

## IMO 2007 DIARY - DOMINIC YEO



**Saturday 8 July - Heathrow** Finally, after two years in the IMO squad, several arduous selection tests and countless practice questions, the IMO journey began. But, before the gala performance, first came the promotional tour. To this end, we met at Heathrow in front of the Singapore Airlines check-in desks. Ceri, our unflappable deputy leader, handed round packs of team uniforms, including numbered polo shirts (in case anyone was under the illusion that competition mathematics is not a sport), a fetching red-and-blue, “wipe-clean” tie and excessively voluminous rugby shirts for the stay in wintry Sydney. Clearly these had been designed with Geoff, our larger-than-life leader, in mind. He was dealing with the much more important task of managing the precious cargo that was a case of Christopher Bradley’s latest co-ordinate thriller, “The Algebra of Geometry”, this year’s must-have airport read. No coffee table is complete without it.



**Monday 9 July - Singapore** Though it seemed like morning, we arrived at Singapore in the cloying heat of mid-afternoon. After an hour or so in the hotel pool, we decided to brave the Oriental cuisine. Despite Geoff's instructions to take us to a restaurant hotspot, the taxis deposited us in a seedy backwater characterised by an abundance of sex shops. The only eatery in sight was a "vegetarian health cafe". Nevertheless, 'chicken and pork laksa' and other such evidently non-vegetarian options appeared on the menu, so we bemusedly entered. Unfortunately, when the food arrived, it was clear that the interpretation of 'chicken' was rather liberal, since it was, in fact, tofu. Geoff did not seem to have noticed this, remarking that the meat was very lean, and it seemed a shame to disappoint him. Subsequently, Geoff and Pam ordered ice creams made with durian, a fruit which emits such a noxious stench that it is a civil offence (punishable with a 5000 dollar fine) to carry one on the Singapore metro. The seating arrangement rapidly became bipartite.



**Tuesday 10 July - Singapore** At some point before the next morning, Ceri clearly told Geoff about the tofu in such a way as to implicate me as architect of the deception. Geoff vowed that he would take revenge, possibly while co-ordinating my script. That morning we went for a boat trip down the Singapore River, accompanied by the most hateful commentary known to man. This time, we were able to find a restaurant that offered real meat, but no-one felt sufficiently brave to sample the live bullfrog. Geoff caused quite a stir as we manoeuvred through the narrow market streets of Chinatown. One merchant offered him “longer trouser for shorter price!” only for his colleague to acidly interject: “Don’t bother - he’s only the bodyguard.” However, this was only a whistlestop tour, and soon we were back at Changi Airport. Singapore Airlines’ reputation for classy service is well-deserved. The food tasted like actual food and the crew were unrelenting in their production of drinks, warm towels and curious rice snacks.



**Wednesday 11 July - Sydney, Cairns** Unfortunately, even my deluxe faux-velvet travel pillow could not detract from the effects of jetlag, and I did not get much sleep. As a result, our first glimpses of Australia were not particularly perceptive as we staggered bleary-eyed out of the terminal into the biting cold. Since our internal flight to Cairns was not for ages, we headed into the city centre. As a relaxing way to see the sights of Sydney, we caught a ferry across the harbour to the suitably-Australian-named Manly. This gave Alison and Pam the chance to relive the excellent Singapore Airlines breakfast experience, while the rest of us took in the Opera House and the Harbour Bridge. After a spot of lunch, we returned to the airport for our Virgin Blue flight to Cairns. While Geoff swapped idle banter with the troupe of Queensland pig hunters who were sitting next to us, we slept. Eventually, after our three day trip, we arrived at Footlights Student Lodge, about ten miles outside Cairns. The facilities were slightly Spartan, but, such was our tiredness, any form of bed was welcome relief.



**Thursday 12 July - Cairns Zoo** After a fairly extended lie-in, we spent the morning sitting in the courtyard next to our building trying some past IMO problems. Given that it was midwinter in Cairns, the weather (c. 25C) was pretty acceptable. We spent the afternoon at the local zoo, admiring the exotic range of Australian fauna. Whereas most European creatures have evolved to be an inconspicuous shade of brown, clearly in Australia Evolution/God decided that this was a rubbish system, and that nature would be much more interesting if every animal were outrageously poisonous and had, say, blue plumage over its whole body or an extra head. Since this eccentricity of appearance affects all Australian animals, none are at any extra risk of predation, since, while they might glow in the dark, so do their hunters. Koalas seem to do little except sleep and eat. Apparently they are endangered because they can only eat the leaves of one specific tree, which is being felled. I think it's more likely that they are too lazy to mate. Nevertheless, as a species, if you are going to get yourself endangered, you might as well be cuddly and photogenic. Although the saltwater crocodile is equally at risk, perhaps more so, the idea of "save-the-reptile" stuffed toys does not seem very realistic.



**Friday 13 July - Kuranda** This morning saw the first practice 4.5 hour IMO exam. We sat the paper in our rooms and were fuelled by an infinite quantity of biscuits and Coke provided by the indefatigable Pam. I'll brush over the details of all the exams since clearly the only people who might come close to caring are those who actually sat it, who consequently know all there is to know about it. This afternoon we piled into a small coach for a short ride to the nearby mountain town/village of Kuranda. Our driver, a cheery character, pointed out items of "interest" along the way, including trees and the fact that the road had an innovative safety device called a 'barrier'. I think he was under the impression that in Britain, vehicles routinely plunge into the abyss of doom from the sides of mile-high mountains. That said, the journey was very comfortable, and afforded superb views over the whole of the surrounding area. Our first stop was the butterfly house, in which specimens the size of small plates flapped idly by, occasionally alighting on a panama hat or camera. Apparently they like the colour red, so it soon became clear which members of the team had not applied enough sunscreen. Next, to the Skyrail, a sort of cablecar which rides above the rainforest for about five miles. Having a mild fear of heights, I expected this to be terrifying. To everyone else's disappointment, it wasn't. En route, we had the chance to see some of the stunning scenery of waterfalls, rivers and the awesome rainforest canopy as we soared majestically above. Magnificent.



**Saturday 14 July - Cairns** Not much really happened. I had a complete nightmare on the second practice exam after being unable to do addition, and therefore getting Question 1 wrong. Tim explained how to use Jensen's Weighted Inequality to devastating effect in Question 2, and together the other five of us taught Takaki areal co-ordinates, without which Question 3 was impossible. In the afternoon, we tried out the pool at the student lodge, and found it to be appallingly cold, even though the outside weather was lovely and so, after we had all acquired a blue tint, we retired to the poolside. We got chatting to Simon, one of a group of Canadians on a biology fieldtrip who were staying in the same place as us. As a location for a fieldtrip, I don't think you can beat the Great Barrier Reef and the Queensland Rainforest, attractive though the idea of a sewage works in Aldershot may sound. We whiled away the evening playing a variety of fun card games, before the lust for intellectual pursuits became too great and we resorted to Bridge.



**Sunday 15 July - Port Douglas, Great Barrier Reef** Brief respite from the daily cycle of examinations was provided by a day-trip to the Great Barrier Reef. After arriving at Port Douglas, we boarded a massive, silver catamaran for the 90 minute cruise to the operator's pontoon on the Outer Reef. From there, we were all issued with lycra bodysuits, and spent the remainder of the morning snorkelling around the pontoon. After getting used to the equipment, we donned wetsuits, and headed out on a smaller boat for a guided snorkelling tour on the very edge of the reef. This involved diving into the sea from the moving boat, and then surfacing again. Unfortunately, Geoff, who had been unable to find a wetsuit to suit and was therefore relying only on his yellow Hungary Camp shirt for buoyancy, only accomplished the former, causing mild concern on the part of the guides and outright terror on the part of the coral, which is, after all, little except a colourful light receptor. On one side of us were thousands of miles of open water, but it was the sea just underneath that was of interest. An incredible variety of fish, coral and assorted crustacea darted, swam and wobbled past. Amongst many other things we saw several types of starfish and a rare sea cucumber whose method of defence against predators is to excrete its entire intestinal system when another creature comes near, then suck it back in a moment later. The whole experience was perfect - everyone should do this once in their life.



**Monday 16 July - Cairns, Trinity Beach** Again, nothing much happened. We had a third exam, which was quite uneventful. The afternoon was spent at Trinity Beach, a short bus ride away. Unfortunately, I had forgotten my swimming stuff, so had to make do with sunbathing. Tim did a functional equation in the sand... The hours rolled by, before an amazing pizza on the seafront. This made Geoff, who had been left at the student lodge to mark exams, very jealous.



**Tuesday 17 July - Cairns, Trinity Beach, Sydney** The fourth exam was the first training exam for the Australian team, whom we would be joining on the next day in Sydney. Geoff had assured us that it would be awe-inspiringly easy, but it became evident that this was just colonial arrogance, as it was just as difficult as our own exams. He, keen to try the now much-vaunted pizza, suggested we return to Trinity Beach for lunch, before our evening flight to Sydney. Aware that it was going to be colder when we went south, we made the most of the weather while we could, before pootling off to Cairns airport. Sydney may have been cold the previous time we arrived, but this time it was 10.30 at night, so was absolutely freezing. Also, it appeared that no eating establishments were open, so we were forced to make do with a McDonalds, but it did give us a chance to get to know the Australian team, who were much amused by Geoff as he thundered at the pathetic McWorker who had brought the wrong number of fries.



**Wednesday 18 July - University of NSW, Sydney** Just as England is a country that does not deal well with heat, Australia copes fairly poorly with cold. This was demonstrated by the fact that, though it was only 3C outside, the only protection from the cold of night provided was a thin sheet, and the officer showing us our rooms dryly remarked that the heaters would “take a day or two” to warm up. While we settled down in a lecture room to sit the second Australian practice exam, Geoff and Joseph set off for Hanoi. In the afternoon, the two teams were asked to set the following morning’s exam for the other team from a shortlist of problems. Perhaps to appeal to our own competitive insecurities, we made the Aussie’s exam really difficult. We spent the evening playing a variety of internationally-recognised parlour-ish/mathsy games including Mafia and Psychiatrist.



**Thursday 19 July - UNSW** When, early in the morning, we sat down to the exam, it became clear that the Australians were a lot less insecure than us, and had chosen the questions for our paper rather charitably. We came to regret our selection when we were told that we had to mark their scripts. Fortunately, Jack and Tom drew the short straw and had to mark the fiendish combinatorics essays, while Alison and I were assigned the relatively simple Question Two. However, it still took most of the afternoon, and there was time for little else.



**Friday 20 July - UNSW, Central Sydney** Yet another exam filled the morning. By now, I was getting pretty tired of the UNSW catering, which was provided by Scolarest, of 'Jamie's School Dinners' notoriety. There was no water available at mealtimes - the only cold drinks on offer were a selection of bizarrely coloured cordials, which bore a strong resemblance to effluent from a nuclear power station. As such, we were quite pleased when the Australian team, five of whom are from Sydney, offered to show us round the city and mentioned that the first stop would be a chocolate shop. After that, we had a look round Sydney Tower, first at the fairly standard shopping centre at ground level, and then we climbed to the observation deck, the highest point of the city. Viewed from above, Sydney is a very beautiful city - there is water everywhere, which radiated in the orange light as the sun set over the harbour.



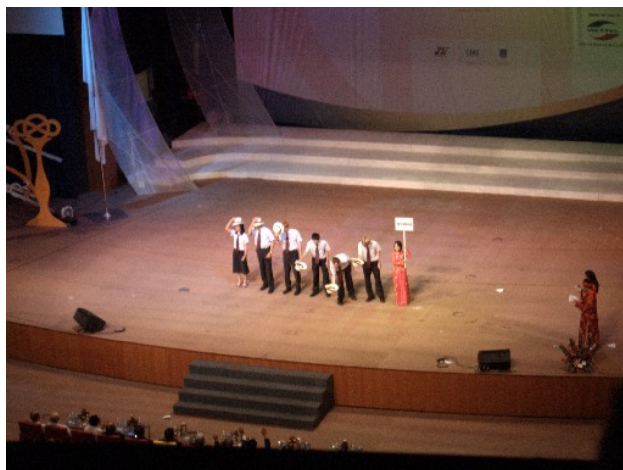
**Saturday 21 July - UNSW, Sydney Opera House, Botanical Gardens** Ceri, something of an opera fan, had managed to procure some cheap reduced-view tickets to see a matinee performance of ‘Barber of Seville’ at the world-famous opera house. We began the daily exam at the tortuously early hour of 7.30, and finished after a mere four hours to allow time to hurry across the city to the opera house. As a building, Sydney Opera House really is impressive, though inside it feels rather like most other theatres. The production was of a very high standard, and our seats were perfectly acceptable, since, though I could not see a small portion of the stage, I could see all the surtitles. It really is a very good opera, and the orchestra and the singers, especially the excellent Figaro, did it justice. Afterwards, we went for a brief stroll through the renowned Botanical Gardens. As a park, I still think it isn’t quite as good as Hyde Park, but it did have its fair share of exotic wildlife, from a flock of ibis on the lake to a colony of bats in the trees, and an exhibition on grass.



**Sunday 22 July - Sydney, Singapore** If Hell ever freezes over, it will probably feel a lot like Sydney at 4.30 on a wet, wintry morning. Fortunately, after buying some cliched Australian merchandise, the flight was sufficiently relaxing that I was able to make up the hours of sleep I had been denied by our early start. We had been forewarned that accommodation in Vietnam might be of the mudhut variety, and so, determined to take advantage of an afternoon in Western palatial splendour, we hit the pool. This time, we were able to find the restaurant quarter for supper and Ceri, aware that we would be experiencing more than our fair share of rice and noodles over the coming days picked a super Mexican restaurant beside the river which served massive sizzling fajitas and lemonades in buckets. Unfortunately, I was too shattered to really appreciate it.



**Monday 23 July - Singapore, Hanoi** Another early start was made more tolerable by the fact that we had actually had a good night's sleep in our luxurious hotel beds. After what seemed like a short three-hour flight, we landed at Hanoi Airport. We were all issued with fetching IMO flags, and were met by our guide, Quy. After a short wait we ventured out of the air-conditioned terminal into the searing heat of the Vietnamese summer. In a slightly surreal scene, like something out of 'A Passage to India', we had to load the luggage into the coach through a window. Pam's giant pink suitcase caused particular trouble. Ceri looked concerned: I don't think she'd mentioned spinal damage on the risk assessment form. As the coach weaved its way along the flaky roads between the paddy fields and past the Red River, it became clear that Vietnamese right of way was very much determined by the volume of your horn. Contrary to what we'd been told, our hotel was very comfortable indeed, and such is Vietnamese efficiency that the rooms were allocated without any fuss. After meeting some of the other teams, including the Australians, who had arrived the previous day, the South Africans and the New Zealanders, and spending about half an hour pathetically trying to erect my mosquito net, I slept.



**Tuesday 24 July - Hanoi, Opening Ceremony** Most of the morning was spent poolside, an oasis in the scorching heat, though it did also feature an entertaining argument between the team and Pam about the nature of democracy. However, the main event of the day was the Opening Ceremony, held at the most modern and imposing building in Hanoi, the National Conference Centre. After a short coach ride complete with police escort, we were seated alphabetically, next to the USA team who had a strange obsession with stealing our hats, and behind Turkmenistan. After a selection of speeches, and an ample quantity of singing and dancing in traditional Vietnamese dress, the teams walked across the stage. Clad in our fetching polyester trousers, panama hats (how are they British?) and UKMT-issue shirts, we processed across. We had originally intended to go for the authoritative dignified look, but after a last-minute change of plan we doffed our hats at the audience. As the photos show, this was, unfortunately, not very synchronised! Sadly, in terms of uniform, we were outdone in the headgear department by the Mexican sombreros and in general terms by the Nigerian team and their flowing tribal robes. There are great plans for next year's uniform. Wetsuits were mentioned...



**Wednesday 25 July - IMO Day One** A combination of Hanoi water (apparently it contains a non-trivial amount of Arsenic), nerves and an ill-advised rehydration sachet meant I felt fairly rubbish. However, my stomach had pretty well settled by the time we sat down in the Conference Centre to attempt the first day's exam. I spent the best part of three hours attempting Question One, a strange algebra-ish question that was stated in the most baroque and obfuscating manner imaginable. It was split into two parts: the first half was pretty manageable provided you saw the trick; the second half had another clever solution, which I didn't see, but I thought I'd solved it anyway using a sort of inside-out induction argument. Joseph had warned us repeatedly: "If you use an induction argument, make sure you don't lose marks because of a sloppy base case". I heeded his advice, but was later to realise that I had lost marks because a sloppy (bordering on non-existent) inductive step. I spotted an interesting Simson Line in the geometric Question Two, but it didn't seem to help at all in the problem. My Question Three submission consisted of an empty folder... Of the other team members, Jack seemed to have aced the first two questions, Takaki hadn't solved anything, and the others had made somewhat similar progress to me. After a quick debrief with Ceri, we headed back to the hotel for an informal post-mortem by the pool.



**Thursday 26 July - IMO Day Two** It was still all to play for on the second day, and we were feeling pretty confident. The paper started fairly ignominiously when I tried to open the sealed envelope containing the questions, and merely succeeding in ripping off the tab, and so had to engage the help of a Vietnamese invigilator with a letter opener to prise it apart. Question Four was another geometry question, which had quite an easy solution using trigonometry and a few similar triangles. The number theory Question Five somewhat surprisingly also seemed quite straightforward, so I was left with three hours to tackle the impenetrable Question Six. IMO Question Sixes are normally ludicrously difficult, so, as I expected, I was unable to make much real progress. Unfortunately, after consulting with Jack, who had solved it, afterwards, it transpired that my Q5 solution was fatally and irreconcilably flawed, so, like the other four UK competitors, I only had question to my name. The exam was soon forgotten, and we spent the afternoon outside, taking part in a variety of activities. Jack and I had ill-advisedly put ourselves forward to carry the UK's sporting reputation in a badminton tournament. Unfortunately, we had drawn the sociable Vietnamese team in the first round. They seemed very professional, talking about strategy and compensating for the wind. We lost. Quite badly.



**Friday 27 July - Dam Long, Van Phuc** While Geoff and Ceri were poring over our scripts at the leaders' hotel, all the students were whisked off in an imposing convoy of pink coaches complete with police escort, to the nature resort of Dam Long, about two hours from Hanoi. The whole complex was situated next to a massive lake, and the humidity was stifling. Monkeys frolicked on the rooftops. A bear yawned in its cage. A throng of women lined up to try and sell us conic hats, wind chimes, and other assorted Oriental trinkets. My attempt to ask for two hats by raising two fingers was misinterpreted as an attempt to negotiate a lower price. Eventually, through a mixture of gesticulation and pained facial expressions, everyone was able to acquire the wares they desired. On the way back to Hanoi, the IMO retinue stopped off at Van Phuc, a village famous for its fine silks. Obviously I couldn't resist the temptation to purchase several ties of varying degrees of tastefulness, and a silk dressing-gown emblazoned with dragons.



**Saturday 28 July - Halong Bay** While the second day of co-ordination was in progress, we were taken on an epic four-hour journey to the beautiful seaside resort of Halong Bay. After a massive lunch in an upmarket hotel next to the bay, we set out in a flotilla of boats to explore the stunning green archipelago. The first island we visited is home to an impressive cave, which we were able to walk through at our leisure. As we emerged blinking into the brilliant afternoon sun, we received news of our final marks from Ceri. We had scored 7, 13 (me), 14, 14, 16 and 31. This was pretty good for Jack, who was now basically certain to win a gold, but was nerve-wracking for me, since 14 seemed a fairly feasible candidate to be the bronze medal boundary. We cruised around the azure sea, inspecting the islands, including two which our guide told us resembled two chickens kissing. Despite not being an expert on such matters, I was unconvinced. After the journey back, during which my fingernails took a bit of a pounding, we were able to see the results for most of the countries and participants on a giant board in the hotel. To our chagrin, it was apparent that UK had not performed especially well, coming in 28th, which meant we had been beaten by our new rivals Australia, in addition to several others. Fortunately, we had avoided the ignominy of defeat to Ireland or New Zealand! All that remained was to find out the medal boundaries. Having migrated to the Irish room, where they had managed to bring some assorted Vietnamese snacks and drinks, we awaited with bated breath. Finally, Ceri texted Alison from the jury room: the bronze boundary was 14. Oh well, there's always next year...



**Sunday 29 July - Hanoi** Based on the fact that I was alone at breakfast, I inferred that the previous night's party had gone on fairly late into the morning. However, there was no rest for the wicked, as the organisers had planned an intrepid expedition into Hanoi. Despite the obvious attraction of the Vietnam branches of Gap and JD Sports, we were pleased to find a coffee shop. The next stop was an excursion of the University of Hanoi, founded about a thousand years ago, and therefore more like a temple. Complete with multiple statues of Confucius, and an entertaining pentatonic orchestra, it proved quite interesting. The afternoon spent at the Hanoi Ethnology Museum (apparently it is the best ethnology museum in Hanoi), was slightly less of a success. The evening was spent attending an awful party/talent show thing in the hotel that was, incredibly, broadcast live on Vietnamese TV. The stage had been set up with a backdrop proclaiming "I \*heart\* math", which kind of set the tone, as a succession of acts processed onto the stage and proved that mathematicians aren't really that talented, though some of the dancing was pretty good. Someone had clearly told the ghastly bint hosting the event that it was Jack's birthday, so Ceri and I had strategically manoeuvred him into the front row. Even with our encouragement, he was reluctant to stand up on cue when it was announced. That did not save him from the fate of being interviewed by the screeching harpy live on TV. As compensation, he did receive a novel faux-terracotta (ie plastic) piggybank, and was asked to make a wish. My excellent and original suggestion of "world peace" sadly was not taken up.



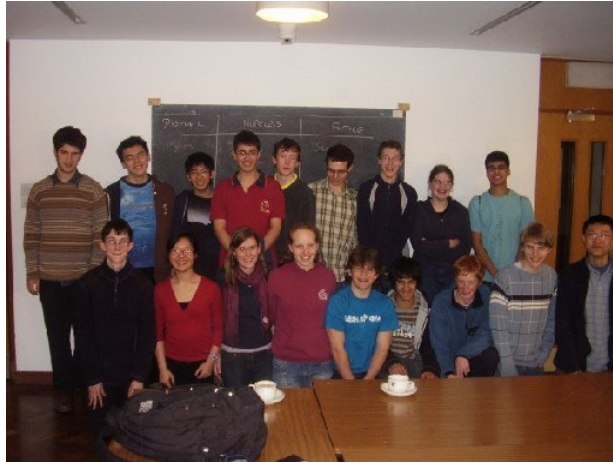
**Monday 30 July - Hanoi, Closing Ceremony** By now, I had kind of lost my appetite for fried rice, a staple of every meal for the past week. After breakfast, there was, thankfully, nothing planned for the morning by the conscientious organisers, and we were free to laze around the hotel. Mid-afternoon, we returned to the Conference Centre for the closing ceremony. There were a few speeches, and a rendition of the appalling IMO song, featuring the lyrics “let’s realise our dreams about creativity!” by a Vietnamese girlband. The main event, however, was the presentation of the medals. Unfortunately, as explained before, I was only a spectator. Nevertheless, it was nice to see Geoff again, and we swapped banter about the co-ordination process while the medal winners crossed the stage. Jack received his gold from the President. Afterwards, there were final chances to obtain photographs with the more imaginatively dressed teams before the closing banquet, held in the same banqueting rooms in which the paper had been sat. The food was very good indeed, and the conversation flowed as freely as the interesting Vietnamese wine. Geoff just managed to avoid winning for the second year in a row the Golden Microphone, awarded to the leader most in need of a verbal Imodium.



**Tuesday 31 July - Hanoi, Singapore** Finally, over three weeks after flying out of Heathrow, we were heading home. We had a fairly early start, and so we were only able to say goodbye to the intrepid teams who had actually woken up. Hanoi Airport was a bit of an adventure, especially since we had arrived with about ninety minutes to kill. For all its faults, Heathrow seemed a model of efficiency by comparison. Nevertheless, there were some acceptable shops in which to spend my final few thousand ‘dong’, since it is illegal to remove the currency from Vietnam. The short three-hour hop to Singapore was uneventful, as was the five-hour layover in comfortable but soulless Changi. After enjoying a couple of films on Singapore Airlines’ superb entertainment system, I slept.



**Wednesday 1 August - Heathrow, Home** Anti-social though it may have seemed, I was reluctant to lug my suitcase now laden with what seemed like a tonne of uniform and IMO t-shirts through the London rush-hour, so I said my goodbyes and left the airport at 6.15, barely half an hour after landing. The prospect of my own bed without a mosquito net, a day without any 4.5 hour exams, and a meal without rice was very welcoming...



As we look back on the past year, one thing that stands out is the incredible effort put into the IMO campaign by so many people. In particular, thanks go out to Geoff and Ceri for their tireless endeavours over the course of the year, and for having such a positive attitude towards the competition, which made the IMO and the build-up so enjoyable. Also, thanks to Joseph for being an endless font of IMO trivia, and excellent advice; and to Pam, for invaluable assistance in those problems of team photos, biscuit provisions and washing machines which could not be solved using quadratic reciprocity. In addition, thanks to my mentor, Toby, and to all the other individuals who have taught, advised, and poured squash at the various camps throughout the year.

The IMO, the preceding stay in Australia, and indeed the whole of the year in the IMO squad has undoubtedly been one of the most richly rewarding experiences of my life. Though this competition was, in mathematical terms, a personal failure, that does not detract from the challenges, the fun and the friendships that have come from it. With the Bath camp just around the corner, and with SMC in a mere three months, thoughts must turn to IMO 2008 in Madrid. Six golds, anyone?