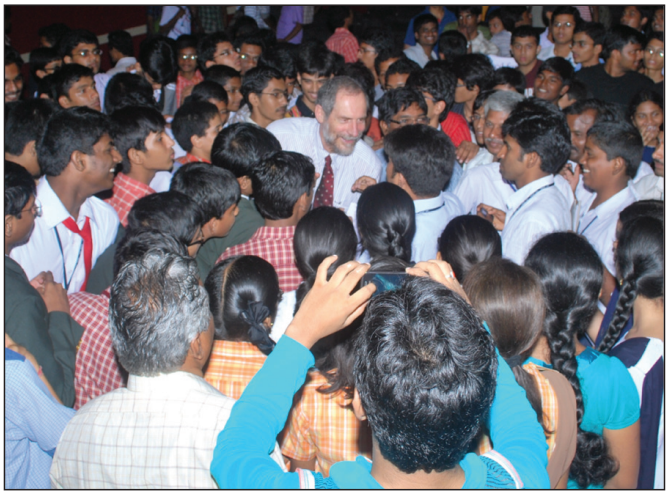
The Public Lectures in Hyderabad

The cover shows the lecture platform in the Global Peace Auditorium in Hyderabad, Andhra Pradesh, India. It was here that were given the public lectures sponsored by the International Mathematical Union during the recent International Congress of Mathematicians.

Few mathematicians attending the ICM witnessed what might have been the most remarkable events associated with it, the lectures given by Bill Barton (Auckand) and Günter Ziegler (Berlin) to thousands of students and teachers from the state of Andhra Pradesh. The lectures seemed to have been extraordinarily successful, and an unusual experience for everyone concerned.



After Bill Barton's lecture.

Barton writes to us:

"Indeed the public lectures were unusual. My experience at the Global Peace Auditorium was very like Günter's.

"I realised that this was not a normal experience as we approached the auditorium and drove through avenues of empty buses with a dawning realization that they had been full of my audience. Indeed it was so, nearly all of the seats seemed occupied (girls and boys separated). I've never had a warm-up act before when I've spoken, but on this occasion a woman exhorted us to meditation and then took the whole audience through a 15-minute session. Consequently my lecture started significantly late—but I was very relaxed!

"I like the presentation of roses in the introduction, and the ceremony of the huge banner and multiple speakers. I'm not sure what effect this has on the audience, except possibly to give them the impression that mathematics is important and highly valued? My talk appeared to go well, but with such an audience, and a raised stage, my normal attempts at humour or interaction did not get very far. Definitely attentive, however. As with Günter's talk, the follow-up was extraordinary. 'Mobbed' is the word, fortunately I refused autograph signing or else it would have been much longer. As it was, I was completely surrounded about six deep for an hour and a half, fielding questions from: 'Who is working on Ramanujan's results now?' and 'How do you explain that i is the square root of -1, how can that be?' through 'Why is something divided by zero equal to infinity?' to 'Where is the best university in the world to study mathematics?' Towards the end there was a photo shoot, and I started to realise what celebrities go through constantly.

"The idea of a mathematics rock star is still one I'm coming to terms with—but I know it is unlikely to be repeated in my own country!

"I was asked to give a second public lecture at rather short notice (three days), and, because it was to teachers, agreed. This was also a different experience. In the hour-long taxi ride through the chaotic streets of Hyderabad I chatted to my escort and became aware that I was not talking to secondary teachers, but to undergraduate college lecturers. Fortunately the trip was long, as I spent most of it adapting my PowerPoint. We arrived at a local college in a heritage building that reminded me of a rather run-down mosque: entry at ground level, but then down into an open space of large stone pillars. Designed, of course, for coolness. Again, elements of celebrity status: a welcoming committee who were standing outside the door (hence my companion's cell-phone account of our trip through the streets) ready to shake hands, being led through the school with two people in front of me shooing students aside so I could walk clearly. Imagine that in any New Zealand university! Ushered into a reception area with twenty people standing around while the Principal and I had coffee and cakes, then to the auditorium: only 200 this time in an old galleried hall. I'm not sure how well my talk went down. It was entitled 'Why are mathematics lecturers like Sachin Tendulkar?'—the answer being, of course, that we are all professionals, and as such should be in a culture of continual professional development. And then talked about renewing our own joy with mathematics with a raft of examples of mathematics and applications that pique my own interest (I had ascertained that most of these people were more like tutors, no research function in their jobs). Just like in New Zealand, the younger lecturers/teachers 'got it', and some of the older ones did not seem to. But again the mobbing, this time for only an hour, including a new triple algebra manuscript thrust into my hand for my evaluation. Part of this reaction, I realized later, was that these teachers had come from all over Andhra Pradesh (as had the student audiences earlier) travelling some hours and long distances. They, rightly, wanted their money's worth. I hope they got it."

You might wonder what you can talk about to about 1,500 students at one shot, or for that matter to 200 teachers from an extremely wide range of backgrounds.

The audience at Ziegler's lecture.

Barton's first audience came from what is called in India *senior schools* in the state of Andhra Pradesh. The title of the first talk was "Where is mathematics taking us?" As for the second, we should mention that Sachin Tendulkar is known throughout India as an outstanding professional cricket player—one of the most famous living persons in the country. The slides for Barton's talks are available at

`https://www.math.auckland.ac.nz/wiki/Bill_Barton`

Günter Ziegler answering questions.

Ziegler's audience was a slightly older group, and slightly larger (1,600 vs. 1,400), and his lecture was titled "Proofs for the book" (a reference to the well-known book by him and Martin Aigler). In his lecture he chose a small number of theorems—asserting, for example, that the rational numbers are countable—that could be demonstrated almost transparently with good illustrations.

We have had some trouble tracking down how the organization of the events proceeded, even with the help of several of the people who took part in the organization! Rajat Tandon (University Of Hyderabad) credits a letter to him from Gérard Tronel (Paris-Jussieu) with inspiration, but Martin Grötschel (Berlin) points out that in principle the International Mathematics Union has always tried to organize public events during the Congresses, and mentions several events during the one in Berlin.

It seems fair to say, though, that the lectures in Hyderabad are just one more piece of evidence that the real potential for a good public interface for mathematics has not yet been really tapped.

The work that went into preparing for these events, perhaps unprecedented in the history of mathematics, must have been prodigious. Finding a suitable venue, negotiating availability, advertising the events, preparing teachers for what was to come at an organizational meeting held more than a month in advance, thinking about security at the lectures (the lectures might well have been a magnet for trouble), possible emergencies, transportation, navigation instructions, parking for a huge number of buses, assigning seats for thousands, even the large banner—these are not problems one usually has to think about for your everyday mathematics lecture.

There is a website at which the lectures can be seen on video:

`http://www.apcce.gov.in/icmpubliclecture.aspx`.

We wish to thank Rajat Tandon and David Kumar Rapaka, (one of the principal local organizers), for supplying information and photographs; also Günter Ziegler, Bill Barton, and Martin Grötschel for their help.

—Bill Casselman
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