

REMEMBERING NAZA TANOVIC-MILLER

Harry I. Miller

International University of Sarajevo, B&H
E-mail: himiller@hotmail.com



To remember Naza Tanovic-Miller and attempt to understand her contribution to her country and its people one needs a 'big picture' approach to viewing her life and not just a standard dry presentation of dates and lists of publications, conferences attended, and courses taught. She was, down to her bone marrow, a true Bosnian-Herzegovian patriot.

Naza was the descendant of two powerful families: Curcic (mother Fata) and Tanovic (father Jusuf). Naza was born on April 12, 1938 in Sarajevo. She attended the First Real Female Gymnasium and graduated in 1956. Already in high school Naza excelled intellectually. She won second prize in a city wide essay contest (the first prize went to

(now) Academic Prof. Dr. Tvrtko Kulenovic the renowned writer). Her classmates recall, with affection that on math exams she solved all the separate problems given to the two different groups (A and B) as well as 1 or 2 additional problems for Naza only.

Her father, Dr. Jusuf Tanovic, the eminent Sarajevo lawyer was particularly instrumental in encouraging her early intellectual development. He supported her desire (certainly not typical at the time), on graduating high school, to go to Zagreb to study electrical engineering (10 girls and several hundred boys were in her generation). While in Zagreb, due to her mathematical talent, she was elected as a student demonstrator in mathematics. Despite the efforts of several of her professors she was removed from this position and lost the stipend associated with the position when she declined joining the Communist Youth Party of the Faculty.

After graduation, Naza returned to Sarajevo and a position at Energoinvest where she worked briefly as a research engineer. In 1962 she moved to Chicago where she worked at the Rauland Research Department of the Zenith Corporation from 1962 to 1965. At this time she started her graduate studies in mathematics at the Illinois Institute of Technology, At Rauland, using her solid mathematical background Naza solved several open problems in electronic optics. Pregnant with her first daughter (1965) she, as the only female presenter, lectured on her engineering work at a major conference in Washington D.C.

She received her PhD degree in mathematics in 1969 under the direction of Prof. Dr. Gunther Goes. Her areas of expertise, in her thesis, dealt with multipliers of sequence spaces and Fourier analysis.

The year 1969 was a critical one for Naza. On receiving her PhD the Rauland Corporation offered Naza a high paying substantial position. Remember, that at this time her husband had a tenure track position at DePaul University. In addition, despite coming from a communist country the American National Aeronautics and Space Administration (NASA) offered her a position at the Johnson Space Center in Houston Texas and were even willing to throw in a position for her husband in order to get her. Naza thanked everyone and together with her husband and daughter Lejla choose to return to Sarajevo and (both) join the Math. Dept. of the PMF of the University of Sarajevo for the august salary of \$100 a month each. Hard to imagine, in these times, a young couple giving up a life in America with a combined income of over \$2000 per month for \$200 in Sarajevo. It was a different time and Naza was a different kind of person, she never considered staying. Her love of country and its peoples trumped over the chance of a 10-fold jump in income and a MUCH more comfortable life in the USA.

On moving to Sarajevo to Sarajevo in July 1969 (the time of the first manned flight to the moon) Naza's intellectual attention shifted completely to mathematics and helping Bosnia move ahead scientifically. In spite of the burden of the enormous amount of time Naza spent on tasks other than her own research she became ever more powerful in her scientific work. Naza Tanovic-Miller, till her death on November 15, 2001, wrote over 30 research papers, which appeared in 15 different prestigious international journals published in 10 countries. At the time of her death she was at the height of her powers with many manuscripts waiting to be finished. For a complete list of her publications see

Radovi Matematički, Vol, 10, No. 2, 2001, 146-148. In 2001 she was at the top of her area (as recognized by researchers in Canada, America, Hungary and Russia), namely the problem of integrability and convergence classes of Fourier series. She gave over 65 talks on her mathematical research over the years.

The Tanovic- Miller' s second daughter , Alica, was born in 1970. Naza's patience, determination, and leading by example made her an outstanding mother. Both of her daughters are talented research mathematicians. Lejla got her PhD at the University of Michigan in 1994 and Alica got her PhD in 2001 at Michigan State University.

Naza's publications only show a small part of the influence she had in Bosnia during the length of her career. She initiated the Department of Mathematics Colloquium Series and a whole series of other departmental activities. She organized and ran the post graduate studies program of the Dept. of Mathematics from 1970 to 1980; served as Dept. Head, President of the Society of Mathematicians, Physicists and Astronomers of BiH. She led 7 three year scientific projects each of which included 10 to 25 mathematicians and also participated in 6 other scientific projects co-financed by the Bosnian Republican Fund for Scientific Work. She served on dozens of educational and scientific commissions at various levels (departmental, faculty, state).

Naza and Martin Buntinas of Loyola University in Chicago held a prestigious three year (1989-1990) NSF-Yugoslav research grant. In 1985 she won the state prize for scientific work 'Vesilin Maslesa'.

She helped tens of her physics and Mathematics students apply to leading graduate universities, especially in the United States.

1988 was a banner year! She helped 5 Math. Dept. students go to the U.S. for their PhD degrees. Hajrudin Fejzic (Michigan State University), Mirna Dzamonja (the University of Wisconsin), Mladen Despic (University of California- Berkeley) and Iztok Hozo and Lejla Miller (both to the University of Michigan).

Over the years the Tanovic-Miller home served as a meeting place for visiting mathematicians from around the world including Paul Erdos and Walter and Mary Ellen Rudin. Students , visitors, and friends met, ate (very well!) and socialized at A. Sahinagica 8.

Everyone who knew Naza, knows that none of the above mentioned activities were taken in a formal way; she had only one way of operating - full commitment.

This brief summary of Naza's activities would be incomplete if we didn't comment on the following three items. The journal Radovi Matematički, her book Testimony of a Bosnian and her patriotic activities, in America, during the war of aggression against her country (BiH).

Naza's general plan was to help put her country, BiH, on the map scientifically. For her and Prof. Mahmut Bajraktarevic it was clear in the mid - 80's that the next logical step was

to create an international mathematical journal based in Sarajevo. This idea led to the birth of 'Radovi Matematički' in 1985 (the same year that the gentle and dear Prof. Bajraktarević passed away). Naza, over the years, referred to the journal as her third child and treated it as such. The birth of Radovi Matematički was anything but easy. The terrible anti-Bosnian nationalism, that would erupt seven years later leaving hundreds of thousands dead and millions displaced was already on display. The pressures on the supporters of the new journal were extremely intense. The courage displayed by Prof. Bajraktarević and Naza in fighting for the new journal, against attacks by the chauvinists, was inspirational. In the end the child lived and thrived. For years Naza served as Associate Editor in Chief and did all the work. In 1996, finally (!), she was named Editor in Chief. Recall that the war of aggression against BiH made it impossible to publish Radovi Matematički from 1992 up until 1998. After the war, Naza resuscitated Radovi Matematički through her back breaking efforts. After her death RM continued as the Sarajevo Journal of Mathematics, with her husband acting as Editor in Chief. Times were tough and money was lacking. The journal stayed afloat through donations by various editors, friends and institutions. It has NOT been easy.

While in the U.S, from November 1993 till June 1997 besides teaching at the Universities of Michigan and Tennessee-Chattanooga and working as an Associate Editor of the prestigious Mathematical Reviews (of the American Mathematical Society) Naza was extremely active in trying to alert the media, the general public and leading American politicians to the horrors taking place in BiH. These efforts started already in Sarajevo with interviews for CNN (C. Amanpour), CBS (America, Bob Simon), and John Burns of the NYTIMES. In America she gave dozens of talks about true nature of the war of aggression against BiH at various American Universities in Illinois, Indiana, Ohio, Michigan and Tennessee. She organized and participated in meetings, symposiums and demonstrations on behalf of the Bosnian cause. She gave a large number of interviews before the media and organized the signing of petitions supporting Bosnia. These petitions were used to pressure the relevant American and international institutions. Naza worked, from the start of the war, with BosNet, The Bosnian Information Network. Also, during this period, she did an amazing amount of humanitarian work on behalf of Bosnian refugees in America. In December 1992 she was one of the founders of the American Bosnian-Herzegovian Association which coordinated humanitarian and cultural activities. The organization was very active in getting medical treatment for the wounded, tending to the needs of refugees, and in organizing the collection and shipment of humanitarian aid to BiH. Till her death Naza was honorary president of the Association. Also, during her years in America, Naza aided dozens of her former students in finding jobs, continuing their education and writing countless letters of recommendation.

On top of all the activities mentioned here, Naza wrote a wonderful book 'A Testimony of a Bosnian' that was published by Texas A&M University Press in 2001. Her book, as Academic Prof. Dr. Trvko Kulenović wrote, is both beautiful literature and a comprehensive, accurate presentation of what the war in Bosnia was really about. Naza identifies the actual perpetrators of the war and unapologetically calls to task those who had the power to prevent the atrocities but did not. The book contains a survey of Bosnian history and personal stories from the war that add a human dimension to the book.

We live in an age of cynicism and people with little altruism seem to dominate the public scene. But remembering Naza Tanovic-Miller should remind us what a scientist, a professor, and a person in general, ought to be like. It's character, just character. She stands like a rock in our memory.

Selected Research Publications

- [33] **N.Tanovic-Miller**: *On integrability and L^1 convergence of differential trigonometric series*, J.Math. Analysis and App., ISSN: 0022-247X, **284**(1)(2003), 351-372
- [32] **N.Tanovic-Miller**: *On Fomin and Fomin-type integrability and L^1 convergence classes*, Acta Sci. Math. (Szeged), ISSN 0044-4235, **68** (2002), pp. 751–775
- [31] **N.Tanovic-Miller** and M.R.Ramanujan, *A generalization of Hausdorff - Young theorem*, Acta Math. Hungarica, ISSN: 0236-5294, **81**(4)(1998): 279-303.
- [30] **N.Tanovic-Miller** and I.Szalay, *On the dual of A^p and S^p , the spaces of absolutely and strongly convergent Fourier series of index $p > 1$* , Acta Sci. Math. (Szeged), ISSN 0044-4235, **60**(1995): 637-657.
- [29] **N.Tanovic-Miller**, *Some new integrability classes for general trigonometric series*, Sarajevo J. Math. (Formerly: Rad. Mat.), ISSN 1840-06558, (1992): 291-310
- [28] **N.Tanovic-Miller** and M.Buntinas, *New integrability and L^1 convergence classes for even trigonometric series II*, In: J.Szanads and K.Taudori (eds.): *Approximation theory*, Vol. **58** of Colloq. Math. Soc. Janos Bolyai, North-Holland, 1991: 103-125
- [27] **N.Tanovic-Miller** and M.Buntinas, *Integrability classes and summability*, Israel Math. Conf. Proc. **4**(1991): 75-88
- [26] **N.Tanovic-Miller** and M.Buntinas, *Strong boundedness and strong convergence in sequence spaces*, Canadian J. Math., ISSN 0008-414X, **43**(5)(1991): 960-974.
- [25] **N.Tanovic-Miller** and M.Buntinas, *Absolute boundedness and absolute convergence in sequence spaces*, Proc. Amer. Math. Soc., ISSN 0002-9939, **111**(4)(1991): 967-979.
- [24] **N.Tanovic-Miller** and I.Szalay, *On Banach spaces of absolutely and strongly convergent Fourier series, II*, Acta Math. Hungarica, ISSN: 0236-5294, **57**(1-2)(1991): 131-149.
- [23] **N.Tanovic-Miller** and M.Buntinas, *New integrability and L^1 convergence classes for even trigonometric spaces*, Sarajevo J. Math. (Formerly: Rad. Mat.), ISSN 1840-06558, **6**(1)(1990): 149-170.
- [22] **N.Tanovic-Miller** and I.Szalay, *On Banach spaces of absolutely and strongly convergent Fourier series*, Acta Math. Hungarica, ISSN: 0236-5294, **55**(1-2)(1990): 149-160.
- [21] **N.Tanovic-Miller**: *On Banach spaces on strongly convergent trigonometric series*, J.Math. Ann. and Appl., ISSN: 0022-247X, **146**(1)(1990): 110-127.
- [20] **N.Tanovic-Miller**: *On integrability and L^1 convergence cosine series*, Boll. Un. Math. Ital, ISSN: 1972-6724, **6** (1-B) (1990): 494-516
- [19] **N.Tanovic-Miller**: *Strongly convergent trigonometric series as Fourier series*, Acta Math. Hungarica, ISSN: 0236-5294, **47** (1-2)(1986): 127-135.

- [18] **N.Tanovic-Miller**: *On a paper Bojanic and Stanojevic*, Rendiconti Cir. Mat. Palermo, ISSN: 0009-725X, **34** (2)(1985): 310-324
- [17] **N.Tanovic-Miller**: *On the order of approximation of continuous functions by triangular means*, Boll. Un. Math. Ital, ISSN: 1972-6724, **6** (4-B) (1985): 671-687.
- [16] **N.Tanovic-Miller** and M.Avdispahic: *On the spectra on nonnegative triangular matrix transformation*, Analysis, International mathematical journal of analysis and its applications, ISSN: 2196-6753, **3**(1983): 39-54
- [15] **N.Tanovic-Miller**: *On strongly convergence on trigonometric and Fourier series*, Acta Math. Hungarica, ISSN: 0236-5294, **42**(1983), 35-43
- [14] **N.Tanovic-Miller**: *On some generalization of Fejer-Lebesgue theorem*, Boll. Un. Math. Ital, ISSN: 1972-6724, **6** (1-B) (1982), 1217-1233
- [13] **N.Tanovic-Miller**: *A Mercerian theorem for slowly varying*, Publ. de l'Inst. Math., ISSN: 0350-1302, **28**(42)(1980), 203-208
- [12] **N.Tanovic-Miller**: *On strong summability, II*, Glasnik Mat, ISSN 0017-095X, **15**(35)(2)(1980), 283-302.
- [11] **N.Tanovic-Miller**: *Inclusion relation for some composed matrix transformation*, Akad. Nauka Umjet. Bosne i Hercegovine, Odjelj. Prir. Mat. Nauka, LXVI (19)(1980), 77-86
- [10] **N.Tanovic-Miller**: *On strong regularity*, Akad. Nauka Umjet. Bosne i Hercegovine, Odjelj. Prir. Mat. Nauka, LXVI (19)(1980), 59-69
- [9] **N.Tanovic-Miller**: *On strong summability*, Glasnik Mat, ISSN 0017-095X, **34**(1979), 87-97.
- [8] **N.Tanovic-Miller**: *On the inclusion relation for absolute summability*, Akad. Nauka Umjet. Bosne i Hercegovine, Odjelj. Prir. Mat. Nauka, LIV (16)(1976), 103-115
- [7] **N.Tanovic-Miller**: *On multipliers of some sequence spaces, II*, Akad. Nauka Umjet. Bosne i Hercegovine, Odjelj. Prir. Mat. Nauka, LIV (16)(1976), 85-102
- [6] **N.Tanovic-Miller**: *On multipliers of some sequence spaces*, Akad. Nauka Umjet. Bosne i Hercegovine, Odjelj. Prir. Mat. Nauka, LIV (16)(1976), 49-68
- [5] **N.Tanovic-Miller**: *On multipliers of Cesaro summable sequences*, Akad. Nauka Umjet. Bosne i Hercegovine, Odjelj. Prir. Mat. Nauka, XLV (12)(1973), 93-103
- [4] **N.Tanovic-Miller**: *On multipliers of some sequence spaces*, Ph.D. Ill. Inst. Tech., 1969, 77 pp. and
N.Tanovic-Miller: *On multipliers of some sequence spaces, abstract*. Dissertations, 1970, 2841-B
- [3] **N.Tanovic-Miller** and A. Wolsky: *A scan convertor storage tube with travelling wave deflection system*, Proc. Conf. IEEE, Washington, 1965
- [2] **N.Tanovic-Miller**: *A meander travelling wave deflection system*, Rauland Co., Chicago, 1965, 84 pp.
- [1] **N.Tanovic-Miller**: *The influence of high energy on the operation on closed field multipliers*, Rauland Co., Chicago, 1964, 54 pp.

Received by editors 29.05.2015; Revised version 31.07.2015; Available online 01.09.2015.