International Young Physicists' Tournament

EC Meeting November 2016 – Minutes

2016-11-11, 9:30 am to 2016-11-13, 11:30 am | Kent Vale / National University of Singapore (NUS)

Participants:

President	Martin Plesch	MP	plesch@savba.sk
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Treasurer	Ilya Martchenko	IM	ilya.martchenko@iypt.org
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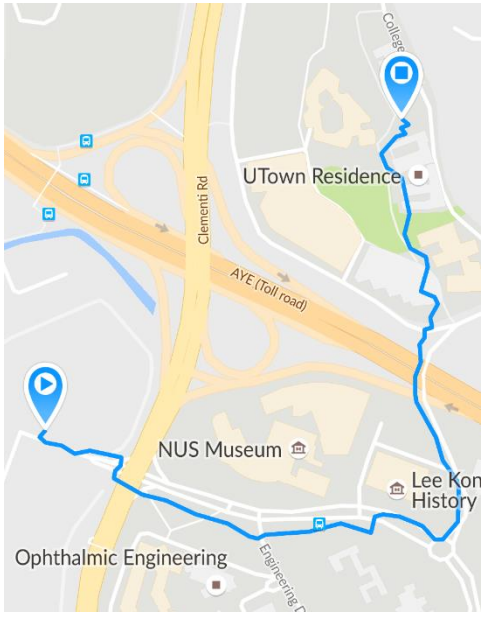
Member	Qian Sun	QS	qiansun@nankai.edu.cn
Member (LOC 2018)	Qi Mi	QM	miqi@rdfz.cn
Member (LOC 2017)	Yeo Ye	YY	sciyeoy@nus.edu.sg
Nidhi Sharma of the LOC was present during day one of the meeting. YY and QM are present on day one and two of the meeting.			

0. **Review of the agenda**
   The agenda is slightly adapted and then accepted by the EC.

IYPT 2017

1. **Visit to campus & dormitory**
   We start by visiting different types of apartments at Kent Vale that will be used for Jurors and EC. The default room for the breakfast can only host about 50 people, therefore a different room should be used, so that everyone can have breakfast in parallel. It takes about 15 minutes to walk from Kent Vale to the fight rooms. There will be a dedicated bus provided in the morning, there is also a non-direct university shuttle bus connection available.
   There are 11 seminar rooms and lecture halls booked, one of them is to be used as the tournament office.
   Five of these rooms are lecture halls where the seating is fixed, of which one is larger and can host more than 400 visitors. Six more rooms are about 5 minutes away. They are seminar rooms, one of them with fixed tables (which will therefore be used as the tournament office). Most rooms have 2 projectors already; in the others a second projector will be provided. All rooms will be equipped with a whiteboard.



Kent Vale to UTown, 1.4km, 15min walk

   For the ceremonies and the finals, a large lecture hall will be used and equipped with a whiteboard. If technically possible, the whiteboard will be filmed and projected so that the audience can see what's written / drawn. TH will send an email to LOC with more detailed descriptions of the preferred setup and requirements for the rooms.

All projectors have VGA connections only, so if needed, teams need to bring their own adapters. All power outlets are Type G (British), teams are required to bring their own adapters if needed.
There is Wi-Fi throughout all of the campus, also eduroam. Some of the rooms in UTown dorms have only LAN connection.

After visiting the campus and dormitory we discuss the list of booked rooms. We adapt the contract accordingly so that once published it will give the teams the exact info on what kind of accommodation to expect.
Based on the available rooms in Kent Vale and in UTown, we decide that the default option is for Jurors (including TL-Jurors), EC members and Visitors is to stay in Kent Vale and for TL and Team members to stay in UTown. Both upgrade and downgrade options will be available based on availability.

Anyone staying in UTown will need to bring their own towels and toiletry, bedding will be provided.

Participants of the IOC meeting will stay in Kent Vale for the meeting. In Russia there were 39 persons present at the IOC meeting, now there are rooms booked for 42 people. LOC will try to arrange for a bit more flexibility in case more people need to participate (e.g. new IMOs) by exchanging two of the booked double bedroom apartments in three-bedroom apartments. The meeting will take place in a seminar room.

The fees will be published on the website together with all dates and the contract.

Photos taken at one of the Kent Vale Apartments. As the dorm rooms at UTown were occupied by students, no photos were taken there.

This large lecture hall at NUS will be used for the ceremonies and the finals of IYPT 2017.

2. **Information by the LOC about preparation works 2017**

YY gives an overview on the current state of planning. There was a slight miscommunication concerning the number of participating teams and jurors: EC considered the numbers given so far as preliminary, based on past tournaments and expectations, while LOC already needed fixed numbers for their planning, which started considerably sooner than EC is used to. Therefore, at this point, possibilities for changes, especially involving any of the university infrastructure, are already rather limited.

a. Guides/Fight Assistants: There will be one guide per team and 11 FAs. The guides will also help with the fights. They will be available at least one day before the start of IYPT so they can be instructed how to use the tournament system.

b. Transportation: Busses will transport participants from the airport to NUS and back and to the excursions. Transportation for IOC members at the end of the IOC meeting will be provided as well.

c. Jurors: EC requests 5 local jurors who should be available during all the fights. They need to register in CURIIE as well.

d. Data for registration (to be set up in CURIIE): We discuss what data has to be provided via the registration system.
    - Participation data:
        - Airport OR via road from Malaysia
        - Food: anything, halal, vegetarian
        - Upgrade to Kent Vale (for TL (non-juror) only): +160 euros
        - Downgrade to UTown for (jurors only)
        - 'where visa applied' is not needed.
        - A way to indicate who will be present at the IOC meeting.
    - Profile data will stay as is.

e. Other issues

We discuss whether it's possible to provide prepaid sim cards to each team, so that we are able to reach them. Wi-Fi is available throughout the campus and the cost for prepaid simcards is high (compared to other countries). Therefore, LOC prefers not to provide simcards to the teams. All teams will be requested to give us a way to contact them via mobile phone or WhatsApp.

MP asks if it's possible to change the schedule in order not to have a fight on the first day. Many teams will suffer from jetlag and prefer to have some extra time to prepare. The time could be used to have more juror training and to have more time to prepare the jury schedule. As having two days with two fights would be too much, the suggestion is to have one fight on the day where the full day excursion is planned. YY explains that the planned excursion to Universal Studios Singapore will only make sense when a full day is used. The schedule will therefore not be changed, but a similar proposal will be made for IYPT 2018.

The tournament website is up already at http://iypt2017.nus.edu.sg but has yet to be finalized, we give some feedback on the website.

3. **Fees**

a. Participation fees

Participation fee per team is 1500 Euro (split as 800 to LOC and 700 to IYPT), for Observer/Visitor the fee is 1100 Euro (Split as 800 to LOC plus 300 to IYPT) as decided by IOC in July 2016. The upgrade from UTown to Kent Vale is 160 Euro (Split as 80 to LOC, 80 to IYPT).

b. Discount observers

Given the actual costs of accommodation at UTown there will not be the possibility to provide an option for discounts to observers.

c. Payment deadlines & tolerance towards delays

The deadline for pre-registration is Jan. 31st 2017. If a team is not pre-registered by Jan. 31st, the team cannot come.

Deadline for Application as Experienced Juror is April 15th 2017.

Deadline for payment is April 26th 2017 (for everyone). If the fee is not paid, the team cannot come.

Deadline for entering data is June 6th. If preferences are not entered by this date, participants cannot expect to have them fulfilled, including their preferences for food, t-shirt sizes etc. If the person's name is not in the system by this date, they will not show up in documents like the booklet etc.

CURIIE will stay open for changes, but those changes will be no longer necessarily be reflected. It is however important to us, to allow everybody to keep data on how to contact them or their arrival dates up to date.

Nidhi Sharma will get full access to the data via CURIIE, further read-only access is provided to other members of the LOC.

d. Refunds

Once the money is sent to LOC, it cannot be refunded from the IYPT. The LOC will not make any refunds.

4. **Staff for IYPT 2017**
   IYPT will send 3 persons to help run the tournament, coordinated by TH and MP.

5. **Signing of the contract**
   After working out some final details, the contract is agreed on.

6. **Appointment of the EC inspector**
   IM is appointed as EC inspector; he will visit at the end of May. A date will be fixed by the end of November.

   We decide to continue at 8:30 on Saturday. End of day 1 – 18:30.

EC Interna

7. **Future plans for Tournament Software – CURIIE, NEWTOON, Jury Planner etc.**
   Day 2 starts at 8:30 with the signing of the agreed upon contract, then discussion on the (new) software starts.

   New software is currently under development by former participants from Germany. The new software will eventually be a replacement for all currently used tools. For 2017 the plan is to replace some parts (e.g. NEWTOON, Jury Planner), based on how far the software is progressed. The old tools are still available and can always be used as a backup. CURIIE will not be replaced for 2017, as participants are used to it by now and it will already be required to work in January.
   Therefore, only some of the most important changes were made to CURIIE:
   - A role/function has to be set when persons are added to a group. Extra text describing e.g. the requirements on a TL-J will be added until the registration starts.
   - Export for CSV files that Excel will accept
   - Daily backups of full CSV exports
   - Read-only access to query page (includes download of full csv, photos etc.)
   - Checkbox “I will be present as IOC representative during the IOC meeting” to be added until the registration starts

   This leaves open an already quite long list with feature requests from IOC and EC which will be forwarded to the new team in order for the new system to already include those features. This includes pre-registration, different deadlines for different data, automated reminders and a better ‘set for all’ feature. Another requested feature is to show only the relevant options to those registering based on their function – e.g. show upgrade options only to Jurors. For IYPT 2017 pre-registration will again be done via email registration@iypt.org (forwarded to TH, MP, our secretary as well as to the LOC).
   There are plans to use the new software at the Austrian tournament, run by our Austrian IMO, the AYPT. AYPT agrees to host the new software’s authors, TH plans to cover their travel from the IT budget.
   TH will provide the EC with a document detailing the relationship with the new team responsible for the new software once the decision is made to use it. It shall specify responsibilities on both sides and be signed by both parties.
   TH repeats the usual requests concerning registration via CURIIE: EC-Members should register only in the EC group. Users should be advised to re-use accounts and not create a new one for each IYPT. Passwords can be reset easily, there is a link for that on the main page. You can change all data including your email address, so there is really no need for new accounts. Do not add placeholder names. Respect the deadlines.

8. **Adding the 'collegiality principle' to the RoP for EC**

MP, SB and TH suggest to add a clause similar to the following to the EC RoP, a collegiality principle: "EC members agree to adhere to the principle of collegiality. This principle, which governs all the EC's work, means that all EC members are jointly responsible for decisions and actions taken by the EC and that they support them towards the IOC and all of the IYPT community."

IM agrees with the suggestion to adopt this principle and points out that it's very important to always specify whether something is an EC decision or personal opinion.
Some past examples from working and decision making within the EC and how the output was presented to IOC are discussed.

MP puts forward the motion that a collegiality principle is added to the EC RoP.
Present: 7, For: 7, Against: 0, Abstain: 0

The Motion is accepted and the proposed text will be added to the EC RoP by TH.

9. **Tasks within the EC**

According to the EC RoP, "Tasks of the EC can be delegated to committees or individual persons, however always overseen by one of the EC members." MP proposes to go through the list of tasks and (re)distribute them. Some tasks are fixed by statutes (President, Secretary General, Treasurer), furthermore there are existing committees (Problem, Jury, Disciplinary) and some other responsibilities (IT, Connection to IYPT Archive, PR, Fundraising).
IM proposes to first go through the committees' reports and only afterwards decide on the distribution of tasks. MP points to the agreed upon agenda. SB explains as the decision is made on a different level, trying to distribute responsibilities equally among EC members, so hearing the reports first is not necessary.
We start the discussion on who should chair the Problem Committee. SB wants to take over more responsibilities within the EC in order to better distribute the workload. As he already is a member of the Problem Committee and therefore familiar with its work, MP's proposal is for SB to head the committee in the future. IM describes the large amount of work that is involved with the problems, especially the work with volunteers that he has been doing.

MP puts forward the motion to distribute responsibilities within the EC according to the following list:

- MP: President, Jury Committee
- TH: Secretary General, IT
- IM: Treasurer, Connection to IYPT Archive
- SB: Problem Committee, PR
- QS: Disciplinary Committee, Fundraising
- YY: IYPT 2017
- QM: IYPT 2018

Motion: Accept the distribution of responsibilities.
Present: 7, For: 6, Against: 0, Abstain: 1

The distribution of responsibilities is accepted.

10. **List of tasks**

    TH tried to keep the document up to date and send out reminders. Often deadlines were not fulfilled and some tasks are still open.
    We have a look at the document. Everything that's done is removed and new tasks are added as they come up during the meeting. Also the part on responsibilities will be updated according to item 9 on the agenda.

11. **IYPT corporate identity**

    The general idea to follow for the logo was discussed at the last EC meeting. SB reports that the work on a (new) logo is not done. The last idea was to use a website like crowdspring.com where designs can be proposed and we pay only for the one we like and decide to use. IM adds that there is still an offer from UrFU, and that Olga and Gleb Burganov should be contacted. SB will look into crowdspring.com and talk to Olga and Gleb, if this does not work out until the end of the year we'll look into alternatives like approaching a design studio. Having agreed on the new logo, also stationary, cards and presentation templates shall be designed.
    The logo will be that of the IYPT. SB will propose a policy and rules for usage of the logo by IMOs and LOCs.

    We also quickly discuss our presence on the web including the website iypt.org, the iyptorg facebook page and the iypt twitter handle. The webpage and fb page are kept up to date by TH and Natalia Ruzickova with SB also having access rights. Twitter is handled by IM. TH will look into reactivating the connection to the twitter handle, so that any posts via twitter are shared on the fb page too.

12. **Problem Committee**

    IM gives a presentation on the committee's work, the slides are attached. He emphasizes the differences between "objective" (feasible or not, repeated or not, dangerous or not) and "subjective" criteria.

    QS suggests to use an alternative to google forms for the problem submission, possibly hosted on the IYPT webserver, because google services cannot be used from some countries including China.

    MP asks to look at the 'problem performance' (slide 4) only for years more recent to get a better impression on the influence of the committee. IM replies, that there is no strong time dependence anyway.

    YY suggests to add categories to the voting, especially the one about feasibility. SB agrees, this is something the committee is already working on. Unlike whether a problem is well liked or not, a lack of feasibility is a clear criterion to exclude a problem from further discussion.

    MP strongly criticizes that his review on one of the problems was made public. IM points out that it's only a historical example, and that this issue was raised and discussed before already.

    MP proposes to have different inputs to the final ranking proposed by the committee to the IOC that includes not just the IOC online vote, but also reviews that give an opinion to help select good problems. IM questions the definition of 'good' – it can be about the preferences of the IOC, but that's just one way to look at it. As we see that often experts do not agree, it might be dangerous to ask a single person to review a problem. MP suggests to have a review to give a second opinion to the author's. A problem is good, if teams report it, i.e. it is both challenged and not rejected by the teams, especially in the 5th round, as there the teams select their problem.
    YY points out that this criterion can only be evaluated after the competition. MP wants to find characteristics of such problems that identify successful problems.

IM explains that already the committee tries to get a lot of input, but it means a high workload for the committee to organize reviews. MP suggests to distribute the workload within the IYPT community. TH proposes that each IOC member is asked personally to review one or two of the proposals that the committee selects for them. It might also help with the issue of some countries not fulfilling the quota on problem submissions: In those cases, IOC members can help with the creation of a good problem set by working more on the reviews. SB adds that the structure should be specified, so that the expectations are clear. The reviews would then be part of the documentation given to the IOC.

SB suggests to vote on the shortlist (e.g. 20 problems) a few weeks before the IOC meeting so that some of the concerns are raised earlier. It's too much to ask of all IOC members to have a close look at all of the about 80 problems contained in the full report.

MP asks who is invited to the discussion of the problems, as there are persons who are not in the committee involved in some of them. IM explains that in principle everyone is invited and in some cases he reaches out to other physicists to be included in specific discussions.

QS suggests to separate the discussions into topics, to e.g. have a group that specializes in mechanics to discuss problems from that area.
SB proposes to have the discussion in public, e.g. on a forum on the web.

There are still countries that do not submit problems. MP suggests to add to the RoP consequences if the rule of submitting 3 proposals per IMO per year is broken. TH suggests to list the IMOs that have suggested problems (or problems that were selected) on the released document with the problems next to the authors.

TH suggests to sum up what ideas the EC agrees on, so that it can be stated clearly in the minutes:

- Setting up a public forum for discussing the problems
- Think about a way to allow for discussion within groups focusing on specific fields
- Ask IOC members to help by providing reviews
- Send a shortlist of problems to IOC and ask for a vote a few weeks before the IOC meeting
- Find an alternative to google forms for the problem submission
- Allow more detailed feedback during the online voting, especially regarding feasibility
- The Problem Committee is expected to come up with suggestions for consequences if IMOs do not submit problems

We continue with the discussion on the Rules of Procedure for the Problem Committee, IM provides an overview on the document proposed by the committee.

MP thinks that the document contains many things that should not be part of the RoP. He suggests a more concise (2-3 pages) document to be prepared. TH agrees and mentions some specific parts of the proposed document that should rather be part of a report. IM argues, that it's important to have everything in the document so that in the future it's clear, how the problems were selected. TH agrees that that's important, but this is what the report is for. QS and YY agree that there are parts in the document that should rather be in a report or an addendum.

MP suggests to have a new, condensed proposal that is then discussed and voted on via email.

13. **Disciplinary Committee**

Newly appointed chair of the disciplinary committee QS explains the fundamental question of what consequences are appropriate. Expected behavior is explained in the guidelines for participants and the regulations, both available on the website.

The RoP for the Disciplinary Committee should contain a list of incidents and proposed consequences, including what body is responsible for the decision – e.g. the IOC if an IMO should not be allowed to send a team because of a grave offense.

IM asks for the RoP to include a clear procedure to identify the details of a complaint". If a team A complains about a team B, and the team B says "no way, this is not true", it is extremely difficult to identify what actually happened.
One of several different recent incidents involved a team using the internet during their presentation, because they used google slides. This is against the rules.

MP suggests to QS to find members for the committee, starting with asking the current members Alan Allinson, Ivan Antsipau and Kent Hogan. QS is free to select the members of his committee; it's suggested to find people who will likely be present at the IYPT 2017. IM will send a list with incidents from the past to QS.

QS will suggest members for the committee until the end of March and come up with a proposal for RoP as soon as possible. Until there is an agreed upon RoP, the disciplinary committee is asked to arbitrate and amicably settle any conflicts, but does not have any further power to decide on consequences. If the mediation does not solve the issues, any case is referred to the EC.

14. **Jury Committee**

MP gives a report for the jury committee, the slides are attached and include a report on the feedback received from teams, a proposal for a new scoresheet and a proposed change in the committee's RoP concerning the naming of different categories of jurors.

For IYPT 2017 in each round 5 jurors will be deployed, which is the minimum allowed in the regulations.
MP presents ideas for a new scoresheet. YY thinks the current scoresheet works well.
The JC wants to further increase the number of Experienced Jurors. This is based on the feedback received from teams, where more extreme complaints are only found for non-experienced jurors.

Motion: The suggested changes in the RoP for the Jury Committee are accepted.
Present: 7, For: 7, Against: 0, Abstain: 0

The suggested changes in the RoP for the Jury Committee are accepted.

15. **Statistical analysis on gradings in history**

IM has prepared a report on statistical significance of IYPT results, ranking dynamics, differences in grading between new and experienced jurors, overall distributions of grading parameters and long-term trends; slides are attached.

16. **Re-issue of IMO status for many countries**

There are 19 IMOs who need to re-apply for IMO status at the IOC meeting in 2017. TH suggests to give two options to each IMO: If there are no changes to their original application (same organization, same procedure for selecting students etc.) the IMO can request for their status to be renewed either in writing (via email before the IOC meeting) or in person at the IOC meeting. In all other cases a full application has to be submitted electronically (a scan) before the IOC meeting and the original documents must be handed over to the SecGen at the IOC meeting.

MP disagrees and suggests that everyone submits a full application and gives a (very) short presentation on how the selection process works. If there is no application submitted (a signed original brought to the IOC meeting) there cannot be a vote. IMOs that fail to apply can send a team in 2018 the same way any new organization can apply to send a team (any other organization could apply to become IMO and send a team too). SB supports this proposal, as it's the same that we require from new IMOs.

TH asks for a vote on the two proposed ways to proceed. Of the 7 EC members present, 2 vote in favor of THs proposal to allow for a simplified process, 3 against and 2 abstain. Therefore, a full application is requested from all 19 IMOs, including the description of the selection process. We will inform IMOs that a new application is needed early 2017.

MP puts forward the motion to put forward the motion to IOC to, depending on whether the motions of IYPT are changed anyway, add the period of 5 years as the default and maximum for how long an IMO status is granted to the statutes.
Present: 7, For: 7, Against: 0, Abstain: 0

The motion will be prepared by MP and put to the IOC by EC depending on the statutes being changed anyway.

17. **Motion to change the IYPT statutes: Restructuring of the EC**

MP would like to open a discussion on restructuring the EC in the future. Since we started this model of EC, the situation in IYPT changed significantly: We have more teams coming, more formal IMO organizations and more formal relationships (including a contract) between IYPT and EC on one side and LOC on the other side. Also, many obligations that were on shoulders of the LOC in the past were transferred to the IYPT and EC, such as registration, juries and providing the IT to run the tournament. As such, it makes sense to decouple the EC and the heads of LOC. IM supports the principle idea of the proposal and suggests to add to the preamble already the definition of RoPs.

Motion: The EC will propose to the IOC a change of the statutes concerning the structure of the EC as distributed with the agenda.
Present: 7, For: 3, Against: 3, Abstain: 1

Motion: The EC will propose to the IOC a change of the statutes concerning the structure of the EC as attached to these minutes but with a change to only 5 Members.
Present: 7, For: 5, Against: 1, Abstain: 1

The motion as attached to the minutes will be put forward to the IOC.

18. **Motion to change the IYPT statutes: Direct connections with other competitions**
Based on his participation at the WFPhC congress, MP suggests a change in wording of our statutes that would allow IYPT to maintain direct connections with other competitions. After some discussion and small changes to the proposal, MP puts forward a motion to change the statutes.

Motion: The EC will propose to the IOC a change of the statutes as attached to these minutes.
Present: 7 For: 7 Against: 0 Abstain: 0

The motion as attached will be put forward to the IOC.

19. **Founding of IYPT support center in Slovakia**
MP started negotiations with the Ministry of Education in Slovakia. They are willing to bind themselves to cover travel expenses connected with the position of President and also possibly to contribute to some administrative expenses and other costs connected with the office, if we formally set up an IYPT support center in Slovakia.

TH puts forward the motion to support the setup of an IYPT support center in cooperation with the Ministry of Education in Slovakia.
Present: 7 For: 7 Against: 0 Abstain: 0

The EC supports and applauds the initiative of the Ministry of Education in Slovakia in creating an IYPT support center.

IYPT finances

20. **Travel support for experienced jurors**
TH reports that from the point of view of running the tournament, experienced jurors are the most valuable for many reasons, including their availability already during the first round, their familiarity with the rules of the IYPT and them being the group (most) chairs are recruited from. In 2016 there were fewer applicants that fulfilled the criteria than the number of jurors we could have accepted. In order to increase the number of applicants, we could support the travel of experienced jurors who need support by increasing the team participation fee. The JC supports the idea.

In order to see if the measure works it should be tested first without increasing the participation fee and for a limited number of jurors. As the budget is already accepted by the IOC, the increased spending is done via EC decision, which allows overspending of up to 500 Euro per chapter. As the EC is using less money for travel than in the budget, the total budget will not be overspent.

MP puts forward the motion to allow overspending of up to 500 Euro in both the chapter for the Jury Committee and the Presidential Fund in order to spend up to 2500 Euro from those two chapters in for supporting the travel of up to 5 Experienced Jurors to IYPT 2017 with up to 500 Euros each. The selection will be made by the Jury Committee.
Present: 7 For: 7 Against: 0 Abstain: 0

Therefore, travel support for up to 5 Experienced Jurors will be provided at IYPT 2017.

21. **Budget 2017/2018**

IM presents his draft of the budget for 2017/2018.
QM cannot offer discount observers who stay in the dormitory, because the costs are not significantly lower.
The visitor fee will be increased to reflect the real costs.
There is a quick discussion on the other chapters with some proposals for changes that will have to be prepared.

We decide to continue at 8:30 tomorrow. End of day 2 – 19:15.

22. **Financial report LOC 2016**

Start of day 2 at 8:40.

IM presents the financial report from LOC 2016. There was one update because the first one was done without VAT. The EC kindly asks that future LOC include any in-kind contributions to their statement (not necessarily with a monetary amount, but in order to complete the list).

23. **Updates to the General budget guidelines**

TH presents his ideas to change the budget guidelines to include a revision of the budget and a forecast. After some discussion and revisions, the motion is brought forward to make the changes, as documented in the updated version attached to the minutes.
Present: 5, For: 4, Against: 0, Abstain: 1

TH presents further ideas for changes to the structure and puts forward the motion to add a chapter for "Travel - Tournament Support" and move the travel costs from chapter 2 there. Furthermore, a chapter for "Travel support for Experienced Jurors" shall be added, with the descriptions of the chapters as discussed in the meeting.
Present: 5, For: 4, Against: 0, Abstain: 1

TH puts forward the motion to remove the chapter for the Archive, as the Archive is a private initiative by IM and therefore the guidelines should not require us to have this chapter. This does not mean the support is removed from the budget, as it can be done via the chapter for 'other IYPT priorities'.
Present: 5, For: 3, Against: 0, Abstain: 2

MP puts forward the motion to add a chapter for "Public relation and outreach" and move the outreach part from the fundraising chapter there.
Present: 5, For: 4, Against: 0, Abstain: 1

IM explains that he thinks the kind of changes we're now discussing are needed for each budget and each of their revisions. He therefore thinks, that it's not optimal to continuously change the rules of budget building. Therefore, while all the changes are supported by IM as reasonable, he opts for not endorsing them with his vote anyway.

MP asks whether the new budget rules that allow for a revision should already be applied to the current budget. As the rules were not presented to the IOC and the IOC approved the current budget, this will not be done. Furthermore, there is already a solution to support the travel for experienced jurors that was decided yesterday.

SB agrees to adapt the document according to the passed motions.

24. **IYPT bank account**

The rights on the bank account for MP were not added yet by IM. MP insists on a clear deadline. IM proposes the end of February 2017, MP agrees. MP puts forward the motion to open another account in the Eurozone and transfer the funds there if this deadline isn't kept. The old one is to be closed within a year if this is the case.
Present: 5, For: 5, Against: 0, Abstain: 0

MP suggests that we have an account where we can get a credit card or debit card that can be used for payments and cash withdrawals worldwide. He suggests to find out how much this service would cost at our current bank and to compare with prices at other banks. Based on the result, we should consider switching our bank. IM will provide us with the costs at our current banks and MP will inquire about prices at a Slovak bank.

25. **Fundraising / alumni**

QS asks for an update to the website that includes information for alumni. TH will be happy to add such a page if the content is provided by QS.

26. **Report on spending of budget 2015/2016**

The report was already sent to the EC, as there is no more time to discuss, any discussion is to be done via email.

27. **Report on spending of budget 2016/2017**

No account movements have been made in this financial year.

28. **Any other business**

IYPT Magazine

TH reports that there was a request to send out a call for papers to past years' participants. EC agrees that within the Terms of Service & Privacy Policy for CURIIE this use of data (email addresses) is ok. As the IYPT magazine was accepted as part of IYPT, its promotion is considered promotion of the IYPT.

IYPT Archive

The Archive is a personal initiative by IM, positioned as a retrospective research project. The majority of archived documents are not courtesy of IM or of the Association IYPT. It's formally accredited by the Executive Committee, and receives funding from the IYPT. Such a status gives the project a good combination of research freedom and addressing priorities of the community. The Archive maintains its information webpage at two sites, archive.iypt.org and iypt.ilyam.org, that mirror each other. This situation was always clearly stated on the archive's website and IM has no intention of changing this.

TH explains that a collection of facts is copyrightable. Therefore, TH suggests that IM attaches a suitable license to these collections. This will ensure, that the investment made by the IYPT is protected, even in the unlikely case that IM decides to stop his work on the archive. IYPT wants to protect its investment without infringing upon IM's rights. EC agrees to move forward in this direction, TH and IM will discuss further.

Update to the list of tasks

As new to-dos were added, TH suggests to have another look at the list of tasks and update it, also adding deadlines. After small changes to the list, TH puts forward the motion to accept this list of tasks, responsibilities and deadlines.
Present: 5, For: 5, Against: 0, Abstain: 0

MP closes the EC meeting at 11:30

The minutes were prepared by Timotheus Hell and are approved for publication by the IYPT EC.

	Signatory	Timotheus Johannes Hell
	Date/Time-UTC	2016-11-26T23:00:32+01:00
	Verification	Information about the verification of the electronic signature can be found at: https://www.signaturpruefung.gv.at
Note	This document is signed with a qualified electronic signature. According to Art. 25 para. 2 of the Regulation (EU) No 910/2014 of 23. July 2014 ("eIDAS-Regulation") it shall have the equivalent legal effect of a handwritten signature.	

Appendix – Information for IYPT 2017

This appendix contains information relevant to the participants of IYPT 2017, for most topics more details are provided in the minutes and will be provided on the IYPT 2017 tournament website located at http://iypt2017.nus.edu.sg. IYPT 2017 will be held in Singapore from 5th to 12th of July 2017, hosted by the National University of Singapore. IOC meeting will be held from 12th till 14th of July 2017.

Deadlines

- Jan. 31: pre-registration for Teams via email to registration@iypt.org
- March 31: application for Experienced Jurors via curiie.iypt.org
- April 26: payment via IYPT account / IM
- June 6: submission of all data via curiie.iypt.org

Fees

- Per team (5 students, 2 teamleader): 1500 Euro
- Per Observer/Visitor: 1100 Euro
- Upgrade from UTown to Kent Vale: 160 Euro

Given the actual costs of accommodation at UTown, there will not be the possibility to provide an option for discounts to observers. Options for refunds are very limited, because once money is sent to LOC, it cannot be refunded from the IYPT. The LOC will not make any refunds.

Accommodation

Jurors (including TL-Jurors), EC members and Visitors stay in Kent Vale. Participants of the IOC meeting will stay in Kent Vale for the meeting too. TL and Team members stay in UTown. Both upgrade and downgrade options will be available based on availability. Anyone staying in UTown will need to bring their own towels and toiletry, bedding will be provided.

Teams

No simcards will be provided to the teams. All teams are requested to give us a way to contact them via mobile phone or WhatsApp. Teams must not use any service for their presentations that require an internet connection, as this isn't allowed by the regulations. All projectors have VGA connections only, so if needed, teams need to bring their own adapters. All power outlets are 230V AC 'Type G' (British), teams are required to bring their own adapters if needed. If WiFi is needed at UTown, bringing an access point / router might be beneficial.

Jurors

If a team brings two TL, then one of them must fulfill the basic criteria for jury qualification (see JC RoP). If both TL fulfill the criteria, they can split their work in the jury. In this case, both TL should be registered in CURIIE as TL-J.
All jurors must be available for the jury for all fights, the schedule will be created so that each juror will probably have at least one fight off.
Experiences Jurors (EJ) apply via the CURIIE registration software. Travel support for up to 5 Experienced Jurors will be provided at IYPT 2017.
Team leader Jurors are added to their respective team via the CURIIE registration software.
Local jurors and other jurors who must fulfill the basic criteria for jury qualification (see JC RoP) are coopted to the jury based on the decision by the JC. They also have to register via CURIIE.

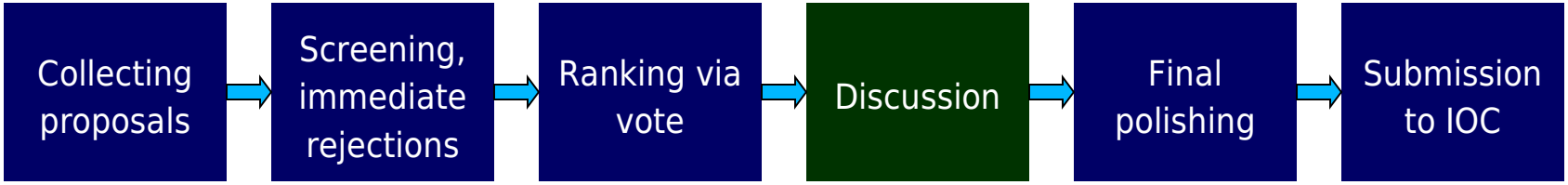
IMOs

A full application (for the form see iypt.org) is requested from all 19 IMOs that need to renew their application, including the description of their selection process. A scan of the signed documents should be sent to TH, the original signed document delivered to TH at the beginning of the IOC meeting latest.

Committee for Problem Selection:

progress report, outlook, Rules of Procedure

Operational cycle



24/365
- any contributor (Statutes, p. 2)
- deadline, next IYPT: February 28
- detailed forms with information
- reminders

March
- indexing, IDs
- rejecting repeats, dangerous etc.
- consensus decision-making
- no edits

April
- obtaining a quantitative parameter
- learning if IOC likes a problem
- control of significance

April-June
- weighting all aspects
- reviews, checks, requests
- consensus decision-making on a short list

June
- wording, figures
- random order
- possible replacements
- “a reasonable set of problems”

June
- a many-page report to check each step we did - statistics, reviews
- vote of approval by IOC

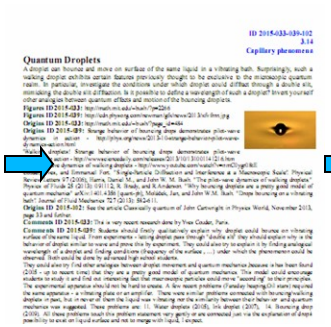
Example: No. 5 “Ultrahydrophobic water” (IYPT 2016)

- Second most popular problem at the IYPT 2016 (presented 16 times, rejected 3 times)
- Selected for Finals and third most popular selection for PF 5 (3 times)
  - ID 2016-127/2015-033-039-102 (=4 independent proposals in two years)
  - Vote for IYPT 2015: 3.14 points, rank 15, not proposed by Committee
  - Vote for IYPT 2016: 3.33 points, rank 13, proposed by Committee

ID 2015-033

ID 2015-039

ID 2015-102



Answer	Count
1 (1)	5
2 (2)	5
3 (3)	4
4 (4)	9
5 (5)	5
No answer	0
Not displayed	0
Arithmetic mean	3.14
Standard deviation	1.41
Sum (Answers)	28
Number of cases	28

Decision (05.03.2014): merged from the proposals ID 2015-033, ID 2015-039 and ID 2015-102. A merged, interim wording suggested. Original text of ID 2015-033: “**Dancing droplets.** It is possible to make a tiny fluid droplet levitate on the surface of a vibrating bath, walking or bouncing across, propelled by its own wave field. Surprisingly, these walking droplets exhibit certain features previously thought to be exclusive to the microscopic quantum realm. Invent yourself some experiments that prove this behavior.” Original text of ID 2015-039: “**Diffraction of a Bouncing Droplet.** It is known that a droplet could bounce and move on surface of the same liquid if it is vibrating with right frequency. Explain the phenomenon and investigate the conditions under which droplet could diffract through double slit - mimicking the well known experiment - double slit diffraction. Is it possible to define a wavelength of such droplet? Are they any other analogies between quantum nature of world and movement of bouncing droplets?” Original text of ID 2015-102: “**Quantum walkers.** Place an oil bath on a vertical vibrator. By adjusting frequency and amplitude droplets appear that bounce on the surface and remain stable for a very long time. These droplets are called walkers. Perform experiments on the behavior of these walkers showing even macroscopic quantum effects.”

Commentary (J. B.): Seems OK
Commentary (S. B.): ok, but we would have to check feasibility of experiments if accepted
Commentary (S. B.): I assume that a very good vertical vibrator is required for reasonable results. I doubt that anyone would be able to get anywhere close to double slit diffraction or any other quantum behaviour.

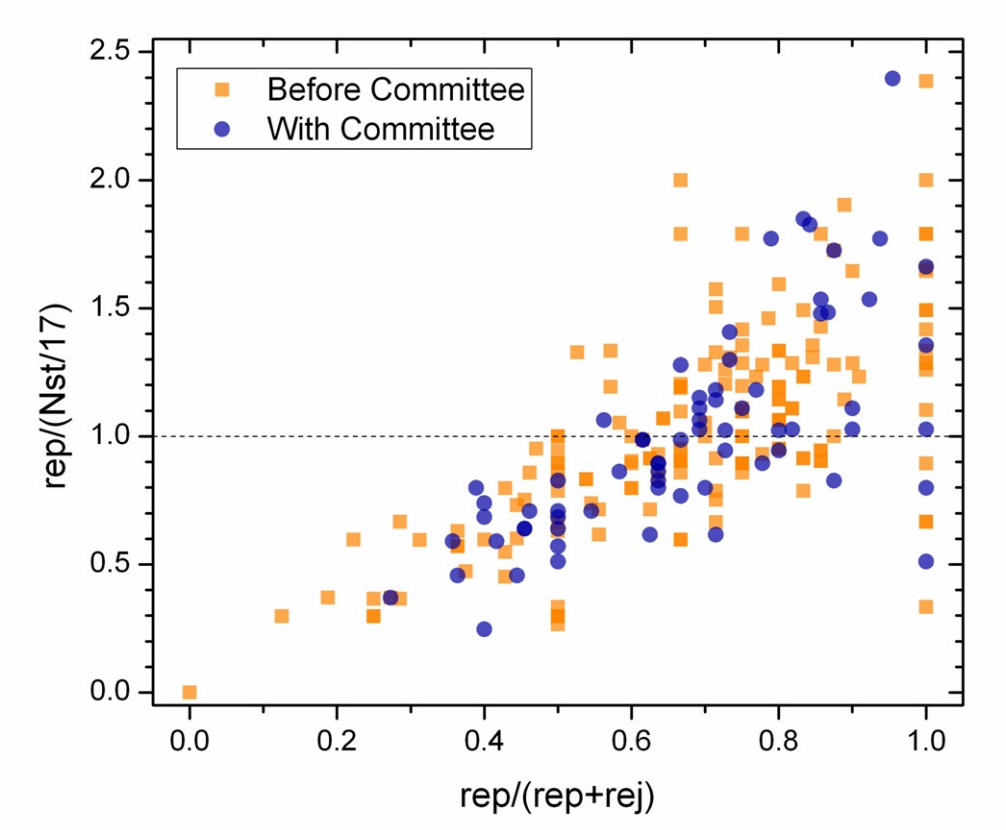
ID 2016-127

Repeat of “Water droplets” (2005)?

Commentary (I. M., 07.03.2015): Merge with ID 2015-033-039-102. The new wording seems so much clearer, and the video looks impressive, so I think we can have a look again at the problem.
Commentary (S. B., 16.03.2015): ok
Commentary (J. B., 19.03.2015): reject---Many teams looked at this phenomenon for Water (2005)
Commentary (I. M., 19.03.2015): I agree there is quite some similarity with No. 11 “Water droplets” (2005). However this problem puts emphasis on acoustic stabilization; the physical mechanism that prevents immediate coalescence must be different; and the lifetime of the droplets seems to be longer by orders of magnitude. I would give this proposal a chance.

Answer	Count
1 (1)	2
2 (2)	3
3 (3)	7
4 (4)	4
5 (5)	5
No answer	0
Not displayed	0
Arithmetic mean	3.33
Standard deviation	1.28
Sum (Answers)	21
Number of cases	21

How do the problems perform in the IYPT?



Relative popularity in the IYPT as a function of ratio between reports and total reports and rejections. Data for 14 different IYPTs

- Problems accepted in less than ⅓ cases *or* never challenged and never reported:
  - 1 out of 68 with the Committee (**1.5%**)

    last-minute replacement No. 15 “Moving brush” (IYPT 2015)
  - 13 out of 170 before the Committee (**7.6%**)

    archived data only for 14 IYPTs so far

Initial screening

- Univocal indexing: ID XXXX-YYY
- Mergers (sometimes with previous proposals, to credit authors of the “same” problems)
- Immediate rejections

Repeats	Unsafe	Legal, ethical issues	Trivial, close-ended	Speculative	Special equipment needed
Definition: Problem B is a repeat of existing Problem A, if a reasonable solution of A would pass as a solution of B	RoP explain typical examples (explosives, high currents, 10 mW lasers etc.) Decided case-by-case	RoP explain typical examples (alcohol, controversial experiments on humans). Decided case-by-case	Unique quantitative answer, standard textbook demonstrations. Decided case-by-case	RoP explain typical examples (cold fusion, quantum gravity), an answer than can only be guessed. Decided case-by-case	RoP explain typical examples (3D printers, liquid nitrogen, industrial lasers etc.)

Remark: “Magnetic train” is perhaps the most popular problem of all times (as judged by partial data)

Still, only 52% IOC members thought that it is “excellent”, and 19% thought it is “average”

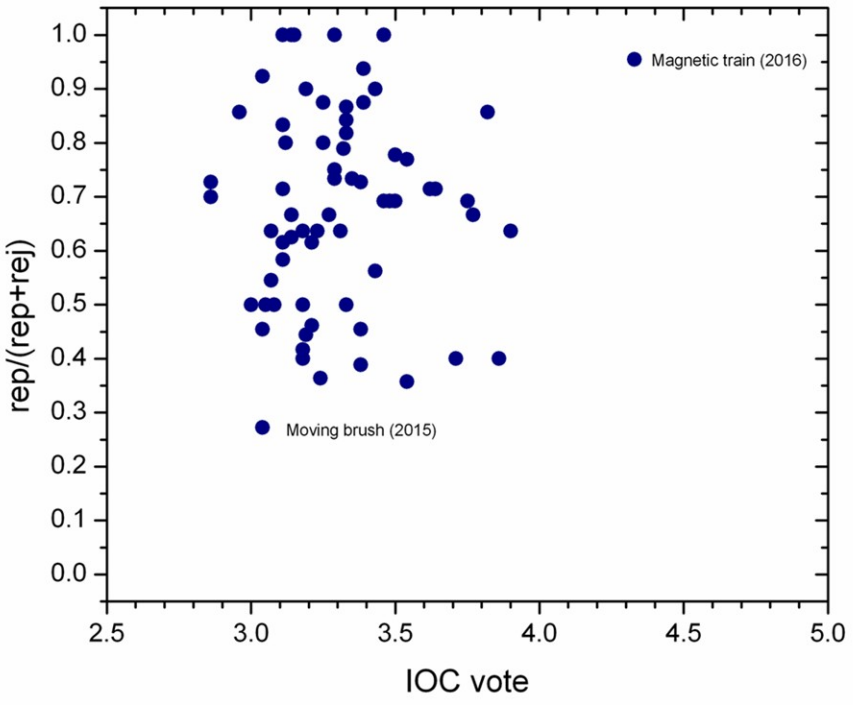
Quick statistics
Survey 121534 'IYPT Problems Selection 2

Field summary for ID2016018

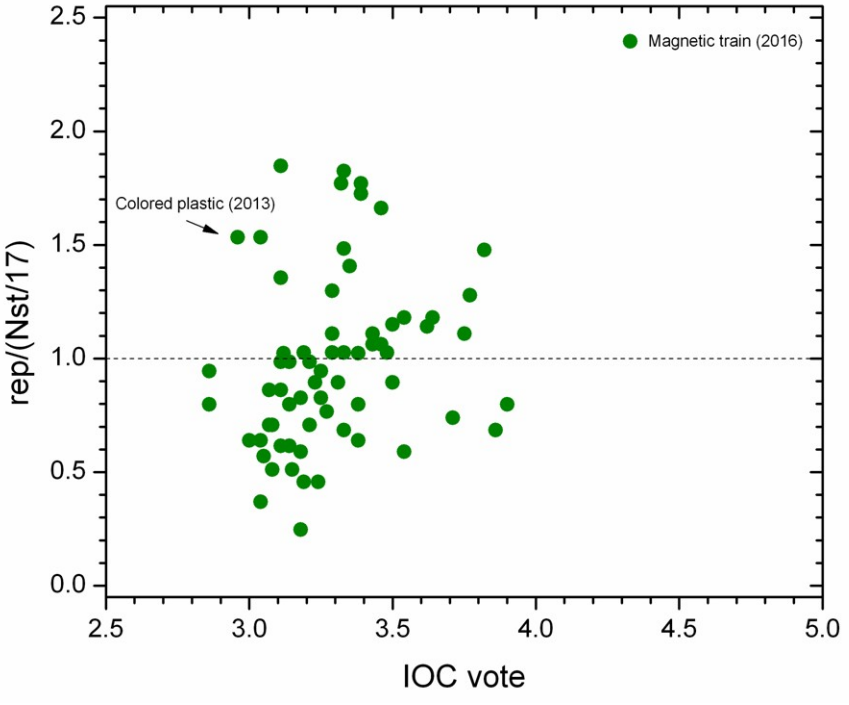
ID 2016-018-066-067-068-069-075-144. Magnetic Train. Attach neodymium ‘button’ magnets to each end of a small battery, i.e. AA. Create a loose, cylindrical coil of bare copper wire through which the battery and magnets can easily slide. Insert the battery fully into the coil and observe its behaviour. Explain the phenomenon and investigate how relevant parameters affect the train's maximum speed.

Answer	Count	Percentage	Sum
1 (1)	0	0.00%	0.00%
2 (2)	0	0.00%	
3 (3)	4	19.05%	19.05%
4 (4)	6	28.57%	
5 (5)	11	52.38%	80.95%
No answer	0	0.00%	
Not displayed	0	0.00%	
Arithmetic mean	4.33		
Standard deviation	0.8		
Sum (Answers)	21	100.00%	100.00%
Number of cases	21	100.00%	

Correlation between votes and performance in IYPT



Ratio between reports *and* total reports and rejections. Data for 68 problems in 2013-2016



Relative popularity in the IYPT. Data for 68 problems in 2013-2016

Handling a range of opinions: remarks

- Opinions on any individual problem may vary radically (within the Committee, within the EC, within the IOC)
- We privilege discussion over an isolated point of view
- We rely on arguments and approaches that would not short-circuit high quality professional judgment
- We try to use balanced, meaningful and universally acceptable ranking procedures
  - interesting vs not interesting → subjective parameter
  - feasible vs not feasible → objective parameter
- We seek opinions of active and motivated IOC voters (cf. stability of selection prior to 2012)

Discussion and selection

- **Basic principle is reasoning, questioning and seeking consensus**
- Proceedings of the discussion are public as to ensure step-by-step verification
- Covers various aspects of the problems (looked in comparison), including but not limited to
  - ranking in the IOC vote
  - coverage of various branches of physics
  - feasibility
  - relevance
  - reviews
  - originality
  - safety
- Incoming comments are actively encouraged (IOC email list, when sending reminders, collecting votes), but many provide feedback only at the IOC meeting

Discussion example: “Radiative cooling” (ID 2014-64)

ID 2014-64
3.36
Optics, heat and mass transfer

Radiative cooling

By using parabolic mirrors solar energy can be focussed on a collector. Due to absorption the collector gets hot. Use the same method in order to cool down an object. Construct such a device and determine on what parameters the minimum possible temperature of the object depends. What is your minimum?

Figures:

Origins:
An article about this phenomenon was published in a magazin of the Dutch Physical Society (Nederlands tijdschrift door Natuurkunde) June 2012, page 192.
See for instance also: http://people.csail.mit.edu/jaffer/cool/Aperture/

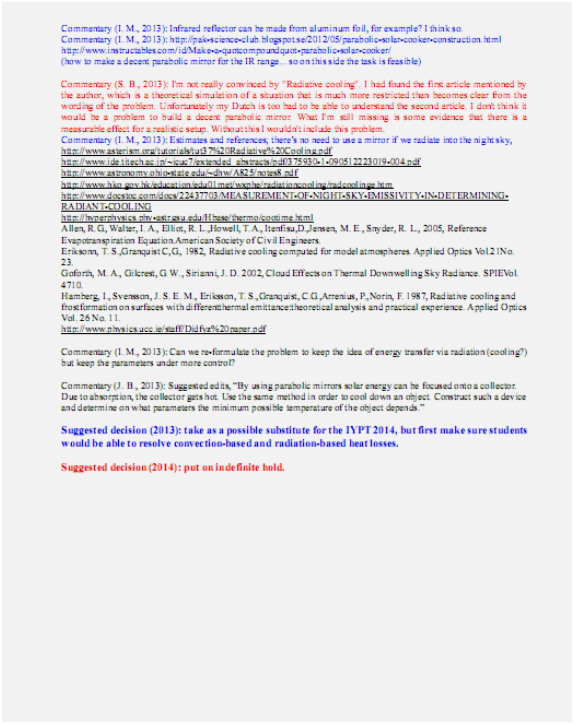
Commentaries:
The students are expected to construct the device and try to measure the cooling effect.

New? Yes Feasible? Yes

Commentary (E. Yu., 2013): ‘t can be specified that a very cold object (liquid nitrogen) is placed into the focus of the second reflector
Commentary (M. P., 2013): +/-
Commentary (I. M., 2013):I think the problem is very promising (not sure if rephrasing is needed and what would be the best.)
Commentary (A. Sh., 2013): The effect is good and didactic. But the task leads to quite demanding technical solutions that are difficult to implement: a elliptically shaped mirror, evacuated air, liquid nitrogen etc. Probably we should fix the minimum limit of temperature of the heat sink?
Commentary (S. B., 2013): Has anyone tried this with a setup that can be realised at a typical high school? I'm not sure whether this can be successfully done without access to advanced equipment. The last question is unnecessary. Students are expected to report their temperature decrease anyway.

Questions to the author: Would it be possible to ask you to comment on these remarks? Could you please comment on the opinion that the problem may be too demanding for the students? In particular, it would be really wonderful if you could comment if students may reach good results without smooth curved mirrors, liquid nitrogen and other pieces of equipment that may be quite demanding for the inexperienced teams. Would you suggest to expect that the heat is radiated into the environment or rather consumed by the heat sinks (liquid nitrogen etc.) Depending on this, it would probably be necessary to edit the text.
Answers from the author: I got the idea after reading an article about this in the Journal of the Dutch Physics Society: 'Nederlands Tijdschrift door Natuurkunde', 2012, June, page 192.
Seen the remarks I think that the referees didn't get it. The purpose is to cool an object placed in the focus of the parabolic mirror. When radiation from a source (at infinity and along the major axis) is received by the mirror, the object in the focus is heated. The inverse is true while the mirror points in a direction where there is no source. When the temperature of an object is constant, there is an energy balance. With the help of the mirror there is no balance anymore: the influx is lower than the out flux and the object cools down. So there is no liquid nitrogen needed! Who got that idea? The students have to think about how to optimize the out flux of radiation and how to minimis the influx of all kinds of energy. That does not seem too hard to me.

Commentary (S. B., 2013): I'm still hesitant. It is one thing to state that there should be an effect (to be honest the explanation doesn't really convince me), but another to be sure whether the effect is measurable under conditions and with equipment available to our students. I agree with the reviewer of Cold balloon that the physical effect should be detectable in the very first tests, which doesn't seem to be clear in this case. Without any clear evidence, I wouldn't include this problem in the first selection.
Commentary (I. M., 2013): Article that the author mentions: http://www.beam-up.nl/pdf%20documentatie/artikel%20(NT)vN.pdf (ouph :•) it took me 20 min to find the article, I was about to write to the editor of the journal :•))
In principle, students can buy small pieces of mirrors (one month ago we urgently needed such mirrors in Turkey at the IYNT and there was no trouble to get them in supermarkets, the size was ca. 6x8 cm; also there are many options like http://www.ebay.com/itm/SMALL-CUT-MIRROR-PIECES-200-pieces-/370253281425, 200 pieces for 16 USD.) And with such mirrors they can put together a good approximation of a parabolic surface.



Commentary (I. M., 2013): Infrared reflector can be made from aluminum foil, for example? I think so.
Commentary (I. M., 2013): http://pak-science-club.blogspot.se/2012/05/parabolic-solar-cooker-construction.html
http://www.instructables.com/id/Make-a-quot-compound-quot-parabolic-solar-cooker/
(how to make a decent parabolic mirror for the IR range… so on this side the task is feasible)

Commentary (S. B., 2013): I'm not really convinced by "Radiative cooling". I had found the first article mentioned by the author, which is a theoretical simulation of a situation that is much more restricted than becomes clear from the wording of the problem. Unfortunately my Dutch is too bad to be able to understand the second article. I don't think it would be a problem to build a decent parabolic mirror. What I'm still missing is some evidence that there is a measurable effect for a realistic setup. Without this I wouldn't include this problem.
Commentary (I. M., 2013): Estimates and references, there's no need to use a mirror if we radiate into the night sky,
http://www.asterism.org/tutorials/tut37%20Radiative%20Cooling.pdf
http://www.ide.titech.ac.jp/~icuc7/extended_abstracts/pdf/375930-1-090512223019-004.pdf
http://www.astronomy.ohio-state.edu/~djhw/AEZ5/note8.pdf
http://www.bio.gov.hk/education/eda/01.met/exe/he/radiationcooling/radcooling e.htm
http://www.docstoc.com/docs/22437703/MEASUREMENT-OF-NIGHT-SKY-EMISSIVITY-IN-DETERMINING-RADIANT-COOLING
http://hyperphysics.phy-astr.gsu.edu/Hbase/thermo/soottime.html
Allen, R. G, Walter, I. A., Elliot, R. L.,Howell, T. A., Itenfisu,D.,Jensen, M. E., Snyder, R. L., 2005, Reference Evapotranspiration Equation.American Society of Civil Engineers
Eriksonn, T. S.,Granquist C,G, 1982, Radiative cooling computed for model atmospheres. Applied Optics Vol.2 INo. 23.
Goforth, M. A., Gilcrest, G W., Sirianni, J. D. 2002, Cloud Effects on Thermal Downwelling Sky Radiance. SPIEVol. 4710.
Hamberg, I., Svensson, J. S. E. M., Eriksson, T. S.,Granquist, C.G.,Arrenius, P.,Norin, F. 1987, Radiative cooling and frost formation on surfaces with different thermal emittance:theoretical analysis and practical experience. Applied Optics Vol. 26 No. 11.
http://www.physics.ucc.ie/staff/Did/fyr%20paper.pdf

Commentary (I. M., 2013): Can we re-formulate the problem to keep the idea of energy transfer via radiation (cooling!) but keep the parameters under more control?

Commentary (J. B., 2013): Suggested edits, "By using parabolic mirrors solar energy can be focused onto a collector. Due to absorption, the collector gets hot. Use the same method in order to cool down an object. Construct such a device and determine on what parameters the minimum possible temperature of the object depends."

Suggested decision (2013): take as a possible substitute for the IYPT 2014, but first make sure students would be able to resolve convection-based and radiation-based heat losses.

Suggested decision (2014): put on indefinite hold.

Referee report

ID 2014-64 Radiative Cooling

The idea of the task is simple, straightforward and nice – use radiative power of an abject to cool it down. However, the formulation itself causes misunderstandings, what is reflected in the discussion between the authors and the committee members and experts.

First question is what shall be used as the cooling environment. Is it the Universe (via atmosphere) or a specific cold object (e. g. liquid nitrogen container)? It needs to be cleared out, what are the allowed devices to use.

Independently on the previous question, mentioning parabolic mirror is misleading. In both cases the cold objects are or can be “large” and thus no real focusing is needed. One or two plain mirrors would take the geometrical efficiency without any problems to 80-90%.

The real problem is elsewhere.
If the cooling environment is the Universe, the object will be cooled with a power that does not exceed about double the power the object would be cooled without any device during a clear night. So an apparatus consisting of a plane mirror under the object (painted black), would maximize the cooling power. As for the temperature, the best result is obtained for plane objects (high surface and low heat capacity) that are well isolated from environment to prevent from conductive heating. There is no theoretical limit other than the temperature of the universe, so the only limits will be engineering limits.

If the cooling environment is artificial, experimenting is a bit easier and not weather dependent, but an extra problem with insulations appears (so that the object is not cooled via conduction). Again, the only theoretical limit is the temperature of liquid nitrogen.

Simple calculation show that one liter of water in a black box could cool towards the Universe as quickly as 23 K per hour. In reality (taking into account transmissivity of the atmosphere in relevant wavelengths) a few K per hour would not be a problem to reach, but this is exactly what one observes during a clear night – everything cools down. Using nitrogen brings not much difference.

To summarize, it seems not to be a problem to design a working experiment, but it is virtually impossible to optimize it. There is no interesting physics involved except Stephan-Boltzmann law. It is certainly not an optics problem, rather a thermo dynamical one.

Therefor I suggest not including the problem into the IYPT set of problems.

Martin Plesch

- Vote for IYPT 2014: 3.36 points, rank 7
- A lengthy discussion with author, an impartial formal reviewer called
- Example of intriguing at first glance, yet speculative and unfeasible problem

Experts and reviewers

First-hand experts ⟷ **Specialists** ⟷ **IOC members**

- Authors of relevant peer-reviewed papers
- Know the subject better than anyone in the World
- We have contacted such experts in a number of cases
- A final expert say on physics, required equipment
- Have little idea about the IYPT problems, motivation and level of Teams
- Since own work involved, may tend to say “yes, it is super interesting and easily feasible”
- Would be inappropriate to ask for too much of their time

- Good experts in e.g. optics or acoustics
- Can give comparative judgment on feasibility
- Can outline what topics are *hotter* in cutting-edge research
- Can connect us to more informed experts
- Comparative judgment on subjective features (“interesting”, “fascinating”) is subjective too
- Have little idea about the IYPT problems

- Have a good gut feeling on good IYPT problems
- Vote and approve the problem set (Statutes)
- Responsible for IYPT teams worldwide (Statutes)
- Comparative judgment on subjective features: only possible with many opinions, not one (diverse opinions, we need statistics)
- May lack detailed technical information, especially on feasibility
- Often need to be approached on an individual basis, lack of timely motivation

First-hand experts: “Climbing droplets” (ID 2013-36)

De : Guillaume Dupeux [guillaume.dupeux@ladhyx.polytechnique.fr]
Date d'envoi : vendredi 22 juin 2012 17:53
À : MARTCHENKO Ilya
Objet : Re: droplet on a ratchet: question

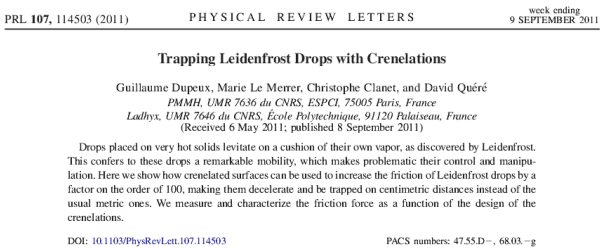
Dear Ilya,

The ratchet experiment is not really difficult to build. The tough part is to machine the ratchet. You need a milling machine and a piece of metal (1x5x10 cm) that can be machined (aluminium, brass...). Then you tilt the head of the milling machine by an angle of 10° and you machine a groove every 1.5mm (the drill should enter into the metal with a depth of 300 microns at least). If you have such equipment available, it is only a matter of time (a few hour to machine a ratchet). The rest of the equipment is a hot plate like the one used for chemistry (large enough according to the size of the ratchet and hot enough, about 350°C for water drops) and a camera if you want to record the motion of a droplet.

About the question of the subject difficulty, it depends I think of what you expect from the students. The physical explanation of the motion has been the subject of at least 4 scientific papers during last months and the only experimental demonstration that has been proposed is really hard to repeat without technical equipment (dry ice, fast camera...). But studying the motion of a propelled drop (acceleration and terminal velocity) can be interesting and experimentally feasible. And the Leidenfrost effect is quite fascinating so I am sure that it will be appreciated by the student.

Sincerly,

Guillaume Dupeux



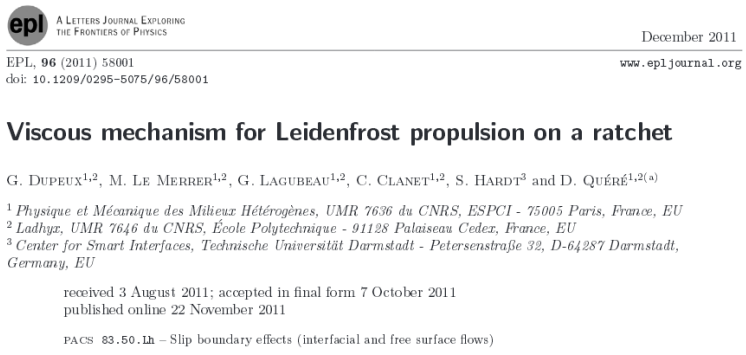
PRL 107, 114503 (2011) PHYSICAL REVIEW LETTERS week ending 9 SEPTEMBER 2011

Trapping Leidenfrost Drops with Crenelations

Guillaume Dupeux, Marie Le Merrer, Christophe Clanet, and David Quéré
PMMH, UMR 7636 du CNRS, ESPCI, 75005 Paris, France
Ladhyx, UMR 7646 du CNRS, École Polytechnique, 91120 Palaiseau, France
(Received 6 May 2011; published 8 September 2011)

Drops placed on very hot solids levitate on a cushion of their own vapor, as discovered by Leidenfrost. This confers to these drops a remarkable mobility, which makes problematic their control and manipulation. Here we show how crenelated surfaces can be used to increase the friction of Leidenfrost drops by a factor on the order of 100, making them decelerate and be trapped on centimetric distances instead of the usual metric ones. We measure and characterize the friction force as a function of the design of the crenelations.

DOI: 10.1103/PhysRevLett.107.114503 PACS numbers: 47.55.D−, 68.03.−g



epl A Letters Journal Exploring the Frontiers of Physics December 2011

EPL, **96** (2011) 58001 www.epljournal.org
doi: 10.1209/0295-5075/96/58001

Viscous mechanism for Leidenfrost propulsion on a ratchet

G. Dupeux[1,2], M. Le Merrer[1,2], G. Lagubeau[1,2], C. Clanet[1,2], S. Hardt[3] and D. Quéré[1,2(a)]

[1] *Physique et Mécanique des Milieux Hétérogènes, UMR 7636 du CNRS, ESPCI - 75005 Paris, France, EU*
[2] *Ladhyx, UMR 7646 du CNRS, École Polytechnique - 91128 Palaiseau Cedex, France, EU*
[3] *Center for Smart Interfaces, Technische Universität Darmstadt - Petersenstraße 32, D-64287 Darmstadt, Germany, EU*

received 3 August 2011; accepted in final form 7 October 2011
published online 22 November 2011

PACS 83.50.Lh – Slip boundary effects (interfacial and free surface flows)

First-hand experts: “Counting photons with an LED” (ID 2017-021)

- Vote for IYPT 2017: 3.65 points, rank 2, proposed by Committee after lengthy checks with author
- Discarded at last moment for IYPT 2017 “as it could be thermal noise, not photons”

From: David Starling <djs75@psu.edu>
Date: Mon, 31 Oct 2016 12:48:01 -0400
Subject: Re: IYPT problem on single-photon detector + LED: we need your help
To: MARTCHENKO Ilya <ilya.martchenko@iypt.org>

Dr Ilya Martchenko,

It is my pleasure to help you. The experimental setup you attached and the basic concept is sound. This is the (simplified) way in which single photon detectors are made from avalanche photodiodes, and it works for LEDs as well. This is not a "thermal" effect as some of your members have suggested, although thermal effects do account for background counts. (if you require more details, let me know) I'll answer your specific questions below.

1. Is it realistic for motivated high school students to build a working setup at their school lab? The setup is very easy to build. *However, the pulse counter is not a piece of equipment that most high schools will have.* They may need to buy one, or make one. That would be a fun electronics project in and of itself.

2. Is it realistic to detect isolated single photon events? Yes. Although the LED is not a "single photon" source, upon detection in the semiconductor, the quantum state of the LED light is projected to a single photon. This is a well-known effect.

3. Is it realistic to detect discreteness of the light flux? I'm not sure I understand your question, but I will say definitively that you can easily see the pulses of light on a fast (1 MHz) oscilloscope. *Counting *them will be difficult unless you have a pulse counter available.

First-hand experts (cont.): “Counting photons with an LED” (ID 2017-021)

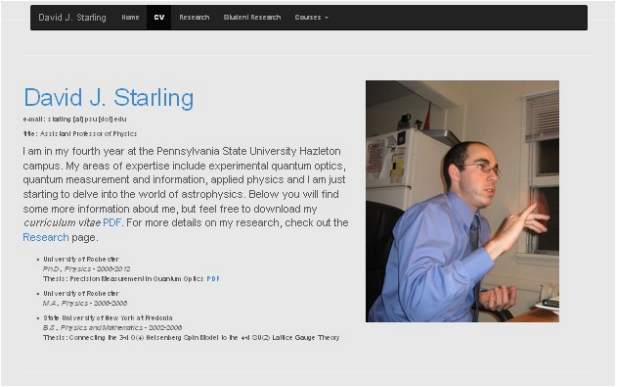
4. How can students produce single photon flashes? You do not need to produce the photons one at a time. Instead, you can shine a dim light (like from an LED) on the detector and, upon detection, the field is projected to a single photon (for dim light). If the light is too bright, and more than one photon on average can be detected at a time, then this is not true.

5. Is the problem suitable and clear for high school students fascinated with physics? Yes, I think the basic concepts are interesting and would give young physicists a good chance to learn about electronics and the nature of light.

My impression, based upon your 2017 questions on your website, is that this would be the most advanced topic in the list. It might be good to add if only to stretch the difficulty level a little higher. My main concern is about the pulse counter.

I hope I have answered your questions. Let me know if you need any more assistance.

Best,
David Starling



David J. Starling *et al*. An actively quenched single photon detector with a light emitting diode. Modern Appl. Sci. 10, 1, 114-120 (2016)

Review from a specialist *and* IOC member: example

004
Isn't this similar to Rocking Bottle 2012 or Bouncing Ball 2013?

012
Similar to Cutting the Air 2012 but here the effect is created by the bob on the end.

003
Very unclear geometry. Is the flow horizontal or vertical? Do the sheets look mostly like ribbons or big flat surfaces?

019
Need a more rigorous formulation in terms of e.g. temperature. Also it is chalennging if one needs to include a model for human sweating - this is more of a physiological than physical issue.
However the outdoorsy aspect of the problem is inspiring.

020
I think there are way too many free parameters here. A lot of teams would be tempted to run PDE solvers, but there are too many geometrical considerations to adjust, and I am afraid that simpel scaling arguments would not work.

103
From the John Bush webpage cited it seems that there are progressive new theories and complications built upon the classic hydraulic jump effect. I think this one, with symmetry breaking, is quite interesting.

Selection of a shortlist

- Basic principle is informed judgment and consensus decision-making
- The Committee discusses and weights those proposals that
  1. would cover various areas of physics in a reasonable balance
  2. would however have highest possible ranking among their direct competitors
  3. have no objective concerns about safety, relevance and other strong and verifiable criteria
  4. would be supported by independent credible sources and expert opinions about their feasibility and similarly strong criteria

“Quality control”

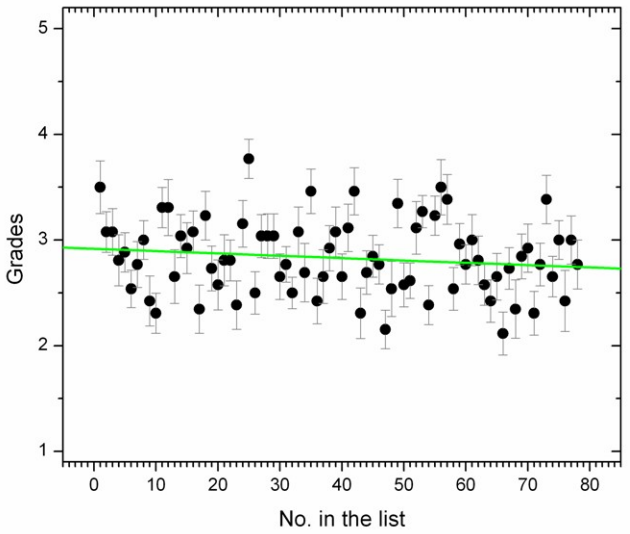
- Performance in the IYPT (accepted and rejected problems)
- Performance in national competitions
- Vote of approval at the IOC meeting (as is)

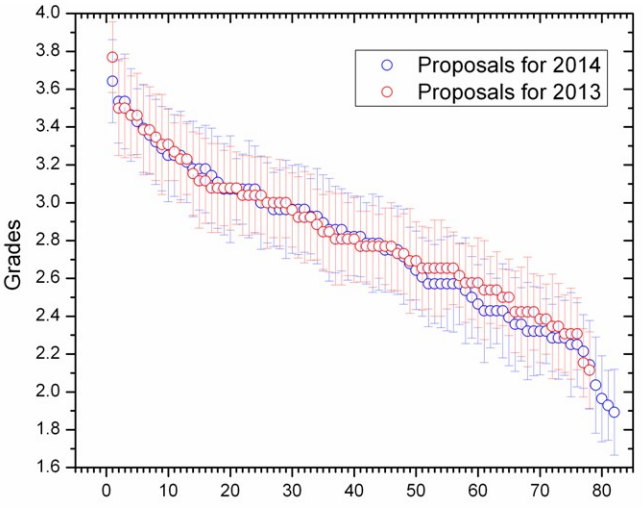
Presentation of the suggested problems (15 minutes), 11:30
Ilya Martchenko comments on each of the problems.

Motion: Accept the problems as they are.

Pro: 12
Against: 14
Abstain: 0

- Eventual vote of approval at the IOC meeting
  - In 2012-2016, the IOC has discarded 4 out of 85 proposed problems (acceptance ratio of 95%)
- Statistical significance of the IYPT votes
- Written feedback, informal discussions, external publications
- Feedback from Teams?
  - 10th International Young Physicists’ Tournament. IDM MŠMT, Prague (1998) ISBN 80-86033-26-2





pendulum: a hidden 'Coriolis' force in an inertial frame: http://arxiv.org/abs/1501.03658"

IYPT 2014 in Shrewsbury, United Kingdom

Posted on February 13, 2015 | Leave a comment

I am proud that my work "*Brouwer's problem on a heavy particle in a rotating vessel: wave propagation, ion traps, and rotor dynamics*" has been one of the sources of inspiration for the organizers of the International Young Physicists Tournament IYPT 2014 that took place 3rd till 10th of July 2014 in Shrewsbury, United Kingdom.

http://iypt.org/Tournaments/Shrewsbury

Problem 13: Rotating saddle

A ball is placed in the middle of a rotating saddle. Investigate its dynamics and explain the conditions under which the ball does not fall off the saddle.

http://solutions.iypt.org/uploads/2014_HR_Rotating_saddle_Domagoj_Plu%C5%A1%C4%8Dec_1405694495.pdf

f) out of answer 12

P. Put down numbers of tasks at 10th IYPT, which seemed to you:

number	a) too easy	b) too difficult	c) interesting	d) wrong
1	7	4	18	**14**
2	3	9	**30**	0
3	8	10	16	5
4	0	**17**	29	2
5	8	7	28	6
6	3	14	25	3
7	1	11	11	3
8	7	11	17	1
9	5	8	20	1
10	1	7	25	5
11	0	9	24	1
12	9	9	16	2
13	0	12	18	3
14	8	4	23	1
15	2	6	14	6
16	**11**	8	21	0
17	10	3	19	8

all apposite 4

no answer 5

Q. Have you had any possibility to use the solution of some of YPT and/or IYPT tasks out of these competitions? If so, describe where and how

a) yes (inclusive on the conferences 5) 10

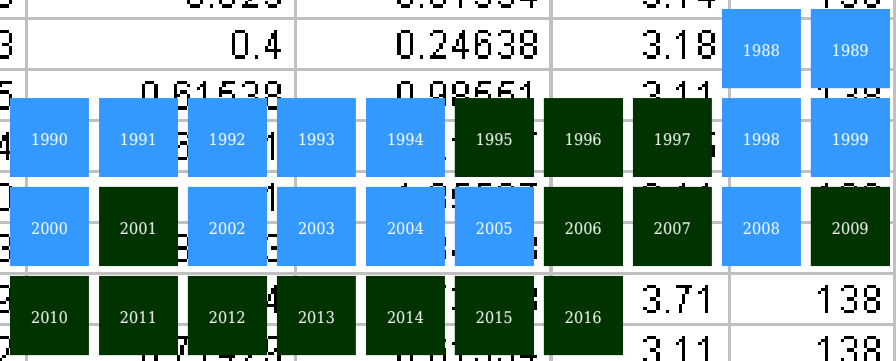
b) no 43

c) no answer 19

R. What physics competitions are organised in your country?

2016	1	Invent_yourself	9	0	1	1.02685	3.29	149	
2016	2	Lagging_pendulum	9	2	0.81818	1.02685	3.33	149	
2016	3	Acoustic_lens	7	4	0.63636	0.79866	3.9	149	
2016	4	Super_Ball	9	4	0.69231	1.02685	3.48	149	
2016	5	Ultrahydrophobic_water	16	3	0.84211	1.8255	3.33	149	
2016	6	Electric_honeycomb	6	6	0.5	0.68456	3.33	149	
2016	7	Hot_water_fountain	13	2	0.86667	1.48322	3.33	149	
2016	8	Magnetic_train	21	1	0.95455	2.39597	4.33	149	
2016	9	Water_waves	4	7	0.36364	0.45638	3.24	149	
2016	10	Light_rings	7	11	0.38889	0.79866	3.38	149	
2016	11	Rolling_on_a_disc	10	4	0.71429	1.14094	3.62	149	
2016	12	Van_der_Pauw_method	9	1	0.9	1.02685	3.19	149	
2016	13	Paper_vice	7	3	0.7	0.79866	2.86	149	
2016	14	Sensitive_flame	4	5	0.44444	0.45638	3.19	149	
2016	15	Contactless_calliper	7	0	1	0.79866	3.14	149	
2016	16	Frisbee_vortices	5	5	0.5	0.57047	3.05	149	
2016	17	Crazy_suitcase	6	9	0.4	0.68456	3.86	149	
--	--	--	--	--	--	--	--	--	
2015	1	Packing	5	3	0.625	0.61594	3.14	138	
2015	2	Plume_of_smoke	2	3	0.4	0.24638	3.18	138	
2015	3	Artificial_muscle	8	5	0.61538	0.98551	3.11	138	
2015	4	Shaded_pole	6	9	0.4	0.37438	3.71	138	
2015	8	Sugar_and_salt	5	2	0.71429	0.61594	3.11	138	
2015	9	Hovercraft	12	2	0.85714	1.47826	3.82	138	
2015	10	Singing_blades_of_grass	8	5	0.61538	0.98551	3.21	138	

Get a copy of fine-grained statistical data to assess how 255 (out of 493) historical problems performed and were evaluated



Topics for discussion

- Many IMOs (still) ignore a “three proposals per country” rule
- Any other quantitative parameters to rank proposals by “subjective criteria”?
- Any methods to predict popularity and performance in IYPT?
  - non-binding informal votes by young ex-participants?
- Even stricter filters for feasibility vs. risks of losing such problems as No. 7 “Hearing Light” (IYPT 2013)?
- Any other retrospective “quality control” measures?
- We already process a lot of mutually conflicting expert reviews and professional opinions
  - we need just a couple of *extremely* qualified and *absolutely* trustworthy opinions on objective criteria (**feasibility**)
  - we need quantitative parameters and bulk data on subjective criteria (**interesting or not, boring or fascinating**)
- Digitizing and indexing old proposals?

Jury Committee report
Martin Plesch

Singapore, 12th of November 2016

Topics

- Selection of jurors
- Feedback on jurors
- Selection of chairs
- Feedback on chairs
- Changes in RoP
- New scoresheet
  - Proposition 2016
  - Feedback on Proposition 2016
  - Proposition 2017

Jurors

- Team leader jurors
  - Only qualification criteria
  - Some teams tend not to send
- Independent jurors
  - To few applicants
  - Motivation needed – subsidizing travel costs?
- Local jurors
  - Unstable quality and reliability on IYPT 2016

Feedback on Jurors

- Much more data than last year
- Scale: 1 best, 5 weakest
- Best juror 1.43
- Weakest juror 2,6 -> not bad

- Some teams only give 1 to all jurors
- -> relative grading
- Mean differences between -0,56 to 0,53

Feedback on Jurors

- Correlation between points and comments far from perfect
- We will speak with some individual jurors and give them some hints
- Depending on number of available jurors we might reduce deployment of the weakest (juries of five)
- Will be considered for selection of IJs, if any

- Feedback to be delivered to jurors soon
- Will include percentile of their grading

Complaints on Jurors

- One formal complaint

- Considered as justified
- Juror recalled from the last round

- Will be considered as inexperienced for next IYPT
  - Not acceptable as independent juror
  - Need to run the training round

Chairs

- Selected from the list of jurors
- Expectations:
  - Reasonable experience
  - Perfect English
  - Good perception by students and jurors
- Nominations welcome
  - Selection by the JC

Feedback on Chairs

- Scale: 1 best, 4 weakest
- Best chair in all categories 1.11
- Weakest chair 2,67 -> need improvement

- Relative grading
- Mean differences between -0,5 to 0,533

- Unstable for some chairs

Feedback on Chairs

- Good correlation between level of deployment and grading
- Sometimes weak grades are given for problems beyond the possibilities of chair
  - Clock stopped repeatedly
- Some comments justified
  - Not taking attention, playing with mobile

Feedback on Chairs

- Will continue attracting new chairs
- Based on it, possibly the weakest chairs will not be asked to chair anymore

- Feedback to be send to chairs will include percentile as well

Changes in JC RoP

- Independent juror -> Experienced juror
- Team leader juror no changes
- Local juror -> Coopted juror
  - Need to be on site for all PFs
  - Do not need to be experienced
  - Joint position of former local jurors and invited jurors
  - Will be selected in cooperation between LOC and JC

Scoresheet

- IYPT 2016
  - Minor changes in the existing sheet (no problems)
  - Trial scoresheet tested and feedback collected

- FEEDBACK WAS VERY CONFLICTING
  - There was not that much feedback
  - Different jurors have (vary) different opinions
  - The target group was not clear (new vs. experienced)

Scoresheet

- New paradigm in process
- PARTIAL GRADES FOR STAGES
- Reporter:
  - Report
  - Discussion
  - Answers
- Opponent
  - Opposition
  - Discussion
  - …

Scoresheet

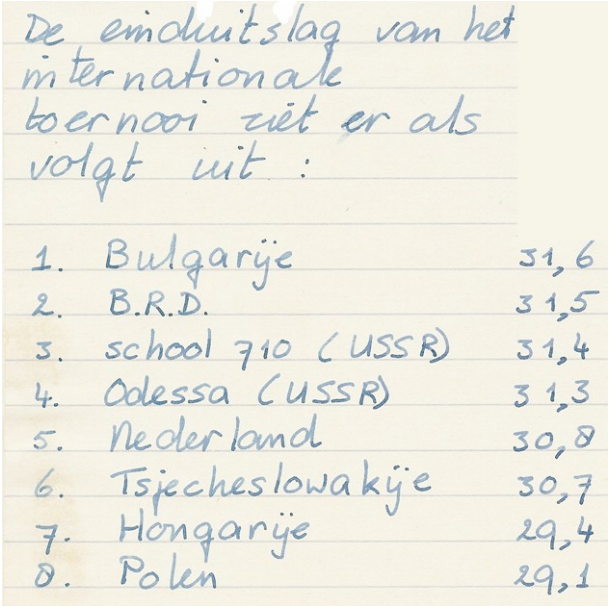
- Design under construction
- Will be
  - Tested locally
  - Sent out to jurors from last year for feedback
- Deployed only if all goes perfect
  - EC approval needed

- Otherwise we keep the old, possible slightly adjusted.

Statistics of historical IYPT Grades

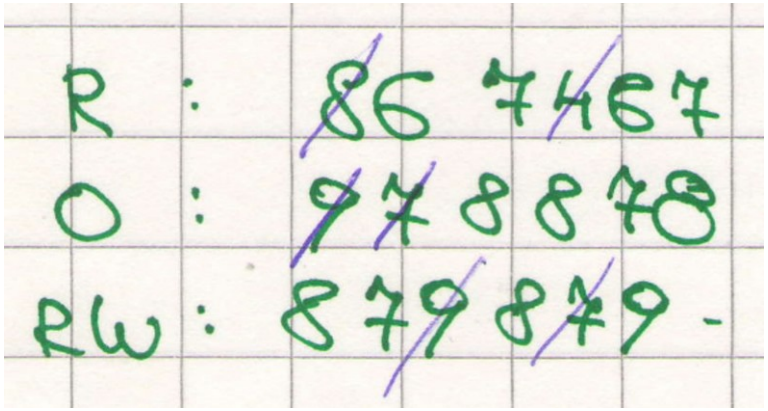
Ilya Martchenko

Introduction



De einduitslag van het internationale toernooi ziet er als volgt uit :

1.	Bulgarije	31,6
2.	B.R.D.	31,5
3.	school 710 (USSR)	31,4
4.	Odessa (USSR)	31,3
5.	Nederland	30,8
6.	Tsjecheslowakije	30,7
7.	Hongarije	29,4
8.	Polen	29,1



R : 86 7467

O : 97 8878

RW : 879879 -

All TSPs can fall into a very narrow region

σ=**2.9%** in this example

Grades from Jurors in one Group can vary a lot

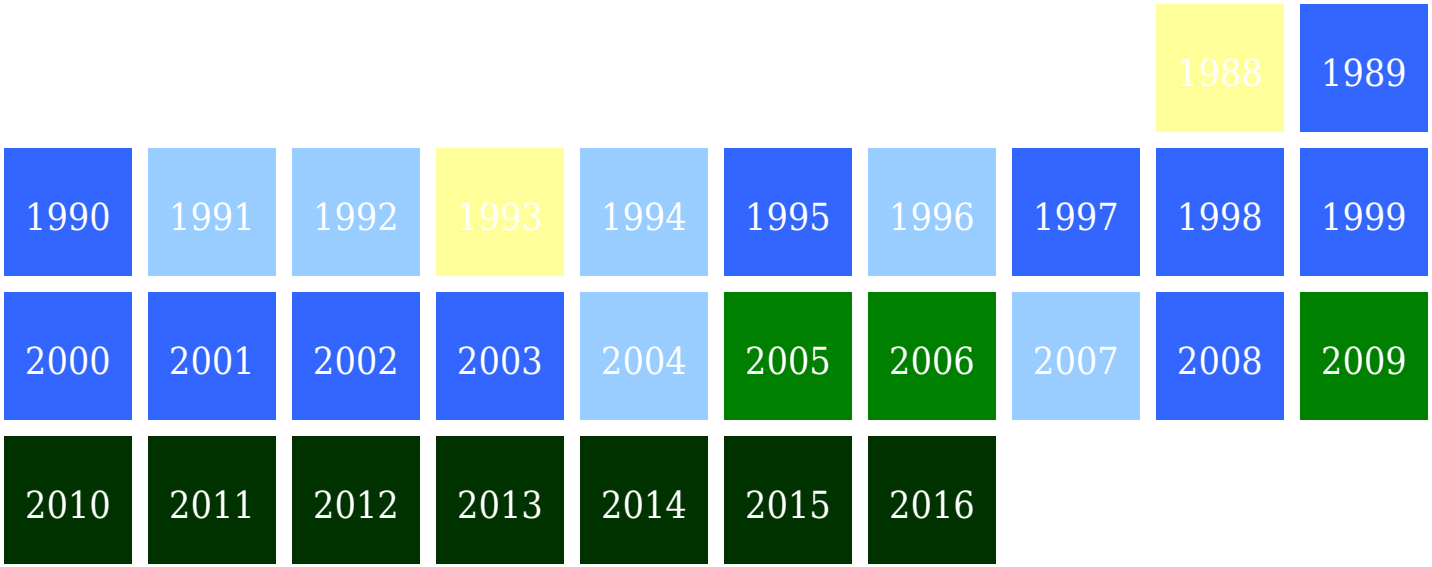
8 and **4** in this example

Final ranking at IYPT 1989 on the scale up to SP=33; grades in Stage 2, PF 1, Group 2, IYPT 2001

Assumption

One of the IYPT goals is to establish a stable, significant ranking of all Teams which is not hindered by statistical noise

Available verified data



- Complete, fine grained data with all *G*
- Complete, to be processed and indexed
- All SP and all TSP
- All TSP, but some gaps in SP
- Fragmented data

17403 out of ca. 48000 attributed Grades — 36%

2279 out of 2603 Sums of Points — 88%

532 out of 551 Total Sums of Points — 97%

2010 thru 2016: **17403** Grades; **934** Stages and SPs;
489 out of ca. 1500 Juror appearances; **182** out of 551 graded Teams

Different grading scales

G_{max}=10, SP_{max}=60

G_{max}=53, SP_{max}=318

G_{max}=5.5, SP_{max}=33

G, 1994-2000 into modern: G = 0.30275 × Grade1994 − 6.11009
SP, 1994-2000 into modern: SP = 0.30275 × Grade1994 − 36.66055
G, 1989-1990 into modern: G = 2.91429 × Grade1989 − 5.88571
SP, 1989-1990 into modern: SP = 2.91429 × Grade1989 − 35.31429

Comparison of systems

Old system:

- 9 different marks
- at least 6-7 used frequently
- More complicated to calculate
- a non-linear scale could be applied

New system:

- 10 different marks
- only 5-6 used frequently
- Easier to calculate
- Linear scale

Georg Hofferek, hofferek@aypt.at

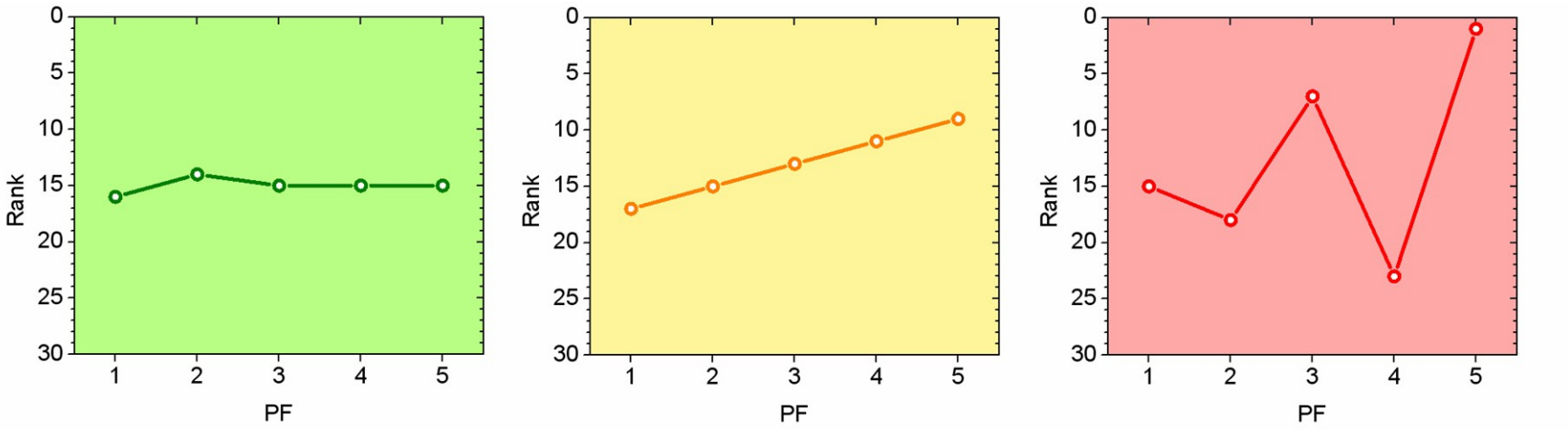
The Different Jury Problem

- Performances of teams in different groups are incomparable
- IYPT05:
  - approx. 50 jurors
  - None of them met the same team more than twice during Selective PFs
  - balanced composition of jury

Georg Hofferek, hofferek@aypt.at

Approach: ranking dynamics

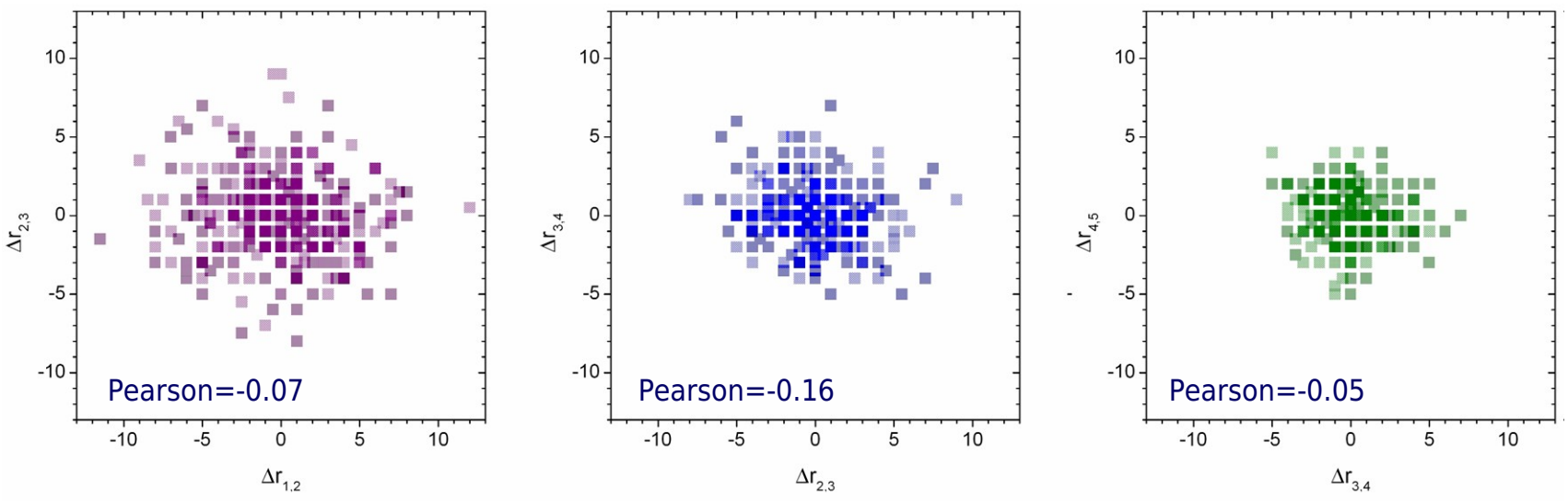
- $r_1 \ldots r_5$ are ranks of a Team after PF 1…PF 5
- $\Delta r_{i,j}$ is drift between two ranks for one Team after i-th and j-th PFs
- $\sigma(\Delta r_{i,j})$ is standard deviation of all drifts between i-th and j-th PFs in one IYPT



N. Blumm et al. Dynamics of Ranking Processes in Complex Systems. Phys. Rev. Lett. 109, 128701 (2012)

Drifts between ranks

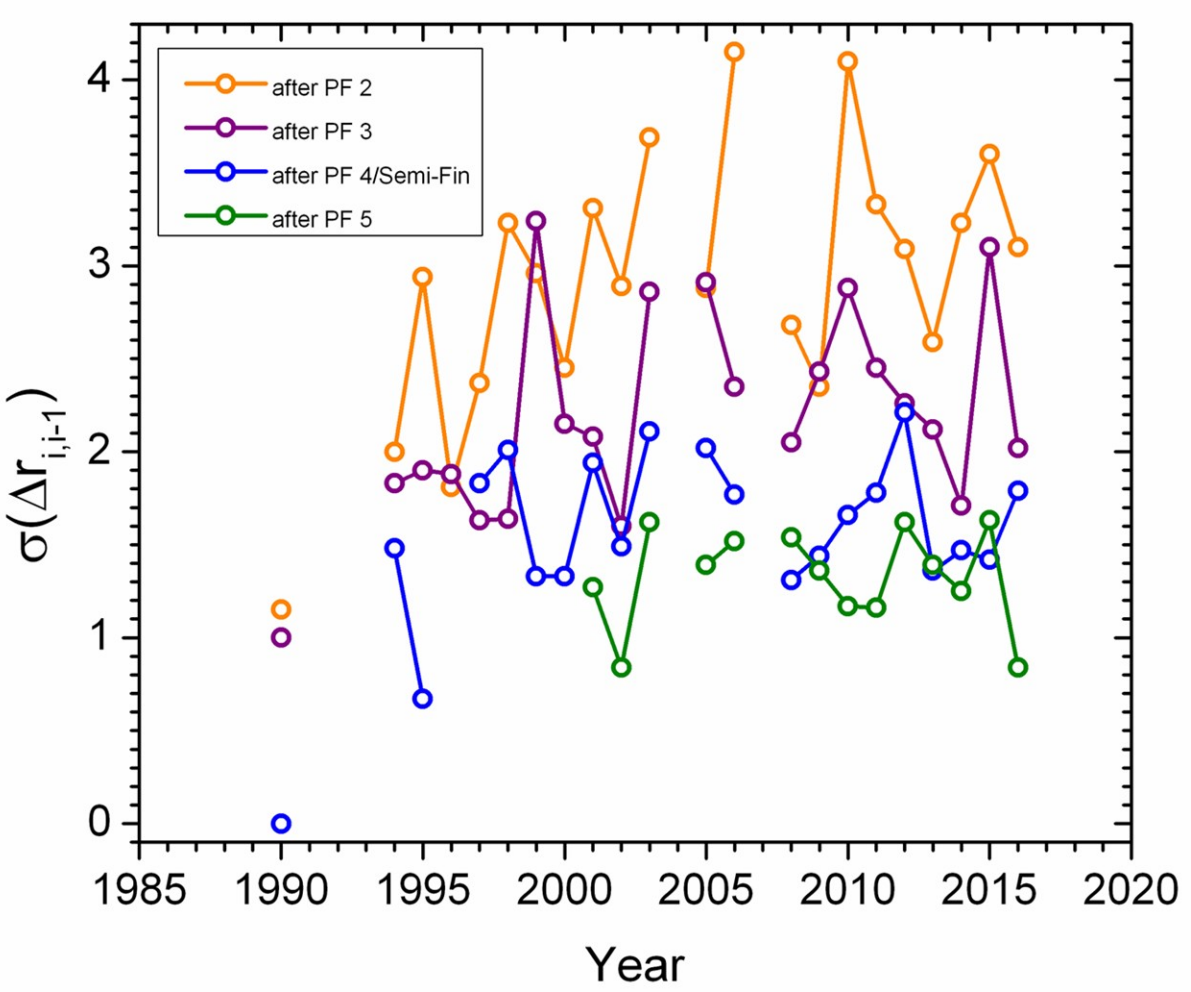
Each point = 1 Team



- For Teams, there is no correlation between $\Delta r_{i-1,i}$ and $\Delta r_{i,i+1}$
  - "If rank grows after a PF, it is equally probable that it grows and decreases after next PF"
- Ranks fluctuate less and less with PF number
  - $\sigma(\Delta r_{i-1,i})$ decreases with i
  - "The ranks converge to a more stable value after each PF"

Data on the graphs for all IYPTs, except 1988-1989, 1991-1993, 2004, 2007, with partial gaps in 1996
Data "after Semi-Finals" in 1994-2000 only for Semi-Finalists, i.e. 64 out of 109 Teams
Regulations of each IYPT apply to determine rank, including Ratings *R* in 1994-2000 and PF places in 1990

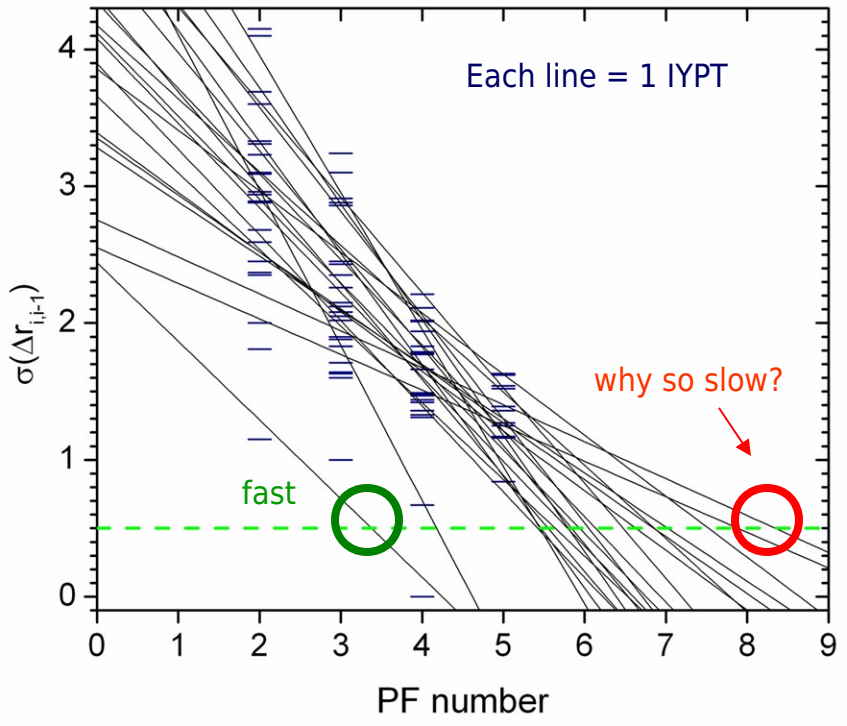
Convergence of ranks (different IYPTs)

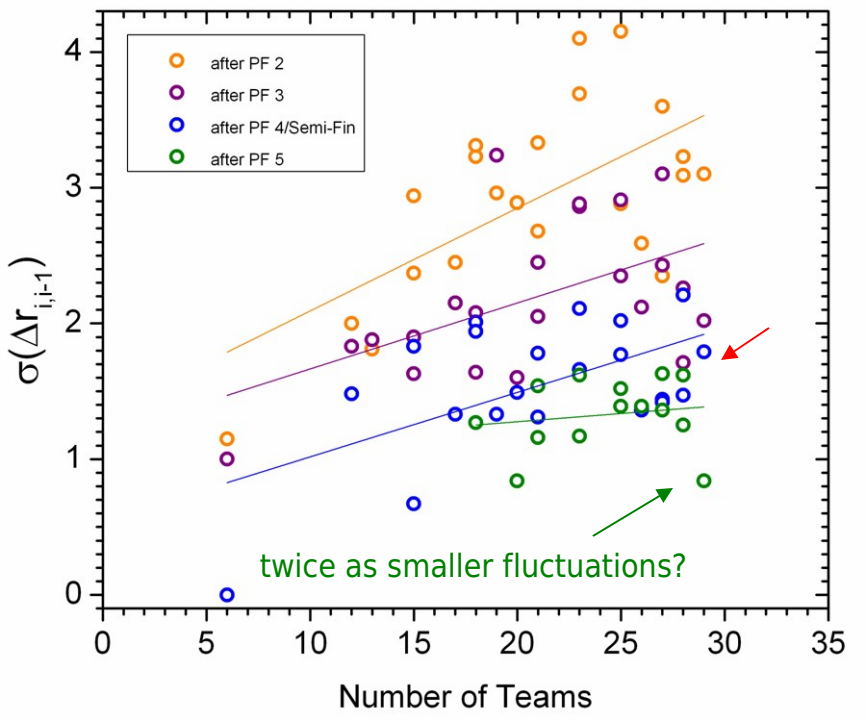


- Ranking fluctuations after PF 5 seem not to grow with years (and with total number of Teams)
- IYPTs are obviously not the same
- What is noise and what are explicable differences? (ranking procedures? grading criteria? qualities of Jurors? differences of Teams?)

Data on the graphs for all IYPTs, except 1988-1989, 1991-1993, 2004, 2007, with partial gaps in 1996
Data "after Semi-Finals" in 1994-2000 only for Semi-Finalists, i.e. 64 out of 109 Teams
Regulations of each IYPT apply to determine rank, including Ratings *R* in 1994-2000 and PF places in 1990

Some analysis of convergence of ranks





- How many PFs are required for the ranks to stabilize beyond a chosen threshold?
- $\sigma(\Delta r_{4,5})$ is not sensitive to number of Teams, but still varies from 0.8 to 1.6
- $\sigma(\Delta r_{i-1,i})$ decreases with i, but rate of convergence varies considerably for different IYPTs

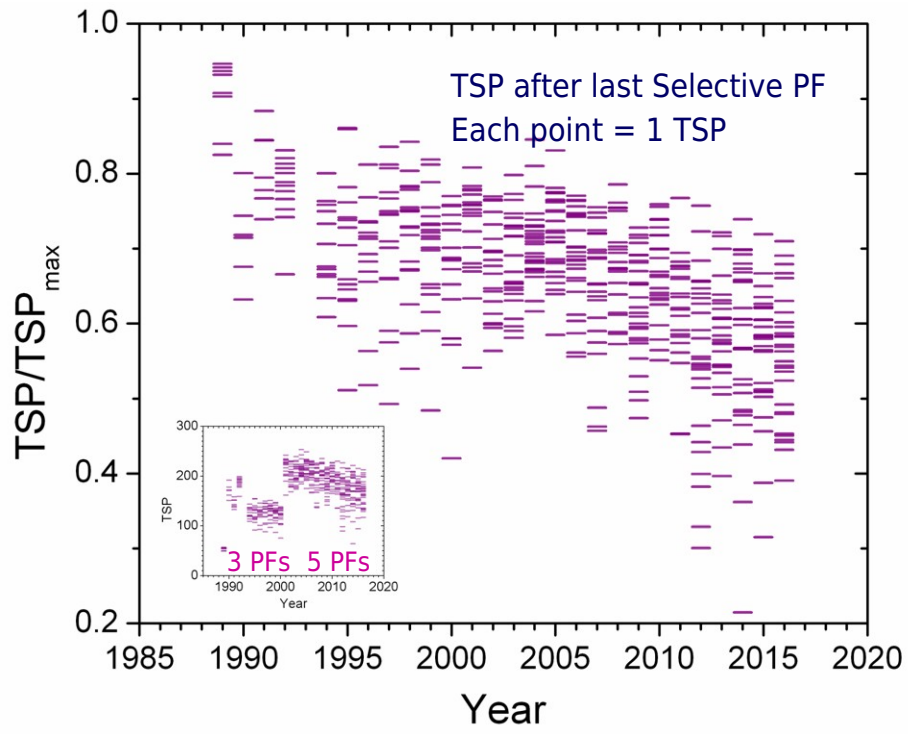
Data on the graphs for all IYPTs, except 1988-1989, 1991-1993, 2004, 2007, with partial gaps in 1996
Data "after Semi-Finals" in 1994-2000 only for Semi-Finalists, i.e. 64 out of 109 Teams
Regulations of each IYPT apply to determine rank, including Ratings R in 1994-2000 and PF places in 1990

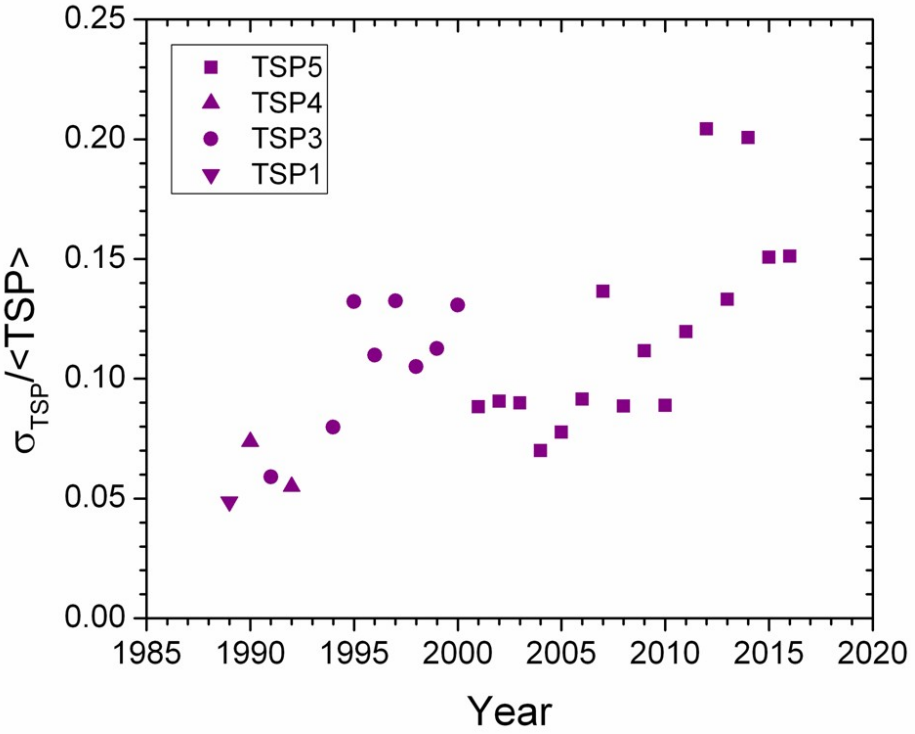
Approach: “The Different Jury Problem”

- $\langle G \rangle$ is arithmetic mean of all Grades delivered during one IYPT by one Juror — JC term: “mean grading”
- σ_G is standard deviation of all Grades delivered during one IYPT by one Juror — JC term: “std. deviation”
- σ_{G-P} is standard deviation of all residuals $G-P$ for one Juror during one IYPT — Ideally, $\sigma_{G-P}=0$
- $\langle G-P \rangle$ is arithmetic mean of all residuals $G-P$ for one Juror during one IYPT — Similar to JC “bias” Ideally, $\langle G-P \rangle=0$

	Example 1			Example 2			Example 3		
	Team 1	Team 2	σ_{G-P}	Team 1	Team 2	σ_{G-P}	Team 1	Team 2	σ_{G-P}
Grade by Juror *i*	9	1	0	2	8	0.8	8	1	3.5
Grade by Juror *ii*	9	1	0	2	8	0.8	1	6	2.6
Grade by Juror *iii*	9	1	0	2	8	0.8	7	2	2.5
Grade by Juror *iv*	9	1	0	2	8	0.8	3	8	2.6
Grade by Juror *v*	9	1	0	10	1	6.8	6	4	1.0
Grade by Juror *vi*	9	1	0	2	8	0.8	5	9	2.1
Average Point *P*	***9.0***	***1.0***		***2.8***	***7.3***		***5.1***	***5.0***	

Separation of Teams, *TSP* after selective PFs

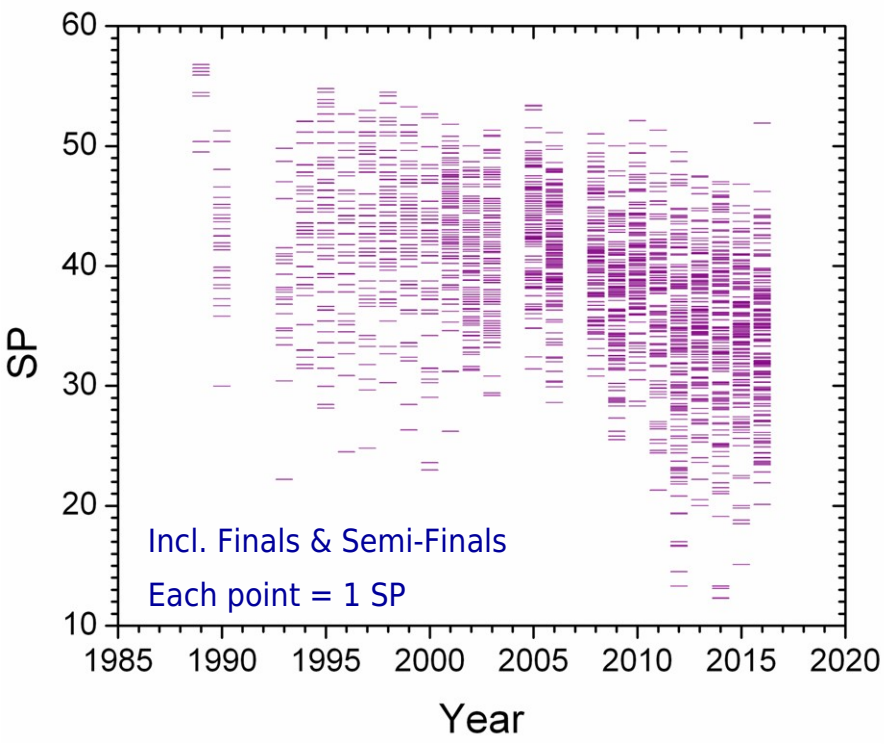


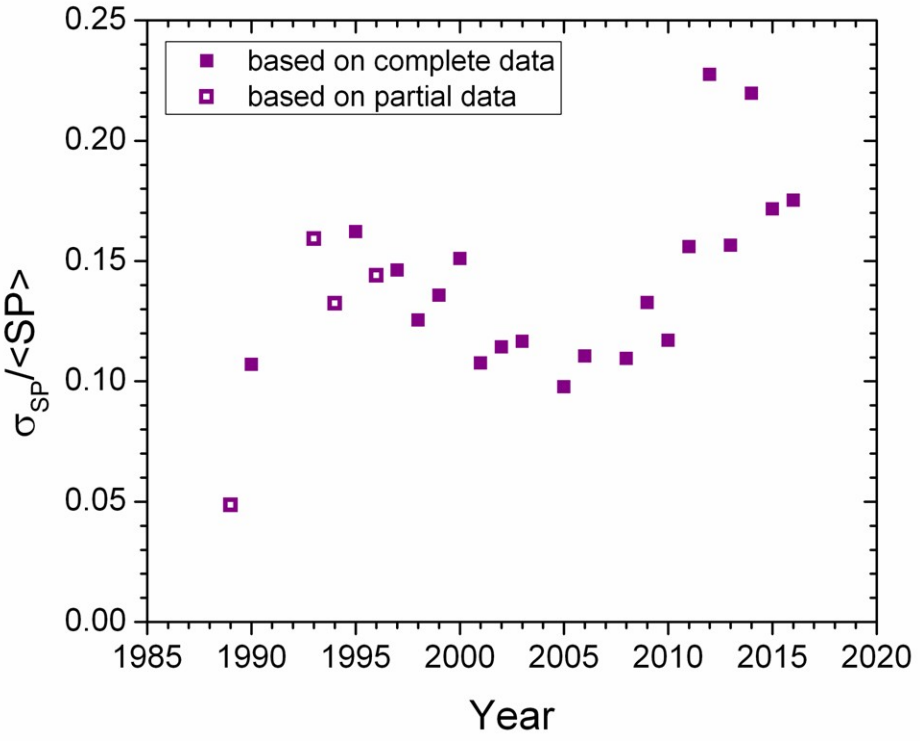


- What are “error bars” of each *TSP*?
- How to compare any two IYPTs on a uniform scale?

Data on the graphs for all IYPTs, except 1988 and 1993
Points for 1989-1990 and 1994-2000 converted to modern scale of SP
Coverage: 532 points out of 551

Separation of Teams, *SP* in all PFs





- What are “error bars” of each *SP*?
- Growth of relative spread until 1996, decline until 2006, growth up to now?
- Links to: jury briefings, differences in team level, qualities of Jury?
- No correlation with the total number of Teams!

Plotted with gaps in 1993, 1994, 1996. Not plotted in 1988, 1991, 1992, 2004, 2007
Points for 1989-1990 and 1994-2000 converted to modern scale of SP
Coverage: 2208 points out of ca. 2700

Feedback statistics (2015)

Feedback from IYPT 2015

"IYPT jury committee" <jurors@iypt.org>

Кому: ilyamartch@mail.ru

20 ноября 2015, 10:54

Dear IYPT Juror Ilya Martchenko,

We would like to provide you some statistics about your grading on the IYPT 2015 conduct. Your mean grade was 6,2 in comparison to the overall mean grade 5.87 for the whole tournament. Standard deviation of your grading was 1,51 in comparison to the mean standard deviation 1.32 for the whole tournament.

We also received some feedback on your grading by teams. For Questions you were awarded 3,1,2,2,2, for Explanations 2,1,1,1,1, for Grading 2,2,2,1,1, where 1=excellent, 5=poor. Here is the list of comments that the teams included into their feedback forms (in nothing appers, the teams did not provide a written feedback): "He could have posed more questions, has high criteria.","His judging was very good.","Great time management. Different grading from other jurors, but explained clearly.",,,.

Thank you for acting as a juror at IYPT 2015 and we hope to meet you on one of our future competitions.

IYPT Jury committee

Disclaimer: This is an automatically generated message. If you feel the presented data are incorrect, please let us know.

Email received on Nov 20, 2015

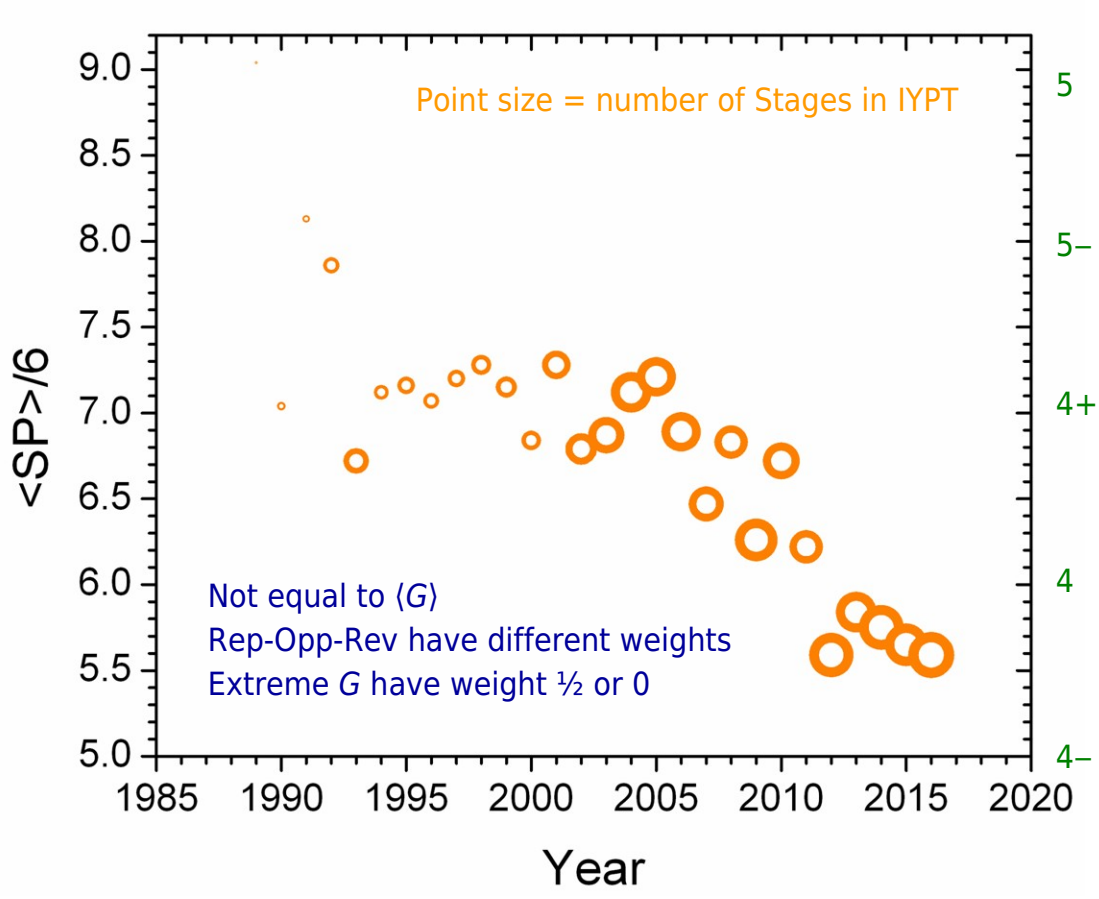
A bit of statistics

- Mean grading
  - Wished **5,5**, 2014: 5,96, 2013: 5,99
- Std. deviation
  - Wished **1,5**, 2014: 1,44, 2013: 1,32

- Almost no extremal jurors since 2013
  - Means 5,11 - 6,8 (2014) and 5,15 - 6,95 (2015)
  - Very experienced jurors cover the edges
  - As low as 3,44 in 2013 by a newcomer (!)

http://iypt.org/images/f/f0/juror_meeting_2016.pdf

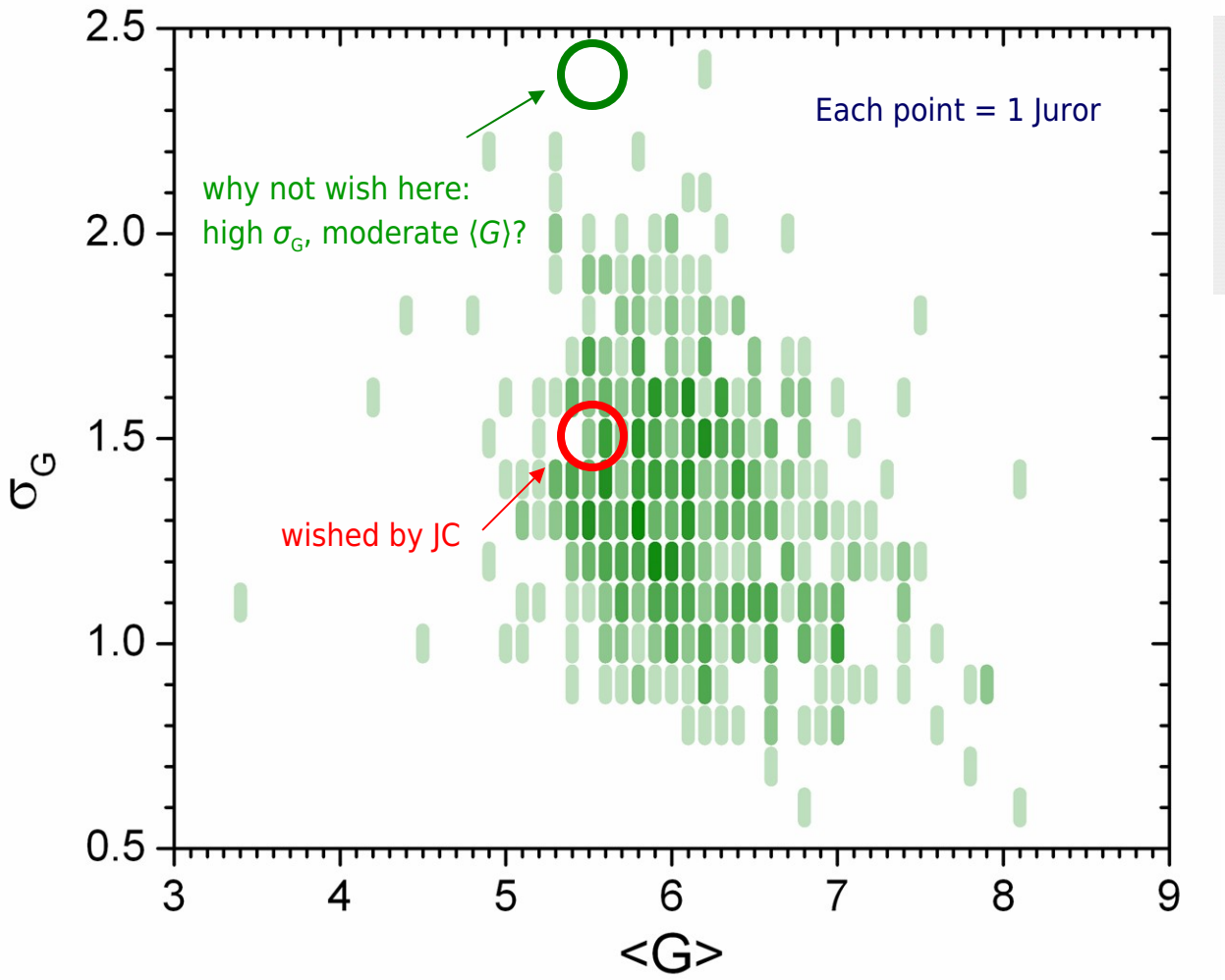
⟨*SP*⟩/6 vs time



- A downwards trend seems to have started in 2005

Photo shows grades in 1990 by Vadim Manakin, Andrei Sklyankin, Vladimir Afanasiev, and Aleksei Seliverstov
Points for 1989-1990 and 1994-2000 converted to modern scale of SP

σ_G vs $\langle G \rangle$ ("std. deviation" vs "mean grading")

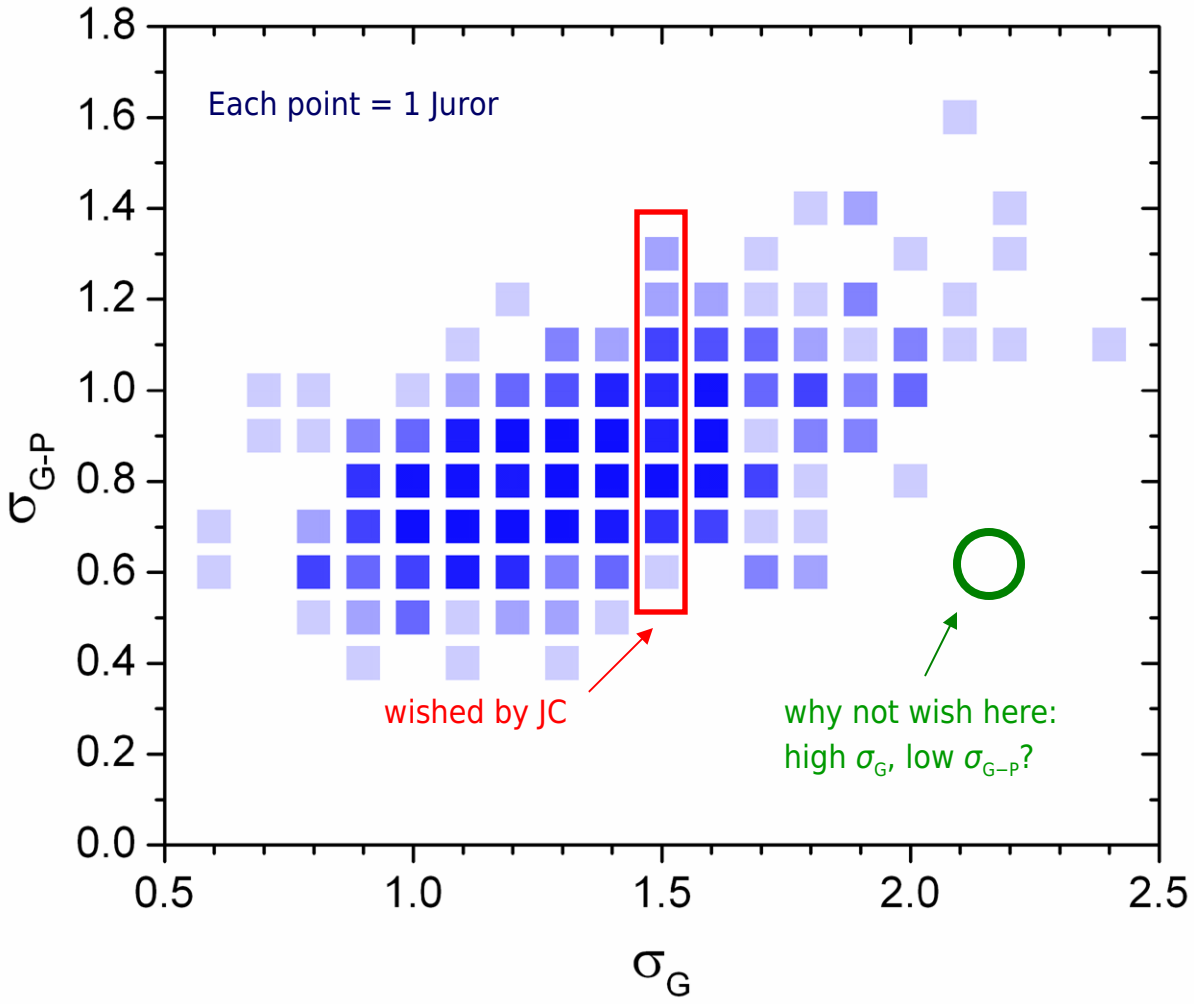


A bit of statistics

- Mean grading
  - Wished **5,5**, 2014: 5,96, 2013: 5,99
- Std. deviation
  - Wished **1,5**, 2014: 1,44, 2013: 1,32

http://iypt.org/images/f/f0/juror_meeting_2016.pdf Data on the graph for IYPT 2010 thru 2016

σ_{G-P} vs σ_G



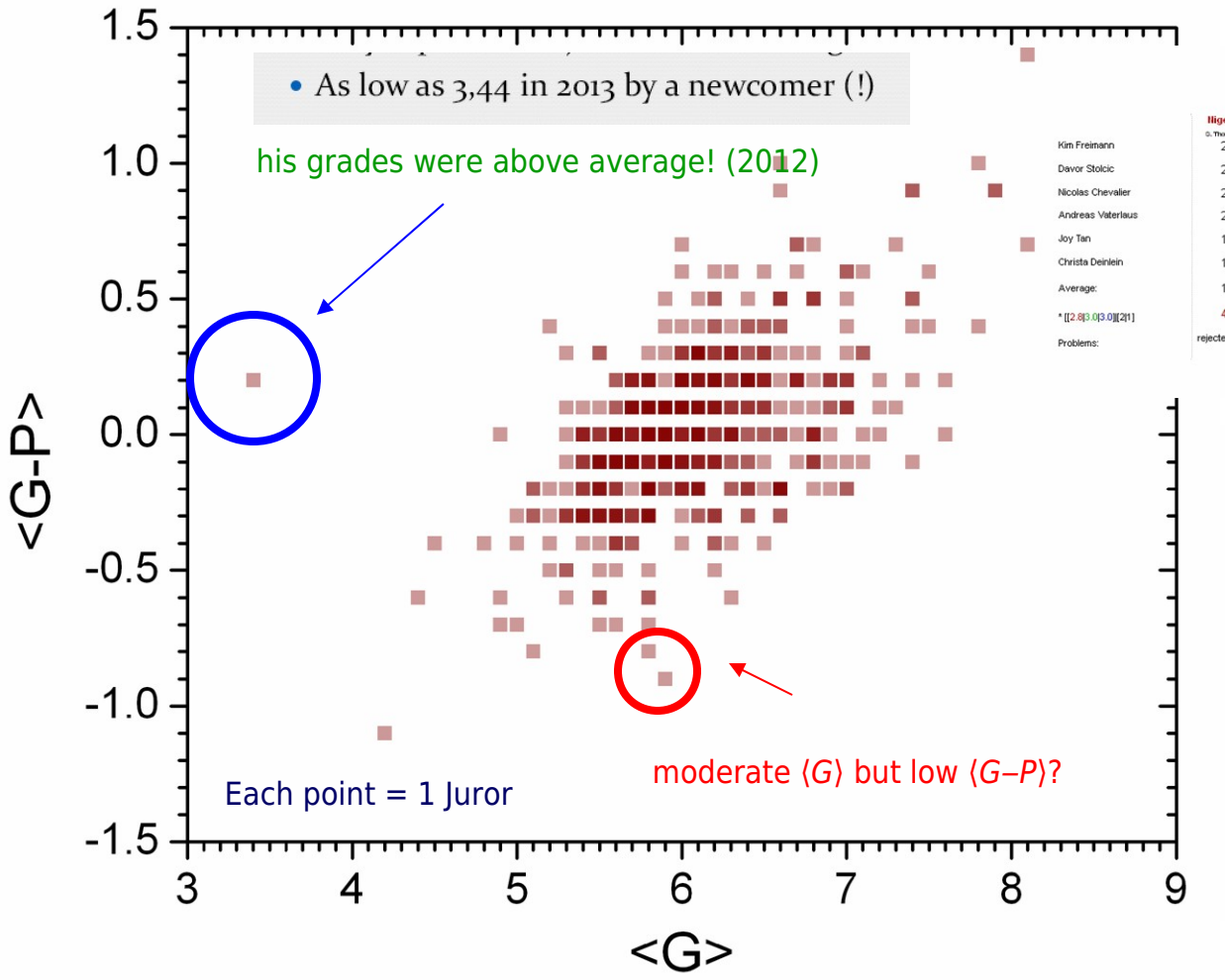
A bit of statistics

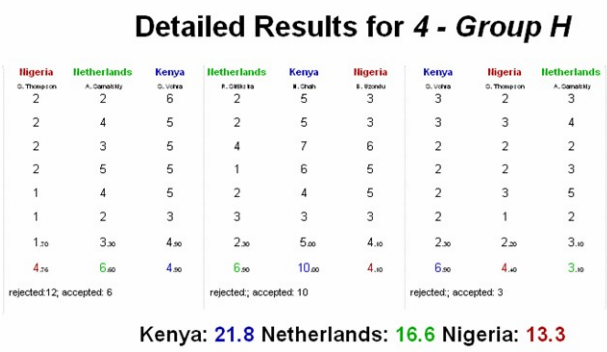
- Mean grading
  - Wished **5,5**, 2014: 5,96, 2013: 5,99
- Std. deviation
  - Wished **1,5**, 2014: 1,44, 2013: 1,32

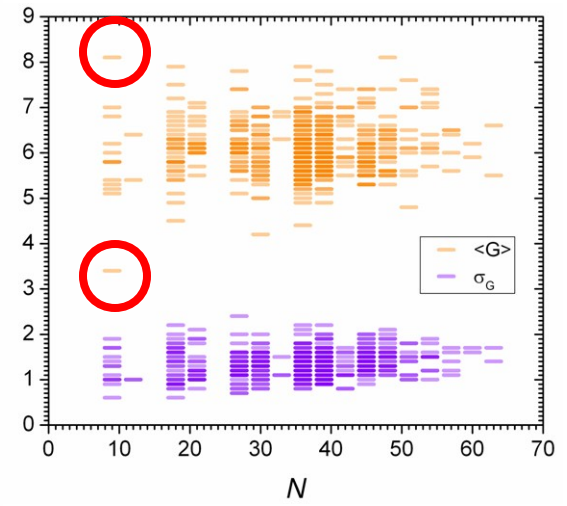
- Tradeoff: using a broader scale increases chances of being far from other Jurors

http://iypt.org/images/f/f0/juror_meeting_2016.pdf Data on the graph for IYPT 2010 thru 2016

⟨*G*–*P*⟩ vs ⟨*G*⟩, effects of small datasets

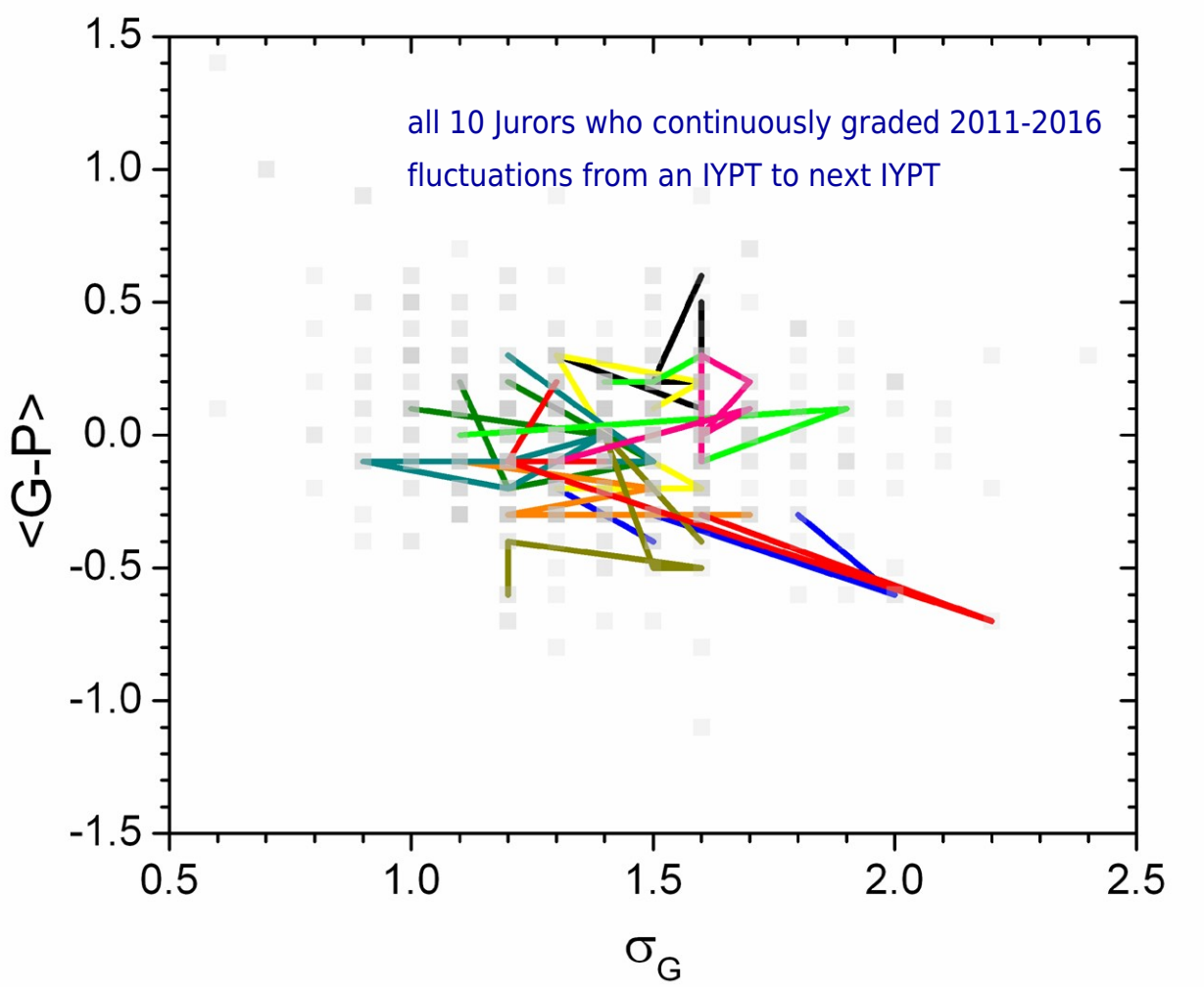






http://iypt.org/images/f/f0/juror_meeting_2016.pdf Data on the graph for IYPT 2010 thru 2016

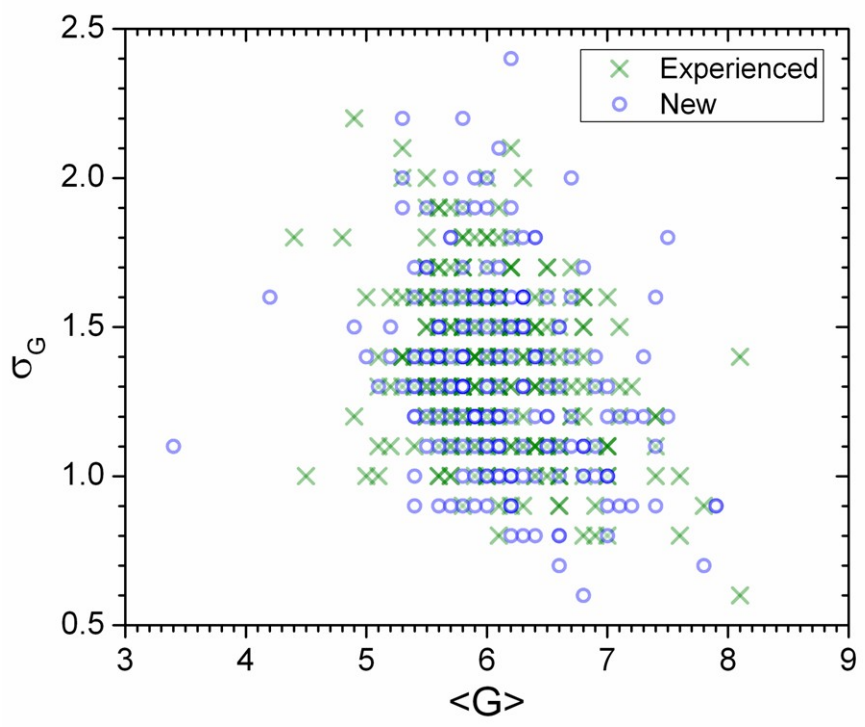
Is it easy to calibrate yourself?

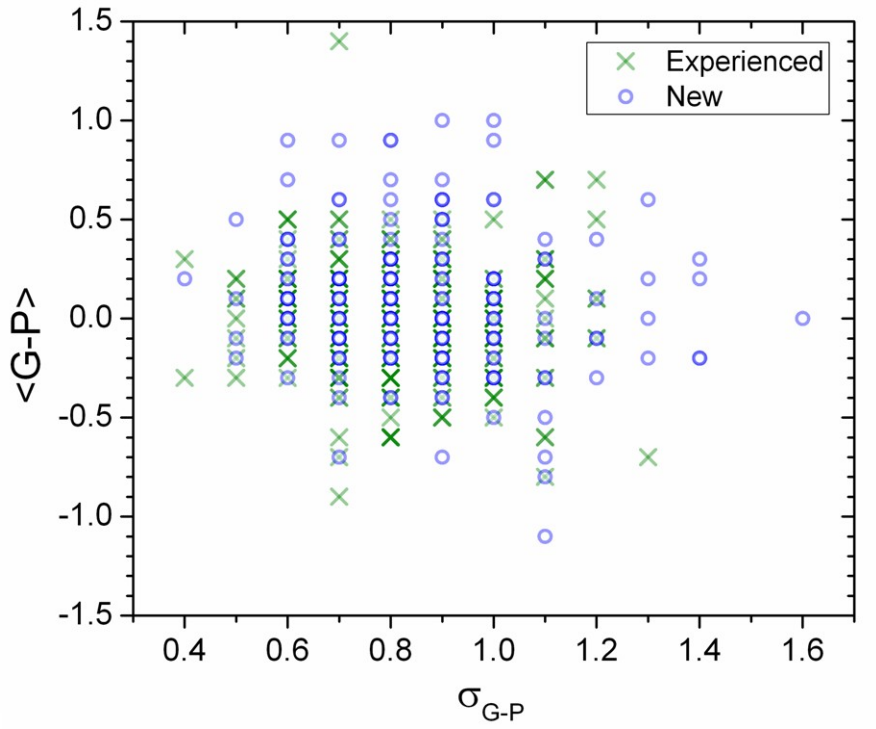


- Experienced Chairs, with opinions on consistent grading and proper calibration
- Random walk amplitude in σ_G-$\langle G–P \rangle$ space similar to average Juror-to-Juror variations
- Still, with a great level of error, personal preferences are visible

Data on the graph for IYPT 2011 thru 2016

Can we distinguish between experienced & new Jurors?





	N	$\langle\langle G\rangle\rangle_{\pm\mathrm{SEM}}$	$\sigma_{\langle G\rangle}$	σ_{G}	$\sigma_{\mathrm{G-P}}$	$\langle\langle G-P\rangle\rangle_{\pm\mathrm{SEM}}$	$\sigma_{\langle G-P\rangle}$
Experienced	281	$6.05_{\pm 0.03}$	0.57	1.36 ± 0.27	0.82 ± 0.16	$-0.03_{\pm 0.02}$	0.28
New	208	$6.12_{\pm 0.04}$	0.61	1.33 ± 0.32	0.85 ± 0.19	$+0.08_{\pm 0.02}$	0.33

Data on the graphs for IYPT 2010 thru 2016

Approach: statistical significance (to be done)

	Reports						Oppositions						Reviews					
	Stage I P=19.2		Stage II P=21.4		Stage III P=22.4		Stage I P=11.7		Stage II P=16.1		Stage III P=14.0		Stage I P=8.2		Stage II P=9.2		Stage III P=8.0	
	g	g−P	g	g−P	g	g−P	g	g−P	g	g−P	g	g−P	g	g−P	g	g−P	g	g−P
Ilya Martchenko	~~17~~		22	+0.6	~~27~~		9	−2.7	~~11~~		12	−2.0	9	+0.8	10	+0.8	9	−1.0
Zahra Yazdgardi	21	+1.8	19	−2.4	24	+1.6	12	+0.3	14	−2.1	14	+0.0	8	−0.2	9	−0.2	7	−1.0
Dmitry Zhukalin	~~26~~		~~25~~		26	+3.6	14	+2.3	17	+0.9	16	+2.0	9	+0.8	9	−0.2	9	+1.0
Samuel Byland	18	−1.2	23	+1.6	24	+1.6	12	+0.3	17	+0.9	16	+2.0	8	−0.2	9	−0.2	8	+0.0
Evgeny Yunosov	18	−1.2	23	+1.6	26	+3.6	13	+1.3	17	+0.9	~~16~~		8	−0.2	10	+0.8	9	−1.0
Mladen Matev	18	−1.2	20	−1.4	18	−4.4	12	+0.3	15	−1.1	13	−1.0	8	−0.2	9	−0.2	~~9~~	
Azizolah Azizi	19	−0.2	24	+2.6	21	−1.4	13	+1.3	17	+0.9	15	+1.0	9	+0.8	9	−0.2	8	+1.0
Masoud Torabi Azad	20	+0.8	21	−0.4	21	−1.4	~~14~~		16	−0.1	14	+0.0	7	−1.2	~~8~~		8	+1.0
Dmitii Dorofeev	18	−1.2	~~16~~		20	−2.4	10	−1.7	17	+0.9	13	−1.0	~~6~~		9	−0.2	7	−1.0
Andrei Klishin	19	−0.2	20	−1.4	~~17~~		~~6~~		~~18~~		~~10~~		~~9~~		~~10~~		~~5~~	
½(G_{max}+G_{min})	21.5	+2.3	20.5	−0.9	22	−0.4	10	−1.7	14.5	−1.6	13	−1.0	7.5	−0.7	9	−0.2	7	−1.0

Notations

σ_{REP}: standard deviation of residuals $g-P$ for all Reports

σ_{OPP}: same for Oppositions

σ_{REV}: same for Reviews

n: number of jurors in the Science Fight

ρ_{SP}: standard error of Sum of Points in the SF

t: Student's t-score

Φ: cumulative distribution function for Student's t-distribution, giving the confidence level for $[SP-2...60]$ and $[SP-10...60]$ intervals

$\sigma_{REP}=1.91$ $\sigma_{OPP}=1.36$ $\sigma_{REV}=0.65$

$$\sigma_{SP}=(\sigma^2_{REP}+\sigma^2_{OPP}+\sigma^2_{REV})^{1/2}=2.43$$

$n-1=9$ $\rho_{SP}=(\sigma^2_{SP}/(n-1))^{1/2}=0.81$ $t_2=2/\rho_{SP}=2.47$ $t_{10}=10/\rho_{SP}=12.3$

$$\Phi(t_2,\ n-1)=98.2\%$$

$$\Phi(t_{10},\ n-1)=99.99997\%$$

Possible metrics to compare *new features* in IYPT

1. Different Jurors better agree with each other → smaller σ_{G-P}
2. Different Teams obtain more different G and SP → larger $\sigma_{SP}/\langle SP \rangle$
3. Ranks converge faster to stable values → smaller $\sigma(\Delta r_{i-1,i})$

Example: IYPT 2014 was better than neighbors as judged by these metrics

Topics for discussion

- Who may have all *SP*s from 2004 and 2007? (also: 1991, 1992, 1993, Finals 1994, Semi-Finals and Finals 1996?)
- Is it realistic for a Juror to calibrate and improve him/herself when learning about their past $\langle G \rangle$ and σ_G? (with or without context for comparison?)
- What do persistent changes in the IYPT grading statistics mean? What do we see over a long term (i.e. 10..20…30 years)?
- Is it realistic to improve statistical significance of the IYPT results *and*/*or* convergence of Team ranks by taking *good organizational decisions*?
- Why is σ_G=1.5 wished for any Juror?
- Why 3 years were required to settle to "regular" σ_{G-P} after a surge with new scoring guidelines (2011)?
- What can we say about potential Jurors with $\langle G \rangle$=3.4, $\langle G-P \rangle$=0.2 (cf. 2012-4-H)?
- What metrics are ideal for parameterizing effects of new grading scales / procedures / scoresheets / social dynamics of Jurors / Teams?
- What metrics are ideal for distinguishing "proper" vs "chaotic" IYPT grading?

Motion to change the IYPT statutes – EC

Current status:

7.4 Executive Committee EC

The Executive Committee consists of the following eight members:

a) President,

b) Secretary General,

c) Treasurer,

d) Two members elected by the IOC,

e) The three representatives of the past, present and future LOC's.

President, Secretary General, Treasurer, and the two members elected by IOC have a term of four years. They can be re-elected. Terms of office start on November 01, following the election. Members of the EC can resign from their office. The resignation has to be in writing handed to the EC. In case a position in the EC becomes vacant, a successor has to be elected at the next IOC meeting. The term of office of the successor is limited to the term of the original office-holder. The Executive Committee prepares the agenda to be brought up at the IOC Meeting. It conducts current work between the Meetings of the IOC, normally by e-mail. The President represents the Organization in law and chairs the meetings of the EC and the IOC. The Secretary General prepares the minutes of IOC and Executive Committee Meetings. The Treasurer prepares an annual financial statement and the budget for the following year and seeks for sponsors. The Executive Committee decides about all matters which are not explicitly delegated to other bodies of the IYPT. The EC is, however, bounded by all IOC decisions. All decisions of the Executive Committee are taken by simple majority of valid votes. A vote is valid if more than half of EC members did hand in a valid vote. In case of a draw, the vote of the chairperson of the meeting decides.

Suggested update 1 → accepted

7.4 Executive Committee EC

The Executive Committee consists of five members:

a) President, represents the Organization in law and public and chairs the meetings of the EC and the IOC

b) Secretary General, prepares the agenda and minutes of IOC and EC meetings

c) Treasurer, prepares the budget and annual financial statement

d) Two further members

All members have a term of four years. They can be re-elected. Terms of office start on November 01, following the election.
Members of the EC can resign from their office. The resignation has to be in writing handed to the EC. In case a position in the EC becomes vacant, a successor has to be elected at the next IOC meeting. The term of office of the successor is limited to the term of the original office-holder.
The Executive Committee prepares the agenda to be brought up at the IOC Meeting. It conducts current work between the Meetings of the IOC, normally by e-mail.

The Executive Committee decides about all matters which are not explicitly delegated to other bodies of the IYPT. The EC is, however, bounded by all IOC decisions. All decisions of the Executive Committee are taken by simple majority of valid votes. A vote is valid if more than half of EC members did hand in a valid vote. In case of a draw, the vote of the chairperson of the meeting decides.
Heads of the LOC's of the current and future years are invited for EC meetings and take part in the e-mail discussions.

Suggested update 2

7.4 Executive Committee EC

The Executive Committee consists of seven members:

a) President, represents the Organization in law and public and chairs the meetings of the EC and the IOC

b) Secretary General, prepares the agenda and minutes of IOC and EC meetings

c) Treasurer, prepares the budget and annual financial statement

d) Four further members

All members have a term of four years. They can be re-elected. Terms of office start on November 01, following the election.
Members of the EC can resign from their office. The resignation has to be in writing handed to the EC. In case a position in the EC becomes vacant, a successor has to be elected at the next IOC meeting. The term of office of the successor is limited to the term of the original office-holder.
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Heads of the LOC's of the current and future years are invited for EC meetings and take part in the e-mail discussions.

Motion to change the IYPT statutes – External relations

Current status:

10. Affiliation to WFPhC

IYPT establishes and maintains close relations with international organizations which pursue aims equivalent to its own. These contacts are normally channelled through the World Federation of Physics Competitions (WFPhC). IYPT is a member of this organisation. The Executive Committee appoints representatives to the meetings organised by WFPhC and reports back to the IOC.

Suggested update

10. External relations

IYPT establishes and maintains close relations with organizations which pursue aims equivalent to its own. Whenever appropriate, IYPT appoints representatives to meetings or other events organized by these organizations.

Releasing payments

Transfer rights for the accounts are with the Treasurer and the President and/or Secretary General.

Payments are released by the Treasurer based on the request of the chapter governor, if they are covered by the budget. If the Treasurer is the governor of the chapter, payments are released only after confirmation of the President.

The Treasurer can decide about releasing amounts exceeding the budget by up to 100 EUR per chapter, the President by up to 200 EUR per chapter and the EC for higher amounts.

Payments are preferably done via electronic transfers. Payments are released and transactions are executed based on the following supporting documents: invoices (preferably issued on the IYPT), receipts, tickets, contracts, etc.

<u>Add to chapter 'timeline':</u>

The current budget can be revised once at the autumn EC meeting in year Y.
The revision is prepared by the treasurer and decided by the EC.
Changes are limited to 750 EUR per chapter.
The reason for each change is given in the minutes of the EC meeting.

A forecast is prepared once after the end of the payment deadline for IYPT in year Y+1. The forecast in comparison to the revised budget and the original budget as well as reasons for deviations are presented at the IOC meeting in year Y+1.

A financial report is prepared for the IOC meeting in Y+2 where it is presented and deviations between the budget, revised budget, forecast and the actuals are explained.

<u>Remove from chapter 'spending':</u>

"Treasurer can decide about change in the budget of a chapter by up to 100 EUR, President by up to 200 EUR and the EC by up to 500 EUR. Changes of the budget exceeding these limits need to be approved by the IOC."