

International Mathematical Olympiad 1990

Beijing, China

Report by Dr Peter Shiu, Leader of the UK team

The UK team

Thomas Leinster	(Lancing College)
Vin De Silva	(Dulwich College)
Alan Iwi	(Westminster School)
Oliver Riordan	(St Paul's School)
Amites Sarkar	(Winchester College)
Michael Fryers	(Altrincham Grammar School)
Leader:	Dr Peter Shiu, Loughborough University
Deputy Leader:	Mr Paul Woodruff, Dulwich College

The 31st International Mathematical Olympiad was held during 9-19 July, 1990 in Beijing, China. There were 308 contestants from 52 countries, and the United Kingdom entered a team of 6, the maximum size for the last 8 Olympiads.

There was a simple but cordial welcome at the airport from Professor Wang Yuan, the President of the Chinese Mathematical Society, after which the team leaders were taken to the Fragrant Hill Hotel. The deputy leaders were accommodated in the Jimen Hotel and the students were housed in the Beijing Language Institute. Apart from brief sessions dealing with queries at the start of each examination all meetings of the Jury were held in the Fragrant Hill, and the deputy leaders joined us immediately after the second examination.

Professor Qiu Zonghu, a former leader of the Chinese team, was chairman of the Jury. The language used was English, although there was the occasional complaint from Spanish speaking countries. This often happened when important points were being hotly contested, and it usually had the calming effect of reminding leaders that one has to be fair and reasonable at an international meeting. As another manifestation of the need to communicate clearly I was occasionally asked by leaders of other countries to speak on their behalf, if only because the UK leader is expected to be heard and understood. The main task of the Jury was the choice of the final six problems from a short listed selection of 46 out of an original bank of over one hundred. The usual difficulty of assessing the relative difficulty of the problems was exacerbated by the poor presentation (in English) of the problems as well as their solutions, especially those which had been modified by the Chinese hosts. In particular, I feel sure that a good combinatorics problem from Japan would have been selected had it been properly presented. Although the 6 chosen problems were difficult, there was not much room for creative flair, and no special prize was given. The coordination seems much smoother and apparently much less strict than in previous years. Out of a maximum score of $6 \times 7 = 42$, the thresholds for first ("gold"), second ("silver") and third ("bronze") prizes were set at 34, 23 and 16 respectively, confirming that the problems were more difficult than in previous years. There were 23 first, 56 second and 76 third prizes awarded, and non-prize-winning contestants with a perfect score of 7 on one problem were given an "honourable mention".

The selection of the UK IMO team began last December with the National Mathematics Contest, a test which attracts nationally about 10000 entrants. This was followed by the British Mathematical Olympiad for about 400 selected students, and a Further International Selection Test for 60 of these students. These competitions were all organised by the National Committee for Mathematical Contests, a committee of the Mathematical Association. On the basis of all these competitions, and taking account the age and experience of the pupils, 20 candidates were invited to attend a three-day residential Training and Selection Session during the Easter holidays at Trinity College, Cambridge. From these 20, the final team of six was chosen. It is worth noting that about half of those at the Training Session are young enough to be available for the IMO next year.

As the enclosed tables show, the UK team gained two first prizes and two third prizes, and Alan Iwi qualified for honourable mention. The team total of 141 was 10th in the unofficial ranking. This is our best performance in recent years, and whether we can retain such a position in future is an interesting point. From the table of results, it seems clear that countries which take the competition most seriously in the sense of providing long training do perform well; for example, China and the USSR provide several months of training for their possible contestants. It must be said that such training for these exceptionally talented students is not always a good thing for the future mathematician. As a leading scientific nation, the United Kingdom might be expected to attain a reasonably high position within the competition, and we should explore ways of achieving this without much alteration to our small training program. I myself am in favour of the suggestion of encouraging more schools to enter the preliminary competitions so that the eventual team can be selected from a bigger pool of raw talent.

Returning to this year's Olympiad in Beijing, I should add that the customary programme of receptions and sightseeing was wonderful, with the Great Wall, the Summer Palace and the Palace Museum being particularly impressive. Although we had to miss the farewell dinner at the Great Hall of the People, we were able to attend the closing ceremony at which we were all invited by the Swedish leader to the 32nd IMO at Sigtuna in July 1991. The ceremony ended with a memorable performance of the last movement of Beethoven's Choral Symphony sung in Chinese by fine soloists and a large choir.

Finally it is a great pleasure to acknowledge the excellent work of Paul Woodruff, our Deputy Leader, who organised our travel arrangements and looked after our general welfare with quiet efficiency. The encouragement he gave to the team and the comfort he offered to those who might have done better are examples of his overall good sense. Paul also took an equal share of the academic part of the work; he was diligent with the assessment of the scripts, and was particularly helpful during the coordination stage of the competition. Dr A. D. Gardiner, the originally proposed team leader, injured his hand in July and I was asked to lead the team with very short notice, and Paul gave me all possible assistance to allow me to carry out my task. In short, the contributions from Paul can aptly be described as vital.

Peter Shiu
17, August, 1990

1990 United Kingdom IMO Individual Scores.

Student	Q1	Q2	Q3	Q4	Q5	Q6	Total	Prize
Thomas Leinster (Lancing College)	5	2	2	1	1	1	12	
Vin De Silva (Dulwich College)	7	7	4	7	7	7	39	Gold
Alan Iwi (Westminster School)	0	0	3	7	3	0	13	H.M.
Oliver Riordan (St Paul's School)	7	7	7	7	7	5	40	Gold
Amites Sarkar (Winchester College)	7	3	2	1	5	1	19	Bronze
Michael Fryers (Altrincham G.S.)	4	2	2	3	7	0	18	Bronze
Team Total	30	21	20	26	30	14	141	

1990 IMO Top Twelve Countries.

Country	Gold	Silver	Bronze	Score
China	5	1	–	230
USSR	3	2	1	193
USA	2	2	1	174
Romania	2	2	2	171
France	3	1	–	168
Hungary	1	3	2	162
E. Germany	–	4	2	158
Czechoslovakia	–	5	1	153
Bulgaria	1	4	1	152
United Kingdom	2	–	2	141
Canada	–	3	1	139
W. Germany	–	2	4	138

United Kingdom IMO Record Since 1976.

Year	Venue	Gold	Silver	Bronze	Position
1976	Austria	2	4	1	2/19
1977	Yugoslavia	1	3	3	3/21
1978	Romania	1	2	2	3/17
1979	United Kingdom	–	4	4	4/23
1980	NO IMO				
1981	USA	3	4	1	3/27
1982	Hungary	–	–	4	10/30
1983	France	–	3	1	11/32
1984	Czechoslovakia	1	3	1	6/34
1985	Finland	1	2	3	10/38
1986	Poland	–	2	3	11/37
1987	Cuba	1	2	2	10/42
1988	Australia	–	3	2	11/49
1989	W. Germany	–	2	1	20/50
1990	China	2	–	2	10/52