AUSTRALASIAN JOURNAL OF COMBINATORICS
Volume **69(3)** (2017), Pages 292–305

Special Issue in Honour of Mirka Miller

GUEST EDITOR: BRIAN ALSPACH*

Mirka Miller: An Introduction

Mirka Miller sadly passed away on January 2nd, 2016, in Newcastle, Australia, just six months after being diagnosed with gastro-oesophageal cancer.

Mirka was born on May 9th 1949 in Rumburk, Czechoslovakia. Her parents were both strong members of the Communist Party with her mother being a branch official who took time away from duties to have four children in four years. She was then instructed to return to duties and promptly left the party—a bold move. This also imbued in Mirka disrespect for mindless bureaucracy—everywhere. At an early age,

* School of Mathematical and Physical Sciences, University of Newcastle, Newcastle, NSW 2308, Australia

Mirka showed an aptitude for Mathematics and majored in MatFyz (Mathematics and Physics) at school. She went on to tertiary studies in Mathematics at Charles University but did not complete her degree. When the Soviet tanks rolled into Wenceslas Square, Mirka rolled out and came to Australia.

Despite having no English and being culturally isolated, Mirka soon made her home in Australia. During her early years in her new adopted country, Mirka worked at several jobs, played volleyball for New South Wales and Australia, married, had a son (Filip) and returned to her studies, finally completing a B.A. from the University of Sydney. Mirka then spent two years living on Lord Howe Island working as a programmer for NSW Parks and Wildlife, playing tennis, making pottery and supporting her husband Ben as he successfully rescued the Lord Howe Island Woodhen from extinction.

After her marriage broke up, Mirka and Filip moved to Armidale where she returned to her studies gaining an M. Litt. with Ernie Bowen as supervisor, an M.A. with fellow expatriate Ivan Friš as supervisor, and eventually a PhD in Security of Statistical Databases under Jennifer Seberry. This last Mirka completed in two and a half years as an external and part-time candidate.

Although she had been employed as a tutor and lecturer at the University of New England, Mirka's academic career took off when she accepted a position as Senior Lecturer in the Faculty of Engineering at the University of Newcastle. Although for many years the only female academic in the faculty, Mirka became Associate Professor and Assistant Dean (Postgraduate Research).

It was at Newcastle that Mirka first began to supervise PhD students and it was here that she developed her Rule 1: "Be nice to your supervisor". By this she meant general advice (not just to apply to her) and by nice she did not mean buy your supervisor chocolates or send a postcard when travelling. She meant communicate. Do the work your supervisor sets. If you cannot complete the work, bring to your supervisor your attempts and problems that you encountered. Make it fun for the supervisor to work with you and she will always have time for you. Almost all students followed this advice and Mirka was happy when her students passed this advice on to their own students.

All Mirka's students loved her and loved working with her and all would agree that the most valuable thing she had done for them was to introduce them to collaborators around the world. Mirka's students graduated with not just a degree but with a network of colleagues and co-authors working in similar fields. Mirka herself was also included here and she continued to work with her ex-students long after they graduated.

Mirka's love of working in collaboration was manifest in her love of conferences. Whether it be a train trip in the USA, a boat cruise on the Danube, botanical gardens in Jakarta or a castle in Slovakia, Mirka would look around and announce "You could hold a conference here". Mirka not only attended many conferences, she initiated some as well: International Conference on Combinatorial Algorithms (IWOCA), 1988; International Conference on Graph Labeling (IWOGL),

2003; International Conference on Optimal Network Topologies (IWONT), 2005; and GraphMasters (2010). All these workshops and conferences are still going strong. Mirka was also guest of honour at the first International Conference on Graph Theory and Information Security (ICGTIS) in 2008 which was held to celebrate her birthday.

Mirka was twice appointed as UNESCO-TWAS (The World Academy of Science) visiting Professor to Indonesia (2003 and 2005) and organised CIMPA-UNESCO schools in

- Bandung, Indonesia, 2009, Extremal Problems and Hamiltonicity in Graphs
- Vientiane, Laos, 2014, Graph Labelings, Graph Decompositions and Hamiltonian Cycles
- Havana, Cuba, 2016, Mathematical Models for Security Applications (posthumously).

One word people often use to describe Mirka is generous. It has been noted that she would rather use an idea to groom a co-author than take sole credit for it. Mirka was also generous with her time and as well as her prolific output and supervising of students she was still happy to contribute to the community. Mirka refereed many journal and conference papers, examined several PhD and Masters theses including sitting on a PhD jury on six occasions, and assessed grant proposals for Australian and international agencies. She was a member of the editorial board of

- Australasian Journal of Combinatorics
- MIHMI (Journal of the Indonesian Mathematics Society)
- AKCE International Journal of Graphs and Combinatorics
- Acta Mechanica Slovaca
- Advances and Applications in Discrete Mathematics

As well as the many positions Mirka held on University committees, she was also Vice-President of the Institute of Combinatorics and its Applications, member of the ARC College of Experts, and member of Steering Committees of the conferences she founded. While Professor and later Emeritus Professor at the University of Newcastle, Mirka was also a Conjoint Professor at Kings College, London, ITB, Bandung, Indonesia and the University of West Bohemia, Pilsen, Czech Republic.

Of course student scholarships and conferences are not cheap. Mirka had success with grant applications, having been awarded:

- ARC Discovery grants, 2016 and 2004
- Marie Curie Professorship, 2013
- French-Australian Science and Technology (FAST), 2008
- Leverhulme Foundation, 2007
- Royal Society grants, 2006, 2009 and 2011
- Raybould Fellowship, 2004
- ARC Linkage grant, 2003

- Many private sources including Kersley Group Ltd. Hong Kong, China Bank, Projekt QUE, Jakarta, AusAid and AIDAB.

As busy as she was, Mirka was able to relax though her mind did not seem to. She loved nothing more than basking on a beach and occasionally dipping into the salty water. But even there she would often be found with a pencil and paper working through whatever problem had her in its grasp. She enjoyed tennis and loved volleyball. Mirka was a wonderful entertainer and enjoyed hosting large groups of people at home. But her flair for cooking was instinctive and many times people would praise her cakes and dishes and ask for the recipe. However, often they were met with an apologetic look and the explanation that she did not work from a recipe and while she might remember ingredients, she had no idea of quantities beyond "what seems right".

Mirka died far too young. If there is any consolation it is that she is now reading The Book (cf. Pal Erdős) and, as Miquel-Àngel Fiol said, she must be happy knowing the solution to the problem of the Moore Graph of degree 57. That is a comfort to those of us who knew her, love her and miss her.

Mirka's PhD Students

1. Edy Tri Baskoro, 1996, "Optimal Interconnection Networks"
2. Paul Manuel, 1997, "Sequential and Parallel Algorithms on Balanced Graphs"
3. Ljiljana Brankovic, 1998, "Usability of Secure Statistical Database"
4. Martin Sutton, 2001, "Summable Graph Labelings and their Applications"
5. Slamin, 2002, "Diregularity of Digraphs Close to Moore Bound"
6. Rinovia Simanjuntak, 2003, "Distance Related Problems in Graph Theory"
7. Yuqing Lin, 2004, "Topology and Connectivity of Networks"
8. Yus M. Cholily, 2005, "Large Directed Graphs" (with Edy Tri Baskoro)
9. Hoang Minh Nguyen, 2005, "Interconnection Topologies for Low-Cost Networks"
10. Kiki Ariyanti Sugeng, 2006, "Magic and Antimagic Labeling of Graphs"
11. Geoff Skinner, 2007, "Mobile Agent Computing" (with Elizabeth Chang)
12. Jakub Teska, 2008, "Graphs with Bounded Degree" (with Zdeněk Ryjáček)
13. Nacho López, 2008, "Contribucion al Estudio de Excentricidades en Grafos Dirigidos" (with Joan Gimbert)
14. Dafik, 2009, "Structural Properties and Labeling of Graphs"
15. Jianmin Tang, 2009, "Variations of Classical Extremal Graph-Theoretical Problems: Moore Bound and Connectivity"
16. Guillermo Pineda-Villavicencio, 2009, "Improving Upper and Lower Bounds on the Order of Large Graphs under Degree and Distance Constraints"
17. Hebert Pérez-Rosés, 2011, "Extremal Graph Theory"
18. Kim Marshall, 2011, "Investigating Properties of Dynamic Networks"
19. Oudone Phanalasy, 2013, "Antimagic Labellings of Graphs"
20. Ramiro Feria-Purón, 2015, "Large Interconnection Networks with Given Degree and Diameter" (with Joe Ryan)

Publications of Mirka Miller

Mirka Miller has published over 200 articles in academic journals and refereed conference proceedings. An inaccurate and possibly incomplete list of publications is available through Google Scholar. A complete list of publications is not feasible at the time of writing, as articles and at least one book are still to appear. When available, a complete list will be displayed at `www.graphtheorygroup.com`. All citations mentioned are from Google Scholar.

The fields in which Mirka has produced most significant results are graph theory, data security, and combinatorial algorithms. Some of her more well cited (and favourite) articles are listed below. This selection documents her versatility and openness to novel ideas.

One of her foremost and most cited results in the field of algorithms concerns the Train Marshalling Problem (TMP), also known as the Chinese Train Problem since it arose from arrangements of freight cars in China. A train marshalling yard is a railroad yard, found at freight train stations, used to separate railroad cars onto one of several tracks. The train marshalling problem is to determine the minimum number of tracks needed to rearrange a train of n cars so that the cars going to the same destination are grouped together. In 1992, Donald Knuth asked whether the problem is NP-complete in general and he wrote that his "first attempts to solve the general problem efficiently or to prove it NP-complete led nowhere". In 2000 Mirka, along with her collaborators, solved the problem proving that it is NP-complete and giving sharp upper bounds on the minimum number of tracks in terms of the number of cars [1]. There have been at least 84 citations to this paper in both academic scholastic journals as well as railway industry publications.

Mirka's most original results are undoubtedly in several areas of graph theory, namely graph labelling, eccentric digraphs, connectivity of graphs, graph domination, EX graphs and most importantly in the degree/diameter problem.

References [2] to [7] give a quick overview of her contributions to the problem of finding the largest possible graphs in terms of the number of nodes, given constraints on the number of connections at each node and given that any two nodes in the graph must not be further apart than a given number of steps, the so called diameter of the graph. This problem is known as the degree/diameter problem. In this research area it sometimes takes a decade or more before a particular paper is properly appreciated and before it inspires further results. Papers [4] and [5] are earlier papers that have been becoming more and more influential during the last 10 years. Paper [2] introduced a new method for dealing with the degree/diameter problem and opened up a door for obtaining new results. Of particular importance is the construction of an infinite family of large graphs in [3]; these graphs are now commonly called the McKay-Miller-Širáň graphs, or MMS graphs.

In a more recent paper [8], Mirka proved the nonexistence of graphs with cyclic defect; this was an open problem for over 30 years. The latest deep results obtained in the degree/diameter problem are [9] and [10]; the paper [9] proves the nonexistence of infinitely many almost Moore digraphs, while [10] proves the conjecture that there

exist (infinitely many) radial Moore graphs for every diameter and gives an algorithm for the construction of such graphs. Mirka, together with Jozef Širáň, published what is undoubtedly her most cited work, a definitive dynamic survey on the topic [11]. This survey has received excellent reviews and, at time of writing has over 300 citations.

In graph labelling Mirka is in the unique position of having opened and closed an entire field of research. In 2003, Mirka and co-authors began research into antimagic total labellings [12], an area which spawned dozens of subsequent articles (66 citations) and in 2011 she closed the topic by showing that all graphs possessed such labellings [13]. Other labelling contributions include vertex-magic total labellings [14] (168 citations), the seminal paper on irregular total labellings [15] (146 citations), sum labellings [16] (38 citations), and Mirka's first book [17] (119 citations).

The problem of the security of statistical databases, or the privacy of data sets problem, is concerned with the amount of statistics about subgroups of records from a database that it is possible to release without revealing any information about an individual record. This work was the basis of Mirka's PhD thesis and she studied this problem in terms of the Audit Expert. Her paper, joint with her supervisor Jennifer Seberry, was selected as one of the best five papers at the annual Australasian Computer Science conference in Wollongong in 1989 and was published in a Special Issue of the Australian Computer Journal [14].

Mirka, with Ian Roberts and Jamie Simpson, determined upper bounds for the maximum possible number of answerable queries (without a compromise of the database) and showed that these bounds are sharp. The bounds were determined using novel methods [15,16]

Further results concerning the security of statistical databases were obtained for the prevention of compromise in general and using range queries (e.g., [17],[18]). In [19] Mirka and Joan Cooper considered security requirements for medical databases. This paper was selected as one of the best papers of the year and reprinted in the 1997 IMIA Yearbook of Medical informatics.

Mirka's latest research in information security is to find a mechanism to protect privacy of social network participants. To do so, the network graph data should be anonymised prior to its release. Most proposals in the literature aim to achieve k-anonymity under specific assumptions about the background information available to the attacker. Mirka is introducing a new method which is based on randomizing the location of the triangles in the network graph [20].

Selected Publications

1. E. Dahlhaus, P. Horák, M. Miller and J. Ryan, The train marshalling problem, *Discrete Appl. Math.* 103 (2000), 41–54.
2. E.T. Baskoro, M. Miller, J. Plesník and Š. Znám, Digraphs of degree 3 close to Moore bound, *J. Graph Theory* 20 (1995), 339–349.
3. B.D. McKay, M. Miller, J. Širáň, A note on large graphs of diameter two and given maximum degree, *J. Combin. Theory Ser. B* 74 (1998), 110–118.

4. R. Feria-Purón, M. Miller and G. Pineda-Villavicencio, On large bipartite graphs of diameter 3, *Discrete Math.* 313 (no. 4) (2013), 381–390.
5. C. Delorme, L. Jorgensen, M. Miller and G. Pineda-Villavicencio, On bipartite graphs with defect 2, *European J. Combin.* 30 (2009), 798–808.
6. C. Delorme, L. Jorgensen, M. Miller and G. Pineda-Villavicencio, On bipartite graphs of diameter 3 and defect 2, *J. Graph Theory* 61 (no. 4) (2009), 271–288.
7. M.À. Fiol, J. Gimbert and M. Miller, Multipartite Moore digraphs, *Lin. Alg. Applic.* 419 (2006), 234–250.
8. M. Miller, Nonexistence of graphs with cyclic defect, *Electron. J. Combin.* 18 (2011), #P71.
9. J. Conde, J. Gimbert, J. Gonzalez, M. Miller and J.M. Miret, On the nonexistence of almost Moore digraphs, *European J. Combin.* 39 (2014), 170–177.
10. J. Gómez and M. Miller, On the existence of radial Moore graphs for every radius and every degree, *European J. Combin.* 47 (2015), 15–22.
11. M. Miller and J. Širáň, Moore graphs and beyond: A survey of the degree/diameter problem, 2nd edition, *Electron. J. Combin.* 61 (2013), DS14, 1–92..
12. M. Bača, J.A. MacDougall, F. Bertault, M. Miller and R. Simanjuntak, Vertex-antimagic total labelings of graphs, *Discuss. Math. Graph Theory* 23 (1) (2003), 67–83.
13. M. Miller, O. Phanalasy and J. Ryan, All graphs have antimagic total labellings, *Electron. Notes in Discrete Math.* 36 (2011), 645–650.
14. J.A. MacDougall, M. Miller and W.D. Wallis, Vertex-magic total labelings of graphs, *Utilitas Math.* 61 (2002), 3–21.
15. M. Bača, S. Jendroľ, M. Miller and J. Ryan, Irregular total labellings, *Discrete Math.* 307 no. 11 (2007), 1378–1388.
16. M. Miller, J. Ryan and W.F. Smyth, Labelling wheels for minimum sum number, *J. Combin. Math. Combin. Comput.* 28 (1998), 289–297.
17. M. Bača and M. Miller, *Super edge-antimagic graphs: A wealth of problems and some solutions*, Brown Walker Press, Boca Raton, USA, 2008
18. M. Miller and J. Seberry, Relative compromise of statistical databases, *Austral. Computer J.* 21 no. 2 (1989), 56–61.
19. M. Miller, I. Roberts and J. Simpson, Application of symmetric chains to an optimisation problem in the security of statistical databases, *Bull. ICA* 2 (1991), 47–58.
20. M. Miller, I. Roberts and J. Simpson, Prevention of relative compromise in statistical databases using Audit Expert, *Bull. ICA* 10 (1994), 51–62.
21. L. Brankovic, P. Horák and M. Miller, An optimization problem in statistical database security, *SIAM J. Discrete Math.* 13 no. 3 (2000), 346–353.
22. P. Horák, L. Brankovic and M. Miller, A combinatorial problem in database security, *Discrete Appl. Math.* 91 (1-3) (1999), 119–126.
23. M. Miller and J. Cooper, Security considerations for present and future medical databases, *Int. J. Bio-Medical Computing* 41 (1996), 39–46. Reprinted in *1997 IMIA Yearbook of Medical Informatics* (1997), 307–314.
24. L. Brankovic, N. López, M. Miller and F. Sebe, Triangle randomization for social network data anonymization, *Ars Mathematica Contemporanea* 7 (2) (2014), 461–477.

Epilogue

Even when very ill, Mirka still cared for her students. She set them tasks such as working through "Pearls in Graph Theory" with the students taking turns to read and present material a chapter at a time. Sometimes, between bouts of chemotherapy, she would have them visit her at home and deliver their findings. She was weak and warned them, "if I fall asleep, keep going–I want to hear you working when I awake".

Since her passing, IWOCA 2017 in Newcastle was dedicated to her, as was Distance in Graphs (DiGUbud) in Bali in 2016. Also IWOGL, Krakow, Poland, 2016, IWONT, Sanya, China, 2016 and ACCMCC, 2016, Newcastle, had sessions dedicated to Mirka and her work. The CIMPA school in Havana, Cuba "Mathematical Models for Security Applications" was successfully conducted and dedicated to Mirka.

In addition to the journal articles that are yet to appear under Mirka's name, there is also the forthcoming publication of her second book with Martin Bača, Joe Ryan and Andrea Semaničová-Feňovčíková. This book is currently with the publishers.

Obituaries to Mirka have been published in Bulletin of the Australian Mathematical Society, Bulletin of the Institute of Combinatorics and its Applications, and AKCE: International Journal on Graphs and Combinatorics.

But perhaps most pleasing to Mirka would be that her students are progressing successfully through their degrees. Novi Herawati Bong was awarded PhD in April, 2017; Cyriac Grigorious was awarded PhD in May 2017; Dushyant Tanna has submitted his PhD thesis and, at the time of writing, is awaiting examiners reports; Sudeep Stephen is on target to submit his PhD thesis; Rachel Wulan Nirmalasari Wijaya is on target to submit her M. Phil thesis and Nathan van Maastricht will complete his M. Phil in 2018.

With such an academic family tree and extended network of collaborators, Mirka will not be forgotten.

Reminiscences of Mirka

Brian Alspach *University of Newcastle, Australia*

I first met Mirka in 2003 but it wasn't until I relocated to Australia in 2007 that I really came to know and appreciate her. We, of course, shared a university campus and eventually an office. She was one of those people who sees the good side of life and people. I don't recall ever hearing her criticize someone. One enjoys being around people who exude positivity as she did.

I was impressed with the number of graduate students she was supervising, her treatment of them, and her willingness to go to battle for them. This manifested itself in her ability to procure scholarship support for many of them.

We never worked together on a research project in spite of several conversations along the lines of "it would be fun to look at this." Nevertheless, I was impressed at the number of visitors she hosted and her willingness to plunge into problems with them.

Thus, when I was asked in April 2017 to take over editing this special issue of the *Australasian Journal of Combinatorics* dedicated to her memory, I was happy to say yes. The special issue had been floundering and thanks to the help of Novi Bong, Yuqing Lin and Joe Ryan, I was able to complete the project in a span of four months.

Her desk around the corner may be empty, but my heart and mind are filled with her memory.

Martin Bača *Technical University, Košice*

I have known Mirka Miller since 1997. She was a very kind and friendly person with an open heart for everyone around. Her life optimism was contagious. Very quickly we found several common research intersections in the area of graph labelings and our collaboration started. Several times Mirka, together with Joe Ryan, visited me and my colleagues at the Technical University in Košice and I had several research stays at the University of Newcastle and at the University of Ballarat. These personal meetings and discussions consolidated our personal friendship and intensified our collaboration.

Together with Mirka we wrote one book on graph labelings and published 46 joint research papers. During our stay with Stanislav Jendrol' in Ballarat in 2004, we started research on irregular total labelings. Today this topic has become very fruitful with the original article now having nearly 150 citations. Mirka loved to discuss ideas and to work at the same time on different topics with others.

Mirka was a very good supervisor for her students, with many inspirations and motivations. They loved her. She was always able to find time for them and helped them in research and also in their personal matters. She was like a mother for them, a very kind and careful mother.

Mirka was always ready and willing to help others. I learned much from her and will miss her greatly.

Edy Tri Baskoro *Institut Teknologi Bandung, Indonesia*

I first met Mirka Miller in the middle of the autumn of 1990 at the Indonesian Independence Day Festival held at the University of New England, Australia. That night we had a cultural performance and food festival. In this event, I had to perform a cultural mask dance. In the middle of the dance, I asked Mirka and some other guests to join me to dance together. On the next day, I came to her office to ask her to be my supervisor for completing my masters thesis and she agreed. Actually, in the previous semester I took her course "Database: Concept and Applications." The way she teaches is inspiring to everyone. I very much enjoyed her way of teaching. After two to three weeks of discussions, she finally decided to introduce me to the well-known degree-diameter problem to work on for my masters thesis. I liked this problem even though this was my first time learning graph theory.

With Mirka's guidance and wisdom, we proved the uniqueness of a regular digraph of degree 3, diameter 2 and order 11. Two years later, in 1992, I enrolled in a PhD program at the University of Newcastle, Australia, and Mirka was again my supervisor. I was very happy to be her first PhD student and to be able to continue working on the degree-diameter problem under her excellent supervision. She gave me everything: opportunity to develop my research ability and to work hard, to care, to increase my passion for mathematics, and to build linkages. I think she supervised all her students full of love, total commitment and care. She treated all her students as human (social person), as well as potential future colleagues. She always had time for discussions with students either on academic or other matters. She loved to know different cultures brought to her by her overseas students. She fostered and facilitated the student's development of academic skills and self-direction. Mirka was a real guru, not only in mathematics but also in other academic life. She gave us an example of being a productive researcher and active creator of collaboration.

I learnt a lot from her on how to supervise and to treat students nicely. She introduced me to graphs. She sent me to many conferences, and gave me opportunities to collaborate with other researchers. I felt that she trained me for being a scholar. A students success was her priority; I owe her a lot. The collaboration with Mirka never ended, even though I finished my PhD degree in 1996. It became even more fruitful. Her first visit to Indonesia (ITB Bandung) was in 1998. After then, almost every two years she visited Indonesia. Her influence on the development of the graph theory community in Indonesia was very significant. I could say that she brought graphs to Indonesia and brought our graph theory society to the level of international cutting-edge research interaction. Her innovation in creating mutual collaboration between Indonesia and Australia is highly appreciated. In our education program, she also provided a great contribution to the improvement of the quality of the bachelor degree program of Mathematics of ITB. She also travelled a lot to various universities in different provinces in Indonesia to give seminars and workshops in graphs. Many young people were fascinated with her way to convince everyone to do and fall in love with graph theory. She always enjoyed her stay in Indonesia. ITB Bandung was her favourite place to work. She was an adjunct professor there. Mirka and I wrote more than 17 research papers in various topics: degree-diameter problem, Ramsey theory,

edge-magic labelling and anti-magic labelling. One of them that I like very much is the paper regarding the structure of almost Moore digraphs. One of our papers on Ramsey number for trees versus small wheels is also interesting. She liked working with others, always motivating, encouraging and supporting young people. There is no doubt that this partnership was a great boost to my career. She always gave innovative ideas to tackle mathematical problems. She never stopped working and thinking, and liked to initiate many things. She also liked telling stories, exchanging experiences, and she had a great sense of humour. Having an opportunity of working with her was very special.

She is one of the founders of many well-known workshops: AWOCA (the 12th AWOCA was in Bandung Indonesia 2001, and later became IWOCA); IWOGL (the 2nd one was Batu Indonesia 2004); IWONT (the 5th was at ITB Indonesia, 2012); and GraphMasters Workshop (held many times in Indonesia). Recently, together with her we were able to establish a new journal on graph theory called the *Electronic Journal of Graph Theory and Applications*. Now this journal is indexed by Scopus. Finally, I would say Mirka is our model for being a great scholar, researcher and supervisor. She was a great person!

Dominique Buset *Ecole polytechnique de Bruxelles, Université Libre de Bruxelles*

If I had to choose one word to describe Mirka, I should say: "amazing". She was so brilliant and had such a wonderful mind! Humanly, she was so kind, so attentive to others; always ready to help, to explain, to try new experiences or adventures.... She was unique, and my only regret is that I didn't meet her earlier.

We first met in Ghent University in 2008. Immediately we felt like old friends and this friendship remained very strong until the end. I'll recall all those nice moments for the rest of my life. After this first meeting, Mirka invited me to Australia to work with her and we planned to write a book on the Degree/Diameter Problem. Unfortunately this nice project currently remains incomplete, but I hope I could finish it with new co-authors, because it was important to both of us and it would be a nice gift to Mirka. Every year we met at least two or three times and in 2010 she came to Brussels to work with me for two months.

During all those very nice moments we shared, I would like to mention one crazy thing she did which was really amazing. Mirka loved traveling by train, and each time she was in Europe, she went everywhere by train. So she decided to pick me up in Brussels after some days she was spending in London, and travel by train with me to Pilzň. Unfortunately, her stay in London was cancelled. So what did Mirka do? She came (by train) from Pilzň to Brussels to pick me up and bring me back to Pilzň (by train of course)! It was one of the funniest trips I made, and during the whole trip we stayed in the wagon restaurant working on optimal graphs. This was Mirka!

I'll miss her so much and I'll always remember the way she used to ask "to share" in restaurants, the pleasure to work together in cafés, her patience to explain differently some mathematical problem, her facility to create, to understand, to feel

and to solve problems in graph theory, and the most important: her joy of living and her love for Joe and Filip. She left a big hole in a lot of hearts.

Joe Ryan *University of Newcastle, Australia*

"If you can meet with Triumph and Disaster and treat those two imposters just the same."

I am not sure if Mirka ever knew Kipling's words but they express a philosophy she would often espouse. Mirka would express the same attitude as "don't let it define you". Whatever success you achieved or whatever troubles befell you, remember that there is always more to you. This was not a cold "get over it" because she was compassionate. But it was advice she would give to others and the way she lived her own life.

She single-handedly (and successfully) raised a son but she was more than a mother; she represented Australia in volleyball but she was more than an athlete; she produced many works of pottery but she was more than an artist; and she had many research collaborations and articles but she was more than an academic. There were misfortunes as well, mostly too personal to mention here. Though painful, these sufferings were not buried, but rather embraced as part of the experience that contributed to her make-up. But she did not let them define her.

So neither will I try to define her, but I can describe her, in words like original, loyal, analytical, honest, giving, loving, focussed, beautiful, funny and oh so generous. Her life was brave, amazing, passionate and inspirational. To return to Kiplings poem (slightly paraphrased): [She did] "fill the unforgiving minute, With sixty seconds worth of distance run." She will be sadly missed and fondly remembered by all who knew her.

Zdeněk Ryjáček *University of West Bohemia*

Mirka was one year younger than me (she was born in 1949 in Rumburk, North Bohemia, Czechoslovakia). We both studied at the Faculty of Mathematics and Physics, Charles University, in Prague, Czechoslovakia. In 1968, when Soviet troops invaded Czechoslovakia to interrupt political reforms, I was starting the third year of my studies, and she was one school year under me. Our lifepaths split one year later, when the political situation in Czechoslovakia was getting tough, and Mirka decided to leave the country. At that time, Czechoslovakia lost many excellent people, and Mirka was one of them. I know from her narrative, how difficult it was for her to start a new life like this, from zero, and I can only admire how brave she was. After the (very) difficult first years of her "new life", Mirka succeeded in completing her unfinished education (she had to start almost from zero even for this), got her PhD degree, and took an academic position (first in Armidale, and then in Newcastle, Ballarat and back to Newcastle), and when we met (it was at the workshop "Cycles and Colourings" in High Tatras, Slovakia, in 1994), she was already in her new home, Australia, a well-established academician with a strong international reputation.

Mirka never abandoned Czechoslovak citizenship, and after the political changes

of 1989 in Czechoslovakia, it became possible for her to come home. Mirka enjoyed the possibility of visiting her old homeland, and she was thinking of establishing a sort of a base in the Czech Republic. After some searching, she purchased a small apartment in Pilsen, and that's how Pilsen became her base for her European trips, and that's how we became, from colleagues, to—I dare say—friends. When in Pilsen, she—besides doing maths—spent time with her relatives, and she also liked to go to a spa (Teplice, or Konstantinovy Lázně), to take spa procedures and to relax there.

Mirka was always ready and happy to help other people. Probably also due to her difficult first years in Australia, she knew very well what it means to help others, and she was happy to do so. She supervised over 20 PhD students, many of them from developing countries, and for all of them she was more than a patient and careful teacher. Whenever I came to visit her (in Newcastle or in Ballarat), she was always a central point of a group of young and enthusiastic people: a real "academic mother." She often took her students with her on her trips, and so, many of them also visited (and I hope enjoyed) Pilsen.

Mirka knew how to enjoy life. She liked having people around and having a good time with them (where having a good time of course includes doing mathematics). When visiting her in Newcastle, I always enjoyed working with her, often at her beautiful large balcony with its seaview, or at her favorite base in the cafeteria "Lexie's on the beach." She was always full of ideas, always optimistic and enthusiastic.

With my wife Marta, we both miss Mirka greatly; she was a close friend of both of us. She should have stayed longer with us; she has left a big gap in our hearts.

Leanne Rylands *Western Sydney University*

I first met Mirka more than two decades ago at a conference. Many of my memories of Mirka are from conferences and from small meetings in Newcastle. Mirka seemed to enjoy conferences the way some people enjoy parties. Mirka is responsible for me attending more conferences, doing more mathematics and giving more presentations that I would have otherwise. I got to know Mirka, and also Joe Ryan, much better in the last decade, partly when working with Mirka, Joe and Oudone Phanalasy. Oudone had wanted for many years to do a PhD, but being from Laos, needed funding. It was Mirka who made this possible, and Oudone is the first person from Laos to obtain a PhD in discrete mathematics. Through conferences and visits to Newcastle I met some of Mirka's students, and colleagues from Indonesia and elsewhere. Mirka was particularly good at getting people together around mathematics; through her I found new friends and colleagues. Mirka was open, friendly, enthusiastic and inclusive. She was very happy to tell people about problems and projects, hoping to tempt them to contribute, and open to working on problems with anyone who was interested. I have wonderful memories of working for hours at a cafe at Stockton Beach near where she lived, and of cycling home from work thinking about problems that Mirka had posed.

Like many others, I miss Mirka very much. I particularly miss not having her here working on the ARC discovery grant that she planned so well.

Kiki Sugeng *Universitas Indonesia*

We all knew Mirka as a professional researcher and mentor, but I would like to start with a personal story. In 2001 I received a scholarship to do my PhD but my visa was refused because of a miscommunication in my visa application. I was very lucky that I met Mirka Miller at a cryptogaphy workshop in ITB, Bandung, Indonesia. She happily accepted me as her PhD student and saved me from losing my scholarship. Since then we have shared very enjoyable research and Mirka was always open to give her ideas and was very patient in showing me the way to do research with some fun. We have had 12 collaborative papers since then, not only during my PhD studies but also after I completed my PhD. Mirka was not only an excellent supervisor but also a great friend. Meeting with her was always a great joy. Mirka always introduced her students to her visitors. She loved to invite people to come to Australia and encouraged collaboration with her and with her students. I am very grateful to have had Mirka as my supervisor, since when I got back to my country and my University, Universitas Indonesia, I have known many experts in combinatorics, especially in graph theory. I feel now that I have friends all over the world, since with Mirka, I could collaborate with people in the USA, several countries in Europe, and Australia. She made us feel that we are like a big family.

We call Mirka the "Mother of Indonesian Combinatorics." The majority of the most productive researchers in Indonesia are her former students. She was very helpful to all her academic children and also her academic grandchildren. She helped to nurture the blooming of graph theory in Indonesia. Almost every year she visited Indonesia and gave talks as an invited speaker and guest lecturer, while also trying to build more networks. It was a great sadness when she passed away. We feel like we have lost our mother. But we want to make her proud. Surely she would be happy to know that I have been appointed to be a vice-president of the ICA. We miss you Mirka, but we will always keep her spirit alive in our hearts and minds.

(Received August 2017)