



Melbourne girls in contention for Australian maths and informatics Olympiad teams

Two year 12 students from Methodist Ladies' College in Melbourne are competing against 29 boys for a small number of places on Australia's teams for the international mathematical and informatics Olympiads.

Michelle Chen was one of 15 senior students at the recent [Australian Mathematical Olympiad Committee \(AMOC\)](#)



Michelle Chen

[Selection School](#) vying for a place on the national team that will compete at the International Mathematical Olympiad (IMO) in Hong Kong in July this year. Ten junior maths students ranging from year 7 to 10, including one girl, also trained in a bid to be considered for IMO teams in future years.

Belinda Shi was one of 16 students at the recent [Australian Informatics Olympiad Committee \(AIOC\)](#) [Selection School](#) with a chance to represent Australia at the International Olympiad in Informatics (IOI) in Kazan, Russia, in August 2016. IOI contestants need to use information technology skills for problem analysis, design of algorithms and data structures, coding and testing.

Michelle, Belinda and the other contenders recently completed the 10-day intensive AMOC and AIOC selections schools at Macquarie University that wrapped up on 19 and 20 April respectively. Six IMO and four IOI team members will be officially announced and presented with their Australian team blazers at Parliament House, Canberra, on 20 June.

The [Australian Mathematics Trust \(AMT\)](#), a not-for-profit organisation, coordinates the training and selection for



Belinda Shi

the Olympiad programs. [Optiver](#) is an official sponsor for the AMT's Olympiad programs. The Mathematics/Informatics Olympiads are supported by the Australian Government Department of Education and Training through the Mathematics and Science Participation Program.

Since attending the AIOC Selection School for the first time last year,

Belinda feels that she has 'definitely improved a lot'. 'It's really a lot of fun and you learn so much. It extends you beyond the work that you do at school, and I quite like that', she said. 'While there is still a community perception that learning about programming is more of a male thing to do, I think that people, including females, are realising how great programming can be, how useful it is.'

When Michelle went to her first maths training school for the IMO in 2014 she was the only girl. 'I found the maths really hard at first and I didn't really know anyone, but it got better after I attended a few more training schools', she explained. 'You get an opportunity to talk to people who are also good at maths. You feel a bit competitive, but at the same time everybody is happy to help each other out. I feel comfortable asking other students for help.'

To encourage more school girls to pursue studies in science, technology, engineering and mathematics, the AMT and Australian Science Innovations jointly administer [Curious Minds](#), a hands-on extension and mentoring program for girls. The program is supported by the Australian Government, the Australian National University and PricewaterhouseCoopers.

The future is bright for selection school graduates

Optiver employee and former mathematics Olympian, Sen Lin, shared his experiences with students at the recent selection schools for the international mathematics and informatics Olympiads.

As far back as Sen Lin can remember, he was always 'pretty solid at maths'. The mathematics that he did at school felt routine and easy, but something in Sen changed when he first encountered the Australian Intermediate Mathematics Olympiad.

'This was a lot of firsts for me', Sen explained to a room full of students attending the selection schools for the international Olympiads. His talk was part of a presentation ceremony hosted by Optiver on the evening of Tuesday 12 April.

'It was the first time I used mod bash to solve some number theory problems. It was the first time I used more than one line in a geometric proof. It was the first time I really felt passionate about something.'

Over three years, Sen attended a series of 10-day intensive Australian Mathematical Olympiad Committee (AMOC) Schools of Excellence and Selection Schools, known informally by students as 'camps'.

'Camp after camp, I picked up more and more tricks before eventually being selected for the International Mathematical Olympiad in 2007. It was a dream come true to represent Australia doing something I really enjoyed.'

The experience served Sen well, as he went on to study pure mathematics and actuarial studies at the University of New South Wales (UNSW) and was keen to pursue a career drawing on his mathematics skills.

'I wanted a fast-paced career that would allow me to use those mathematical skills and concepts I had learnt through my years at the camps and apply them to real-world complex problems', Sen explained. 'I discovered a derivative trading firm called Optiver, and heard about the cool problems they were solving using maths. It sounded exactly like what I wanted to do.'

Optiver is one of the biggest market makers of financial products in the Asia-Pacific region, offering trading opportunities on major global financial markets using their own capital at their own risk.

Sen described his job at Optiver as a 'never-ending computer game where you are constantly striving to get to the next level'. 'The work environment is dynamic—the same solution doesn't work forever as competitors adapt their strategies in response to your changes. The problems



Sen Lin addresses the students.

are non-stop and continuously challenging. The high rate of change is exciting to me and something I want to experience in my day-to-day job.'

Other Optiver employees Sampson Wong and Paul Cheung (former mathematics Olympians) and Daniel Berger (former informatics Olympian) also attended the event to speak to students about their experiences. It's clear the skills obtained at camp are highly valuable in the workforce.

Following the talks by Sen, Sampson, Paul and Daniel, Optiver Grad Talent Scout People Leader Martina Carr and AMT Executive Director Mike Clapper presented students from both selection schools with certificates of attendance and Olympiad program t-shirts designed by Optiver.

On Wednesday 20 April, after the completion of both selection schools, Optiver arranged a half-day Mentoring Leadership Program for our Olympiad tutors. This session focused on 'brilliant mentoring' and was facilitated by Optiver's Head of Education, Peter Leong, and Talent, Learning and Growth Leader Megan Bennett. The program enabled these students to step back from the day-to-day activities of the selection schools to learn some tips and techniques to help them get the most out of their mentoring interactions. The session was split into two parts. The first session covered how to use adult learning principles to deliver more engaging training whereby recipients would more likely retain the new knowledge. The second session highlighted the latest research about the brain and discussed how to apply this knowledge to help students perform at their peak. We thank Optiver for providing this excellent program to our Olympiad tutors.

Get your entries in for the Australian Mathematics Competition

The [Australian Mathematics Competition \(AMC\)](#), a fun 30-problem competition which shows the relevance of mathematics in students' everyday lives, is on 28 July 2016. Australia's leading educators and academics, who have a deep understanding of national curriculum standards, design the unique AMC problems each year. Last year students of all levels of ability from year 3 to 12 and from about 3,500 schools participated.

For the first time, we are offering the AMC to schools online. The online version has the same questions as the paper version. The [2016 Online AMC](#) will be open for a limited time period to accommodate students in different time zones—about 36 hours beginning from 28 July. Schools

that cannot run the online competition within the specified time should enter their students into the paper version of the competition instead.

We encourage students to prepare for AMC by signing up to [GetSet AMC](#). This self-paced, online course is designed to help students of all levels prepare effectively for the AMC. Students can get started quickly and easily, without teachers' assistance. We are offering GetSet AMC for \$2 per student to schools that order them with AMC entries. GetSet AMC normally costs \$6 per student.

Get your entries in for the AMC now: www.amt.edu.au/entry/

Have you registered for MCYA Enrichment?

The [Mathematics Challenge for Young Australians \(MCYA\)](#) is a staged program designed to help teachers motivate and develop mathematically interested students in years 3–10. There are three independent stages in the MCYA: Challenge, Enrichment and the Australian Intermediate Mathematics Olympiad. You might have already registered your students for the MCYA Challenge.

Enrichment is a program held over 12–16 weeks within the period from April until September. It is independent of the Challenge stage, but they have the common feature of providing challenging mathematics problems for students, as well as accessible support materials for teachers.

Enrichment comprises six parallel stages of comprehensive student and teacher support notes, for years 4–10. The stages are in order of difficulty with general year level recommendations: Ramanujan (years 4–5), Newton (years 5–6), Dirichlet (years 6–7), Euler (years 7–8), Gauss (years 8–9), Noether (very able students in years 9–10), and Polya (top 10% of year 10). Ramanujan, Newton and Dirichlet have 8 problems, Euler and Gauss have 12 problems, and Noether and Polya have 16 problems.

Don't miss out, register through: www.amt.edu.au/entry/

Congrats to those who sat CAT

Congratulations to all of the students who participated in CAT, our [Computational and Algorithmic Thinking](#) competition. Over 200 students worldwide achieved perfect scores and they are listed [here](#) on the AMT website. More than half of these students sat the online version of the paper.

We wish to thank all of the schools involved for their assistance in running this year's CAT. The competition is the first stage in identifying and training students to represent Australia at the International Olympiad in Informatics (IOI).

This is the second year that we have offered CAT online in addition to the paper version, which will continue to remain as an option for schools. The online version was offered for free and proved very successful: 18,792 students from 331 schools chose the online option. Overall, the CAT entries tripled compared with last year.

We are delighted with school coordinators' and students' strong level of interest in the online version of this competition. We are making improvements in response to feedback received—this will increase both teachers' and students' enjoyment of CAT in the future. Don't forget that your students can prepare for next year's competition through GetSet CAT, a self-paced, online course designed for students of all levels.

We strongly encourage the students who did well and enjoyed CAT to enter the next stage, which is the [Australian Informatics Olympiad \(AIO\)](#). This is a programming competition in which students try to solve a series of problems. This year the AIO will be held on Thursday 1 September. The AMT website provides informatics practice problems and information on how to learn programming.

Australian Statistics Competition

The Australian Statistics Competition (ASC), which is open to years 7–12 students, encourages participants to explore challenging and fun mathematical and statistical concepts as they plan, gather their own data, analyse their results and

create a presentation. They also gain experience working as part of a team. All participants will receive certificates and will be in the running for state and national prizes.

To learn more, visit: www.amt.edu.au/mathematics/asc/

Australia wins FARIO for 9th year running

Congratulations to Australia who, for the ninth year running, has won the French-Australian Regional Informatics Olympiad (FARIO). The first two places were taken by Australian students with third place tied by an Australian and New Zealand student.

Richard Gong from Sydney Grammar School achieved the highest score, while Jerry Mao from Caulfield Grammar School was in second place and Declan McDonnell from Normanhurst Boys High School came equal third.

FARIO is a fun online invitational competition, consisting of three questions, between Australia, France, Belgium and New Zealand. Like the Australian Informatics Olympiad, it also forms part of Australia's International Olympiad in Informatics team selection process. It offers the best high school computer programmers in Australia, France, Belgium and New Zealand a chance to compete against like-minded students from other countries.

The top students and their results are listed to the right.

Name	Country	Score
Richard Gong	Australia	174
Jerry Mao	Australia	167
Declan McDonnell	Australia	152
Qingchuan Zhang	New Zealand	152
Arthur Leonard	France	139
Belinda Shi	Australia	139
Charles Jameson	Australia	139
Clement Chiu	Australia	139
Felix Breton	France	139
Thomas Sepulchre	France	130
Etienne Rossignol	France	119
Theophane Vallaeys	France	110
Alex Socha	Australia	100
Killian Dengreville	France	100