

Bio-data of Professor B. N. Waphare



1. Full Name: DR. BALU NATHAJI WAPHARE

2. Date of Birth: 01-06-1962 (First June Nineteen Hundred Sixty Two)

3. Designation: Professor, Department of Mathematics, University of Pune

4. Addresses:

(a) **Office:** Department of Mathematics, University of Pune, Pune-411 007.

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(b) **Residential:** “*Pramey*”, Near Bora Happy Homes, Jagtap Dairy, Pimple-Nilakh, Pune-411 027. **Mobile:** 09420179163

(c) **E-mail:** < *bnwaph@math.unipune.ac.in* > or < *waphare@yahoo.com* >

5. Educational Qualification: *M.Sc., M.Phil., Ph.D.*

(a) **B.Sc.(Maths):** In 1984 with **First class** from Ahmednagar College, Ahmednagar affiliated to University of Pune.

(b) **M.Sc.(Maths):** In 1986 with **First in order of Merit of Pune University** from Department of Mathematics, University of Pune.

(c) **M.Phil.(Maths):** In 1988 with ‘**O**’(Outstanding) grade from Department of Mathematics, University of Pune.

(d) **Ph.D. (Lattice Theory):** In 1993 from Department of Mathematics, University of Pune under the guidance of Professor N.K.Thakare.

6. Prizes/Scholarships/Honors:

(i) Prizes for scoring highest marks in M.A./M.Sc. Mathematics Examinations Pune University held in May 1986.

- (a) IMS, Poona Golden Jubilee Prize.
- (b) The Lokmanya Tilak Prize.
- (c) Prof. M.K.Agarwal M.Sc. Mathematics Prize.
- (d) Shri. J.R.Hiranandani Prize.
- (ii) IMS Prize for presenting the best research paper in Number Theory at the 65th Conference of the Indian Mathematical Society in 1999.
- (iii) National Board for Higher Mathematics[NBHM] Scholarship[1984-1986]
- (iv) Invited speaker for about 20 National and International Conferences.
- (v) Chaired a session at International Congress of Mathematicians(ICM)[2010]
- (vi) Editor of Journal of Indian Mathematical Society
- (vii) Academic Secretary of Academy of Discrete Mathematics and Applications(ADMA)
- (viii) Steering Committee member of Asian Mathematical Conference 2016
- (ix) Co-ordinator IGNOU Study center.

7. Experience: (a)Teaching: Total **28 years** (1 year under graduate + 27years post graduate).

(b) Administrative:

- (i) **Member, Management Council**, University of Pune: 30th March, 2007 to 31st August, 2010.
- (ii) **Head, Department of Mathematics**, University of Pune: 10th October, 2005 to 11th October, 2010.
- (iii) **Member, Senate**, University of Pune: 1st December, 2005 to which are beneficial for economically and socially backward students, for example, 31st August, 2010.
- (iv) **Member, Board of Studies** in Mathematics, University of Pune: 2000-till date
- (v) **Chairman, Board of Studies** in Mathematics, University of Pune: 2008- 2010
- (vi) **Member, Faculty of Science**, University of Pune: 2008-till date
- (vii) **Member, Board of Studies** in Mathematics, North Maharashtra University, Jalgaon: 2000- 2005

(viii) **Member, Board of Studies** in Stats and Comp. Appl., Univ. of Pune:
2005- 2010.

(ix) **Local Organizing Secretary** for:

- Seventh International Conference of SSFA, 21-23 February, 2006
- Centenary Year International Conference (73rd Annual Conference) of the Indian Mathematical Society, 27-30 December 2007.
- International Conference on Algebra and Algebraic Geometry (In honor of Professor Shriram Abhyankar on the occasion of his 80th Birthday), 17-22 December, 2010.
- National Conference on Discrete Mathematics, 22-24 December 2012.
- National Conference on Discrete Mathematics, Algebra and Analysis on the occasion of 75th birthdays of Prof. N. K. Thakare and Prof. T. T. Raghunathan, 21-24 April 2013.

(x) **Member, Council** of the Indian Mathematical Society: 2010-2012.

(xi) **Member**, American Mathematical Society[**AMS**][2000-till date]

(xii) **Life Member**, Indian Science Congress[**ISC**]

(xiii) **Life Member**, Indian Mathematical Society[**IMS**]

(xiv) **Reviewer, Mathematical Reviews** of AMS[2004-till date]

(xv) **Convener, Board of Studies in Mathematics**, Maharashtra State Higher Secondary Education, Govt. of Maharashtra.

(d) **Research:**

Areas of interest: Algebra(rings with involution), Lattice Theory, Graph Theory, Matroid Theory.

(i) Guided 8 Ph.D. and 3 M.Phil. students.

(ii) Completed Three Research Projects of worth Rs. 3 Lacs each.

(iii) Published more than 50 research articles and 5 books.

Solutions to the following long standing open problems are obtained:

- Can every weakly Rickart $*$ -ring be embedded in a Rickart $*$ -ring with preservation of right projections ?
- Enumerate Baer $*$ -rings with finitely many elements.
- How should one define modular pairs in posets?
- Define the natural extensions of notions of standard elements and neutral elements in posets.
- Give asymptotic upper bounds for the number of non-isomorphic posets with a given number of elements.

8. Publications:

1. On some properties of circuits in graphs, *Journal of Advances in Science and Technology*, **01**(1995) 45-48 (with M.M.Shikare and T.T.Raghunathan).
2. Partial solutions to the open problem of unitification, *Indian J. Pure Appl. Math.*, **28**(1997) 189-195 (with N.K.Thakare).
3. Splitting in a binary matroid, *Discrete Math.*, **184**(1998) 267-271 (with M.M.Shikare and T.T.Raghunathan).
4. Baer $*$ -rings with finitely many elements, *J. Combin. Math. Combin. Comput.*, **26**(1998) 161-164 (with N.K.Thakare).
5. Reducibility in finite posets, *European J. Combin.*, **22**(2001), 197-205 (with V.S.Kharat).
6. On Stone posets and strongly pseudocomplemented posets, *J. Indian Math. Soc. (N.S.)*, **68**(2001), 91-95 (with M.M.Pawar).
7. A structure theorem for dismantlable lattices and enumeration, *Period. Math. Hungar.*, **45**(1) (2002), 147-160 (with N.K.Thakare and M.M.Pawar).
8. Generalization of splitting off operation to binary matroids, *Electron. Notes Discrete Math.*, **15**(2003), 188-190 (with M.M.Shikare and G. Azadi)
9. A note on characterizations of central elements, *Acta Scientiarum Mathematicarum(Szeged)*, **69**(2003), 497-504 (with V. V. Joshi).
10. Modular pairs and covering property in posets, *J. Indian Math. Soc. (N. S.)*, **70**(2003), 50-87 (with N.K.Thakare and S.Maeda(Japan)).

11. Enumeration of non-isomorphic lattices with equal number of elements and edges. *Indian J. Math.*, **45**(2003), no. 3, 315–323. (with M. M. Pawar)
12. On forbidden configuration for strong posets, *Algebra Universalis*, **51**(2004)111-124 (with V. S. Kharat and N. K. Thakare).
13. Distributive Pairs in Biatomic Lattices, *Acta Mathematica Universitatis Comeniana*., **71**(2004), 69-73 (with V. V. Joshi)
14. Modular pairs, standard elements, neutral elements and related results in partially ordered sets, *J. Indian Math. Soc. (N. S.)*, **71**(2004), 13-53 (with N. K. Thakare and M. M. Pawar)
15. Characterizations of standard elements in posets, *Order* **21** (2004), 49-60 (with V.V.Joshi).
16. Some open problems in Baer *-rings: a survey, *Proceedings of the International Symposium On Theory of Rings and Modules*, Anamaya Publ., New Delhi, 145-160(2005) (with N. K. Thakare)
17. Characterizations of 0-distributive posets, *Math. Boh.*, **130**(2005), 73-80 (with V.Joshi).
18. On Uniquely Complemented Posets, *Order*, **22**(2005), 11-20 (with V.V.Joshi).
19. Biatomic Pairs in Posets, *Southeast Asian Bull. Math.*, **31**(2007), 35-46 (with V.Joshi).
20. On Distributive Pairs in Posets, *Southeast Asian Bull. Math.*, **31**(2007) 1205-1233 (with V.Joshi).
21. Fuzzy hyper p -ideal of hyper BCK -algebras, *Int. J. Math. Sci.*, **6(2)**(2007), 15-25 (with A. Gilani).
22. The cocircuits of splitting matroids, *Journal of the Indian Math. Soc.*, **74** 3-4(2007), 185-202(with M. M. Shikare and H. Azanchiler)
23. On pseudo a -ideal of pseudo- BCI algebras, *Sci. Magna*, **3**(2007), 50-59(with A. Gilani).
24. Fuzzy extensions in BCI -algebras, *Sci. Magna*, **3**(2007), 26-32 (with A. Gilani).

25. BCK -algebras with chain condition via fuzzy ideals, *International review of pure and applied Mathematics*, **3(2)**(2007), 319-326(with A. Gilani).
26. Reducibility Number, *Discrete Applied Mathematics*, **155(6)**(2007), 2069-2076 (with V. S. Kharat and N. K. Thakare).
27. A characterization of connected matroids, *Ars Combinatoria*, **86**(2008) 345-347 (with M. M. Shikare).
28. Reducibility of Regular Graphs-I, *Annual Iran M. C*, **I**(2008) 45-67 (with A. Attar).
29. Reducibility of Eulerian Graphs and Digraphs, *Journal of Al-Qadisiyah for Pure Science*, **13(4)**(2008) 183-194 (with Akram Attar).
30. n -ary $P - H_v$ groups, *J. Appl. Math. Inform.* **26**(2008) 945-959 (with A. Ghadiri).
31. On removable series classes in connected matroids, *Australasian Journal of Combinatorics*, **40**(2008) 247-252 (with Y. M. Borse).
32. Vertex-Disjoint non-separating removable cycles in connected graphs, *J. Indian Math. Soc.*, **75** (2008), 167-184(with Y. M. Borse).
33. Fuzzy multiply q -ideal in BCI -algebras, *International Journal of Algebra, Number Theory and Applications*, **1(1)**(2009)13-24(with A. Gilani).
34. Intuitionistic Fuzzy closed a -ideals of BCI -algebras, *International Journal of Algebra, Number Theory and Applications*, **1(1)**(2009)25-33(with A. Gilani).
35. A note on neutral elements in posets, *Math. Slovaca* **59** (2009), No. 4, 405-412(with V. V. Joshi).
36. Excluded minors for the class of graphic splitting matroids, *Ars Combinatoria*, **97** 2010, 111-127 (with M. M. Shikare).
37. On determination and construction of critically 2-connected graphs, *AKCE J. Graphs and Combin.*, **9** (1)(2010), 73-83 (with Y. M. Borse).
38. On antifuzzy normal closed b -ideal of BCI -algebras, *International Review of Fuzzy Mathematics* **2** (2007), no. 2, 171179(with A. Gilani).
39. n -ary H_v structures, *South-East Asian Bull. of Math.* **34** 2010, 243-255(with M. Ghadiri and D. Davvaz).

40. On removable cycles in connected graphs, *J. Indian Math. Soc.* **76** (2009) 31-46(with Y. M. Borse).
41. n -ary Polygroups, *Iranian Journal of Science and Technology* **33(42)** (2009) 145-158 (with Ghadiri).
42. Generalized splitting operation for binary matroids and its applications. *J. Indian Math. Soc.* **79** (2011) 66-75(with M. M. Shikare and G. Azadi).
43. Intuitionistic P^n -fuzzy subalgebra in $BCI(BCK)$ -algebras, *SIAM Journal on Discrete Mathematics*, (to appear)(with A. Gilani).
44. Regular connected bipancyclic spanning subgraphs of hypercubes, *Comp. Math. with Appl.*, **62 (9)**(2011), 3551-3554 (with S. Mane).
45. Quotient n -Ary PHv-Ring, *Carpathian J. Math.* **28 (2)**(2012), 239-246 (with M. Ghadiri, and B. Davvaz)
46. On Independent and (d, n) -domination numbers of hypercubes, *AKCE Int. J. Graphs Comb.*, **No. 2(9)** (2012), pp. 161-168 (with S. Mane).
47. On generalized zero-divisor graph of a poset, *Discrete Appl. Math.* **161** (2013) 1490-1495. (with Vinayak Joshi and H. Pourali).
48. Zero divisor graph of lattices with respect to primal ideals, *Asian-Eur. J. Math.* **Vol. 5, No. 3** (2012) 1250037 (9 pages) (with Vinayak Joshi and H. Y. Pourali).
49. On characterizations of strong posets, *J. Indian Math. Soc.(N.S.)* **79 No.1-4** (2012), 61-72 (with Vinayak Joshi).
50. On removable and non-separating even cycles in graphs, *J. Indian Math. Soc.(N.S.)* **80 No.3-4** (2013), 61-72 (with Y. M. Borse).
51. Removable cycles avoiding two connected subgraphs, *ISRN Discrete Math.*, **Vol.2013** (2013), Article ID 164535, 4 pages (with Y. M. Borse).
52. Dismantlability and reducibility in discrete structures, *Math. Student*, **82(1-4)**(2013), 117-130.
53. Graph of equivalence classes of zero divisors, *ISRN Discrete Math.*, Volume 2014, Article ID 896270, 7 pages (with Vinayak Joshi and H. Y. Pourali).

54. Diameter of Zero Divisor Graphs of Finite Direct Product of Lattices, Int. J. Math., Comput., Physical Quantum Eng. **8** No:9, (2014), 1206-1210 (with Vinayak Joshi and H. Y. Pourali).
55. Semi-Baer Modules, J. Algebra Appl., **14** (10) (2015) 1550145 (12 pages) (with A. S. Khairnar).
56. Zero-divisor graph of lower dismantlable lattices-I?, Math. Slovaca (To appear) (with Avinash Patil, Vinayak Joshi and H. Y. Pourali).
57. A proof of Frankl's Union-Closed Sets Conjecture for dismantlable lattices?, Algebra Universalis (To appear) (with Vinayak Joshi and S. P. Kavishwar)
58. Zero-divisor Graph of Rickart $*$ -rings, Asian-Euro. J. Math. (To appear) (with Avinash Patil)

9. Books Published:

1. Combinatorial Optimizations, Narosa Publishing House, New Delhi (2004) (Edited with M. M. Shikare)
2. Geometry, X^{th} standard(English version), Maharashtra State Board of Secondary and Higher Secondary Education (2007)(Written with R. V. Warade and others).
3. Geometry, X^{th} standard(Marathi version), Maharashtra State Board of Secondary and Higher Secondary Education (2007)(Written with R. V. Warade and others).
4. Proceedings of the Seventh International Conference of the Society for Special Functions and Their Applications, Pune (2007)(Edtd. with N. K. Thakare et al.)
5. Algebra, XII^{th} standard, Maharashtra State Board of Secondary and Higher Secondary Education (2011)(Written with J. V. Atre and others).

10. Invited Talks (2011-15)

1. International Conference on Algebra and its Applications organised by Department of Mathematics AMU, Aligarh, December 15-17, 2014.
2. 23^{rd} Hansraj Gupta Memorial Award Lecture in 78^{th} Annual Conference of Indian Mathematical Society organised by Banaras Hindu University, Varanasi (UP), January 22-25, 2012.

3. (Symposia and Talk) 77th Annual Conference of Indian Mathematical Society organised by School of Mathematical Sciences, SRTM University, Nanded (MS), December 27-30, 2011.
4. State Level Seminar organised by Shri Vijaysinha Yadav Arts and Science College, Peth Vadgaon, October 16-17, 2014.
5. National Conference on Mathematical Sciences organised by School of Mathematical Sciences, North Maharashtra University, Jalgaon, March 5th, 2012.

11. Resource Person (2011-15)

1. Chaired session in th 80th Annual Conference of The Indian Mathematical Society, organized by Department of Mathematics, Indian School of Mines, Dhanbad. December 27-30, 2014.
2. DST-INSPIRE PROGRAMME organised by Yashwantrao Chavan College of Science, Karad, January 9-13, 2014.
3. DST-INSPIRE PROGRAMME organised by Shri Dhokeshwar Mahavidhyalaya, Takali Dhokeshwar, January 3-07, 2012.
4. DST-INSPIRE PROGRAMME organised by New Arts, Commerce and Science College, Shevgaon, January 20-24, 2011.
5. DST-INSPIRE PROGRAMME organised by Arts, Science and Commerce College, Rajur, January 04-08, 2013.
6. DST-INSPIRE PROGRAMME organised by N New Arts, Commerce and Science College, Parner, December 13-17, 2012.
7. 19th Annual Conference of Shivaji University Mathematical Society, organised by Department of Mathematics, Shrimati Kasturbai Walchand College, Sangali, February 10-11, 2012.
8. Refresher Course in Mathematics at BAMU, March 11-12, 2015.
9. Refresher Course in Mathematics at BAMU, September 25-26, 2012.
10. 22nd Annual Conference organised by Balwant College, Vita, March 9-10, 2015.
11. University Level Workshop organised by R.B. Narayanrao Borawake College, Shrirampur, January, 24, 2011.

12. Annual Conference organised by Barshi Taluka Ganit Adhyapak Mandal, Barshi, December, 22, 2011.
13. NET-SET Coaching Scheme organised by Department of Mathematics, Shivaji University Kolhapur, March 9-16, 2014.
14. Restructuring of Syllabus organised by KTHM College, Nashik January 24, 2014.
15. Member RR committee in Mathematics, SRTM University, Nanded.

12. Participation / Presentations (2011-15)

1. Participation in an International Conference organised by Universits Gadjah Mada, Yogyakarta, Indonesia, August 18-21, 2015.
2. Participation in 16th Intentional Scientific Olympiad (Mathematics) in Hamedan, Iran, August 16-19, 2015.
3. Participation in 79th Annual Conference of Indian Mathematical Society organised by Rajagiri School of Engineering and Technology, Kochi Kerala, December 28-31, 2013.
4. Participation in meeting for co-coordinators of Lerner Support Centers conducted by IGNOU regional center, Pune, March 16, 2013.
5. Participation in meeting for co-coordinators of Lerner Support Centers conducted by IGNOU regional center, Pune, February 01, 2014.