(Young) Physicists' Tournament

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SPS Annual Meeting
Physics education and communication
Zurich, 13 September

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What is a Physicists‘ Tournament?

Invented in late 1970s in former USSR, first international tournament in 1988

Project-oriented physics competition

Models a science conference

- Research before tournament
- Interactive format with presentations and discussions of results

Team competition

Additional skills like scientific communication

Not necessarily same target group as „traditional“ science competitions (e.g. IPhO)

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Physics Fight

3 Teams, 3 Tasks
- Reporter
- Opponent
- Reviewer

Strict schedule

Grading by jury

Final Fight for best teams after preliminary rounds

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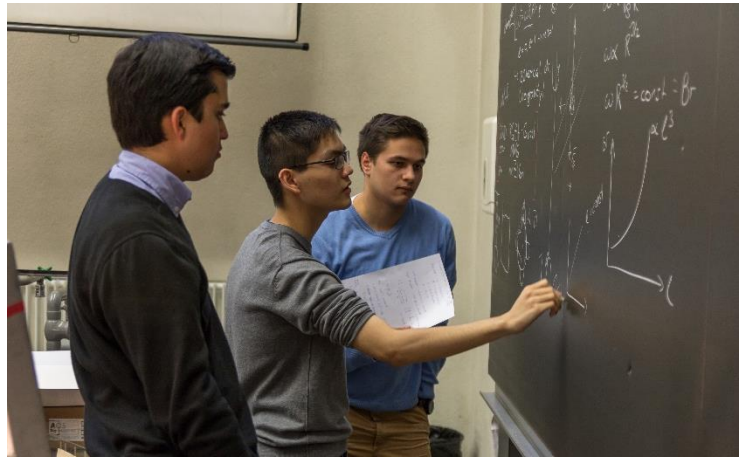
Problems

17 open ended problems

Accessible for students on different levels

No “standard” problems, usually no known full solution

Challenging theoretical and experimental aspects



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Problems: Examples IYPT

Air Muscle:

Place a balloon inside a cylindrical net (as is sometimes used to wrap garlic) and inflate it. The net will expand and shorten. Investigate the properties of such a “muscle”.

Levitating Fluid:

When a container partially filled with liquid is oscillated vertically and air is injected at the bottom of the container, the fluid can “levitate”. Investigate the phenomenon.

Wailing Bowl:

When you strike the side of a metal bowl containing some water, you can hear a characteristic sound. The sound changes when the water in the bowl is moving. Explain and investigate the phenomenon.

Problems: Examples IPT

The Big Bang:

When a balloon explodes, it produces a short loud sound. Can you predict the geometry and internal pressure of the exploded balloon from the sound of the explosion? Do any external parameters affect the sound?

Pool Vortex Rings:

A plate dragged through the surface of still water can produce two black circles on the bottom of the pool, which are the shadows of vortices on the surface (see the provided video). Analyzing a short video of the shadows at some point in time, can you predict how long the vortices will last?

SYPT for Highschool Students

Swiss Young Physicists‘ Tournament: National tournament

Preparation at schools, support by motivated teachers, ideally as part of project-oriented teaching

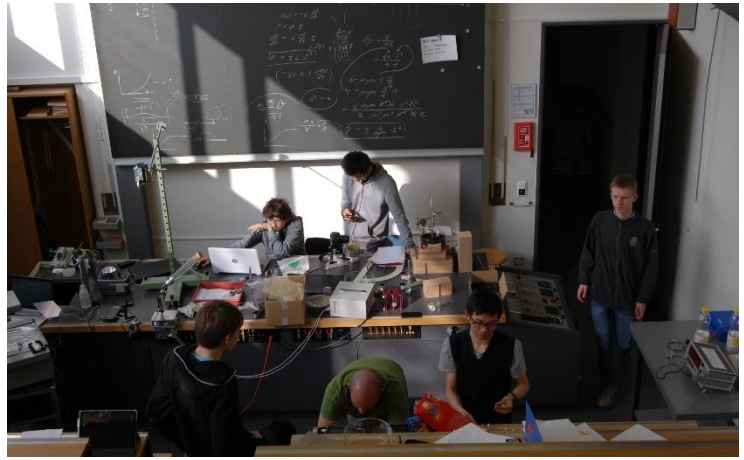
Preparation week in Zurich („SYPT Physics Week“), organised by Pro IYPT-CH

- Adequate infrastructure (if required at ETH/UZH)
- Experienced coaches

Team qualification to select team for IYPT

Switzerland has developed into one of the top teams at the IYPT:

- Several qualifications for final of best three or four teams
- **Winner of IYPT 2022!**



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What Students Learn

Teamwork

Analysis of complex problems

Deciding on essential points

Structuring a scientific presentation

Debating about physics (in English)

Give and receive critical feedback

Documentation

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Essential Skills

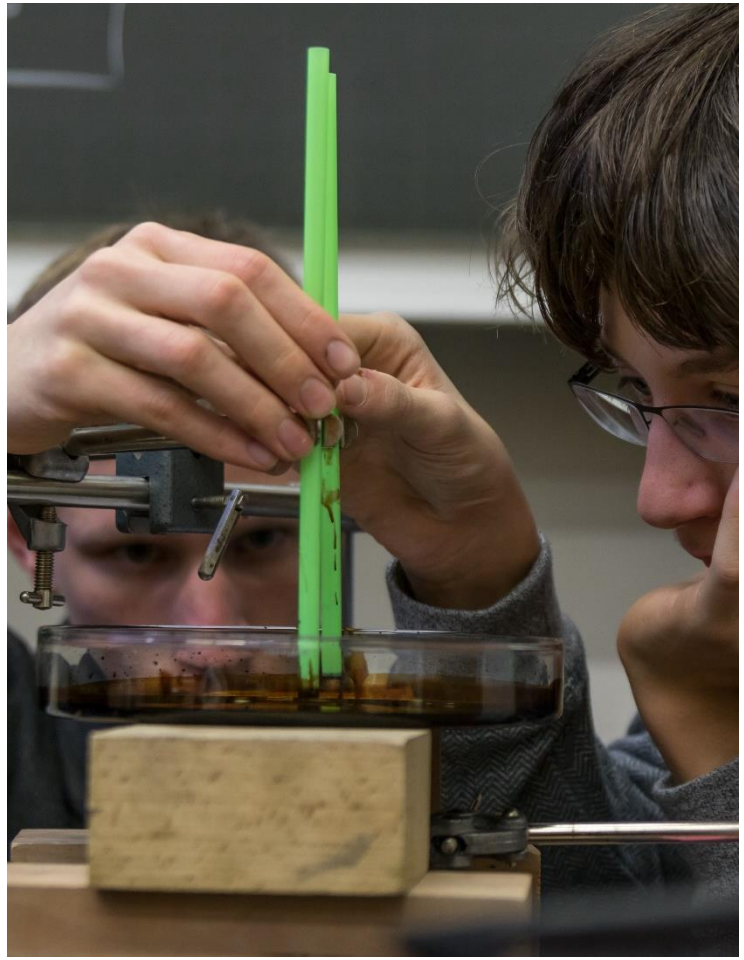
Interest in doing science

Persistence

Project management

Quick perception

Communicative skills



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In our experience …

… students participating at the SYPT have a high motivation to study a scientific subject.

… enjoy the insight into „real“ research.

… often continue their projects as part of a „Maturarbeit“ or a SJf project.

… play an active role as team leaders, jurors, etc. a few years later.

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IPT for University Students

- 3rd year Bachelor and Masters
- More autonomy
- ‘Real‘ research

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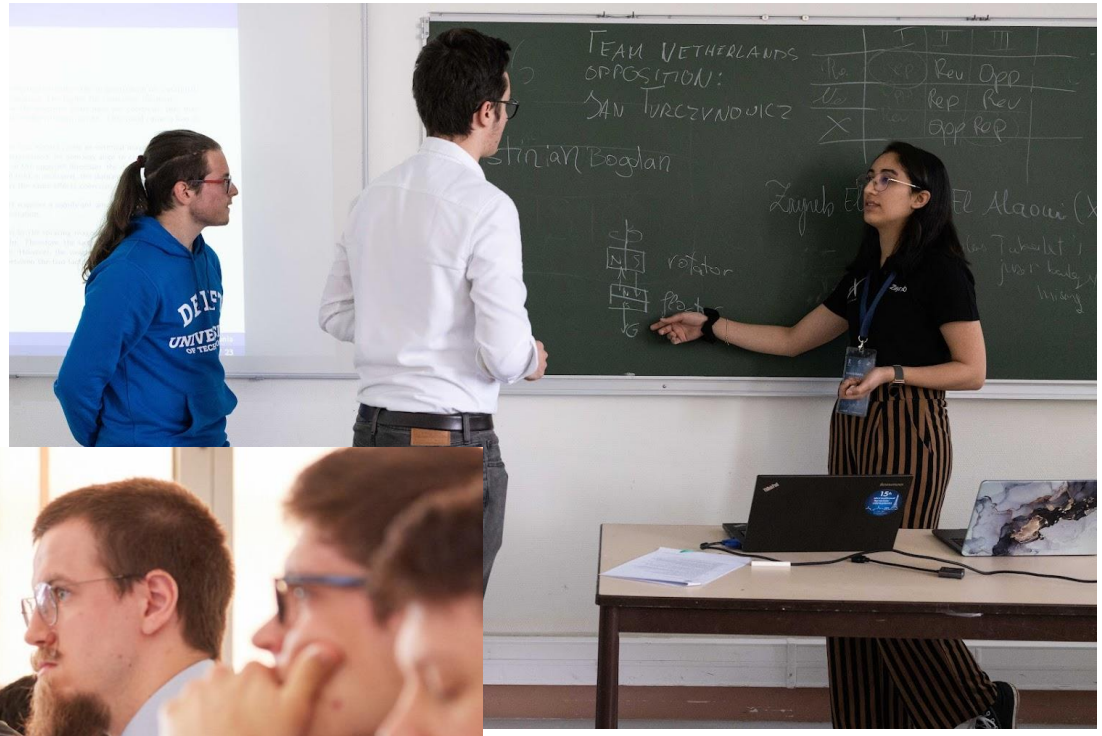
IPT 2024 @ ETH


IPT
International 16th Physicists' Tournament
1 - 7 April 2024
ETH zürich

Honing communication skills



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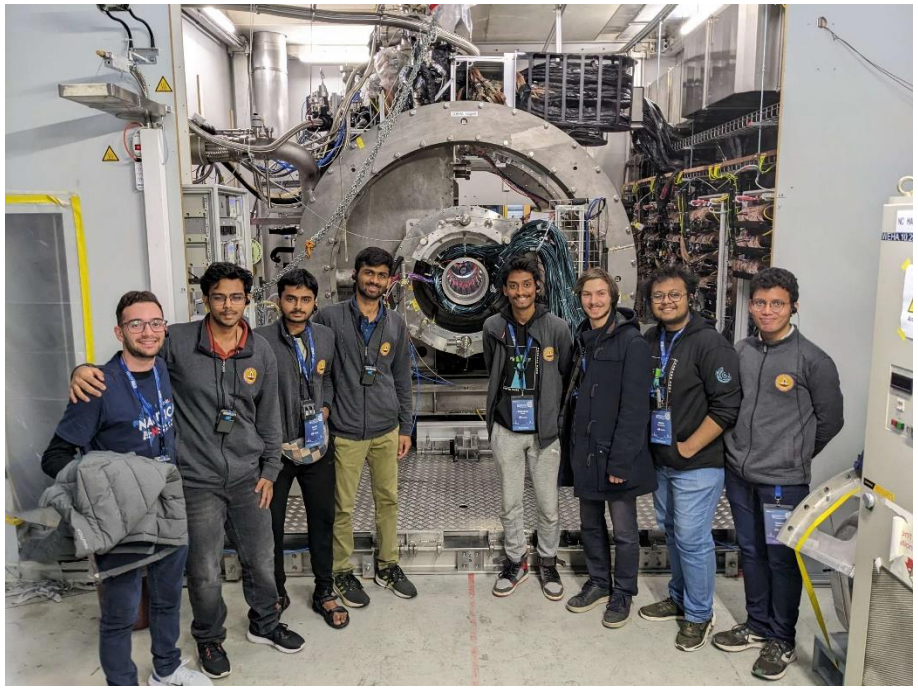

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Spread the word!

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