# Report on the minisymposium *Spectral Graph Theory* held at the 16th ILAS Conference, Pisa, June 21–25, 2010

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Spectral graph theory is a fast developing field in modern discrete mathematics with important applications in computer science, chemistry and operational research. By merging combinatorial techniques with algebraic and analytical methods it creates new approaches to hard discrete problems and gives new insights in classical linear algebra.

The 16th Conference of the International Linear Algebra Society (ILAS) was held in Pisa, Italy, at Palazzo dei Congressi from June 21–25, 2010. Besides the special, plenary and contributed talks, the conference consisted of a number of minisymposia, two of which were interesting for spectral graph theory community: minisymposia on Combinatorial Linear Algebra (CLA) and on Spectral Graph Theory (SGT).

These two minisymposia brought together leading researchers on graph spectra from Europe and Americas and served as sort of a meeting point for spectral graph community this year.

The CLA minisymposium was organized by Shaun Fallat and Bryan Shader, and it was held on Monday and Tuesday (June 21-22).

The SGT minisymposium was organized by Vlado Nikiforov and Dragan Stevanović, and it was held on Tuesday and Wednesday (June 22-23). Both minisymposia were held in the same room, with about 80 seats. However, during some lectures on the first day of the SGT minisymposium about 20-30 people were standing in the audience as well! Besides established researchers, lectures at the SGT minisymposium were also given by two doctoral students from Serbia (Aleksandar Ilić and Bojana Mihailović).

Right after the SGT minisymposium, initial discussions took place that the next Spectral Graph Theory workshop/conference be organized in 2012 (following a quite natural sequence of workshops held in Aveiro in 2006, Rio de Janeiro in 2008 and these minisymposia in Pisa in 2010).

# Speakers and lecture titles

Among the speakers at the Combinatorial Linear Algebra minisymposium were:

- Shaun Fallat, University of Regina, Canada,

- Willem Haemers, Tilburg University,

- Leslie Hogben, Iowa State University,

- Raphael Loewy, Technion-Israel Institute of Technology,

- Vladimir Nikiforov, University of Memphis, USA, and

- Dragan Stevanovic, University of Nis, Serbia.

The Spectral Graph Theory minisymposium consisted of 11 lectures. The following lectures were held on Tuesday:

- Dragos Cvetkovic, Mathematical institute SANU, Belgrade, Serbia:
  *Some topics on integral graphs*

- Nair M.M. de Abreu, Federal University of Rio de Janeiro, Brazil:
  *Constructing infinite families of ALQ-integral graphs*

- Sebastian Cioaba, University of Delaware, USA:
  *Decompositions of graphs and hypergraphs*

- Steve Kirkland, University of Ireland, Maynooth:
  *Algebraic connectivity and vertex-deleted subgraphs*

- Francesco Belardo, University of Messina, Italy:
  *The structure of graphs with small M-indices*

- Domingos Cardoso, Universidade de Aveiro, Portugal:
  *Graph Eigenvalues in Combinatorial Optimization*

The following lectures were held on Wednesday:

- Turker Biyikoglu, Isik University, Istanbul, Turkey:
  *Graphs of given order and size and minimal algebraic connectivity*

- Aleksandar Ilić, University of Niš, Serbia:
  *Distance spectral radius of trees*

- Enide Andrade Martins, Universidade de Aveiro, Portugal:
  *A generalization of Fiedler's lemma and some applications*

- Bojana Mihailović, University of Belgrade, Serbia:
  *Forbidden subgraphs for some classes of treelike reflexive graphs*

- Josef Leydold, WU Vienna, Austria:
  *Extremal graphs with minimal k-th laplacian eigenvalue*

The slides of all lectures held at the SGT minisymposium are posted at the web site of the Research Project 144015G.