

Highlights from Day 1 and Day 2 of the 4th Heidelberg Laureate Forum

by Manjil Saikia - Thursday, September 22, 2016

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What would you expect from a forum that has the superstars of mathematics and computer in a single venue with 200 eager young researchers? Nothing less than magic! The energy and vibrancy of the 4th Heidelberg Laureate Forum (HLF) that is underway was evident right since the opening ceremony. Day 1 and Day 2 were only building up the excitement amongst the young researchers and the established giants.

Day 1 of the HLF started with two marvelous talks by John E. Hopcroft and Sir Michael Atiyah. Prof. Hopcroft decided to speak about the major research directions in computer science that young people could look into. He did that with examples from three branches and introducing the work of his students as well as himself in topics ranging from deep learning to social networks. The fabric of a social network, how it is interconnected is a major research problem today with the advent of social networking giants like Facebook and Twitter. The complex dynamics carries within it various structures which can be studied and segregated with tools from mathematics and computer science, Prof. Hopcroft explained this using examples from social networking profiles of Rice University students where they could isolate trends to a great amount of accuracy.

Sir Michael Atiyah, the doyen of mathematics for a long time, and winner of both the Fields Medal and the Abel Prize spoke at length about different aspects of mathematics, its professionals as well as the philosophy behind different things. His lecture, interspersed with witty remarks (read more on this [here](#)) was a delight, with an accent that was a bit difficult to understand in the beginning considering the author's non-native English speaking skills, it moved pretty fast to things from Platonism and Moore's law to the philosophy of what a solution means to different customers.

The morning session was completed with two more talks from Nobel Laureate Brian Schmidt who spoke about his work on the expansion of the universe. In his very illuminating talk, he explained how he did his painstaking research with his team to calculate that the universe is actually expanding. In the question answer session, he explained very well a question from the audience about whether if the universe is expanding, then is the auditorium also expanding where the lecture was being held? The other talk in the morning was on the work of the German Computer Scientist and entrepreneur Konrad Zuse, who created the world's first programmable computer, a separate exhibition on his work curated by the speaker Raul Rojas was also an absolute delight to visit. We shall follow up on the work of Konrad Zuse in a latter post.

On Day 2, the big talks were by the [2016 Abel Prize winner](#) Sir Andrew Wiles who spoke about his breakthrough proof of the [Fermat's Last Theorem](#), a result that eluded almost four centuries of mathematical geniuses until Sir Wiles proved it in 1994-95 with the help of his colleague Richard Taylor. One of the other morning talks were by Fields Medalist Ngo Bao Chau on the Riemann zeta function and its generalizations. The talk was a bit more technical than the other talks so far, but he did manage to give

a general idea about the field and also mention lot of recent work on different generalizations of this important function in number theory.

The computer science talks on Day 2 were delivered by Joseph Sifakis on the nature of computing, where he went into domains philosophical as well as scientific, while Fred Brooks gave a very illuminating talk on virtual reality and dealt on questions such as how real is virtual reality and so on. With means of some experimental data as well as cutting edge computing, he showed and motivated the topic of virtual reality and how it stands in today's scientific edifice.

The highlight of Day 2 was also a Hot Topic discussion on Artificial intelligence (AI), which had a panel discussion on how could be used to solve problems as well as what are the philosophical and moral implications of AI. This was an apt moment considering the much talked about launch of Google Allo recently which uses AI in a brilliant new way. Raj Reddy, one of the panelist in the discussion suggested to develop an AI app which could in principle be used in two clicks by any person to access some information he wants via means of speech input, this he opined could help solve major problems in third world nations and suggested that such an app could be in principle used by about 2-3 billion people worldwide. The discussion that followed led to some interesting observations on this app.

The detailed abstracts of all the talks can be found [online](#), as well as the [videos of the talks](#).

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