

ROBERT ARNOLD SMITH
23.1.1937–30.3.1983

ERNST KANI

Robert Arnold Smith was born on 23 January 1937 in Santa Monica (near Los Angeles) where he spent most of his childhood years. After the death of Bob's father, the family moved to Venice (also near Los Angeles) and Bob attended the local high school there. Having already spent a year in Junior College, he began his university studies in 1957 at Sacramento State University, from which he graduated in 1960 with a B. A. in Physics and in 1961 with an M. A. in Applied Mathematics. His research in Number Theory, which was to become his major interest in life, began formally at the University of Colorado at Boulder. There he joined a school of number theorists which included S. Chowla, who subsequently became his life-long friend and mentor. When Chowla accepted a professorship at Pennsylvania State University, Bob followed him there in 1963, having just married Karin Roos, whom he had met during his undergraduate years in Sacramento.

His stay at Penn State was a brief one: already in the next year he accepted a position as Lecturer at the University of Toronto, where he was to remain for the rest of his life. After receiving his Ph. D. degree from the University of Colorado in 1965 for his thesis entitled "Some contributions to Analytic Number Theory", he was offered the position of Assistant Professor which was followed up by a promotion to Associate Professor in 1972 and culminated in his recent promotion to Full Professor.

In Toronto Bob met Hans Heilbronn, whom he greatly admired and who over the years exerted a considerable amount of influence on Bob's research, both directly by suggesting problems to him and also indirectly through his lectures. Bob's admiration for Heilbronn led him to undertake the project of editing Heilbronn's collected papers for publication, a project that was cut short at the time of Bob's death but was taken up again later and is now nearing completion. In Toronto Bob also collaborated a great deal (almost daily) with his colleague and friend, John H. H. Chalk, which resulted in two joint papers.

Received by the editors April 15, 1984.

Bob's main research interests ranged from Algebraic Number Theory (in particular, class field theory, algebraic function fields) to Analytic Number Theory (L-functions, exponential sums, (average orders of) arithmetic functions) and Automorphic Function Theory (in particular, Maass wave forms). Although most of his published papers tended to be devoted to Analytic Number Theory, he was keenly interested in the other fields as well, as is evident from the fact that at the time of his death he was writing a book on Algebraic Number Theory.

Although Number Theory was his main love, Bob's other scientific interests also ranged over a rather wide spectrum. Besides being interested in all fields of Mathematics, he still sustained his interest in Physics (which dates back to his undergraduate years) by keeping up with the literature there as much as possible. In his leisure time as well, Bob had engaged himself in many different activities, most of which he did together with his family and, in particular, with his two children, Alva and Michael. Karin sums up his interests as follows:

“Bob had many interests, besides mathematics, interests that had started in his high-school years, and these were: Photography (in order to relax he would make his own prints, in black or color), Astronomy (he has three telescopes, the largest with a twelve inch mirror, which he used to take out in the summer months and observe the sky throughout the night), Music (he loved classical and renaissance music, played the recorder and, to some extent, the piano). In the last few years he began to build a computer: his interest was at first in the ‘hard ware’, but he also began to get involved with ‘soft ware’. He was hoping to do some programming for number theory. (His computer was finished with 64K memory.) . . . His love for nature took him to the high mountains in the Rockies and in the Sierras, as well as the Alps. It was in these places where he really felt at home and in complete peace. But his great love was mathematics.”

The tragic news of Bob's death on 30 March 1983 came as a great shock to his colleagues and many friends. Some of these, including the author, had been with Bob just minutes prior to his fatal heart attack which occurred at the Spadina subway station in Toronto on his way home. Little did we realize that evening that when we said good-bye to him then that it would be forever, for he appeared to be his usual cheerful self.

It was this general cheerfulness and vitality which, coupled with his achievements in Number Theory, made him so popular with his colleagues and fellow mathematicians, especially those he met at conferences. [This popularity was recently put into evidence by the overwhelming response

which Joe Repka received in soliciting papers in honour of Bob to be published in the Canadian Mathematical Bulletin.] Nevertheless, those of us who had the opportunity to get to know him better will probably remember him best for his great enthusiasm and passion for Mathematics, a passion that affected and inspired all those around him, and will continue to do so in the years to come. We all have, indeed, lost a good friend.

LIST OF PUBLICATIONS

1. (With S. Chowla) *On certain functional equations*, Norske Vid. Selsk. Forth. (Trondheim) **40** (1967), 43–47.
2. *The circle problem in an arithmetic progression*, Can. Math. Bull. **11** (1968), 175–184.
3. *On $r(n)r(n+a)$* , Proc. Nat. Acad. Sci. India (Part A) **34** (1968), 132–137.
4. *An error term of Ramanujan*, J. Number Theory **2** (1970), 91–96.
5. *The distribution of rational points on hypersurfaces defined over finite fields*, Mathematika **17** (1970), 328–332.
6. (With J.H.H. Chalk) *On Bombieri's estimate for exponential sums*, Acta Arith. **18** (1971), 191–212.
7. (With T. Callahan) *L -functions of a quadratic form*, Trans. A.M.S. **217** (1976), 297–309.
8. *On n -dimensional Kloosterman sums*, C. R. Math. Rep. Acad. Sci. Canada **1** (1979), 173–176.
9. *On n -dimensional Kloosterman sums*, J. Number Theory **11** (1979), 324–343.
10. *The average order of a class of arithmetic functions over arithmetic progressions with applications to quadratic forms*, J. reine angew. Math. **317** (1980), 74–87.
11. *Estimates for exponential sums*, Proc. A.M.S. **79** (1980), 365–368.
12. *A generalization of the Kuznetsov identity for Kloosterman sums*, C. R. Math. Rep. Acad. Sci. Canada **2** (1980), 315–320.
13. (With M. Subbarao) *The average number of divisors in an arithmetic progression*, Can. Math. Bull. **24** (1981), 37–41.
14. *A note on Dirichlet's theorem*, Can. Math. Bull. **24** (1981), 379–380.
15. *The L^2 -norm of Maass wave functions*, Proc. A.M.S. **82** (1981), 179–182.
16. (With J. Loxton) *Estimates for multiple exponential sums*, J. Australian Math. Soc. **33** (1982), 125–134.
17. (With J.H.H. Chalk) *Sandor's Theorem on polynomial congruences and Hensel's lemma*, C.R. Rep. Acad. Sci. Canada **4** (1982), 49–54.
18. (With J. Loxton) *Hua's estimate for exponential sums*, J. London Math. Soc. (2) **26** (1982), 15–20.
19. *The generalized divisor problem over arithmetic progressions*, Math. Ann. **260** (1982), 255–268.
20. *The distribution of rational points on a curve defined modulo q* , this volume, p.
21. (With E. Kani) *The Collected Papers of Hans Arnold Heilbronn* (ed.), John Wiley and Sons, New York, 1985, 589–601.

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