

Curriculum Vitae

Name

Gholamreza Baradaran Khosroshahi

Position

Professor,
University of Tehran, (retired) and
Founding Professor of
Institute for Research
Fundamental Sciences (IPM)

Mailing Address

IPM
P.O.Box 19395-5746
Tehran-Iran.
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**Academic Positions
at other Institutions**

- Visiting scholar, Cornell university, Ithaca (1974, 1977-78).
- Visiting scholar, University of Illinois at Chicago (1978, 1984m 1986).
- Member of scientific council, Institute for Research in Fundamental Sciences (IPM), Tehran (since 1989).
- Senior Associate, Abdus Salam International Center for Theoretical Physics (ICTP) (1990-1998).
- Visiting Associate Professor, Department of Mathematics, Statistics and Computer Science, University of Illinois at Chicago (1989-1990).
- Head, Combinatorics and Comput. Research Group, IPM.
- Associate Director of IPM and Head of School of Mathematics (1997-2007).
- Head of Information Center, IPM (since 1990).

Education

M.S. (1963) University of Tehran, Tehran;
M.S. (1969) Cornell University, Ithaca, N.Y.;
Ph.D. (1972) Cornell University, Ithaca, N.Y.;
Ph.D. Supervisor: L.E. Payne.

Courses Taught*Undergraduate:*

Ordinary and Partial Differential Equations, Mathematical Analysis, Linear Algebra, History of Mathematics, Applied Abstract Algebra, Discrete Mathematics.

Graduate:

Functional Analysis, Spectral Theory, Partial Differential Equations, Theory of Combinatorial Designs, Combinatorics I & II, Topics in Combinatorics, Coding Theory I & II.

Research Interests

Combinatorial Design Theory, Coding Theory, and Graph Theory.

Fellowships and Grants

Iranian Ministry of Higher Education Fellowship (1977-78).
Fulbright Grant (1977-78).
Distinguished Researcher, University of Tehran 1991-1992.
Winner of the Kharazmi International Award (2000) in Fundamental Research.
Distinguished Professor of the country (2005).

Professional Affiliations

American Mathematical Society, Member;
Mathematical Association of America, Member;
Iranian Mathematical Society, Member;
Institute of Combinatorics and its Applications, Fellow.

References

Professor **M.R. Larijani**, Director,
Institute for Research in Fundamental Sciences (IPM),
P.O.Box 19395-5746,
Tehran, Iran.

Professor **A. Hedayat**,
Dept. of Math., Statist., and Computer Science,
University of Illinois,
Chicago. IL., USA.

List of Publications of G.B. Khosrovshahi

Papers, Published

1977

1. *Nonexistence of nontrivial solutions of Schrödinger type systems*, SIAM J. Math. Anal. **8**(1977), 988-1013. **ISI**

1979

2. *On the positive spectrum of Schrödinger operators with long range potentials*, Trans. Amer. Math. Soc. **26**(1979), 211-228, with H. Levine and L.E. Payne. **ISI**

1981

3. *On nonexistence of L^2 solutions of second order differential equations*, Applicable Anal. **2**(1981), 125-137. **ISI**
4. *An algebraic study of BIB designs: A complete solutions for $v = 6$ and $k = 3$* , J. Combin. Theory Ser. A **30**(1981), 43-52, with A. Hedayat. **ISI**

1987

5. *A linear algebraic algorithm for reducing the support sizes of t -designs and generate a basis for trades*, Commun. Statist.-Simula. **16**(4)(1987), 1015-1038, with E.S. Mahmoodian.
6. *On BIB designs with various support sizes for $v = 9$ and $k = 3$* , Commun. Statist. Simula. **16**(4)(1987), 1015-1038, with E.S. Mahmoodian.

1988

7. *BIB $(9, 18t, 8t, 4, 3t)$ designs with repeated blocks*, J. Statist. Plann. Inf. **18**(1988), 125-131, with E.S. Mahmoodian. **ISI**

1990

8. *On some support sizes for BIB designs with $v = 9$ and $k = 4$* , J. Statist. Plann. Inf. **26**(1990), 83-92, with F. Vatan and S. Ajoodani-Namini. **ISI**
9. *A new basis for trades*, SIAM J. Disc. Math. **3**(1990), 364-372, with S. Ajoodani-Namini. **ISI**
10. *On trades and designs*, Comput. Statis. & Data Anal. **10**(1990), 163-167. **ISI**

1991

11. *On $3-(8, 4, \lambda)$ designs*, Ars Combin. **32**(1991), 115-120, with F. Vatan. **ISI**
12. *Combining t -designs*, J. Combin. Theory Ser. A **58**(1991), 26-34, with S. Ajoodani-Namini. **ISI**

1992

13. *An infinite family of 6-designs exists*, Sankhya: Special Vol. **54**(1992), 259-264, with S. Ajoodani-Namini. **ISI**

14. *On the structure of basic trades*, J. Combin., Information and System Sciences **17**(1992), 102-107, with D. Majumdar and M. Widel.

1993

15. *A prospect for a general method of constructing t -designs*, Discrete Appl. Math. **42**(1993), 31-50, with A. Hedayat and D. Majumdar.**ISI**
16. *The spectrum of support sizes of BIB designs with $v = 10$ and $k = 5$* , J. Combin. Math. and Combin. Comput. **14**(1993), 33-37, with S. Ajoodani-Namini, F. Vatan, and M. Widel.

1994

17. *More on halving the complete designs*, Discrete Math. **135** (1994), 29-37, with S. Ajoodani-Namini.**ISI**
18. *On 4 -($10, 5, 6m$) designs with repeated blocks*, Ars Combin. **37**(1994), 275-287, with F. Vatan.**ISI**

1995

19. *A note on labeling graphs*, Linear and Multilinear Algebra **39**(1995), 165-169, with R. Torabi.**ISI**
20. *On the bases for trades*, Linear Algebra Appl. **226-228**(1995), 731-748, with CH. Maysoori.**ISI**
21. *Some simple and automorphism-free 2 -($15, 5, 4$) designs*, J. Combin. Designs **3**(1995), 285-292, with A. Nozari-Dalini and R. Torabi.**ISI**

1996

22. *Intersections of triple systems: small orders*, J. Combin Math. Combin. Comput. **20** (1996), 33-52 with S. Ajoodani-Namini and A. Shokoufandeh.
23. *On a conjecture of A. Hartman*, Combinatorics Advances, C.J. Colbourn and E.S. Mahmoudian (eds.), Kluwer Academic Press, (1996), 1-12, with S. Ajoodani-Namini.
24. *Magic labeling in graphs: bounds, complexity and an application to a variant of TSP*, Networks **28** (1996), 211-219, with B. Kalantari.**ISI**
25. *Construction of some cyclic anti-Pasch Steiner triple systems of small orders*, J. Combin. Inform. System Sci. **21**(1996), 1-4, with H. Yousefi-Azari.
26. *Octahedrals in Steiner quadruple systems*, Utilitas Math. **51**(1996), 33-39, with H. Yousefi-Azari.**ISI**

1997

27. *Further characterization of basic trades*, J. Statist. Plann. Inf. **58**(1997), 87-92, with N.M. Singhi.**ISI**

28. *Trading signed designs and some new 4-(12, 5, 4) designs*, Des. Codes Cryptogr. **11**(1997), 279-288, with A. Nozari-Dalini and R. Torabi.**ISI**
29. *Smallest defining sets for 2-(10, 5, 4) designs*, Australas. J. Combin. **15**(1997), 31-35, with H.R. Maimani.
30. *On maximum size anti-Pasch sets of triples*, in: Geometry, Combinatorial Designs and Related Structures (J.W.P. Hirschfeld, S.S. Magliversa, and M.J. de Resmini, eds.), London Math. Soc. Lecture Note Ser. **245**, Cambridge Univ. Press, Cambridge, 1997, pp. 7-14, with S. Akbari, CH. Maysoori, and SH. Shahriari.

1998

31. *On compressing complete designs*, J. Statist. Plann. Inf. **74**(1998), 193-201, with R. Naserasr.**ISI**

1999

32. *Maximal trades*, Ars Combin. **51**(1999), 211-223, with R. Torabi.**ISI**
33. *On 2-(v, 3) Steiner trades of small volumes*, Ars Combin. **52**(1999), 199-220, with H.R. Maimani.**ISI**
34. *On the structure of higher incidence matrices*, Bull. Inst. Combin. Appl. **25**(1999), 13-22, with CH. Maysoori.
35. *On trades: an update*, Discrete Appl. Math. **95** (1999), 361-376, with H.R. Maimani and R. Torabi.**ISI**
36. *Hypergraphical codes arising from binary trades*, Des. Codes Cryptogr. **18** (1999), 183-186, with R. Naserasr.**ISI**
37. *Classifications of simple 2-(6, 3) and 2-(7, 3) trades*, Austral. J. Combin. **19** (1999), 55-72, with H.R. Maimani and R. Torabi.

2000

38. *On halvings of the 2-(10, 3, 8) design*, J. Statist. Plann. Inf. **86** (2000), 411-419, with Z. Eslami and B. Tayfeh Rezaie.**ISI**
39. *Classification of some large sets and designs*, J. Geom. **67** (2000), 105-110, with Z. Eslami.
40. *A complete classification of 3-(11, 4, 4) designs with a nontrivial automorphism group*, J. Combin. Des. **8** (2000), 419-425, with Z. Eslami.**ISI**

2001

41. *An automorphism-free 4-(15, 5, 5) design*, J. Combin. Math. Combin. Comput. **37** (2001), 187-192, with H.R. Maimani and R. Torabi.

42. *Ternary trades and their codes*, J. Statist. Plann. Inf. **95** (2001), 237-243, with R. Naserasr and B. Tayfeh-Rezaie.**ISI**
43. *On classification of 2-(8, 3) and 2-(9, 3) trades*, J. Combin. Math. Combin. Comput. **38** (2001), 231-242, with Z. Eslami and B. Tayfeh-Rezaie.
44. *A new proof of a classical theorem in design theory*, J. Combin. Theory Ser. A **93** (2001), 391-396, with B. Tayfeh-Rezaie.**ISI**
45. *Some new 6-(14, 7, 4) designs*, J. Combin. Theory Ser. A **93** (2001), 141-152, with Z. Eslami.**ISI**
- 46 *A note on 3-factorizations of K_{10}* , J. Combin. Des. **9**(2001), 379-383, with Ch. Maysoori and B. Tayfeh-Rezaie.**ISI**

2002

47. *On the smallest edge defining sets of graphs*, Ars. Combin. **63** (2002), 293-303, with S. Akbari.**ISI**
48. *Classification of 6-(14, 7, 4) designs with nontrivial automorphism groups*, J. Combin. Des. **10** (2002), 180-194, with M. Mohammad-Noori and B. Tayfeh-Rezaie.**ISI**
49. *Some designs of small orders and their codes*, J. Combin. Math. Combin. Comput. **43** (2002), 101-117, with E. Emamy and Ch. Maysoori.

2003

50. *Some results on the existence of large sets of t -designs*, J. Combin. Des. **11** (2003), 144-151, with B. Tayfeh-Rezaie.**ISI**
51. *Root cases of large sets of t -designs*, Discrete Math. **263** (2003), 143-155, with B. Tayfeh-Rezaie.**ISI**
52. *Some Bush-type Hadamard matrices*, J. Statist. Plann. Inf. **113** (2003), 375-384, with F. Kamali and H. Kharaghani.**ISI**

2004

53. *Some indecomposable t -designs*, Des. Codes Cryptogr. **32** (2004), 235-238, with B. Tayfeh-Rezaie.**ISI**
54. *Enumeration of t -designs through intersection matrices*, Des. Codes Cryptogr. **32**(2004), 185-191, with Z. Eslami and M. M. Noori. **ISI**
55. *On the existence of trades of large volumes*, Ars. Combin. **73**(2004), 45-48, with A. Hoorfar.**ISI**
56. *Some new 4-designs*, Ars Combin.**73**(2004), 225-229, with Z. Eslami, M. M-Noori, and B. Tayfeh-Rezaie.**ISI**

2005

57. *On the nonexistence of Steiner $t(v, k)$ trades*, Ars. Combin. **75**(2005), 195-204, with A. Hoorfar. **ISI**
58. *On large sets of t -designs of size four*, Bayreuth. Math. Schr. **74**(2005), 136-144, with R. Laue and B. Tayfeh-Rezaie.

2006

59. *The kernels of the incidence matrices of graphs revisited*, Linear Algebra Appl. **414**(2006), 617-625, with S. Akbari, N. Ghareghani, and H. R. Maimani. **ISI**
60. *$\{-1, 0, 1\}$ -basis for the null space of a forest*, Linear Algebra Appl. **414**(2006), 506-511, with S. Akbari, A. Alipour, and E. Ghorbani. **ISI**
61. *Large sets of t -designs through partinable sets, a review*, Discrete Math. **306** (2006), 2993-3004, with B. Tayfeh-Rezaie. **ISI**

2007

62. *t -Designs with $t \geq 3$* , Handbook of Combinatorial Designs, second edition (C.J. Colbourn and J.H. Dinitz, eds), Chapman & Hall/CRC, Boca Rton, 2007, pp 79-101, with R. Laue.
63. *Trades*, Handbook of Combinatorial Designs, second edition (C.J. Colbourn and J.H. Dinitz, eds), Chapman & Hall/CRC, Boca Raton, 2007, pp 644-648, with A.S. Hedayat.

2008

64. *On the Spectrum of simple $T(2, 3, v)$ Trades*, J. Statist. Plann. Inference. **138** (2008), 2236-2242, with M. Behbahani and B. Tayfeh-Rezaie. **ISI**
65. *Inclusion matrices and chains*, Combin. Theory. **A115** (2008), 878-887, with E. ghorbani, Ch. Maysoori and Mohammad-Noori. **ISI**

2009

66. *On zero-sum 6-flows of graphs*, Linear Algebra and its Applications **430** (2009), 3047-3052, with S. Akbari, N. Ghareghani, A. Mahmoody. **ISI**
67. *Classification of simple $2-(11, 3, 3)$ designs*, Discrete Math. **309** (2009), 515-520, with B. Tayfeh Rezaie. **ISI**

2011

68. *Simple signed steiner triple systems*, Journal of Combinatorial Designs DOI, **10.1002** (2011), with E. Ghorbani. **ISI**
69. *Zero-sum flows in designs*, J. Combin. Des. **19** (2011), 355-364, with S. Akbari and A. Mofidi. **ISI**

2012

70. *A note on zero-sum 5-flows in regular graphs*, The Electronic Journal of Combinatorics **19**(2) (2012), with A. Akbari, N. Ghareghani, and S. Zare.

2013

71. *On optimality of designs with three distinct eigenvalues*, Electron. J. Combin. **20** (2013), P16, with M.R. Faghigi, , and S. Tat. **ISI** E. Ghorbani
72. *Nowhere-zero 6-flows: A linear algebraic approach*, Bull. Inst. Combin. Appl. (2013), , with S. Akbari, and A. Mofidi. **ISI**

2014

73. *Minimum cycle basis of direct product of $K_2 \times K_n$* , Linear Algebra and its Applications, **458** (2014), 671-678, with N. Ghareghani. **ISI**
74. *More on the Wilson $W_{tk}(v)$ matrices* , The Electronic Journal of Combinatorics, **21**(2) (2014), P2.53, with M.H. Ahmadi, N. Akhlaghinia, and Ch. Maysoori. **ISI**
75. *On the inclusion matrix $W_{23}(v)$* , Linear Algebra and its Applications, **42-50** (2014), with M.H. Ahmadi, N. Akhlaghinia, and Ch. Maysoori. **ISI**

Papers, Submitted

1. *Ranks and signatures of adjacency matrices*, J. Graph Theory. with S. Akbari and P. J. Cameron.

• Books, Publication

1. Proceedings of Conferences (editor)

1. *Theoretical Aspects of Computer Science, Advanced Lectures*, Lecture Notes Comput. Sci. **2292**, Springer, Berlin, with A. Shokoufandeh and A. Shokrollahi, 2002.
2. *Discrete Mathematics*, “International Workshop on Combinatorics, Linear Algebra, and Graph Coloring”, **306**, December, with R. A. Brualdi, S. Hedayat, H. Kharaghani, and S. Shahriari, Published by Elsevier B.V., 2006.
3. *Linear Algebra and Its Applications*, Special issue devoted to selected papers presented at the “First IPM Conference on Algebraic Graph Theory”, **429**, with R. Brualdi, B. Mohar, and P. Rowlinson, Published by Elsevier Inc, 2008.
4. *Discrete Mathematics*, “International Workshop on Design Theory, Graph Theory, and Computational Methods - IPM Combinatorics II”, **309**, with J. Dinitz, H. Kharaghani, and S. Shahriari. Published by Elsevier B.V., 2009.

- 5. *Combinatorics and Graphs*, “Twentieth Anniversary Conference of IPM Combinatorics”, **531**, with Richard A. Brualdi, Samad Hedayat, Hadi Kharaghani and Shahriar Shahriari, Published by American Mathematical Society (AMS), 2009.

2. Books, translated into Farsi

1. Hochstadt, H., *Special Functions of Mathematical Physics*.
2. Crossly, J.N. and others, *What is Mathematical Logic?*, 4th impression, Oxford University Press, London, 1979.
3. Enderton, H.B., *A Mathematical Introduction to Logic*, Academic Press, New York, 1972.
4. Struik, D.J., *A Concise History of Mathematics*, 3rd edition, Dover Publication, Inc., New York, 1966.
5. G. B. Thomas, Jr., *Limits*, Addition-Wesley Publishing Company, Inc., Reading, 1963.
G. B. Thomas, Jr., *Continuity*, Addition-Wesley Publishing Company, Inc., Reading, 1963.
6. Batschelet, E., *Introduction to Mathematics for Life Scientists*, Springer-Verlag, Berlin, 1982.

3. IPM Lecture Notes

- *IPM Lecture Notes Series 1*, “A course on Foundations of Nonstandard Analysis”, V. Kanovei, G.B. khosrovshahi (Managing Editor), Published by IPM, 1994.
- *IPM Lecture Notes Series 2*, “Arithmetic Groups: An Introduction to Trace Formula and Hecke Operators”, S. Shokranian, G.B. khosrovshahi (Managing Editor), Published by IPM, 1997.
- *IPM Lecture Notes Series 3*, “Ten Lectures on Tight Closure”, I. Swanson, G.B. khosrovshahi (Managing Editor), Published by IPM, 2001.
- *IPM Lecture Notes Series 4*, “Combinatorics and Groups: Peter Cameron’s IPM Lecture Notes”, P. Cameron, G.B. khosrovshahi (Managing Editor), Published by IPM, 2001.
- *IPM Lecture Notes Series 5*, “Very Basic Noncommutative Geometry”, M. Khalkhali, G.B. khosrovshahi (Managing Editor), Published by IPM, 2005.
- *IPM Lecture Notes Series 6*, “Scaling Limits for Microscopic Models”, Fraydoun Rezakhanlou, G.B. khosrovshahi (Managing Editor), Published by IPM, 2007.
- *IPM Lecture Notes Series 7*, “Lecture on Classical Analytic Theory of L-function”, Amir Akbary, G.B. khosrovshahi (Managing Editor), Published by IPM, 2008.
- *IPM Lecture Notes Series 8*, “Lecture on Combinatorics I”, A. E. Brouwer, W. H. Haemers, E. Konstantinova, and R. M. Wilson, G.B. khosrovshahi (Managing Editor), Published by IPM, 2008.

• Editorial Board of Periodical Publications

1. Nashr-i-Ryazy, (a mathematics journal), in Farsi, (1988-1990).
2. Jong-i-Ryazy Daneshjoo, (a student mathematics journal) founder and supervisor, in Farsi, (1987-1994).
3. Associate Editor, Bulletin of Iranian Mathematical Society, (1992-1998).
4. Editor-in-Chief, Akhbar, (a newsletter of IPM), in Farsi.
5. Editor, Journal of Combinatorial Designs (JCD), Published by John Wiley and Sons (starting from 2006-2014).
6. Honorary Editor Journal of Combinatorial Designs(JCD),Published by John Wiley and Sons(2015).

Invited Speaker

1. 22nd British Combinatorial Conference (BCC-22), 2009, University of St Andrews, *On Trades and t -designs*.
<http://bcc2009.mcs.st-and.ac.uk/invited.html>
2. Invariants of Incidence Matrices, (March 29-April 3) 2009, Banff, Canada, *Some Remarks on $(t-k)$ Inclusion Matrices*.
3. ALCOMA '05, (April 3-10) 2005, Thurnau, Germany, *On the recursive constructions of large sets of t -designs*.
4. 22nd Annual Iranian Mathematics Conference, (March 13-16) 1991, Ferdowsi University of Mashhad, Iran, *A critique of two construction methods of t -designs*.

Conference Organizing (chairman)

2003

- *Workshop on Combinatorics, Linear Algebra & Graph Coloring*, IPM, Tehran (August 9-14).

2004

- *Workshop on Parallel Computing*, IPM, Tehran (July 14),
- *Workshop on Quantum Computing*, IPM, Tehran (August 1-5).

2006

- IPM Combinatorics II,
Design Theory, Graph Theory, and Computational Methods, IPM, Tehran (April 22-27).

2007

- *The First IPM Conference on Algebraic Graph Theory*, IPM, Tehran (April 21-26).

2009

- *IPM 20-Combinatorics 2009*, IPM, Tehran (May 15-21).

2012

- *ICTP-IPM Workshop and Conference in Combinatorics and Graph Theory*, ICTP, Trieste, (September 3-14). **Co-chairman**