International Number Theory Conference in memory of Alf van der Poorten

Noah's on the Beach, Newcastle
12–16 March 2012

http://carma.newcastle.edu.au/alfcon/

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Summary and purpose of the conference

The purpose of this meeting was to commemorate Alf van der Poorten's research and influence in number theory and generally in mathematics. It also presented an exciting opportunity to

- promote and popularise number theoretic research and graduate study in Australia
- initiate collaborative research in number theory within Australia
- attract several distinguished international visitors and strengthen the existing and establish new collaborative international links between Australian and international researchers, and
- give a comprehensive account of recent achievements in theoretical and computational number theory and its applications to cryptography and theoretic computer science.

The meeting attracted a large number of international participants (about 50% of the total number of participants) from all over the world and fully served its purpose. It is also important to note that the meeting attracted researchers of all generations, from world leading experts to mid-career researchers, young faculty, postdocs and PhD students.

Organising committee

- Laureate Professor Jonathan Borwein, University of Newcastle
- Professor Igor Shparlinski, Macquarie University (now at University of NSW)
- Juliane Turner, University of Newcastle
- Associate Professor (now Professor) Wadim Zudilin, University of Newcastle

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Topics covered

Most of the topics were in the general area of number theory, including its analytic, algebraic and computational aspects. Several topics were directly related to Alf's interests and research activities, including Diophantine approximations, linear recurrence sequences, continued fractions, finite automata and even the 'Thrall of Fibonacci'. Most of the talks were devoted to expositions of recent results in these areas, connecting them with Alf's contributions and also giving perspectives for further developments.

The Proceedings have now been published as: Borwein, J.M., Shparlinski, I. and Zudilin, W. (eds) (2013), *Number Theory and Related Fields: In Memory of Alf van der Poorten*, Springer, New York (see www.springer.com/mathematics/numbers/book/978-1-4614-6641-3).

Keynote presenters

- Yann Bugeaud (University Louis-Pasteur, Strasbourg)
- John Coates (University of Cambridge)
- John Friedlander (University of Toronto)
- Frank Garvan (University of Florida)
- Roger Heath-Brown (University of Oxford)
- Harald Helfgott (ENS, Paris)
- Carl Pomerance (Dartmouth College)
- Jeffrey Shallit (University of Waterloo)
- Cameron Stewart (University of Waterloo)
- Michel Waldschmidt (University Paris 6)
- Hugh Williams (University of Calgary)

Report

The workshop brought together many distinguished number theorists, ex-colleagues and co-authors of Alf van der Poorten and also many other who were influenced by his research.

Most of the contributed talks were up-to-date surveys in the areas of number theory closely related to Alf's interests and research activity, such as Diophantine approximations, continued fractions, finite automata and linear recurrence sequences. However, several talks were devoted to some recent striking results. For example, Professor Heath-Brown gave a talk about his current work towards an improvement of the celebrated Burgess bound (that remains essentially unchanged for almost 50 years). These talks were all of very high quality (which was also reflected in almost 100% attendance by all registered participants) and of high educational value. For a example, a talk by Professor Pomerance showed that although computers and numerical tests and computation are of great value and sources of many exciting conjectures, carelessly applied they may lead to totally wrong conclusions. All contributed talks were also about very recent results, in

some cases even about work in progress, so they allowed the audience to visit the forefront of the relevant research activities.

The talk schedule, allowing plenty of time for questions, helped speakers to fully answer (always numerous) after-talk queries and receive some suggestions from the audience. The logistic of social activities and coffee breaks (always around tables or near whiteboards) stimulated informal discussion and established new links between the participants. It is safe to assume that these links will eventually firm and lead to active collaboration.

Many of the foreign and interstate visitors used this opportunity to visit other Australian universities. For example, Professor Heath-Brown (Oxford University) visited the University of Melbourne and gave a colloquium talk. Professors Brent (ANU), Deshouillers (University of Bordeaux) and Pomerance (Dartmouth College) attended a follow-up workshop at Macquarie University, also attended by some other Australian and international participants.

We believe the workshop has had a great impact on the Australian mathematical community. It decisively confirmed the place of Australian number theory research on the word map. The forthcoming volume of the conference proceedings (to be published by Springer) will leave a permanent record of this exciting and very useful meeting.

Organisers' opinion of success

Appendix 1. Event feedback

As mentioned before, participant feedback was unanimously positive. Participants commented positively on the venue, the quality of the audio and presentation equipment, the social activities, the conference dinner, and, especially, the quality of all the speakers and the balance and variety of the program.

High attendance at all talks (despite really tempting outdoor surroundings), is yet another indicator of the high level of this meeting. We believe that new international and domestic collaborations have been established as well. In the month after the meeting ended we received many emails of thanks and certainly at CARMA recent visitors had already heard glowing reports from participants.

Photographs are available at http://carma.newcastle.edu.au/alfcon/photos/.