

UK Team Leader's Report, IMO 2018

GCS

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A micro-report

The UK Director of IMO Training (and Deputy Leader) Dominic Yeo has written a fine report, and (I am pleased to say) stolen what was left of my thunder. I refer the interested reader to his report for information about the UK experience at IMO 2018.

The United Kingdom's performance was far better than expected, since following two top 10 years, there was a huge turnover in team membership, so securing 12th place was a very pleasant surprise to me. Agnijo Banerjee's perfect score was the first for the UK since Catriona Maclean scored 42 in 1994. The UK has achieved 6 gold medals in the past 3 years, and much else too. Congratulations to all concerned, and thanks to all involved in making this possible, especially to the reserves, the families and teachers of the students, and everyone who helped the UK Maths Trust effort to bring beautiful and demanding mathematics to large numbers of people.

I would like to single out our student Harvey Yau of *Ysgol Dyffryn Taf* in Carmarthenshire, Wales. He won four silver medals and one gold medal, so he has more IMO medals than any other British student. Thanks Harvey, the IMO will miss you.

I thank *Oxford Asset Management* for their continuing generous sponsorship of the UK IMO team, and the other donors, both individual and corporate, who give so generously to UKMT. Why not join in?

The State of the Union

Since I was elected President of the IMO Board in 2014, I have felt somewhat circumscribed in what I can say about IMOs, and I fear that my reports have become a little tame. There is much which goes on behind the scenes, both between and during IMOs, over which a veil must be drawn. There are

diplomatic issues to be handled, financial backers to be met, media interviews to give, hands to be shaken and, unfortunately, sometimes allegations of irregular conduct to be addressed. I particularly want to single out the members of the IMO Ethics Committee to thank for their vital and discreet work: Dávid Kunszenti-Kovács (Norway), Paul Vaderlind (Sweden), Rafael Sánchez (Venezuela) and the newly appointed María Gaspar (Spain).

There is also the continuing issue of trying to maximize the diversity of IMO participants. In the last few years, IMO has welcomed many countries of the Arab world into the fold. Africa is still not well represented, but perhaps the most important thing is to develop mathematics infrastructure in Africa rather than simply try to recruit new African IMO teams. Female participation is still not at satisfactory levels, despite the CGMO, EGMO and associated national competitions for girls. The IMO has introduced the Maryam Mirzakhani awards for the best performing female students at each IMO.

IMO 2018 in Romania was successful in so many ways, most importantly because of the quality of the papers and of the co-ordination. It was a fine tribute to the work of Prof Radu Gologan in steering the maths competition movement in Romania for so many years. Great work Radu!

The medium term future of the IMO is secure, and the jury has accepted the following invitations: 2019 UK, 2020 Russia, 2021 USA, 2022 Norway, 2023 Japan. There are several countries which might be offering to host IMOs after that, but nothing is official as yet. Please contact the IMO Board if you are thinking about offering to host the event. It is particularly helpful if you can be flexible concerning the year, so that we can more easily accommodate as many countries as possible.

On a personal note, as preparations for IMO 2019 in the UK take shape, I contemplate the coming year with trepidation and excitement. I am grateful to the continued support of the IMO jury, and at IMO 2018 I was re-elected the President of the IMO Board. Assuming continued good health, I will serve until the end of IMO 2022.

There is still much work to be done. Watch out for changes to the Annual Regulations in 2019, particularly concerning child protection, health & safety and standards of personal conduct. If the IMO 2019 jury approves these additional regulations, they can then be incorporated into the general (permanent) regulations of the IMO.

Thanks to the quality of Romanian cobblers, I now have very impressive and extremely long shiny black shoes to wear at ceremonies. I am sorry to say that IMO 2019 will not be able to match IMO 2018 in terms of formal speeches, but the shoes will be back.

Picking over the results

There were 107 countries and territories at IMO 2018. Here are the top 40: 1. USA (212), 2 Russia (201), 3 China (199), 4 Ukraine (186), 5 Thailand (183), 6 Taiwan (179), 7 Republic of Korea (177), 8 Singapore (175), 9 Poland (174), 10 Indonesia (171), 11 Australia (169), 12 United Kingdom (161), 13 Japan & Serbia (158), 15 Hungary (157), 16 Canada (156), 17 Italy (154), 18 Kazakhstan (151), 19 Iran (150), 20 Vietnam (148), 21 Bulgaria (146), 22 Croatia (145), 23 Slovakia (140), 24 Sweden & Turkey (138), 26 Israel (136), 27 Georgia (133), 28 Brazil, India & Mongolia (132), 31 Germany (131), 32 Armenia (130), 33 France & Romania (129), 35 Peru (125), 36 Mexico & Netherlands (123), 38 Philippines (121), 39 Argentina & Czechia (115).

The USA are to be congratulated for their third win in the last four years, and their James Lin was the only non-Scottish student to achieve a perfect score. The last time they finished outside the top 4 was in 2009, so they have been performing with remarkable consistency. Russia came second for the first time since 2010, so this is a very strong outcome for them. The Chinese performance is consistently good. The last time they finished outside the top 3 was in 1996, the year of the nearly impossible geometry P5. The performance of Ukraine was remarkable, and 4th place is their highest ever finish.

Thailand's 5th place is their equal highest ever performance, matching their showing during the Thai golden era when they achieved 5th place three years in a row: 2010–2012. Taiwan's 6th place means they now have three top 10 finishes in a row. Similarly South Korea are in the top 10 for the seventh year and Singapore for the eighth year. Poland's position of 9th place is their best performance since 1981 when they finished in 6th place. However, there were only 27 countries participating in 1981. Poland were ranked very highly in the early years of the IMO when it was a tiny event. This is the best Polish performance in the modern era.

The performance of Indonesia in coming 10th is wonderful. Indonesia has never finished higher than 19th before, so this is a magnificent performance. Perhaps there is a new member of the group of Far Eastern tigers which have come to dominate the top of the IMO leaderboard in recent years. Australia achieving 11th place is a very good showing for them, and has them bouncing back to form after a couple of lean years. Annoyingly this means that they beat the UK by one place, just as Australia won the 2018 Mathematical Ashes by 1 mark. Congratulations to Australia.

The leading country to include a girl in its team was Ukraine, followed by

Thailand (which had 2), Republic of Korea, Serbia and Hungary. The top Commonwealth Country was Singapore, followed by Australia and then the United Kingdom and Canada. Australia was the leading Commonwealth Realm. Bangladesh earned their first ever gold medal (congratulations!). Macau was the leading team in which their ranking exceeded their team score. Hungary was the highest ranking team not to receive a gold medal. The leading Monarchy was Thailand, followed by Australia and the UK. The rank order of the top ten EU countries was: 1 Poland, 2 United Kingdom, 3 Hungary, 4 Italy, 5 Bulgaria, 6 Croatia, 7 Slovakia, 8 Sweden, 9 Germany and 10 France.

The Nordic slugfest was won by Sweden, far ahead of Norway, Denmark and Finland which achieved very similar scores, with Iceland a little adrift.

As usual, Luxembourg finished first among the Grand Duchies. The Ibero-American Champion is Brazil, followed by Peru, Mexico and Argentina. The countries of the former USSR are headed by Russia, followed by Ukraine and Kazakhstan.

The *alphabetic championship* was won by Albania, followed by Algeria, Argentina, Armenia, Australia, Austria and Azerbaijan.