

International Young Physicists' Tournament (IYPT)

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Plan of the presentation

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History and development of the International Young Physicists' Tournament

History of the IYPT

Young Physicists' Tournament was founded at the Physics Faculty of Moscow State University in 1979 as a competition for secondary school students from Moscow and its vicinity.

Since 1988 *International Young Physicists' Tournaments* are organised. They took place

- until 1993 in Russia,
- since 1994 in other countries (every year in a different country).

Countries participating in the IYPT

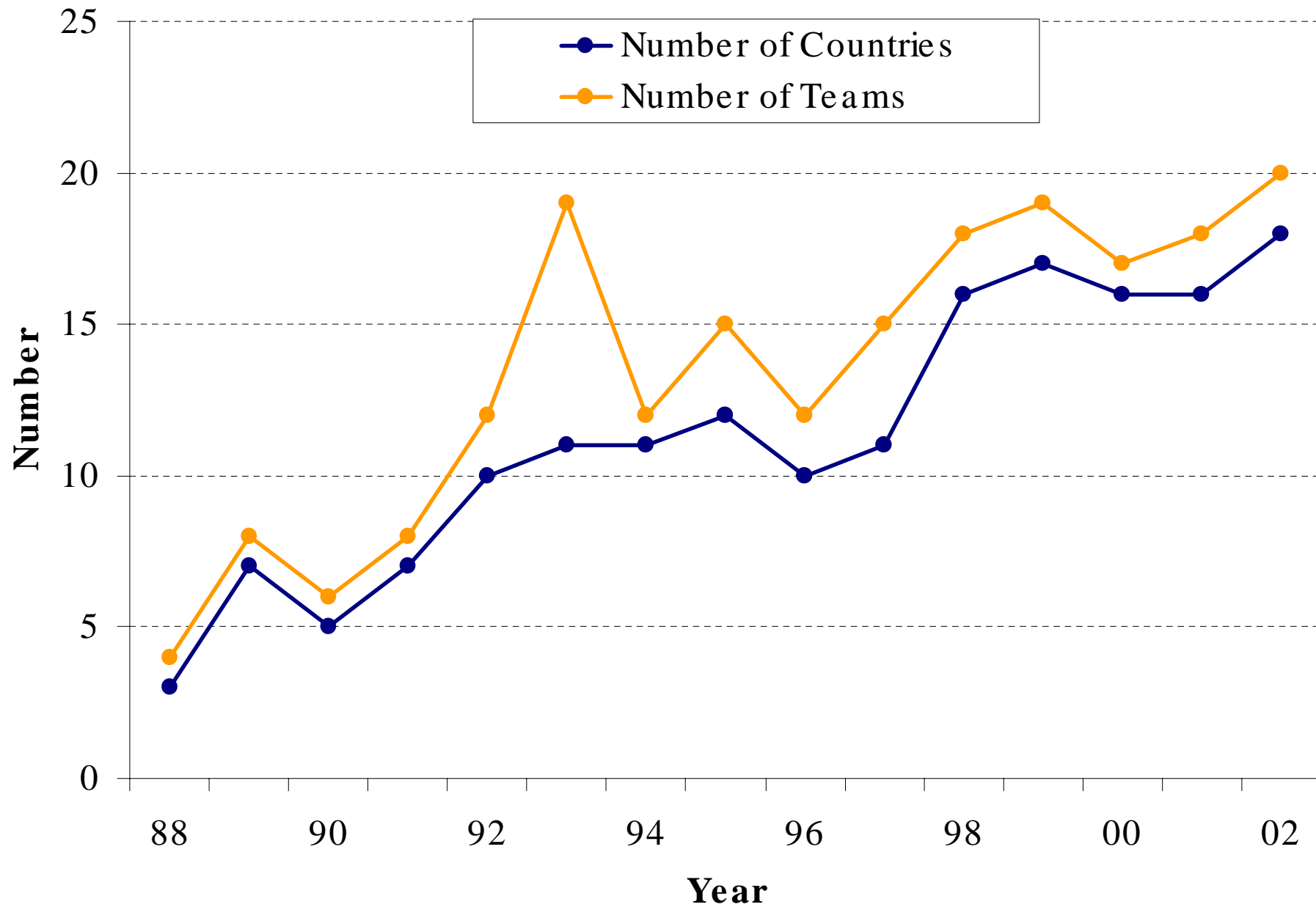
YEAR	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Armenia	-	-	-	+	-	-	-	-	-	-
Australia	-	-	-	-	-	+	+	+	+	+
Austria	-	-	-	-	-	+	H	+	+	+
Belarus	+	+	+	+	+	+	+	+	+	+
Bulgaria	-	-	-	-	-	-	-	+	+	+
Croatia	-	-	-	-	-	-	-	-	O	+
Czech Republic	+	+	+	+	H	+	+	+	+	+
Finland	-	-	+	-	O	+	+	+	H	+
Georgia	+	+	+	H	+	+	+	+	+	+
Germany	-	-	+	+	+	H	+	+	+	+
Hungary	+	+	+	+	+	+	+	H	+	+
Moldavia	+	-	-	-	-	-	-	-	-	-
Mexico	-	-	-	-	-	+	+	+	-	+
The Netherlands	+	H	+	-	-	+	+	+	+	+
Poland	+	+	H	+	+	+	+	+	+	+
Republic of Korea	-	-	-	-	-	-	-	O	O	+
Russia	H	+	+	+	+	+	+	+	+	+
Slovakia	+	+	+	-	+	+	+	+	+	+
Sweden	-	+	O	-	+	+	+	+	+	O
Switzerland	-	-	-	-	O	-	-	O	O	+
USA	-	-	-	-	-	-	+	-	+	O
Ukraine	+	+	+	+	+	+	+	+	+	H
Uzbekistan	+	+	+	+	+	+	+	-	-	-

H host country

+ participating team

O observer

Number of Countries and Teams participating in IYPT's



Format of the Tournament

"Definition" of the IYPT

The International Young Physicists' Tournament (IYPT) is a competition among teams of secondary school students in their ability to solve complicated scientific problems, to present solutions to these problems in a convincing form and to defend them in scientific discussions, called Physics Fights (PF)

[from the Regulations of the International Young Physicists' Tournament]

Description of the competition

- 17 problems, to be solved by participants, are chosen half a year before the IYPT and published, e.g., on the World Wide Web.
- Teams, consisting of 5 students, work out solutions of the problems and prepare their presentations - reports
- During the Tournament teams present their solutions as *Reporter*. The problems are however not chosen by themselves, but *challenged* by the *Opponent*.

Structure of the IYPT

- The main element of the IYPT is a scientific discussion called *Physics Fight (PF)*
- 3 or 4 teams participate in a PF
- There are 3 or 4 *Stages* in one PF (the number of stages equals the number of teams).
- The official language is *English*.
(Russian is still allowed in the following discussion)

Rôles of teams in each stage

- **REPORTER** - presents the solution to the problem
- **OPPONENT** - puts questions and criticises the report
- **REVIEWER** - evaluates the presentations of Reporter and Opponent
- In subsequent Stages teams play all of these rôles according to a special scheme

Scheme of the Physics Fight (PF)

Three teams PF

Team \ Stage	1	2	3
1	Reporter	Reviewer	Opponent
2	Opponent	Reporter	Reviewer
3	Reviewer	Opponent	Reporter

Scheme of the Physics Fight (PF)

Four teams PF

Stage \ Team	1	2	3	4
1	Reporter	Observer	Reviewer	Opponent
2	Opponent	Reporter	Observer	Reviewer
3	Reviewer	Opponent	Reporter	Observer
4	Observer	Reviewer	Opponent	Reporter

The performance order in the Stage

Reserved time in minutes

- The Opponent challenges the Reporter for the problem 1
- The Reporter accepts or rejects the challenge 1
- Preparation of the Reporter 5
- Presentation of the report 12
- Questions of the Opponent to the Reporter
and answers of the Reporter 2
- Preparation of the Opponent 3
- The Opponent takes the floor (maximum 5 min.)
and discussion between the Reporter and the Opponent 15
- Questions of the Reviewer to the Reporter
and the Opponent and answers to the questions 2
- Preparation of the Reviewer 2
- The Reviewer takes the floor 3
- Concluding remarks of the Reporter 2
- Questions of the Jury and grading 2

Grading

Teams (their performances) are graded by a Jury, which is composed of members from different countries. The Jury takes into account all presentations of the members of the team, questions and answers to the questions, and participation in the discussion.

Agenda of the IYPT

- All teams participate in **5 Selective PFs**.
Selective PFs are carried out according to a special schedule, following the rule that, if possible, no team meets another team more than once.
- The best **3 teams** participate in the **Final PF**.

Selected problems

Selected problems from the 13th IYPT

A strange sound

Pour hot water into a cup containing some cappuccino or chocolate powder. Stir slightly. If you then knock the bottom of the cup with a teaspoon you will hear a sound of low pitch. Study how the pitch changes when you continue knocking. Explain the phenomenon.

Plasma

Investigate the electrical conductivity of the flame of a candle. Examine the relevant parameters.

Selected problems from the 14th IYPT

Singing saw

Some people can play music on a handsaw. How do they get different pitches? Give a quantitative description of the phenomenon.

Rubber heat machine

Investigate the conversion of energy in the process of deformation of rubber. Construct a heat machine, which uses rubber as the working element and demonstrate how it works.

Selected problems from the 15th IYPT

Spider's web

A spider's thread looks like a string of pearls. What is the reason for this? Make experiments to investigate the relevant parameters.

Flying colours

Why do flags flutter in the wind? Investigate experimentally the airflow pattern around a flag. Describe this behaviour.

Features of the Tournament

Features of the IYPT

- Problems of complex character
- Team work
- Long-term work
- Public presentation of the results
- Interpersonal discussion (defending of own solution, immediate satisfaction)
- Equal achievements of boys and girls

Participation in the IYPT develops following *skills*

- Ability to use scientific methods and tools for solving complex problems
- Ability to work in a team
- Communication skills (human interactions)
- Adaptation to an international environment
- Leadership skills
(every team is headed by a captain)

Organisation of the IYPT

International Organising Committee (IOC)

- composed of the representatives of participating countries
- meets twice a year :
 - during the Preparatory Seminar (in October)
 - during the IYPT (in May - July)

International Organizing Committee (IOC)

- formulates the problems for the IYPT
- establishes and changes the Regulations
- elects
 - *the President*
 - *the Secretary General*
 - *2 Members of the Executive Committee*
- accepts host country for the next IYPT

Local Organising Committee (LOC)

- organises a Preparatory Seminar in the year preceding the IYPT (in October)
- organises the IYPT

Executive Committee (2002/03)

- President of the IYPT - **Gunnar Tibell** (*Sweden*)
- Secretary General - **Andrzej Nadolny** (*Poland*)

- Chairpersons of the LOC:
 - **Valery Koleboshin** (*Ukraine*) - last IYPT
 - **Sven Liungfelt** (*Sweden*) - next IYPT

- 2 Members elected by the IOC
 - **Rudolf Lehn** (*Germany*)
 - **Valentin Lobyshev** (*Russia*)

References and acknowledgements

This is to acknowledge that some information concerning the history of the IYPT has been taken from:

1. Zdenek Klumber et al., *10th International Young Physicists' Tournament*, Hradec Kralove 1998
2. Zsuzsa Rajkovits, *Physics Competitions*, vol. 1, no 1, 24 (1999)

Contacts

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