

Observations on EGMO 2017

Joseph Myers

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Introduction

The sixth European Girls' Mathematical Olympiad (EGMO) was held in Zürich, Switzerland, between 6 and 12 April 2017.

I participated in this event in my usual roles of IT and Coordinator, travelling with the UK team but not as part of the UK delegation. The UK team consisted of Rosie Cates, Melissa Quail, Alevtina Studenikina and Naomi Wei, with the leader being Jo Harbour and the deputy leader being Jenny Owladi; Kasia Warburton accompanied the team as an observer to provide pastoral support. More about the EGMO 2017 experience from a UK perspective may be found in Jo's report as leader and in the team's student report, when available. These observations should be read as a supplement to those reports, in the spirit of Geoff Smith's Observations on IMO 2011 and IMO 2012.

Diary

30 March The EGMO team and reserve, plus a few boys, gather in Cambridge for training and IMO selection.

The team hoodies have arrived and Kasia distributes them. Some years ago we had a supplier of team clothing lose the provided logo and replace it with one they invented themselves. This time, it seems there has been a misunderstanding of how old the "girls" competing at EGMO are: the hoodies are in child sizes, and few of them fit any team members.

6 April We gather at Heathrow Airport to fly to Zürich. Naomi is very prompt, arriving within a few seconds before the appointed meeting time. Geoff Smith will be coming directly from the Gulf Mathematical Olympiad in Riyadh, while Jenny will arrive in Zürich the next morning.

This is the first time in Switzerland for all of us except Kasia. Alevtina has some trouble at immigration as she is using an Italian Schengen visa instead of a Swiss one. We are met by EGMO staff, and our group divides according to where we will be staying in Zürich; contestants, deputies and

accompanying observers are at a youth hostel, leaders and coordinators at Swissôtel Zürich. We meet coordinator Michelle Sweering (a past EGMO and IMO gold medallist), and are taken to our hotel by train.

7 April The Jury gathers at the University of Zürich, Irchel campus to review and approve the proposed papers. After approval, the Hungarian leader finds the result of problem 4 published in a journal in 2007 (with a reference to a previous paper from 1977), but no-one wishes to exclude the problem on that basis.

34 language versions of the papers are required this year. When we leave for the opening ceremony at ETH Zürich, only English and Bulgarian are ready. The opening ceremony is followed by food for all EGMO participants, and eventually Leaders and Coordinators return to the Jury room to continue work on translations.

Sherry Gong decides that a special English (US) version is needed this year. Her team had voted for British spellings, but they reflect “across” rather than “in” lines. However, the Swiss do not require a separate French version. Eventually all translations are ready and approved, and the papers are printed for tomorrow’s exam.

8 April We have an opportunity to meet students before the first exam, and see the EGMO signs pointing to the “wardrobe”, presumably actually a cloakroom for student use. The Jury deals with queries on the first day’s exam; several students ask about the definition of a convex quadrilateral, while the left/right alternation in problem 3 also results in many questions from students seeking to confirm they have understood it correctly. Coordinators review the proposed mark schemes for the first day’s problems, then they are presented to and approved by the Jury. Problem 6 coordinators report having found the result of that problem in a paper of Darij Grinberg, but neither the coordinators nor the Jury consider this to make the problem unsuitable.

The first day’s scripts are distributed to leaders, and copies to coordinators, and everyone gets to work on understanding them.

The organisers have recruited many international coordinators this year, which helps with understanding scripts in various languages. Many of those coordinators are also past EGMO or IMO contestants, and the coordination team is much more gender-balanced (15 male, 13 female) than at any previous EGMO. There are many past IMO contestants who routinely come to the IMO as coordinators, and we could be seeing the beginnings of that for EGMO, replacing previous nearly-all-male coordination teams.

9 April The Luxembourg Leader and Coordinator / EGMO AB member, on finding there would be a ten-minute wait for a tram to Irchel campus,

decide it is quicker to lead a group walking there. We meet students before the second exam.

A cat pays a visit to the Jury room. Various queries are sent regarding the meaning of “ n -tuple”. There are also many queries on problem 4 about whether the result has to be proved for all sequences of t_i satisfying the given condition, or just for one such sequence, and about whether multiple people can play the same number of games. The “reflection in” issue causes some queries. Mark schemes for today’s paper are discussed and approved.

Weather in Zürich is warm and sunny, and UK people gather outside for lunch. We then meet the team after the exam. By the afternoon, my coordination partner is back from the marathon he was running this morning, and we look further at some scripts. Tonight, contestants will have the choice of dance classes or watching the film $X + Y$.

10 April Coordination on problem 3 goes smoothly and finishes early. Problems 4 and 5, however, drag on and the final Jury meeting has to be put back. There is a suggestion of postponing dinner until after the meeting to encourage efficiency. Eventually we have dinner before the meeting, but the meeting starts with one coordination still ongoing.

We start with EGMO AB business. Future hosts of Italy (Florence) for 2018, Ukraine (Kiev) for 2019 and the Netherlands for 2020 are approved by acclamation, and there are already countries interested in hosting EGMO in 2021 and 2022; expressions of interest are sought for 2023 and later. EGMO continues to grow, and Italy expects to be able to host around 50 participating countries. With the increasing size of EGMO it can be difficult to accommodate all participants in the same place, but Italy and Ukraine expect to do so. EGMO will also follow IMO changes to the rules on eligibility of participants.

The Chief Coordinator’s report notes that it was correct not to consider Darij Grinberg’s work an issue for problem 6; no scripts mentioned anti-Steiner or Euler reflection points. While we await the final scores from the last coordination, the Jury approves the bronze and gold boundaries, as the affected students cannot have scores in that range, then goes on to approve the silver boundary while still waiting for those scores.

The results of that coordination come in, and, for the first time at EGMO, a dispute is taken to the Jury, about whether something is sufficiently clearly explained in a script taking an unusual approach to problem 5. The Jury upholds the coordinators’ recommendation of a score of 6 for that script, and then all the scores are approved. The UK results are spectacularly good, with all team members getting medals and Rosie getting her second gold with a score of 41.

11 April The day starts with an excursion to the mountain Rigi. So far at EGMO we have used the trams, but this excursion will be by coach. Jo attempts to board an unrelated coach, but still gets on the correct one in time. The journey starts with a video safety briefing, discussing how you must stay in your seat with your seatbelt fastened for the whole journey, but also you should sit when using the toilet. Emergency exits, the fire extinguisher and hammers for breaking windows are also covered.

We reach Vitznau, join up with the UK team and take a rack railway up Rigi, followed by a short walk to the top. The mountain is shrouded in mist and no views can be seen; this is the bad-weather programme, while good weather would have seen more hiking on the mountain. We return further down on foot, to Rigi Staffel where we sample fondue and other traditional Swiss food for lunch. Whether Alevtina's combination of apple sauce with onions is traditional is not entirely clear. We then take the rack railway to Arth Goldau and a coach back to the hotel.

The closing ceremony follows, with the EGMO flag handed over to Italy. At the following dinner, the UK team are presented with a prize for their entry in the EGMO water bottle photo competition, a photo showing a cloud being poured out of a water bottle. Some contestants relight a candle more spectacularly than intended, but the only casualty is the glass containing the candle. There is then the traditional dancing.

12 April We return to the airport by train from the hotel, meet the team, check in and meet the US leader whose team has wandered off after arriving at the airport. Geoff has already left earlier in the morning to go to the UKMT AGM. Waiting for our flight, there is a call for volunteers to be paid to be bumped from it, and from another Swiss flight, but none of us volunteer or are otherwise affected.

Alevtina is flying from Zürich to Moscow. The rest of us have an uneventful flight to Heathrow. Some people are met by families, and we go our separate ways.

Thanks

This was an extremely well-organised EGMO, into which the Swiss organisers had put an enormous amount of work since their bid was approved at EGMO 2014 in Turkey. Thanks to them and the EGMO AB for putting on such a great event, so much bigger than EGMO was back when they first bid for EGMO 2017. Thanks to Jo, Jenny, Kasia, Rosie, Melissa, Alevtina and Naomi for being great travel companions and representatives of the UK in another outstanding year. Thanks to the EGMO 2017 organisers and the UK Mathematics Trust for sponsoring my involvement in EGMO, Bev for arranging travel and Man Group for sponsoring the UK EGMO team.