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Recent Results in Designs and Graphs: a Tribute to Lucia Gionfriddo

edited by

Marco Buratti, Curt Lindner, Francesco Mazzocca and Nicola Melone

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- Revisiting constructions of v_k configurations: **05B30, 05B20**.
- 2-Factors of regular graphs: a survey: **05C70, 05C38, 05C75**.
- A survey of Lucia Gionfriddo's results about colourings in \mathbf{BP}_3 -designs: **05B05, 05C05, 05C10**.
- What are graph amalgamations? : **05C70, 05C15, 05C40, 05B40**.
- Percolation in the k -nearest neighbor graph: **60K35, 82B43, 05C80**.
- Bidegreed unicyclic graphs with minimum spectral radius: **05C50**.
- Lucia Gionfriddo's results about nesting in G -designs: a survey: **05B05, 05C05**.
- Extra 2-perfect twofold 6-cycle systems: **05B30**.
- A hierarchy of balanced graph-designs: **05C70**.
- Cyclic kite-designs of order v that are cyclically embedded into a cyclic $(v, 4, 2)$ -design: **05B30, 05C51**.
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- An introduction to whist tournament designs including a detailed summary of all \mathbb{Z} -cyclic $\text{Wh}(v)$, $4 \leq v \leq 24$: **05B05**.
- Colourings of graphs by k -matchings: **05C15, 05C51**.
- Regular cycle systems in complete n -partite graphs: **05C70, 05C38**.
- Upper chromatic number and strict colorings of quadruple systems: **05B05, 05C05, 51E10**.
- Voloshin colourings of mixed hypergraphs derived from graphs: **05C15**.

- Embedding a $TS(v, 1)$ into a $TS(w, \lambda)$, $\lambda \geq 2$: **05B07**.
- On the adjacent vertex distinguishing edge colorings of direct products of graphs: **05C15**, **05C38**.
- On the embedding of any path design into a balanced path design: **05B05**.
- On eigenspaces of some compound graphs: **05C05**.
- Existence and embeddings of resolvable group divisible designs—a survey: **05B05** , **05B30** .
- The story of Graceful Collages (breaking the harmony, for a better one): **05C78**.

Preface

This volume of *Quaderni di Matematica* is devoted to the memory of *Lucia Gionfriddo*, who died at the age of 34 in July 2008.

Lucia received her PhD in Mathematics in 2002, defending a thesis entitled "Nesting of G-designs", at the University of Catania, where she also was a researcher and a teacher. Lucia's scientific work dealt mainly with Graph Theory and Design. During her research activities her scientific and human qualities were very much appreciated by colleagues and co-authors from all over the country. They demonstrate their respect and friendship for her with their commitment to this editorial project.

Before her untimely passing Lucia proved to be not only a creative and productive researcher and teacher, but also a great person, for her cheerfulness, friendliness and generosity. This book therefore is dedicated as a homage by her friends in the international combinatorial mathematics community.

The Editors are indebted to the Authors of the papers in this volume, who took much time from their busy schedules to put together a set of outstanding contributions. A special thanks goes to the Referees who gave a remarkable support in the review process, which was thorough and demanding, leading this editorial project to success.

We would like to conclude with two sentences from the obituary for Lucia, written by our colleague Mario Marchi on the "Notiziario dell'Unione Matematica Italiana" : *Lucia, with her marvellous smile, was an unforgettable, enriching and profound presence in our scientific world and we will always have her in our hearts. Warm and affectionate with her friends, she was a sought after and precious research colleague. She was also highly admired by her students as a fascinating, lovely and competent teacher in the world of her faculty. Lucia was a great source of encouragement, assistance and prospects.*

Marco Buratti, Curt Lindner, Francesco Mazzocca and Nicola Melone

