from different countries.
2. Team leaders, at least one from each team, are included in the jury. Multiple jury members from the same country must be distributed uniformly across the fights (for example 1-1-0). Team leaders must not be members of the juries judging their own country's team.

2.3 The PF regulations

1. Depending on the total number of teams, a PF involves preferably three or, optionally, four teams. In the course of a PF, team members are only allowed to communicate with participants of the same PF. Before the beginning of a PF, the jury and the teams are introduced.
2. The PF consists of three (or four) Rounds. In each Round, a team plays one of the three (four) roles: Reporter, Opponent, Reviewer (Observer). In the subsequent rounds of the PF, the teams change their roles according to the following schemes:

Three teams PF				Four teams PF				
Team/Round	1	2	3	Team/Round	1	2	3	4
A	Rep.	Rev.	Opp.	A	Rep.	Obs.	Rev.	Opp.
B	Opp.	Rep.	Rev.	B	Opp.	Rep.	Obs.	Rev.
C	Rev.	Opp.	Rep.	C	Rev.	Opp.	Rep.	Obs.
				D	Obs.	Rev.	Opp.	Rep.

3. Team captains may choose any available position in the PF (i.e. A, B, C). The order in which the captains choose their positions is determined at the beginning of each PF via the Captains' Fight. The fight's winner chooses whether he wants to be the first, second or third to write down his team's position. Then the captain that arrived second in the fight chooses and finally the teams' positions are decided. The problems for Captains' Fights are prepared by the LOC. The captain fights consist of a challenging little task or test in physics/math, and cannot exceed 3 minutes, except during the final where they can be extended to 30 minutes and multiple problems to solve.

2.4 The stage regulations

1. The PF is ruled by a chairperson, selected by the LOC. Each Stage schedule is regulated by the chair according to the following table:

The performance order in the Stage of a PF	Reserved time in minutes
1. The Opponent challenges the Reporter to present a problem	1
2. The Reporter accepts or rejects the challenge	1
3. Preparation of the Reporter	5
4. Presentation of the report, Selective PF (final)	10(12)
5. Questions from the Opponent to the Reporter and answers of the Reporter	2
6. Preparation of the Opponent	3
7. The Opponent's speech	5
8. Discussion between the Reporter and the Opponent	5
9. Questions from the Reviewer to the Reporter and the Opponent and their answers	2
10. Preparation of the Reviewer	1
11. The Reviewer's Speech	3
12. Discussion between the Reviewer, Reporter and the Opponent	4
13. General discussion between the teams (any member of any team except Observers)	5
14. Concluding remarks by the Reporter	1
15. Questions from the Jury	6
16. Jury decides marks	1
17. Jury remarks/comments	4
Total Time for a Physics Fight	58

- Each team participating in a PF has the right to use one time-out during the whole PF (consisting of three or four rounds). The time-out lasts for one minute and during the time-out every participant of the round can consult with his team. The time-out cannot be taken during any team's presentation.
- In the Final PF the challenge procedure is omitted. The chair of the fight is responsible for the teams and juries' introduction, the Captain's Fight, timing and fair play in general. In some cases, the chairperson is allowed to give a mark as an additional jury member (this is reserved for experienced chairs only).

2.5 Team's performance in rounds

- The Reporter presents the essence of the solution to the problem, attracting the attention of the audience to the main physical ideas and conclusions. It is strongly recommended that the Reporter presents some original ideas and a self-made experiments in the report.
- The Opponent puts questions to the Reporter and criticizes the report, pointing to qualities and/or possible inaccuracies and errors in the understanding of the problem and in the solution. The Opponent analyses the advantages and drawbacks of both the solution and the presentation of the Reporter. The discussion between the Opponent and Reporter should focus on how to correct or improve the Reporter solution. Some experimental results obtained by the Opponent that clearly exhibit the inconsistencies of the Reporter's model and/or short calculations that show the errors or inapplicability of Reporter's theory can be presented in a very brief way. The Jury should decide on the relevance of such elements for the discussion. At the end of the discussion, the participants should agree on what can be changed/improved on the Reporter solution.
- The Reviewer presents a short summary of the presentation of the Reporter and Opponent. The Reviewer presentation should mention in particular if the discussion between the Reporter and Opponent has been fruitful or not, and why. The Reviewer can mention which aspects of the problem could have been addressed, but cannot mention his own results on the problem. The main goal of the Reviewer is to summarize the work done by the Reporter and the Opponent as from a jury member point of view, in order to help the jury decide their marks. In the following discussion between all the participants, the Reviewer will moderate the discussion between the Reporter and Opponent, helping them to focus on the most important physical points of the problem.
- The Observer does not participate in the PF.

5. During a PF only one member of a team takes the floor as an Opponent or a Reviewer but there can be up to two Reporters. Other members of the teams are allowed to help with the presentations technically. There are no limitations on communication between team members during the preparation time. The team members are allowed to give their players brief remarks in written form at any time, except for the Reporter's, Opponent's and Reviewer's presentations.
6. No member of a team is allowed to take the floor more than twice during a Selective PF. During the Final PF any team member can take the floor only once.

2.6 The rules of the problem challenges and rejections

1. All problems presented during a PF must be different.
2. Selective Physics Fight: The Opponent may challenge the Reporter on any problem with the exception of a problem that: a) was permanently rejected by the Reporter earlier; b) was presented by the Reporter earlier; c) was opposed by the Opponent earlier; d) was presented by the Opponent earlier. If there are no problems left to challenge, the bans d), c), b), a) are successively removed, in that order.
3. The Reporter may tactically reject the challenge of three different problems in each selective PF without penalty. In addition to this, each team has one permanent rejection that once made, applies to all future Selective PFs.
4. Every additional rejection is considered as a tactical or permanent rejection (by team choice) and induces a penalty. For each penalty the coefficient of the Reporter is decreased by 0.2. This reduction continues to apply during the following Selective PFs.
5. Final Physics Fight: The teams participating in the Final choose the problems they will report themselves and proclaim them at a meeting of all the finalists. The teams choose their final problems in the order determined by selective PFs results, the team with the most points first. No team can choose a problem already chosen by another team.

2.7 The grading

1. After each stage the jury grades the teams, taking into account the presentations, questions, answers to the questions and participation in the discussion.
2. Each jury member shows integer marks from 1 to 10. If there are five or six jury members one lowest mark is discarded, if there are seven or eight jury members one lowest and one highest mark is discarded. For larger jury numbers, the number of discarded marks is quarter that of the jury members, rounded up (if this number is odd, one more of the lowest marks is discarded than of the highest).
3. This sum is used to calculate the mean mark for the team. The mean marks are multiplied by different coefficients: 3.0 or less (see section 2.6 — “The rules of problem challenges and rejections”) for the Reporter, 2.0 for the Opponent, 1.0 for the Reviewer and then transformed into points.

2.8 The resulting parameters

1. For a team in a PF the sum of points (SP) is the sum of mean marks, multiplied by the corresponding coefficients and rounded to one decimal. Additionally, the team which won the PF receives 2 additional points and the team which arrived second 1 extra point. In case of ex aequo, 3 points are divided between all teams that won the first place in the PF.
2. The total sum of points (TSP) of a team in the tournament is equal to the sum of SPs in all Selective PFs. The number of fights won (FW) is the number of Selective PFs, in which a team received the highest SP amongst the three or four teams participating in the same PF.

2.9 The final

1. The three or four teams having the highest TSP in the Selective PFs participate in the final.
2. The total sum of points of the third, fourth and the fifth teams are defined as TSP3, TSP4 and TSP5 respectively. The fourth team enters into the final if and only if $(TSP3 - TSP4) \leq (TSP4 - TSP5)/2$. In the case of teams having equal TSP, their participation in the final is decided by fights won.

These rules have been accepted by IOC and LOC on October 26th 2014