Emil Artin International Conference
Reflection report

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1 Background

The *Emil Artin International Conference* took place in Yerevan between May 27 and June 2 2018. The conference is, of course, named in the honour of Emil Artin, one of the most famous and influential mathematicians of the last century. Needless to say, the topics of the conference were close to Artin's own interests, and focused mostly on various aspects of algebra, logic and discrete mathematics. The talks presented displayed were varied and touched on many different areas of mathematical research, including Boolean functions, cryptography and applied mathematics which made the event particularly interesting for COINS students. The program included talks by twenty-three invited speakers, including Fields medalist Efim Zelmanov from the University of California among others. Naturally, there was a number of contributed talks (including talks by COINS students), and an excursion, banquet and other social activities provided a very pleasant contrast to the fascinating scientific side of the conference.

The event was organized by the Armenian Mathematical Union, the Institute of Mathematics of the National Academy of Sciences of Armenia, Yerevan State University, the American University of Armenia and the University of Bergen, among others. Attending the conference was an exceptionally productive and equally pleasant experience for me, and I am grateful to COINS for providing the financial support which made this possible.

2 Overview of Selected Talks

As outlined above, the Emil Artin Conference was an extremely large event which attracted a lot of international attention, and the number of talks presented at the venue, as well as the variety of subjects treated, was proportionately large.

Several talks were given by members of our department at the University of Bergen. My supervisor, Lilya Budaghyan, gave a talk with the title "On Optimal Cryptographic Functions", which unsurprisingly coincided very well with the topic of my research. In addition, my colleague Diana Davidova presented the talk "Magic Action OF o-Polynomials and EA-equivalence Of Niho Bent Functions". Finally, I was given the opportunity to speak about my own re-

search on the distance between almost perfect nonlinear (APN) functions in the talk "Changing Points of APN Functions".

The remaining talks did not pertain directly to the field of cryptography as they mostly focused on theoretical problems and mathematical techniques. Nonetheless, this does not mean that the topics presented were irrelevant to our research: as is well known, a large number of cryptographic algorithms and protocols rely on the complexity of solving certain mathematical problems, e.g. the problem of factoring the products of large prime numbers. Some of the talks, therefore, were of interest in the sense that they discussed problems applicable to the theoretical foundations of cryptography, while others focused on general techniques and approaches that can be useful in any area of mathematical research.

Efim Zelmanov's talk was titled "Groups Satisfying Polynomial Identities" and concerned prounipotent and pro-p groups satisfying an identity. The talk "Counting Ray Class Characters and the Artin Primitive Root Conjecture" by Joshua Zelinsky focused on approximating certain sums related Artin's primitive root conjecture (which states that a given $-1 \neq a \in \mathbb{Z}$ which is not a perfect square nor is a primitive root modulo infinitely many primes p). Yuliya Zelenyuk's talk, "Counting Symmetric Bracelets", was an interesting excursion into combinatorics and graph theory, and focused on counting the exact number of certain combinatorial structures. Another interesting talk was "Varieties and Hypervarieties of Algebras and New Discrete Mathematical Functions" by Yuri Movsisyan, which focused on more theoretical questions in abstract algebra.

Overall, the conference presented a unique mixture of interesting topics and provided me with the opportunity to interact with a multitude of interesting people and ideas from various areas of mathematics, as well as to visit Armenia's capital of Yerevan, which at least for me is an exotic and endlessly fascinating destination. Once again, I express my gratitude to COINS for making all of this possible.