

# MUHAMMAD ZAFRULLAH

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## EDUCATION

- 1974 Ph. D. (Mathematics) University of London (Thesis Advisor: P. M. Cohn)
- 1969 M. Sc. (Mathematics) University of the Punjab Lahore, Pakistan
- 1967 B. Sc. (Mathematics and Physics) University of the Punjab, Lahore, Pakistan

## PROFESSIONAL EXPERIENCE

- 2010-2011 Visiting Professor, The University of Iowa, Iowa City, IA
- 2008- Affiliate faculty, Idaho State University, Pocatello, ID
- 2000-2004 Visiting Assistant Professor, Idaho State University, Pocatello, ID
- 1999-2000 Lecturer, The University of Arkansas, Fayetteville, AR
- 1998 Fall Visiting Associate Professor, University of Iowa, Iowa City, IA
- 1998 Spring Part-time instructor, Mount Mercy College, Cedar Rapids, IA
- 1997 Fall Visiting Associate Professor, The University of Iowa, Iowa City, IA
- 1997 Spring Part-time Instructor, Bowie State University, Bowie, MD
- 1996 Fall Part-time Instructor, Bowie State University, Bowie, MD
- 1989-92 Associate Professor, Winthrop University, Rock Hill, SC
- 1989 Spring Visiting Associate Professor, The University of Iowa, Iowa City, IA
- 1988 Fall Visitor, Florida State University, Tallahassee, Florida
- 1987-88 Visitor, University of North Carolina at Charlotte, Charlotte, NC
- 1985-87 Honorary Research Fellow, University College London, London, UK
- 1984-85 Associate Professor, Al- Faateh University, Tripoli, Libya
- 1982-84 Associate Professor, University of Sebha, Sebha, Libya
- 1977-82 Assistant Professor, University of Sebha, Sebha, Libya
- 1975-77 Demonstrator, UMIST, Manchester, UK

## PROFESSIONAL SERVICES

Reviewer, Zentralblatt MATH.

Did review for Mathematical Reviews but then resigned. See letter from AMS at:

<http://www.lohar.com/Letter%20from%20AMS.pdf>

Referee for Mathematical Journals

Outside reviewer of Ph.D. theses

Associate Editor, International Journal of Commutative Ring Theory

## ADMINISTRATIVE EXPERIENCE

Chairman of the Department of Mathematics, University of Sebha, Sebha, Libya: from 1978 to 1983.

At Winthrop University I served on the Seminar Committee and the Winthrop-Wylie Mathematics Tournament Committee.

At the University of Arkansas, I was faculty adviser to a student organization called Pakistan Cultural Club.

## SELECTED CONFERENCES AND VISITS

### Conferences:

1. **Second Piedmont Mathematics Conference**, held at the University of North Carolina at Charlotte. (Duration: 3-13 87 to 3-14 8.) I gave a talk on the work that later developed into [24]. (A number in brackets such as this refers to the ordinal position of the paper in the list of my publications in My Research.)
2. **841st AMS meeting** at the University of Tennessee at Knoxville, TN. (Duration: 3-24-88 to 3-27-88). Evan Houston gave a talk on [21].
3. **861st AMS meeting** held at Denton Texas in November 1990. Presented a paper on  $t$ -class groups and Nagata's class group Theorem. The work later appeared as [47].
4. **Colloque International d'Algebre Commutative**, held at the University of Fez Morocco. (Duration: 4-20-92 to 4-24-92) Gave a talk on  $t$ -invertibility especially highlighting the elements whose presence in an ideal ensures its invertibility (or  $t$ -invertibility). This work later appeared as [48].
5. **915th AMS Meeting** held at UT Chattanooga TN, in October 1997. Gave a talk on unique factorization in non atomic rings
6. **936th AMS Meeting** held at Wake Forest University, Winston-Salem, NC in October, 1998.
7. **962<sup>nd</sup> AMS Meeting**, New Orleans, Louisiana, January 2001. Gave a talk on LCM-Splitting Sets in Some Ring Extensions [68]
8. **International Conference on Commutative Ring Theory**, held at the Inha University in Incheon, Korea on May 18-19, 2001. Gave a talk on factorization and splitting sets. The material presented in this talk later developed into [74].
9. **Fourth International Conference, Commutative Ring Theory and Applications**, June 7-12, 2001, held at Fez, Morocco. Gave a plenary talk on Various facets of rings between  $D[X]$  and  $K[X]$ . Wrote a survey article with the same title. The survey "half appeared" in the conference proceedings, it has appeared in full in Comm. Algebra (see [71]). While in Fez I also served on the jury of Abdeslam Mimouni's thesis. Mimouni is a student of S. Kabbaj, a well-known Moroccan Algebraist.
10. **969<sup>th</sup> AMS Meeting**, September 21-23, 2001, Columbus, Ohio. I gave a talk on Another look at Nagata Type Theorems. In it I talk on  $t$ -LCM Splitting sets and corresponding Nagata type theorems. Most of this material went into [74].

11. **984<sup>th</sup> AMS Meeting**, March 14-16, 2003, Baton Rouge, Louisiana, gave a talk on  $A+XB[X]$  domains and the HFD property. This is joint work with Jim Coykendall and Tiberiu Dumitrescu [81].
12. **994<sup>th</sup> AMS meeting**, March 12-13, 2004, Tallahassee, Florida, gave a talk on t-splitting sets of ideals and the influence Gilmer and Mott had on this area of research.
13. **Workshop on commutative rings and their modules**, May 30-June 4, 2004, Cortona, Italy, gave a plenary talk on v-coprimality and its applications. The title of the talk was, "What v-coprimality can do for you". I have written a survey article [85] on this topic.

#### **Visits:**

1. Italy: At the suggestion of Professor Abdus Salam, I visited the International Centre of Theoretical Physics at Trieste for a month in 1983. During this stay I attended an activity on dynamical systems, directed by Professors Jaco Palis and E.C. Zeeman, wrote [18] and gave the opening talk in a Forum on "Mathematics in the Third World". (The discussion was suggested by Prof. Salam.)
2. Italy: Professor Marco Fontana of Istituto Matematico Universita di Roma invited me, in 1985, to visit for a week. I gave a talk there and wrote [19].
3. France: Professor Alain Bouvier of Universite Claude Bernard, Lyon, France, invited me, in 1986, to visit for ten days. Gave several talks, discussed with Bouvier's students their future work. In Lyon, I met several Moroccan Students. Later some of them, such as Salah Kabbaj, and their students, worked on topics of research of interest to me and furthered my work.
4. US: Professor Joe Mott of Florida State University, Tallahassee Florida invited me to visit and give a Talk at his department. This visit turned into a tour of several universities including The University of Iowa, Iowa City, IA, the University of Tennessee at Knoxville, TN and the University of Virginia at Charlottesville, VA. I gave talks at all these places over a period of some twenty days and wrote or planned a number of papers.
5. Morocco: While in Morocco, in June 2001, I visited Universite Qadi Ayyad, Marrakech to serve as a member of jury on Said el Baghdadi's thesis.
6. China: Dr. Yi Chuan Yang invited me to visit the Beihang University from May 21 to June 22, 2010. While I was in Beijing I gave talks and worked on [103]. I also spent a week in Chengdu, at the invitation of Professor Wang Fanggui at Sichuan Normal University, and gave talks.

### **RESEARCH PUBLICATIONS**

- [1]. A note on two generated finite groups with two defining relations, Punjab Univ. J. Math. (Lahore) 4(1971), 67-68.
- [2]. On the evaluation of a certain arithmetical function, J. Natur. Sci. and Math. 12(1972), 363-365 (with S.M. Kerawala).
- [3]. Semirigid GCD-domains, Manuscripta Math. 17(1975), 55-66.

- [4].The construction  $D + XD_s[X]$ , J. Algebra 53(1978), 423-439 (with D.L. Costa and J.L. Mott).
- [5].On a result of Gilmer, J. London Math. Soc. 16 (1977), 19-20.
- [6].Rigid elements in GCD domains, J. Natur. Sci. and Math. 17(1977), 7-14.
- [7].On unique representation domains, J. Natur. Sci. and Math. 18(1978), 19-29.
- [8].On finite conductor domains, Manuscripta Math. 24(1978), 191-204.
- [9].On Prüfer  $v$ -multiplication domains, Manuscripta Math. 35(1981), 1-26 (with J.L. Mott).
- [10].Some polynomial characterizations of Prüfer  $v$ -multiplication domains, J. Pure Appl. Algebra 32 (1984), 231-237.
- [11].The  $v$ -operation and intersections of quotient rings of integral domains, Comm. Algebra 13(1985) 1699-1712.
- [12].A general theory of almost factoriality, Manuscripta Math. 51(1985), 29-62.
- [13].Overrings and dimensions of general  $D + M$  constructions, J. Natur. Sci. and Math. 26(2) (1986), 7-14 (with D.L. Costa and J.L. Mott ).
- [14].The GCD property and irreducible quadratic polynomials, International J. Math. 9(1986), 749-752 (with S.B. Malik and J.L. Mott).
- [15].On generalized Dedekind domains, Mathematika 33(1986), 285-296.
- [16].On a property of pre-Schreier domains, Comm. Algebra 15(1987), 1895-1920.
- [17].On  $t$ -invertibility, Comm. Algebra 16(1988), 149-170 (with S.B. Malik and J.L. Mott).
- [18].The  $D + XD_s[X]$  construction from GCD-domains, J. Pure Appl. Algebra 50(1988), 93-107.
- [19].Two characterizations of Mori domains, Math. Japonica 33(1988), 645-652.
- [20].On generalized multiplicative functions I, J. Natur. Sci. and Math. 28(1988), 257-268.
- [21].Integral domains in which each  $t$ -ideal is divisorial, Michigan Math. J. 35(1988), 291-300 (with E. Houston).
- [22].Ascending chain conditions and star operations, Comm. Algebra 17(6) (1989), 1523-1533.
- [23].Some characterizations of  $v$ -domains and related questions, Colloq. Math. Vol. LVIII (1989), 1-9 (with D.D. Anderson, D.F. Anderson, D. Costa, D. Dobbs and J.L. Mott).
- [24].Some quotient based characterizations of domains of multiplicative ideal theory, Bull. Math. Ital. (7) 3-B (1989), 455-476 (with D.D. Anderson and J.L. Mott).
- [25].On  $t$ -invertibility II, Comm. Algebra 17(8) (1989), 1955-1969 (with E. Houston).
- [26]. $t$ -linked overrings and Prüfer  $v$ -multiplication domains, Comm. Algebra 17(11) (1989), 2635-2852 (with D. Dobbs, E. Houston and T. Lucas).
- [27].On some class groups of an integral domain, Bull. Soc. Math. Grece. 29(1988), 45-59 (with A. Bouvier).
- [28].Unruly Hilbert domains, Canad. Bull. Math. 33(1) (1990), 106-109 (with J.L. Mott).
- [29].Well behaved prime  $t$ -ideals, J. Pure Appl. Algebra 65(1990), 199-207.
- [30].Contents of polynomials and invertibility, Comm. Algebra 18(5) (1990), 1569-1583 (with J.L. Mott and B. Nashier).
- [31].Flatness and invertibility of ideals, Comm. Algebra 18(7)(1990), 2151-2158.

- [32].t-linked overrings as intersections of localizations, Proc. Amer. Math. Soc. 109(3)(1990), 637-646 (with D. Dobbs, E. Houston and T. Lucas).
- [33].Weakly factorial domains and groups of divisibility, Proc. Amer. Math. Soc. 109(4)(1990), 907-913 (with D.D. Anderson).
- [34].Factoriality in partially ordered groups, Comm. Algebra 18(5)(1990), 1307-1322.
- [35].On almost Bezout domains, J. Algebra 142(1991), 285-309 (with D.D. Anderson).
- [36].On pseudo integrality, Canad. Math. Bull. 34(1)(1991), 15-22 (with D.F. Anderson and E. Houston).
- [37].Factorization in integral domains, J. Pure Appl. Algebra 69(1990),1-19 (with D.D. Anderson and D. F. Anderson).
- [38].Rings between  $D[X]$  and  $K[X]$ , Houston J. Math. 17(1)(1991), 109-129 (with D.D. Anderson and D.F. Anderson).
- [39].On Krull domains, Archiv der Math. 56(1991), 559-568 (with J.L. Mott).
- [40].Splitting the t-class group, J. Pure Appl. Algebra 74(1991), 17-37 (with D.D. Anderson and D.F. Anderson).
- [41].t-linked overrings of Noetherian weakly factorial domains, Proc. Amer. Math. Soc. 115(3)(1992), 601-604 (with M. Martin).
- [42].Factorization in integral domains II, J. Algebra 152(1992), 78-93 (with D.D. Anderson and D.F. Anderson).
- [43].Finite character representations for integral domains, Bull. Math. Ital. (7) 6-B(1992), 613-630 (with D.D. Anderson and J.L. Mott).
- [44].On t-linked overrings, Comm. Algebra 20(5)(1992), 1463-1488 (with D. Dobbs, E. Houston, T. Lucas and M. Roitman).
- [45].Atomic domains in which almost all atoms are primes, Comm. Algebra 20(5)(1992), 1447-1462 (with D.D. Anderson and D.F. Anderson).
- [46].On t-invertibility III, Comm. Algebra 21(1993), 1189-1201 (with D.D. Anderson).
- [47].t-linked extensions, the t-class group and Nagata's Theorem, J. Pure Appl. Algebra 86(1993), 109-124 (with D.D. Anderson and E. Houston).
- [48].On t-invertibility and comparability, *Commutative Ring Theory* (eds. P.-J. Cahen, D. Costa, M. Fontana and S.-E. Kabbaj), Marcel Dekker, New York, 1994, 141-150 (with R. Gilmer and J. Mott).
- [49].Some locally trivial star theoretic properties of integral domains, *Commutative Ring Theory* (eds. P.-J. Cahen, D. Costa, M. Fontana and S.-E. Kabbaj), Marcel Dekker, New York, 1994, 87-96 (with D. Dobbs).
- [50].A note on Riesz groups, Manuscripta Math. 80(1993), 225-238.
- [51].A note on triangular numbers, Punjab. Univ. J. Math. 26( 1993), 75-83 (with H. Lee).
- [52].On a theorem of Kaplansky, Bolletino U.M.I. (7) 8-A (1994), 397-402 (with D.D. Anderson).
- [53].P.M. Cohn's completely primal elements, *Zero-Dimensional Commutative Rings* (eds. D.F. Anderson and D. Dobbs) Marcel Dekker, New York, 1995, 115-123 (with D.D. Anderson).
- [54].On generalized unique factorization, Bollettino U. M. I. (7) 9-A (1995), 401-413 (with D.D. Anderson and D.F. Anderson).
- [55].On agreeable domains, Comm. Algebra 23 (13) (1995), 4861-4883 (with D.D. Anderson and D. J. Kwak).

- [56]. Examples in modern algebra with which students can play, *Primus* 6 No. 4, (1996), 351-354 (with T. Jackson).
- [57]. On  $t$ -invertibility IV, *Factorization in Integral Domains* (ed. D.D. Anderson) Marcel Dekker, New York, 1997, 221-225 (with D.D. Anderson).
- [58]. Criteria for unique factorization in integral domains, *J. Pure Appl. Algebra*, 127(1998), 205-218 (with D.D. Anderson, S. T. Chapman and F. Halter-Koch)
- [59]. Unique factorization in non-atomic integral domains, *Bollettino U. M. I* 8(2-B) (1999) 341-352 (with D.D. Anderson and J.L. Mott).
- [60]. Star operations and primitive polynomials, *Comm. Algebra* 27(7)(1999) 3137-3142 (with D.D. Anderson).
- [61]. Independent locally finite intersections of localizations, *Houston J. Math.* 25(1999) 433-452 (with D. D. Anderson)
- [62]. Integral domains whose over-rings satisfy ACC on principal ideals, *Comm. Algebra* 28(9)(2000), 4403-4409. (with T. Dumitrescu and Tariq Shah).
- [63]. Splitting multiplicative sets *Proc. Amer. Math. Soc.* 129(2001) (8), 2209-2217 (with D. D. Anderson).
- [64]. Putting  $t$ -invertibility to use, *Non-Noetherian commutative ring theory*, 429-457, *Math. Appl.*, 520, *Kluwer Acad. Publ., Dordrecht*, 2000.
- [65]. Primes that become primal in a pullback, *Internat. J. Comm. Ring Theory (Commutative rings)* 201-212, *Nova Sci. Publ., Hauppauge, NY*, 2002. (with T. Dumitrescu and N. Radu).
- [66]. The ring  $D+XD[1/S][X]$  and  $t$ -splitting sets, *Commutative algebra. Arab. J. Sci. Eng. Sect. C Theme Issues* 26 (2001), no. 1, 3--16. (with D. D. Anderson and D.F. Anderson)
- [67]. Distinguished domains, *Commutative rings*, 159--166, *Nova Sci. Publ., Hauppauge, NY*, 2002. (with D.D. Anderson and D.J. Kwak).
- [68]. LCM-splitting sets in some ring extensions *Proc. Amer. Math. Soc.* 130 (2002), no. 6, 1639—1644 (with T. Dumitrescu).
- [69]. Almost GCD domains of finite  $t$ -character, *J. Algebra* 245(2001) no 1, 161-181 (with T. Dumitrescu, Y. Lequain and J. Mott)
- [70]. Various facets of rings between  $D[X]$  and  $K[X]$ , a survey article that has “half appeared” in the proceedings of the 2001 Fez Conference (Lecture notes in Pure and Applied Mathematics Volume 231, pp (Marcel-Dekker 2002), under the nonsensical title, “Facets on rings between  $D[X]$  and  $K[X]$ ”. The paper has appeared as indicated below. I am treating it as two papers because apparently Math. Reviews have done that.
- [71]. Various facets of rings between  $D[X]$  and  $K[X]$ , *Comm. Algebra* 31(5) (2003) 2494-2540.
- [72]. On a property of weakly Krull domains, *Proc. Amer. Soc.* 131(12) (2003) 3689-3692 (with D.D. Anderson).
- [73]. Almost Splitting Sets and AGCD Domains, *Comm. Algebra*, 32(1)(2004), 147-158 (with D. D. Anderson and T. Dumitrescu).
- [74]. Factorization of certain sets of polynomials in an integral domain, *Internat. J. Comm. Ring Theory*, 2(2003) (with D.D. Anderson and Pramod K. Sharma)
- [75].  $t$ -Splitting sets in integral domains, *J. Pure Appl. Algebra* 187, No.1-3, 71-86 (2004). (with G.W. Chang and T. Dumitrescu).

- [76]. AP domains and unique factorization, *J. Pure Appl. Algebra* 189, No.1-3, 27-35 (2004) (with James Coykendall).
- [77]. UMV domains, *Arithmetical properties of commutative rings and monoids*, 304-315, *Lect. Notes Pure Appl. Math.*, 241, Chapman & Hall/CRC, Boca Raton, FL, 2005 (with Evan Houston).
- [78]. Weakly Krull inside factorial domains, *Arithmetical properties of commutative rings and monoids*, 172--179, *Lect. Notes Pure Appl. Math.*, 241, Chapman & Hall/CRC, Boca Raton, FL, 2005 (with D.D. Anderson and G.W. Chang).
- [79]. A note on almost GCD monoids, *Semigroup Forum* Volume 69, Number 1(2004), 141-154 (with DD Anderson).
- [80]  $t$ -splitting sets of ideals, *J. Pure Appl. Algebra* 197(1-3)(2005) 239-248. (with Gyu Whan Chang and T. Dumitrescu)
- [81] The half factorial property and the domains of the form  $A+XB[X]$ , *Houston J. Math.* 32(1)(2006) 33-46 (with J. Coykendall and T. Dumitrescu)
- [82] The  $w$ -integral closure of integral domains. *J. Algebra* 295(1)(2006) 195-210. (with G. W. Chang).
- [83] The Schreier Property and Gauss' Lemma (with D.D. Anderson) *Bollettino U. M. I.* (8) 10-B (2007), 43-62.
- [84] Quasi Schreier domains II (with D.D Anderson and T. Dumitrescu) *Comm. Algebra* 35(7)(2007), 2096-2104.
- [85] What  $v$ -coprimality can do for you, *Multiplicative ideal theory in commutative algebra*, 387--404, Springer, New York, 2006.
- [86] Pseudo almost integral elements *Comm. Algebra* 35(4)(2007), 1127-1131. (with D. D Anderson)
- [87] Monoid domain constructions of antimatter domains, (with D.D. Anderson, L. Hill and J. Coykendall) *Comm. Algebra* 35(10)(2007), 32-36.
- [88] Factoriality in Riesz groups (with J.L. Mott and Munir A. Rashid) *J. Group Theory* 11(1)(2008), 23-41.
- [89] Unique representation domains II (with S. El-Baghdadi and S. Gabelli) *J. Pure Appl. Algebra* 212(2)(2008), 376-393.
- [90] Some remarks on Prufer  $*$ -multiplication domains and class groups (with D.F. Anderson and M. Fontana) *J. Algebra* 319(1)(2008), 272-295.
- [91] Almost Bezout domains, III (with Dan Anderson), *Bull. Math. Soc. Sci. Math. Roumanie Tome 51(99) No. 1* (2008), 3-9.
- [92] A simple application of Zorn's Lemma (with D.D. Anderson and D. Dobbs) *Tamkang J. Math.* 40(2)(2009), 139-150.
- [93] On  $v$ -domains and star operations, (with D.D. Anderson, D.F. Anderson and M. Fontana), *Comm. Algebra* 37(2009) 1-26.
- [94] On  $v$ -domains, a survey, in *Commutative Algebra, Noetherian and non-Noetherian perspectives*, (Editors: Fontana, Kabbaj, Olberding and Swanson) pp. 145-179, Springer 2011.
- [95] Splitting sets and weakly Matlis domains (with Dan Anderson) *Commutative algebra and its applications*, 1-8, Walter de Gruyter, Berlin, 2009.
- [96]  $t$ -invertibility and Bazzoni-like Statements, *J. Pure Appl. Algebra* *J. Pure Appl. Algebra* 214(2010), 654-657.

- [97] Domains in which nonzero locally principal ideals are invertible (with D.D. Anderson) *Comm. Algebra* 39 (2011), no. 3, 933–941.
- [98] A v-operation free' approach to Prüfer v-multiplication domains. *Int J. Math. Sci.* 2009, Art. ID 349010 (with M. Fontana).
- [99] t- Schreier domains (with T. Dumitrescu) *Comm. Algebra* 39 (2011), no. 3, 808--818.
- [100] Characterizing domains of finite \*-character, *J. Pure Appl. Algebra* 214 (2010), 2087-2091 (with T. Dumitrescu).
- [101] \*-Finite ideals contained in infinitely many \*-s-maximal ideals, [Rendiconti del Circolo Matematico di Palermo](#), 2011, [Volume 60, Number 3](#), Pages 319-322 (with Dan Anderson).
- [102] The v-operation in extensions of integral domains, *J. Algebra Appl.*, 11 (2012), no. 1, 1250007, 18 pp (with David Anderson and said El-Baghdadi)
- [103] Bases of pre-Riesz groups and Conrad's F-condition, [Arabian Journal for Science and Engineering](#), 2011, [Volume 36, Number 6](#), Pages 1047-1061 (with Y.C. Yang).
- [104] Integral domains of finite t-character, *J. Algebra*, 396 (2013) 169—183. (With D.D. Anderson and G.W. Chang)
- [105] Corrigendum to "Integral domains of finite t-character", [*J. Algebra* 396 (2013) 169--183], *J. Algebra* 405 (2014), 35--37. (With D.D. Anderson and G.W. Chang)
- [106] Studying monoids is not enough to study multiplicative properties of rings: an elementary approach, *Arabian Journal of Mathematics* (to appear) (With M. Fontana)
- [107] Integral domains in which any two v-[coprime](#) elements are [comaximal](#) *J. Algebra* *Volume 423*, (2015), 93-113. (with Evan Houston)
- [108] [Nagata-like theorems for integral domains of finite character and finite t-character](#) *J. Algebra and Applications* (to appear) (with D.D. Anderson and G. W. Chang)
- [109] Locally GCD domains and the ring  $D + XD_S[X]$ , *Bulletin Iranian Math. Soc.* (to appear) (with G.W. Chang and T. Dumitrescu)
- [110] Cohen type theorems in Commutative ring theory, *Houston J. Math.* (to appear) (with D.D. Anderson).
- [111] Intersections of quotient rings and Prüfer v-multiplication domains, *Journal of Algebra and Applications* (to appear) (with S. El-Baghdadi and M. Fontana)