Minutes of the Meetings of the International Board during the 42nd International Physics Olympiad in Bangkok, Thailand
July 10 – 18, 2011

1. A total number of 393 contestants from the following 84 countries were present at the 42nd International Physics Olympiad:

Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh*, Belarus, Belgium, Bosnia & Herzegovina, Brazil, Brunei , Bulgaria, Cambodia, Canada, China, Colombia, Croatia, Cyprus, Czech Republic, Denmark, El Salvador, Estonia, Finland, France, Georgia, Germany, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, Kuwait, Kyrgyzstan, Lao PDR, Latvia, Liechtenstein, Lithuania, Macau, Macedonia, Malaysia, Mexico, Moldova, Mongolia, Montenegro, Nepal, Netherlands, Nigeria, Norway, Pakistan, Philippines, Poland, Portugal, Puerto Rico, Qatar*, Republic of Korea, Romania, Russia, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, Spain, Sri Lanka, Suriname, Sweden, Switzerland, Syria, Taiwan (Chinese Taipei), Tajikistan, Thailand, Turkey, Turkmenistan, Ukraine, United Kingdom, USA, Vietnam. * : new country invited by the Organizing Committee to the Olympiads this year.

2. The Opening and Closing Ceremonies were graciously presided over by Her Royal Highness Princess Maha Chakri Sirindhorn. Her Royal Highness was warmly welcomed with standing ovations.

3. Due to unforeseen reasons, the Saudi government did not allow her team to travel to Thailand. Upon the agreement of the International Board and the Organizing Committee, the contestants of the Saudi Arabia Team were allowed to take examinations in Kuala Lumpur, Malaysia. Two representatives of the Organizing Committee were sent there with examination papers and experimental equipment and supervised the examinations. Their examination papers were graded by official markers.

4. Results of marking the papers by the organizers were presented.

The best score (48.6 points) was achieved by Mr. Tzu-Ming Hsu from Taiwan (the overall winner of the 42nd IPhO). The following limits for awarding the medals and the honorable mention were established according to the Statutes:

Gold Medal	41.10 points
Silver Medal	34.50 points
Bronze Medal	24.62 points
Honorable Mention	18.00 points

According to the above limits, 54 Gold Medals, 68 Silver Medals, 93 Bronze Medals, and 67 Honorable Mentions were awarded. The grade lists of the awardees were distributed to all the delegation leaders in print.

5. In addition to the regular prizes the following special prizes were awarded:

- *The Overall Winner:*
  - **Mr. Tzu-Ming Hsu (Taiwan)**
- *The Best Scores in the Theoretical Examination:*
  - **Mr. Tzu-Ming Hsu (Taiwan)**
  - **Mr. Lanqing Li (China)**
  - **Mr. Kaisarbek Omirzakhov (Kazakhstan)**
- *The Best Score in the Experimental Examination:*
  - **Mr. Tzu-Ming Hsu (Taiwan)**
- *The Most Balanced Score (given by the European Physical Society):*
  - **Mr. Chew Wei (Malaysia)**
- *The Best New Comer:*
  - **Mr. Abanti Basak (Bangladesh)**

6. The following three leaders were designated by the International Board to serve as consultants to the local academic committee for grading the examination papers : Prof. **Jaan Kalda** (Estonia), Prof. **Kreso Zadro** (Croatia), and Prof. **Andrzej Kotlicki** (Canada).

7. The President of IPhOs, Prof. Hans Jordens, proposed some suggested changes on voting rules contained in the Statutes of IPhO and the establishment of marking rules on IPhO problems. The texts of these proposals had been discussed and passed by the International Board as references for future rewriting of IPhO Statutes. The proposed voting rules and marking rules are attached to the Minutes as appendices.

8. For future organization of IPhOs, the declaration letters of hosting a future Olympiad from the following five countries were received and accepted by the International Board : Japan in 2022; Iran in 2023; France in 2024; Columbia in 2025; and Korea in 2032.

9. The President of the IPhOs, Prof. Hans Jordens, acting on behalf of all the participants, expressed deep thanks to Prof. Sakda Siripant (Chairman of the Organizing Committee), Prof. Suwan Kusamran (Executive Secretary of the Organizing Committee) and all other Members of the Organizing and the Academic Committees for excellent and attentive preparation and conduction of the 42nd International Physics Olympiad. Deep thanks were also conveyed to Chulalongkorn University, the POSN Foundation, and the Ministry of Education of Thailand, all the sponsors, graders, guides and other people who contributed to the success of the Olympiad.

10. The Estonian delegates disseminated printed materials about the 43rd IPhO in 2012 to all the delegations and described present state of the preparatory works to ensure smooth organization of the next Olympiad.

11. In the Closing Ceremony of the Olympiad, on behalf of the organizers of the next International Physics Olympiad, Prof. Jaak Aaviksoo (the Minister of Education of Estonia) announced that the 43rd International Physics Olympiad would be organized in Tallin and Tartu, Estonia from July 15 to 24, 2012 and cordially invited all the participating countries to attend the competition.

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Prof. Hans Jordens	Prof. Ming-Juey Lin	Prof. Sakda Siripant
President of the IPhOs	**Secretary of the IPhOs**	**Chairman of Organizing Committee**

Bangkok, Thailand
July 16, 2011

Appendix I to the Minutes of the 42nd IPhO
International Physics Olympiad – Voting rules – suggested changes (incl. Dr.Petersen's comments)

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
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

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

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

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 to the Minutes of the 42nd IPhO

International Physics Olympiad - Marking Rules (incl. remarks from several AC-members)

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:

- knowledge and physical understanding
- algebraic evaluation (mathematical formulation)
- numerical evaluation and units
- problem solving strategy and knowledge on how to draw conclusions
- collecting data (from measurements)
- representing data (plotting data curve)
- 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

- 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.)