



Dolomites Research Notes on Approximation

Special issue dedicated to Mirosław Baran on the occasion of his 60th birthday, Volume 14 · 2021 · Pages i–ii

Mirosław Baran

Mirosław Baran was born on the 26th of September, 1961, in Tarnów, a town in the south of Poland. He graduated from Jagiellonian University in 1985 where, five years later, he earned a Ph.D. under the supervision of Wiesław Pleśniak. His doctoral dissertation was titled *Funkcja ekstremalna Siciaka i zespolona miara równowagi dla podzbiorów zwartych w \mathbb{R}^n* [*Siciak's extremal function and complex equilibrium measure for compact subsets of \mathbb{R}^n*]. Nine years later he obtained his habilitation qualification at the Institute of Mathematics of the Polish Academy of Sciences, and in 2015 he became a full professor. In Poland, the title of Professor is conferred by the President of the Republic of Poland upon a motion of the Central Commission for Academic Degrees and Titles.

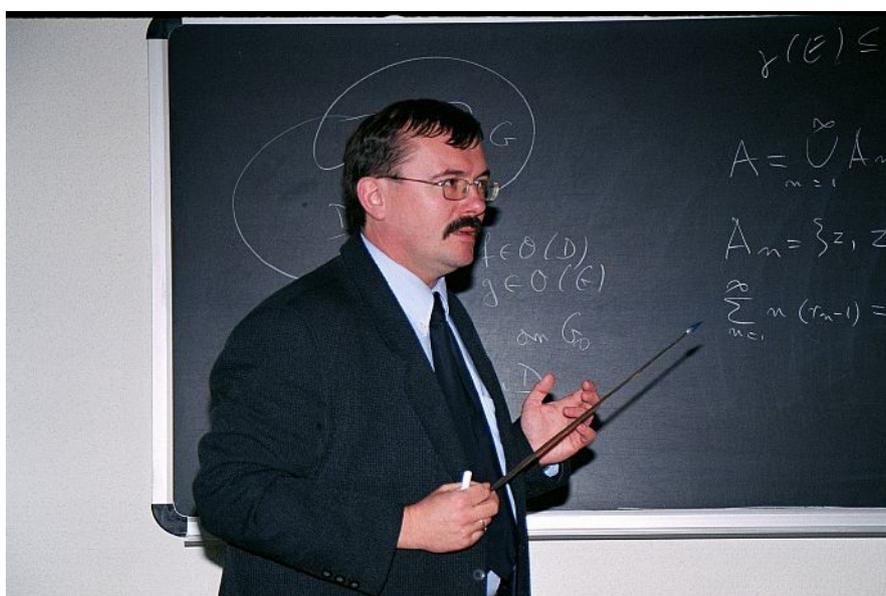


Figure 1: Mirosław Baran on the conference "Journée d'analyse réelle et complexe" in 2003, Université de Toulon

His first paper was published in *Annales Polonici Mathematici* in 1988; it concerned Siciak's extremal function for convex sets in \mathbb{C}^N . He then studied various aspects of the Joukowski transformation. In his habilitation thesis, *Conjugate norms in \mathbb{C}^n and related geometrical problems*, *Dissertationes Math. (Rozprawy Mat.)* 377 (1998), he considered properties of dual norms in \mathbb{R}^n [resp. \mathbb{C}^n] and of natural complexifications of real norms. The method of dual norms together with the method of complexifications of real norms yields important and interesting applications in multidimensional complex analysis, in particular, in pluripotential theory, constructive function theory and geometric function theory.

A significant part of his research, which consists of about 30 papers, has been devoted to polynomial inequalities and their relations with pluripotential theory. In particular, in the joint paper *Hölder continuity of the Green function and Markov brothers' inequality*, *Constr. Approx.* 40 (2014), no. 1, 121–140, with L. Białas-Cieź, the main result is an equivalence of a Vladimir Markov-type inequality on a compact subset E of \mathbb{C}^N with the Hölder continuity property of the pluricomplex Green function associated with E . The relations obtained between pluripotential theory and polynomial inequalities of Bernstein and Markov type resulted in the introduction of the concept of the Baran metric.

Another interesting topic on which he worked is the characterization of compact subsets of algebraic varieties in terms of Bernstein type inequalities. Together with Wiesław Pleśniak, Mirek showed that in the class of compact sets K in \mathbb{R}^n with an analytic parametrization of order m , the sets with Zariski dimension m are exactly those which admit a Bernstein (or a van der Corput-Schaake) type inequality for tangential derivatives of (the traces of) polynomials on K .

Mirek has been able to conduct scientific research in various situations; for example, he sometimes discovered important ideas while traveling by train between Kraków and Tarnów. However, he has always greatly appreciated the possibility of scientific work abroad. At the beginning of his career, in the academic year 1992/1993, he had a postdoctoral position at the Centre de Recerca Matemàtica in Barcelona, Spain. Several years later, for one academic year (1996/1997), under a grant from the French government, he worked at the Université Paul Sabatier in Toulouse. Subsequently he visited this university twice for short research stays in 2014 and in 2017. Mirek Baran has actively participated in the conference Dolomites Research Week on Approximation since 2014 where he has given some very interesting talks: "A convexity related to radial extremal

functions" (DRWA15); "Computation of equilibrium measure" (DRWA17); and "The homogeneous extremal function" (DRWA18). In 2016 he was a member of the Scientific Committee of the 4th Dolomites Workshop on Constructive Approximation and Applications (DWCAA16). He organized a section "Multivariate polynomial approximation and pluripotential theory" together with L. Białas-Cieź. He likes to come to Alba di Canazei for research purposes but also to enjoy the mountainous region and the unique social events at *Ristorante El Pael*. Moreover, three times he has visited the University of Padua (2015, 2016, 2017) for scientific consultations. Mirek is also one of the editors of the *Dolomites Research Notes on Approximation* (DRNA).

Mirek has had four doctoral students: Beata Milówka, Agnieszka Kowalska, Paweł Ozorka, and Tomasz Beberok. He is currently the supervisor of two more students: Barbara Wojnicka and Tomasz Szlachetka. To celebrate his 60th birthday, this group of current and former students organized the conference *Conference on Constructive Approximation of Functions 2* (CAF 2), which took place on September, 23-25, 2021. The host institution was the University of Applied Sciences in Tarnow (UAS Tarnow) with co-organizer the Institute of Technology of Pedagogical University of Kraków, where Mirek is currently working. A photo of this event can be seen below.



Figure 2: CAF 2, September 25, 2021. Mirosław Baran is the third from the right.

We sincerely thank Tomasz Beberok, Len Bos, Marianna Chatzakoua, Yannis Sarantopoulos, Anna Denkowska, Maciej Denkowski, Marta Kosek, Wiesław Pleśniak, Małgorzata Stawiska and András Kroó for their contributions to this special issue of Volume 14 (2021) of the DRNA dedicated to Mirek.

Mirek, we wish you all the best in future, a lot of health and happiness, and further scientific successes.

Happy birthday!

Tomasz Beberok, Leokadia Białas-Cieź, Stefano De Marchi, Agnieszka Kowalska and Norm Levenberg