Canad. Math. Bull. Vol. **52** (3), 2009 pp. 323–326

Dedication: Ted Bisztriczky

K. Böröczky, K. J. Böröczky, F. Fodor, H. Harborth, and W. Kuperberg

1 Introduction

It is with great pleasure that we present this special geometry issue of the *Canadian Mathematical Bulletin* dedicated to Professor Tibor Bisztriczky on occasion of his sixtieth birthday. All articles were prepared by the contributors especially for this collection. This issue presents new results from current investigations in the fields of the combinatorial theory of polytopes, convexity, the theory of packing and covering, and combinatorial geometry, subjects where Professor Bisztriczky made significant contributions and where he is currently engaged in active research. Here we take the opportunity to thank the contributors for submitting their most valuable work and the referees who devoted their efforts and time to make this special volume possible.

Tibor (Ted) Bisztriczky was born on June 15, 1947 in the village of Bodrogszegi in Hungary and emigrated to Hamilton, Ontario in 1956 with his parents Zoltán and Margit. He received his Senior Matriculation in 1966 at the Cathedral Boys High School in Hamilton, Ontario and completed both his Bachelor of Science (Honours) and Master of Science degrees in Mathematics at McMaster University. He received the Master of Science degree in 1971 with the thesis "Directly Differentiable Arcs" under the supervision of Professor Norman Lane. He obtained his Doctor of Philosophy degree in Mathematics at the University of Toronto in 1975 with the dissertation "Hypersurfaces of Order Two" under the supervision of Professor Peter Scherk.

Ted Bisztriczky moved to Calgary in 1975 with his wife Margaret to assume a post-doctoral position at the Department of Mathematics and Statistics of the University of Calgary on a National Research Council Scholarship. They have been living in Calgary ever since. Following the post-doctoral years, Ted was an NSERC Research Fellow from 1980 to 1982. He was appointed Assistant Professor in 1982, Associate Professor in 1985, and Full Professor in 1989. He has served as Head of the Department of Mathematics and Statistics of the University of Calgary from 2000 to the present. He currently has more than 70 publications and has edited several books and special volumes. During his career he supervised several doctoral students, many of whom became successful mathematicians in their own right and now occupy senior academic positions all over the world. He has been an active organizer of international meetings, and many of his colleagues have warm memories of the Bisztriczkys' hospitality in their home.

Received by the editors December 18, 2008.
AMS subject classification: 01A70.

2 Geometry Fest

To honour Professor Ted Bisztriczky on the occasion of his sixtieth birthday, his colleagues and former students organized the Geometry Fest at the Alfréd Rényi Institute of Mathematics of the Hungarian Academy of Sciences in Budapest from June 11 to 16, 2007. Forty-three participants from all over the world attended this international meeting and 28 lectures were delivered.

The scope of the conference encompassed various areas of geometry represented by Ted's research interests. As probably the best dedication, we quote here the opening speech of the conference composed and presented by Wlodzimierz Kuperberg.

> Good Morning, Ladies and Gentlemen! On behalf of the Organizing Committee, I have the pleasure to welcome all present on this opening day of the conference called Geometry Fest. You have come here from North and South, East and West, from around the globe and from next door, to present some of the finest fruits of your labor and to admire those presented by others, to dazzle and be dazzled, to inspire and be inspired.
>
> While doing so, we shall express our highest esteem for Professor Tibor "Ted" Bisztriczky and we will celebrate his sixtieth birthday. He is one of the most accomplished and world-renowned geometers, whose valuable contributions to the field are highly regarded, and whose service to the mathematical community is greatly appreciated.
>
> He is also a great human being who is finally entering a respectable, fully mature age.
>
> Considering his personal and professional ties with the Hungarian mathematical community, it is quite appropriate that we have chosen this very historical site for the festivities, and we thank the Insitute for making it available to us. And, first of all, we all thank the man whom we are honoring for giving us such a joyous purpose for holding this event.
>
> Finally, on my own behalf, I wish to say to Ted, from the bottom of my heart, I am proud to be your friend.
>
> *Happy Birthday, Ted!*

3 Mathematical Biography

Ted Bisztriczky entered the realm of geometry as a doctoral student under the tutelage of Professor Peter Scherk at the University of Toronto. Since then he has always considered himself a geometer in the broadest possible sense. His results cover several different areas of geometry including, but not limited to, order geometry, the combinatorial theory of convex polytopes, discrete and combinatorial geometry, analytic convex geometry, and the theory of packing and covering of convex bodies. His publications have appeared in the most respected and prestigious international mathematical journals, including the *Canadian Journal of Mathematics*, *Crelle's Journal*, *Mathematische Annalen* and the *Israel Journal of Mathematics*, just to name a few. Below we wish to give some highlights of Ted's mathematical achievements.

In the first decade of his carreer he focused on order geometry. According to a theorem of Möbius, a differentiable Jordan curve in the real projective plane has at least three points of inflection if it is odd, that is, meets any nontangent line an odd number of times. Ted proved that a differentiable Jordan curve has at least six points of inflection if it is even and unbounded (*J. Geom.* **34**(1989), 14–29). About space curves with certain regularity properties, he showed that if there is a plane which intersects the curve C in n points distributed "normally", then C possesses at least n inflection points (*Canad. J. Math.* **37**(1985), 217–237). Next is a beautiful result about surfaces in projective space. It is well known that every algebraic surface of degree three in the real projective three-space P^3 contains a line. Ted extended this result to include all surfaces of order three in P^3, *i.e.,* compact and connected sets F such that every intersection of F with a plane is a curve of linear order at most three (*Math. Ann.* **243**(1979), 191–195).

A fascinating result of Ted's, achieved jointly with Gábor Fejes Tóth, is a generalization of the celebrated Erdős–Szekeres theorem. The classical Erdős–Szekeres theorem, dating back to 1935, states that for any $n \geq 4$ there is a threshold k such that among any at least k points in the plane such that no three are collinear there are n that are vertices of a convex n-gon. Ted and Gábor generalized this result to families of pairwise disjoint planar compact convex sets, with suitable extensions of the notions of "collinear" and "n-gon" (*J. Reine Angew. Math.* **395**(1989), 167–170). They have even determined the optimal threshold k for $n = 4, 5$ (*Geom. Dedicata* **31**(1989), 89–104).

In a sequence of three consecutive papers with Ferenc Fodor and Deborah Oliveros, Ted has recently verified the conjecture stating that if there is a transversal line for every four-element subfamily of a family $\mathcal{F}$ of mutually disjoint unit disks in the plane, then there is a line that meets all members of $\mathcal{F}$ with the possible exception of at most one. (*Acta. Math. Hungar.* **106**(2005), 285–291.; *Bol. Soc. Mat. Mexicana (3)* **12**(2006), 59–73; *Israel J. Math.* **168**(2008), 239–252).

According to a long standing conjecture related to the celebrated slicing problem, parallelopipeds maximize the volume of the so-called centroid body of a centrally symmetric convex body of dimension $n \geq 2$ and of volume one. The planar case of this conjecture was verified by Ted in a paper written jointly with K. J. Böröczky. (*Mathematika* **48**(2001), 1–13). In the same paper, they refuted a conjecture by Ervin Lutwak about the centroid body.

Ted's creative power is perhaps most visible in his work on polytopes. The combinatorial structures of the so-called simplicial and simple polytopes have been well understood for some time. As a first step towards understanding general polytopes, suitable families of good examples are needed. Ted has constructed various essential classes of polytopes that can be considered as nonsymplicial analogues of cyclic polytopes. In particular, his constructions include ordinary polytopes of odd dimensions (*Israel J. Math.* **102**(1997), 101–123), periodically-cyclic Gale polytopes of even dimensions (*Beiträge Algebra Geom.* **42**(2001), 89–101), and most recently, braxtopes (*Beiträge Algebra Geom.* **49**(2008), 137–145, jointly with Margaret M. Bayer). Furthermore, Ted constructed *multiplices* (*Mathematika* **43**(1996), 274–285), which are the faces of ordinary polytopes. They are generalizations of simplices in the sense that all of their faces are lower dimensional multiplices.

4 Ted As a Doctoral Father

During the preparation of this special volume we received tremendous support from colleagues and Ted's former doctoral students. Wendy Finbow-Singh, Ted's doctoral child, remininsced about her relation with Ted as quoted below.

> "I was Dr. Tibor (Ted) Bisztriczky's Ph.D. student from 1998–2003 at the University of Calgary. In the short time I have known him, he has had a profound influence on my life.
>
> "He is a role model, a guide and a mentor to his students, offering objective advice, and inspiration through his own actions.
>
> "Like all Ph.D. students, I learned a great deal about my research area from my supervisor. However, I consider myself more fortunate than most because from him I also learned how to communicate mathematically; I truly believe that I would not have received the same quality of education anywhere else.
>
> "The morning of my dissertation defense, I was nervous and he must have sensed it because on the way to the university, he took me to a little park near his house. We were up on a hill and he pointed to a bench surrounded by trees that overlooks the Bow River. He told me that this was his thinking spot, where he came when he needed some quiet time to think and collect his thoughts. He recommended that I find my own spot."

https://doi.org/10.4153/CMB-2009-035-4 Published online by Cambridge University Press