Faculty Details proforma for DU Web-site

(PLEASE FILL THIS IN AND Email it to websiteDU@du.ac.in and cc: director@ducc.du.ac.in

Title	Dr.	First Name	Lalit	Last Name	Kumar	Photograph
Designation		Assistant Professor				
Address		Department of Mathematics University of Delhi (North Campus) Delhi-110007				
Phone No Office		011-27666658				
Residence		G-3/47, Sector 16, Rohini Delhi-1100089				
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Educational Qualifications

Degree	Institution	Year
Ph.D.	Ph.D. (Mathematics), University of Delhi.	2007
M.Phil. / M.Tech.		
PG	M.Sc. (Mathematics), Kurukshetra University.	2000
UG	B.Sc. (Mathematics, Physics and Chemistry) Kirori Mal College, University of Delhi.	1997

Career Profile

12th October, 2009 – till date: Assistant Professor, Department of Mathematics, University of Delhi.

11th December, 2007 – 11th October, 2009: Lecturer (ad-hoc), Dyal Singh College (M), University of Delhi.

23rd October, 2006 – 15th November, 2007: Lecturer (ad-hoc), Motilal Nehru College (M), University of Delhi.

Administrative Assignments

Member in various committees in the department.

Areas of Interest / Specialization

Frames for Banach Spaces, Hilbert Frames, Wavelet Analysis, Functional Analysis

Subjects Taught

UG Level: Real Analysis, Metric space, Linear Algebra, Differential Equations, Partial Differential Equation, Calculus, Geometry, Mechanics.

PG Level: Complex Analysis, Functional Analysis, Matrix Analysis, Measure and Integration, General Measure, Frames and Wavelets, Theory of Bounded Operators.

Research Guidance

1. Supervision of awarded Doctoral Thesis/ Submitted Thesis

(i) **Geetika Khattar** (2011-2015) Title: "*On the Reconstruction Property and Frames in Banach Spaces*''.

(ii) **Saakshi Garg** (2011-2015) Title: " *Weaving Generalized Frames in Hilbert Spaces and Frames in Locally Convex Spaces*''.

(iii) **Deepshikha** (2014-2017) Title: "*Weaving Frames in Hilbert Spaces*''

2. Supervision of Doctoral Thesis under progress

(i) **Hari Krishan Malhotra** (2016-) Under progress.

(ii) **Jyoti** (2017) - Under progress.

3. Supervision of awarded M.Phil dissertations

(i) Shah Jahan (2012), "Modular Frames and Riesz Bases in Hilbert C*-Modules".
(ii) Ashok Kumar (2011), ''A Study of Irregular Weyl-Heisenberg Frames'.'
(iii) Salaj, (2012)"A Study of Finite Frames in Hilbert Space"

(iv) Sulbha Kumar, (2012)''Geometric Means of Positive Definite Matrices" (jointly with Tanvi Jain).
(v) Soni, (2013)''Wavelet Frames and Multiresolution Analysis on Local Fields''.
(vi) Neha Sharma,(2013) ``Duality of Generalized Frames in Hilbert Spaces''.
(vii) Rajni Gupta, (2014) ''Fusion Frames in Hilbert Spaces''.

4. Supervision of M.Phil dissertations under progress.

(i) Ram Kishan (2017), under progress.

Publications Profile

Research papers published in Refereed/Peer Reviewed Journals

(1) Banach frames for conjugate Banach spaces. *Zeitschrift fur Analysis und ihre Anwendungen*. 23(4) (2004): 713-720. (with P K Jain and S K Kaushik.)

(2) Some remarks in the theory of frames in Banach spaces. *J. Anal. Appl*. 2(1) (2004): 39-50. (with P K Jain and S K Kaushik.)

(3) Bessel sequences and Banach frames in Banach spaces. *Bull. Cal. Math. Soc*. 98(1)(2006): 87-92. (with P K Jain and S K Kaushik.)

(4) On perturbation of Banach frames. *International Journal of Wavelets, Multiresoution and Info. Processing (IJWMIP)*. 4(3) (2006) :559-565. (with P K Jain and S K Kaushik.)

(5) On Banach frames. *Indian J. Pure & Applied Math*. 37(5) (2006) :265-272. (with P K Jain and S K Kaushik.)

(6) On stability of Banach frames. *Bull Korean Math*. Soc., 44(1) (2007) :73-81. (with P K Jain and S K Kaushik.)

(7) On Retro Banach frames of type P. Azer. J. Math. *2(1) (2012): 82-89.*

(8) On ϕ-Schauder Frames *TWMS J. App. and Eng. Math. 2(1)(2012) : 116-120.*

(9) On Frames in Banach Spaces, *Commun. Math. Appl. 3(3)(2012): 313-332.*

(10) On Weighted Banach Frames *Commun. Math. Appl.3(3)(2012):* 283-292.

(11) Some results concerning frames associated with measureable spaces, *TWMS J. Pure Appl. Math.,* 4 (1) (2013), 52—60. (with S.K.Kaushik and S.K.Sharma)

(12) On I-reconstruction property, *Adv. Pure Math.,* 3 (3) (2013) , 324--330. (with G. Khattar)

(13) Reconstruction property and frames in Banach spaces*, Palest. J. Math.,* 3(1) (2014), 11—26. (with S. K. Kaushik and G. Khattar).

(14) On Λ-type duality of frames in Banach spaces*, Int. J. Analysis Appl*., 4 (2)(2014), 148--158. (with R. Chugh and M. Singh).

(15) Frames of eigenfunctions associated with a boundary value problem, Int. J. Anal., Vol. 2014, Article ID 590324, 6 pages, 2014. doi:10.1155/2014/590324 (with Shalu Sharma)

(16) The reconstruction property in Banach spaces generated by matrices, *Adv. Pure Appl. Math.*, 5 (3) (2014), 151-160. (with G. Khattar).

(17) Some types of convergence related to the reconstruction property in Banach spaces, *Banach J. Math. Anal.,* 9 (2) (2015), 253-275. (with G. Khattar)

(18) On perturbation of local atoms for subspaces, *Poincare J. Anal. Appl.,* 2015 (2), 129--137. (with Deepshikha)

(19) Shadow of operators on frames, *TWMS J. Appl. Eng. Math.,* 5 (1) (2015), 132--144. (with R. Chugh)

(20) On exact frames in topological algebras, *Palest. J. Math.,* 5 (1) (2016), 131--134 (with Saakshi Garg)

(21) On perturbation of binary linear codes, *Math. Appl. (Brno),* 91--99. (with P. K. Das)

(22) Error locating codes by using blockwise-tensor product of blockwise detecting /correcting codes, *Khayyam J. Math.,* 2 (1) (2016), 6-17. (with P. K. Das)

(23) A note on discrete frames of translates in C^N, *TWMS J. Appl. Eng. Math.,* 6 (1) (2016), 143-149. (with Deepshikha)

(24) Extension of Weyl-Heisenberg wave packet Bessel sequences to dual frames in L^2(R)), J*. Class. Anal.,* 8 (2) (2016), 131--145. (with Deepshikha)

(25) On perturbation of frames in locally convex spaces*, Jordan J. Math. Stat.,* 9 (4) (2016), 271--286. (with S. Garg and G. Khattar)

(26) Weaving properties of generalized continuous frames generated by an iterated function system, *J. Geom. Phys.,* 110 (2016), 282--295. (with Deepshikha)

(27) On continuous weaving frames, *Adv. Pure Appl. Math.,* 8 (1) (2017), 15--31. (with Deepshikha)

(28) Necessary and sufficient conditions for discrete wavelet frames in C^N, *J. Geom. Phys.,* 117 (2017), 134--143. (with Deepshikha)

(29) Extension of Bessel sequences to dual frames in Hilbert spaces, *Politehn. Univ. Bucharest Sci. Bull. Ser. A Appl. Math. Phys.,* 79 (2) (2017), 71--82. (with Deepshikha).

(30) Generalized weaving frames for operators in Hilbert spaces, *Results Math., 72 (3)* (2017), 1360-1391. (with Deepshikha and Geetika Verma)

(31) On WH-packets of matrix-valued wave packet frames in L^2(R^d, C^(s x r)), *Int. J. Wavelets Multiresolut. Inf. Process, 16, (2018) to appear (with Jyoti).*

(32) Sums of matrix-valued wave packet frames in L^2(R^d, C^(s x r)), *Glas. Mat. Ser. III*, to appear (with Jyoti, Deepshikha and G. Verma).

(33) On generalized weaving frames in Hilbert spaces, *Rocky Mountain J. Math*., to appear.

(34) On excess of retro Banach frames, *J. Contemp. Math. Anal.*, to appear. (with G. Verma and M. Singh).

(35) On weaving frames, *Houston J. Math.,* to appear.

(36) On excess of retro Banach frames, J. Contemp. Math. Anal., to appear. (with G. Verma and M. Singh)

Conference Organization/ Presentations (in the last three years)

(a) Participation:

(i) National Meet on History of Mathematical Sciences, at University of Delhi,

07-09 Jan. 2009

(ii) Participated in international conference " Matrices and Operators", at IISc. Bangalore, during

December 27-30, 2012

(b) Paper Presentation / Talk :

(i) Present a paper entitled " *On Banach Frames II* " in International Workshop Wavelets,

Frames and Applications at Kirorimal College, University of Delhi, 15-21 December, 2011.

(ii) Present a paper entitled " On Various Types of Frames in Banach Spaces" in National Conf on Mathematics of Soft Computing at N I T Calicut, Kerla, during 05-07 July-2012.

(iii) Present a paper entitled " On (\omega, \mu) frames in Hilbert spaces" in nationalConfere on Mathematics (NCOM)-2013 at Department of Mathematics & Astronomy, University of Lucknow, Lucknow, 29-11-13 to 01-12-13

(iv) Present a paper entitled ``Some types of linear combinations of wave packet system in $L_2(R)$'' in National conference on emerging trends in mathematical sciences organised by Department of Mathematics, Chaudhary Devi Lal University, Sirsa during March 17-18, 2015.

(v) Delivered a talk ``Extension of Bessel Systems to Frames in L^2(R) in Conference on Geometry of Banach spaces and Operator Theory (GBOT) at IIT Kanpur during 26 - 29 March, 2015.

(vi) Present a paper entitled ``Weaving Frames in Measure Spaces'' in Internaional conference on Recent Advances in Pure and Applied Mathematics & 28th Annual Conference of Rajastha Ganita Parishad, at Department of Mathematics $\&$ Statistics, M. L. Sukhadia Univesity, Udaipur (Raj.), during 13-14 February, 2017.

(c) Invited talk / lecture:

(i) Delivered an invited lecture entitled " *On Retro Banach Frames in Banach spaces*" in National Conference on Recent Advances in Mathematics NCRAM-2012 at Department of Mathematics & Astronomy, University of Lucknow, Lucknow, 2-4, February 2012.

(ii) Delivered an invited lecture entitled \On Wave Packet Frames in $L_2(R)$ in International workshop on wavelets, frames and applications II at Kirori Mal college, University of Delhi, Delhi during 24-30 December, 2014.

(iii) Delivered an invited talk entitled ``Discrete Frames of Translates in C^N'' in National workshop on Analysis, Differential equations $\&$ Applications, at Department of Mathematics & Statistics, M. L. Sukhadia University, Udaipur (Raj.) during 25-27 February, 2016.

(iv) Delivered an invited talk entitled '' Weaving Properties of Generalized Frames in Hilbert Spaces'' in International Conference on Applicable Analysis, organized by Department of Mathematics, Shaheed Bhagat Singh College,University of Delhi, Delhi during 08-11 February, 2017.

(v) Delivered an invited lecture entitled "The Reconstruction Property of Fractals in L^p Spaces'' in International workshop on wavelets, frames and applications III at Kirori Mal college, University of Delhi, Delhi during 14-20 December, 2017.

(vi) Delivered an invited talk entitled '' Hilbert Frames: A Signal Processing Perspective'' in International Conference on Applicable Mathematics, organized by Department of Mathematics, Motilal Nehru College,University of Delhi, Delhi during 19-20 February, 2018.

Research Projects (Major Grants/Research Collaboration)
Awards and Distinctions
GATE -2001 (92.6%tile, 82 AIR) Remark: Qualified Award JRF-UGC vide letter No.- (Ref. No. Sch/JRF/AA/41/2002-03/) for two year . Award SRF-UGC vide letter No.- (Ref. No. Sch/JRF/AA/41/2002-03/) for two year
Association With Professional Bodies
Editing: None Reviewing: Reviewr in national / International journal. Advisory Committees and Boards Memberships. (i) Ramanujan Math. Soc
Other Activities

Signature of Faculty Member

- You are also requested to also give your complete resume as a DOC or PDF file to be attached as a link on your faculty page.