

Report for the 16th International Physicists' Tournament

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1. Description of the Event

The International Physicists' Tournament (IPT) is a competition format in which teams of six dedicated undergraduate physics students from about twenty countries compete in creativity, critical thinking, presentation skills, teamwork and expertise.

Seventeen open physics questions (research questions) are published nine months before the competition and then worked on by interested student teams. The competition itself is designed for a period of seven days. In 2024, this was the week of April 1. - 7. Initially, the teams did "fight" in four selection rounds to reach the semi-finals. The three best teams then went through to the final round, which was open to the public and streamed.

The tournament originated in Ukraine in 2009 between the Ukraine and the Russian Federation, but it has since grown to encompass numerous countries spanning multiple continents. It was initially inspired by the International Young Physicists' Tournament (IYPT) and follows a similar model.

2. Organization

The local organization team was formed in May 2023 and ultimately consisted of Mathieu Suter, Alberto Rolandi, Thomas Meissner and Andreas Vaterlaus. Mathieu studied physics at EPFL and ETHZ. Today he is a doctoral student at ETH Zurich, at the Department of Information Technology and Electrical Engineering. Like Alberto, Mathieu is a member of the board of the IPT's supporting association and a former participant. Mathieu and Alberto brought the IPT to ETH Zurich and initiated the recognition of the preparatory work for the competition of the ETHZ team as part of the internship in the Bachelor of Physics. Alberto also studied physics at EPFL and ETHZ. Today he is a PhD student in physics at the University of Geneva. Thomas is involved in event management at ETH Zurich for various events and brought a wealth of experience in event organization to the LOC team. Andreas is committed to the participation of students in the IPT at the Department of Physics and also supports the corresponding competition format at the compulsory and secondary school level.

The LOC was supported by student helpers. Two of these helpers – Alisa and Florian, two physics students at ETH – headed the team of helpers and were available throughout the week. The helpers were preparing the rooms before and after the fights, guiding students around the building for fights and meal times, and helping at coffee breaks.

The organization was planned ahead and each day had a schedule of action points for the LOC members and the helpers, it was proven to be extremely successful to stay on track with the activities on a busy schedule.

IPT 2024 Competition Week Tuesday 02.04.2024

Time		Topic	Actors	Responsible	Location / Action / Note
Start	End				
08:00	08:20	Get teams on the road	Helpers + EC	Helpers + EC	Hostel, Split in groups, DON'T BE LATE!!
08:00	08:10	Print room schedules	Alberto + Mathieu	Alberto + Mathieu	HG somewhere (ETZ Mathieu backup)
08:00	09:00	Get Audimax ready for the opening	Helpers + Mathieu		HG F 30
08:00	09:00	Attach the Room Schedule to the doors	Helpers + Alberto		
08:00	09:00	Get rooms ready for PFs	Helpers + Alberto	Helpers	storage: HG G 26.3/ bring juror placards to proper rooms
08:30	09:00	Welcome guests, get presentations ready on the system, etc.	Guests	Andreas	HG F 30
09:00	09:45	Opening	Mathieu	Mathieu	HG F 30
Details Opening					
09:00	09:10	<i>Mathieu welcomes everybody - schedule - etc. - says that rector comes next and introduces Günther</i>			
09:10	09:20	<i>Welcome by Günther</i>			
09:20	09:30	<i>Anastasia more general info regarding physics fights</i>			
09:30	09:35	<i>Mathieu gives information about what comes next</i>			
09:35		Two Helpers in front aud Audimax to direct the teams			
09:45	10:15	Jury meeting	Alberto + EC		HG G 26.1 or in HG F 30
10:15	14:00	PF1	EC	EC	
10:15	11:00	Prepare coffee break space	Helpers	Helpers	Get cookies
11:15	13:15	Coffee break			
13:15	13:30	Clear coffee break space	Helpers	Helpers	
14:00	14:10	Guide teams to lunch	Helpers	Helpers	
14:00	15:15	Lunch			Mensa HG

Exemplary part of the process sequence for the event

3. Participants

Teams from twenty nations took part in IPT 2024. These were Brazil, England, Canada, Colombia, Croatia, Denmark, France, Germany, Greece, India, Iran, Italy, Mexico, Poland, Spain, Sweden, Ukraine, Russia (Team IPT, without national identification), the United States of America and Switzerland. The team from Iran was unable to take part in the competition itself because some team members were unable to obtain a visa to enter Switzerland in time, despite our active endorsement and support of the participants with the immigration office. A second team from Poland came as a replacement team, as Poland won last year's competition. Poland therefore had a team from Warsaw and Krakow. The students from Russia took part under the neutral flag of the IPT. The atmosphere between the teams was very friendly and characterized by the positive atmosphere of the competition. Not a single negative incident or complaint was reported to the LOC. Apart from the choice of food, some very funny comments were made from time to time.

The countries were represented by the major universities or technical schools of each country, normally qualified through the national selections, which took place between December 2023 and March 2024. Among the universities who took part in the event are Ecole Polytechnique, University of Warsaw, Oklahoma State University, King’s College London, UFMG, McGill University, Denmark Technical University and more. This proves the recognition of the IPT by the leading higher education institutions across the world for its educational and social value.

Together with the local and international judges and the team leaders, around 220 people took part in the event.



Team at work



Jury grading the performance of a team

4. Attendees Demographics

The registration information about all the participants, jurors, guests and helpers was collected before the event. The gender distribution of all the attendees is 57 women vs 163 men (26% women). Among the team members, the gender distribution is 34 women and 93 men (27% women). This is above the average women representation among university graduates in physics (20% of women worldwide).

The distribution by continents: 38 attendees from Americas, 11 from Asia and the rest from Europe.

5. Competition Week

Most of the teams arrived in Zurich on Easter Monday, April 1. From arrival to departure, the venue takes care of accommodation, all meals and transportation. Our guests were accommodated in the Zurich Youth Hostel and the Hotel Meininger. Most of the catering was provided by SV-Service of ETH.

IPT 2024 Schedule from Monday April 1st till Sunday April 7

Time	Monday 1/4	Tuesday 2/4	Wednesday 3/4	Thursday 4/4	Friday 5/4	Saturday 6/4	Sunday 7/4
08:00		Breakfast and Transfer to ETH	Breakfast and Transfer to ETH		Breakfast and Transfer to ETH	Breakfast and Transfer to ETH	
09:00		Opening (HG F30)		Breakfast and Transfer to ETH			Breakfast
10:00		Jury Meeting (HG F30)	Physics Fight 3 (HG E21, E22, E33.5, F26.1, F33.1, G26.1, G26.5)	Zurich City Tour	Semi Finals (HG G3 and G5)	Final Audimax (HG F30)	Check-Out and Departure
11:00		Physics Fight 1 (HG E21, E22, E33.5, F26.1, F33.1, G26.1, G26.5)					
12:00			Lunch ETH Main Building	Lunch ETH Main Building	Lunch ETH Main Building	Lunch ETH Main Building	
13:00					Move to Hônggerberg		
14:00	Arrival + Check-In (Airport and Youth Hostel)	Lunch ETH Main Building	Physics Fight 4 (HG E21, E22, E33.5, F26.1, F33.1, G26.1, G26.5)	Individual Excursions	Lab Visit D-PHYS	Closing Ceremony Audimax	
15:00					Announcing Final (HPV G4)	IOC Meeting 2 (HG G26.1)	
16:00		Physics Fight 2 (HG E21, E22, E33.5, F26.1, F33.1, G26.1, G26.5)			IPT Conference (HPV G4)		
17:00			Group Picture		Move to Main Building		
18:00							
19:00	Dinner Youth Hostel	Dinner ETH Main Building	Dinner ETH Main Building	Dinner ETH Main Building	Dinner ETH Main Building	Gala Dinner ETH Hônggerberg	
20:00							
21:00	Drawing (Hotel, Saal 1)	IOC Meeting 1 (Hotel, Seminarraum 4)	Announcing Semifinals (HG E3)				

The IPT-week at a glance

The first round of the preliminary competitions began on Tuesday morning after the opening of the IPT 2024 by the President of the IPT, Anastasiia Vasylychenkova, the President of the LOC, Mathieu Suter, and the Rector of ETH Zurich, Günther Dissertori. After the first four rounds of competition, it was determined which of the teams could move on to the semi-finals. These were the teams from Italy, Brazil and Team IPT for one semi-final and the teams from the United States, Germany and Poland (Warsaw) for the second semi-final.

The final, which took place in the ETH Audimax, was between Italy, France and Germany. The team from Germany won! The scores earned in the final are as follows: Germany 53.3 points, Italy 46.2, and France 49.5.



The winning team Germany

The Grand Finale and the closing ceremony were broadcasted on the YouTube channel of the IPT. The broadcasting was kindly assisted by the media team of the IPT. The broadcast gathered around 4,300 unique viewers. It can be accessed via the following link:

<https://www.youtube.com/live/vl3kmfSo-ws?si=p8ZT0K8rV6KneyR2> .

The closing ceremony featured a talk from the President of the European Physics Society, Mairi Sakellariadou. Her talk was covering the activities of the EPS in promoting physics education and research, and especially those for university students. Professor Sakellariadou attended the IPT for the last two days of the event, watching the semifinals, finals, and the IPT conference. She also took part in the discussion of the IPT and EPS coordination with the national representatives of the IPT.

Beyond the main team competition, the students had a chance to present individual talks on their solutions of the IPT problems during the IPT conference. The IPT conference took place on the Höggerberg campus. There were two parallel sessions, in a hybrid format, with both online and in-person presenters. The IPT conference hosted 21 talks, giving the opportunity to non-finalists, national selections participants and guests to present their IPT solutions too. The abstracts from the IPT conference will be published in the abstract book by the IPT organizers in due course. The best talks of the conference were also acknowledged during the closing ceremony.

In addition to the physics competitions, participants were offered guided tours of the city on Thursday and were given free time to explore Zurich and the surrounding area. On Thursday afternoon, participants were also able to take part in an exclusive excursion to the Paul Scherrer Institute in Villingen. The laboratories of the Physics Department of ETH Zurich were open to our visitors on Friday afternoon.

During the IPT week, there were two meetings for the IPT governing body - the Decision Assembly. They were hosted in a hybrid format. The strategic plans, best practices and rules changes were discussed there.

The "Gala Dinner" at the end of the competition week consisted of a barbecue evening on the Hönggerberg campus, which was very much appreciated by all participants, probably also because of the summer-like weather.

5. Challenges met

The week went off without any particular challenges. Only the choice of food was perhaps a little too limited for our guests from different cultural backgrounds. However, this was accepted with a great deal of humor. Recipes for simple dishes were immediately exchanged on social media.

The presence of teams from Ukraine and Russia did not lead to any major tensions and a good spirit of competition was created.

On the morning of the departure day, some participants reported food poisoning. Although, it was not affecting a majority of the participants. The organizers provided the required assistance to the attendees.



Snapshot from the opening presentation in the ETH Zurich Audimax

6. Finances

Overall costs for the entire competition week amounted to CHF 147,386. Of which 27% was financed by foundations, 36% by the ETH Domain, 11% by physics-related collaborations and societies, and 24% by the participants. The city and canton of Zurich financed an “apero riche” on the first evening (2% of the costs), gifts for the participants and free guided tours of the city on Thursday. Switzerland Tourism made its welcome stand at the airport available to us.

IPT 2024 at ETHZ (Monday, April 1 to Sunday, April 7)		
Expenses	CHF	Remark
Accommodation for 176 people	63'776.40	Youth Hostel Zurich
Accommodation for 27 people	8'271.00	Meiningen Hotel Zurich
Lunch, dinner and coffee/tea for the break	26'361.60	SV-Service
Sweets for the coffee break	1'046.45	From CC Top: 660.- and Bertschi: 386 CHF
Bus for the transfer to PSI	1'451.80	Eurobus
Dinner on the final evening	12'153.00	SV-Service
Drinking bottle for tap water	2'698.80	comTeam AG, Zurich, "Cadolino"
Printing of brochures, notepads and grading booklets	1'660.42	Villi, France (prints for CERN)
Photographer for the final on Saturday	800.00	Christian Hutter, freelancer
IOC fees	2'100.00	goes to IPT International
EmSci fees	1'000.00	goes to IPT International
Public transport during the competition week	8'059.50	ZVV tickets for all
Professional event management	4'024.00	Event management ETH Zurich
Two full-time helpers	2'002.30	ETH students and past participants
Printing name badges with VBZ ticket	1'090.40	ETH Print Services
Name tags for the jury	472.74	ETH Services
IPT Fund	2'500.00	Goes to IPT for future Tournaments
Event technology	2'425.00	OnStage, Zurich
Special bus to PSI	324.30	Eurobus
Poster printing for promotion	77.45	ETH Print Services
Printing of the banner for the ETH main building	1'029.30	External Printing, via ETH Services
Extension cables and multiple plugs for the seven fight rooms	334.95	Brack AG
Material for the captains' fights and gifts for the winners	1'378.96	Diverse
Travel expense support for teams Ukraine, Mexico and Greece	2'347.87	
Total of Expenses	147'386.24	
Income		
ETH Zurich (Rector and Physics Department)	45'000.00	
ETH Domain (EPF Lausanne, PSI)	8'000.00	
Swiss Physical Society and the NCCR SwissMAP	16'500.00	
City and State of Zurich	3'026.95	
Foundations (cogito, Swiss Life, Ernst Göhner, Metrohm)	39'000.00	
Registration Fees	18'760.15	
Guests	13'500.00	
IPT Fund	2'500.00	
Private	1'000.00	
Total of Income	147'287.10	
Closing	-99.14	<i>Date 30.05.2024</i>

The prize contribution also came from Brilliant.org. The logos of all the sponsors were featured on the event website: 2024.iptnet.info, on the electronic and print materials. The sponsors' support was acknowledged during the opening and closing ceremonies in the speech from the LOC president.

7. Acknowledgements and Outlook

The LOC would like to thank everyone who made the IPT 2024 at ETH Zurich possible! We received a great deal of financial support from a wide range of sources and people who put a lot of time and effort into the event. - Thank you very much!

The IPT organizers collected feedback from the participants via the online form which was shared on the event Discord and via emails. The form has a total of 34 replies. According to the responses, the attendees rank the organization of the IPT for 8.1 out of 10. Among the things they enjoyed the most, they mention the Gala Dinner BBQ, the city tour, the hostel facilities. Although, the participants mainly feature in this question the physics fights and the opportunity to interact with other teams. The attendees also mention challenges to find the coffee break area and the tight schedule. Overall it seems that all the students, jurors and guests enjoyed the event a lot.

We were able to experience an intensive week of competition and are convinced that many young people now look at physics with different eyes. As a science in which one advances through dialog and teamwork.