beyond

BORDERS

20 – 24 MAY

T4EU week courses

beyond

Symmetry in Graphs

The aim of this course is first to introduce the most commonly studied form of symmetry in graphs, namely that of vertex-transitive graphs, and then to study combining vertex-transitivity with other kinds of symmetry, such as arc-transitivity and edge-transitivity. Vertex-transitive graphs can be described as graphs in which no two vertices can be differentiated from each other, and similarly for other kinds of symmetry. Vertex-transitive graphs are not only interesting mathematically, but are often used as 'uniform' models, particularly in theoretical computer science. Additionally, they are a frequent class of graphs used to try to understand difficult problems, not necessarily related to symmetry. The course will start at the beginning, and will also cover any necessary permutation group theory. A particular aim will be to prove some celebrated work of W.T. Tutte on s-arc-transitive graphs, with some applications of those results...

LANGUAGE: English
ECTS: 3
Max. participants: 50

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ZELENA, DIGITALNA IN VKLJUČUJOČA
Univerza na Primorskem
VERDE, DIGITALE E INCLUSIVA
Università del Litorale

BSC, MSC and PhD Students
of mathematics
and computer science

Symmetry in Graphs

**Prof. Dr.
Edward Tauscher Dobson**

University of Primorska

Ted Dobson is a professor at the University of Primorska, Faculty for Mathematics, Natural Sciences and Information Technologies. He obtained his PhD at Louisiana State University in 1995 under the supervision of Béla Bollobás, followed by a postdoctoral position with Dave Witte Morris at Oklahoma State University. Before moving to Slovenia in 2018 he was a professor at Mississippi State University in the United States of America, where he received the Mississippi State University College of Arts and Sciences Research Award for his research in algebraic graph theory.

He is the author (together with Aleksander Malnič and Dragan Marušič) of the book »Symmetry in Graphs,« which was published by Cambridge University Press in the series Cambridge Studies in Advanced Mathematics in 2022. The book begins with the basic material, leading the reader towards major problems and many active research themes of this fast-growing field, which forms a part of algebraic graph theory. The authors motivate the detailed discussion of individual topics that follow the introduction. It is concerned with the study of highly symmetric graphs, particularly vertex-transitive graphs, and other combinatorial structures, primarily by group-theoretic techniques. Investigations of the field shed new light on permutation groups and related algebraic structures. Featuring many examples and over 450 exercises, it is an essential introduction to the field for graduate students and a valuable addition to any algebraic graph theorist's bookshelf.

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