Furstenberg and Margulis to share the Abel Prize

The Norwegian Academy of Science and Letters has decided to award the Abel Prize for 2020 to
Hillel Furstenberg, Hebrew University of Jerusalem, Israel and
Gregory Margulis, Yale University, New Haven, CT, USA

*"for pioneering the use of methods from probability and dynamics
in group theory, number theory and combinatorics"*

Hillel Furstenberg and Gregory Margulis invented random walk techniques to investigate mathematical objects such as groups and graphs, and in so doing introduced probabilistic methods to solve many open problems in group theory, number theory, combinatorics and graph theory. A random walk is a path consisting of a succession of random steps, and the study of random walks is a central branch of probability theory.

"The works of Furstenberg and Margulis have demonstrated the effectiveness of crossing boundaries between separate mathematical disciplines and brought down the traditional wall between pure and applied mathematics," says Hans Munthe-Kaas, chair of the Abel committee.

He continues: "Furstenberg and Margulis stunned the mathematical world by their ingenious use of probabilistic methods and random walks to solve deep problems in diverse areas of mathematics. This has opened up a wealth of new results, such as the existence of long arithmetic progressions

of prime numbers, understanding the structure of lattices in Lie groups, and the construction of expander graphs with applications to communication technology and computer science, to mention a few."

Hillel Furstenberg

Hillel Furstenberg was born in Berlin in 1935. His family was Jewish and they managed to flee from Nazi Germany to the U.S. in 1939. Sadly, his father did not survive the journey, and Furstenberg grew up with his mother and sister in an orthodox community in New York.

When he published one of his early papers, a rumor circulated that he was not an individual but instead a pseudonym for a group of mathematicians. The paper contained ideas from so many different areas, surely it could not possibly be the work of one man? Following a career in mathematics at several universities in the U.S., he left the country in 1965 for the Hebrew University of Jerusalem, where

he stayed until his retirement in 2003. Spending most of his career in Israel, he helped establish the country as a world center for mathematics. Furstenberg has won the Israel Prize and the Wolf Prize.

Gregory Margulis

Gregory Margulis was born in Moscow in 1946. From early on he showed a unique talent in mathematics. In 1978, he won the Fields Medal at only 32 years old but was unable to receive the medal in Helsinki since the Soviet authorities refused him a visa.

He was one of the top young mathematicians in the Soviet Union but was unable to find a job at Moscow University as he faced discrimination for being of Jewish origin. Instead, he found work at the Institute for Problems in Information Transmission. He was only allowed to travel abroad in 1979 when Soviet academics were given more personal freedoms. During the 1980s he visited academic institutions in Europe and the U.S. before settling at Yale in 1991, where he has been ever since.
Margulis is a winner of the Lobachevsky Prize and the Wolf Prize.

Due to the ten years age difference and the travel restrictions of the Soviet authorities, the laureates did not formally collaborate, however, they influenced each other's work.

About the Abel Prize:

- Due to the corona pandemic there will not be a physical Laureate ceremony on May 19 this year. The honoring of the Abel Prize Laureates will be announced later.

- The Abel Prize is funded by the Norwegian Government and consists of MNOK 7.5 (USD 834,000).

- The prize is awarded by the Norwegian Academy of Science and Letters.

- The choice of the Abel laureates is based on the recommendation of the Abel Committee, which is composed of five internationally recognized mathematicians.

- For more information, please visit www.abelprize.no

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