

Univerza na Primorskem

Titov trg 4
6000 Koper

VABILO NA AKTIVNOSTI PROJEKTA OOOZANANOST!

Those who say maths has no colours have not met association schemes yet!
When symmetry and regularity come into play together...

Kdaj: 22. april 2026, ob 16.00

Kje: UP Famnit (Glagoljaška 8, 6000 Koper)

Izvajalec: dr. Giusy Monzillo

Opis:

Since the ancient determination of the five Platonic solids, the study of symmetry and regularity has always been one of the most fascinating aspects of mathematics, and even nowadays, there are many challenging problems in this area. One intriguing phenomenon is that the arithmetical regularity properties of an object often imply both the uniqueness of the object and the existence of numerous symmetries. This interplay between symmetry and regularity forms the core of the present lecture.

Mathematically speaking, graphs and association schemes easily interpret many symmetry and regularity properties, mainly because the very nature of these peculiar mathematical tools makes them incredibly versatile, convenient to use: association schemes can be roughly understood as special collections of coloured graphs, i.e., nice structures made of “points” that are all connected via distinctly coloured “lines”. For instance, if we consider a (regular) hexagon in a plane, we can choose red to colour its perimeter, green to colour its two inscribed triangles, and blue to colour its three diagonals; in such a way, we partition all edges in a hexagon (connecting every two vertices, we get a complete graph with 15 edges) into three distinct colour classes and obtain an association scheme consisting of three coloured graphs: the red perimeter, the green triangles, and the blue diagonals. In light of this naive but very effective example, we can imagine an association scheme to be a special colour palette for colouring sufficiently regular mathematical structures: association schemes, by assigning colours, can highlight the most beautiful aspects of a studied object, i.e., the symmetries! Much more about the beauty of mathematical symmetries will be revealed during the lecture, along with some curiosities on everyday life topics seen through the lens of association schemes.

LAŽNE NOVICE IN TEORIJE ZAROTE? OPOLNOMOČIMO (SE ZA) ZNANOST! (oooZnanost!)

O predavateljici:

Giusy Monzillo was born in March 1993 in Battipaglia, Salerno, Italy. She graduated in Mathematics from Università degli Studi della Basilicata (Unibas), Potenza, Italy, in February 2016. Giusy received her Master's degree in Mathematics from Unibas in June 2018, where her mathematical interests were Algebra and Geometry. She obtained her Ph.D. in Mathematics from Università del Salento, Lecce, Italy, in June 2022. Since October 2022, she has been a researcher and lecturer at the Faculty of Mathematics, Natural Sciences, and Information Technologies of the University of Primorska, where she has recently been promoted to Assistant Professor. Her current research interests include Algebra, Combinatorics, Graph theory, and Finite Geometry.

(predavanje bo izvedeno v angleščini)