NITheCS
National Institute for
Theoretical and Computational Sciences

COLLOQUIUM

An Arts and Mathematics interaction based on paintings involving Ulam's spiral

Prof Stéphane Vinatier (University of Limoges, France)

DATE: Monday, 27 January 2025 | 16h00–17h00 SAST

VENUES:
- Neelsie Cinema, Stellenbosch University
- Online

--- A recording of the talk will be published on the NITheCS YouTube channel afterwards ---

ABSTRACT

The story begins with a series of hundreds of paintings by British artist Reg Alcorn. Reg was born and grew up in Zambia in the fifties and has lived in France for decades until today. I shall describe the mathematical tools he used to design the geometric structure of the paintings of this series: Truchet tiles, which have their own trace both in history of combinatorics and of decorative arts, and Ulam's spiral. Arranging the natural numbers in the form of a spiral on a sheet of paper, during a "boring conference" in the sixties, mathematician Ulam had the surprise to see rows of prime numbers appear. With his two collaborators Stein and Wells, he was able to explain these alignments by the high rate of prime values of certain polynomial functions evaluated at integers. This is easy to understand once we learn how to position points in the spiral. Nevertheless, their observation is linked to fundamental contemporary issues about the repartition of prime numbers among integers, that we shall briefly overview. Another question is about alignments themselves: which polynomials produce alignments when we position their values at integers in the spiral? And what kind of figures are produced by other polynomials? I shall present partial answers obtained in a joint work with Sophie Marques from Stellenbosch University.

BIOGRAPHY

Stéphane Vinatier is a Professor in Mathematics at the University of Limoges, France. His research is conducted within the XLIM laboratory, which is affiliated with CNRS. Since completing his PhD, he has specialised in algebraic number theory, focusing on the Galois action on invariants in number field extensions under specific ramification conditions. His work also extends to related mathematical domains, like combinatorics and linear algebra. He is currently collaborating with Dr Sophie Marques (Stellenbosch University) on a project exploring alignments in Ulam's spiral.

Stéphane has contributed to the French network of research institutes in mathematics education, serving as its head for two years. He continues to engage in experimental education projects, collaborating with a small group of teachers to explore topics such as modelling in school curricula. He is also interested in mathematics diffusion, particularly through interactions with art. He enjoys teaching a wide array of subjects at various university levels, ranging from probability and finite fields to cryptography and LaTeX.

REGISTER
TO ATTEND
https://bit.ly/3BqSIkP

SUBSCRIBE
TO THE
NITheCS MAILING LIST:

science & innovation
Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

National Research Foundation

Stellenbosch
UNIVERSITY
IYUNIVESITHI
UNIVERSITEIT