DR. SANJAY KUMAR

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Professional Profile

Functional analyst and operator theorist with more than fifteen years of university-level teaching experience. Research focuses on composition and weighted composition operators, Carleson measures, boundedness, compactness, essential norms, and dynamics in classical, quaternionic, and bicomplex spaces of analytic functions.

Experienced in postgraduate teaching, doctoral supervision, funded research, curriculum and examination work, faculty development, conference organization, and institutional academic service.

Research Interests

Functional Analysis, Complex Analysis, Operator Theory, Composition and Weighted Composition Operators, Dirichlet-type, Bergman, Bloch, Besov, Hardy, Fock, Orlicz–Lorentz and de Branges spaces, Carleson measures, essential norm and compactness, quaternionic slice hyperholomorphic analysis, bicomplex function theory, linear dynamics and Li–Yorke chaos.

Education

2004 – 2009	Ph.D. in Mathematics, University of Jammu. Thesis: *A Study of Weighted Composition Operators and Analytic Function Theory.*
2001 – 2003	M.Sc. in Mathematics, University of Jammu.
1998 – 2001	B.Sc., Government Degree College, Kathua, Jammu and Kashmir.

Teaching and Academic Employment

2026-Present	Associate Professor, Department of Mathematics, Central University of Jammu
2017-2026	Assistant Professor, Department of Mathematics, Central University of Jammu
2016–2017	Assistant Professor, Government Degree College Ramban, Government of Jammu and Kashmir.
2012–2016	Assistant Professor, Department of Mathematics, Central University of Jammu.
2009–2010	Teaching Assistant, Department of Mathematics, University of Jammu.

Postdoctoral Fellowships and International Research Exposure

2010–2012	NBHM Postdoctoral Fellowship, Department of Atomic Energy, Government of India.
Sep 2011	Postdoctoral research fellowship, Institute Mittag-Leffler, Royal Swedish Academy of Sciences, Djursholm, Sweden.
Oct 2010	Postdoctoral research fellowship, University of Malaga, Spain.

Research Publications

Peer-reviewed journal articles

1. **Kumar, S.** BMO-Spaces of Slice Hyperholomorphic Functions and Carleson Measure on Quaternionic Dirichlet-Type Spaces. *Mathematische Nachrichten*, **299**(8) (2026), 2118–2138. DOI: 10.1002/mana.70183.
2. **Dolkar, S. and Kumar, S.** Carleson Measures on Hardy Spaces with Bicomplex Scalars. *Ukrainian Mathematical Journal* **78**, article 3 (2026). DOI: 10.1007/s11253-026-02554-z.
3. **Dolkar, S. and Kumar, S.** Bicomplex Bloch and Little Bloch Spaces. *Journal of Fractional Calculus and Applications* **16**(2) (2025), 1–13.
4. **Sharma, A. K., Kumar, S., Sharma, M., Sharma, B., and Mursaleen, M.** On sum of weighted differentiation composition operators from Bergman spaces with admissible weights to Zygmund type spaces. *Advances in Operator Theory* **9**, article 45 (2024). DOI: 10.1007/s43036-024-00345-6.
5. **Kumar, S. and Dolkar, S.** Bicomplex Paley–Wiener Theorem. *Methods of Functional Analysis and Topology* **30**(1–2) (2024), 37–49. DOI: 10.31392/MFAT-npu26_1-2.2024.04.
6. **Dolkar, S. and Kumar, S.** Bicomplex Weighted Bergman Spaces and Composition Operators. *Advances in Applied Clifford Algebras* **33**, article 46 (2023). DOI: 10.1007/s00006-023-01291-x.
7. **Sharma, V., Kumar, S., and Dolkar, S.** Generalized Composition Operators on Besov Spaces. *Australian Journal of Mathematical Analysis and Applications* **20**(1) (2023), Article 18, 12 pp.
8. **Kumar, S. and Sharma, V.** Carleson Measures on Dirichlet-Type Spaces in the Quaternionic Unit Ball. *Advances in Operator Theory* **7**(4) (2022), article 69, 16 pp.
9. **Kumar, S. and Manzoor, K.** Slice Regular Besov Spaces of Hyperholomorphic Functions and Composition Operators. *Communications of the Korean Mathematical Society* **36**(4) (2021), 651–669.
10. **Kumar, S., Sharma, S. D., and Manzoor, K.** Quaternionic Fock Space on Slice Hyperholomorphic Functions. *Filomat* **34**(4) (2020), 1197–1207.
11. **Kumar, S., Manzoor, K., and Singh, P.** Composition Operators in Bloch Spaces of Slice Hyperholomorphic Functions. *Advances in Applied Clifford Algebras* **27**(2) (2017), 1459–1477.
12. **Kumar, R., Singh, K., Saini, H., and Kumar, S.** Bicomplex Weighted Hardy Spaces and Bicomplex C^*-Algebras. *Advances in Applied Clifford Algebras* **26**(1) (2016), 217–235.
13. **Gao, Y., Kumar, S., and Zhou, Z.** Order Bounded Weighted Composition Operators Mapping into the Dirichlet Type Spaces. *Chinese Annals of Mathematics, Series B* **37**(4) (2016), 585–594.
14. **Cheng, Y., Kumar, S., and Zhou, Z.** Composition Operators on Dirichlet Spaces and Bloch Space. *Acta Mathematica Sinica, English Series* **30**(10) (2014), 1775–1784.
15. **Cheng, Y., Kumar, S., and Zhou, Z.** Weighted Composition Operators on Dirichlet-Type Spaces and Related Q_p Spaces. *Publicationes Mathematicae Debrecen* **80**(1–2) (2012), 79–88.
16. **Kumar, S. and Sharma, S. D.** Schatten Class Weighted Composition Operators on Weighted Bergman Spaces of Bounded Symmetric Domains. *Acta Scientiarum Mathematicarum* **76**(1) (2010), 193–206.
17. **Kumar, S.** Weighted Composition Operators between Spaces of Dirichlet Type. *Revista Matematica Complutense* **22**(2) (2009), 469–488.
18. **Kumar, S. and Sharma, S. D.** On Composition Operators Acting between Besov Spaces. *International Journal of Mathematical Analysis* **3** (2009), 133–143.

19. **Kumar, S. and Singh, K. J.** Weighted Composition Operators between Besov Spaces. *Extracta Mathematicae* **23**(3) (2008), 217–234.

20. **Kumar, S. and Singh, K. J.** Weighted Composition Operators on Weighted Bergman Spaces. *Extracta Mathematicae* **22**(3) (2007), 245–256.

21. **Kumar, S. and Singh, K. J.** Weighted Composition Operators on Weighted Bergman Spaces of Bounded Symmetric Domains. *Proceedings - Mathematical Sciences* **117**(2) (2007), 185–196.

Conference proceedings

- Kumar, S. Weighted Composition Operators between Bergman Spaces of a Minimal Bounded Homogeneous Domain. Proceedings of the 22nd Annual Conference of the Jammu Mathematical Society and National Seminar on Complex Analysis and Related Areas, University of Jammu (2012).
- Kumar, S. and Sharma, S. D. Volterra Composition Operators between Weighted Bergman Spaces and Weighted Banach Spaces of Holomorphic Functions. Proceedings of the 20th Annual Conference of the Jammu Mathematical Society and National Seminar on Topological Algebraic Analysis, University of Jammu (2010).

Funded Research Projects

NBHM–DAE	PI, *Research Project Grant*, 2018.
UGC–BSR	PI, *Start-up Grant*, 2018

Research Supervision

Ph.D. scholars - awarded/submitted

Awarded 8 Sep 2017	Khalid Manzoor - Generalized Spaces of Functions and Linear Operators.
Awarded 15 Sep 2023	Vishal Sharma - Generalized Composition Operators on Besov-Type Spaces and Related Spaces.
Awarded 13 Aug 2025	Stanzin Dolkar - Holomorphic Functions and Weighted Composition Operators.
Submitted 17 Mar 2026	Banu Sharma - Some Product-Type Operators on Spaces of Holomorphic Functions.

Ph.D. scholars - in progress

May 2025	Pankaj Sharma - Weighted Composition Operators and Their Topological Properties on Function Spaces.
May 2025	Arunjeet Singh - Orlicz Spaces and Their Applications.

M.Phil. scholars - awarded

2014	Khalid Manzoor - Composition Operators on Bloch-Type Spaces.
2015	Ram Prakash - Composition Operators on Besov Spaces.

M.Sc. project supervision

Completed projects supervised: 7 (2011–2013), 7 (2012–2014), 7 (2013–2015), 5 (2014–2016), 6 (2015–2017), 5 (2016–2018), 5 (2017–2019), 5 (2018–2020), 9 (2019–2021), 8 (2020–2022), 8 (2021–2023), 9 (2022–2024), 4 (2023–2025), and 4 (2024–2026).

Courses taught at undergraduate and postgraduate levels

Abstract Algebra	Calculus	Complex Analysis
Engineering Mathematics I	Engineering Mathematics II	Functional Analysis
Real Analysis	Introduction to LaTeX	Ordinary Differential Equations
Partial Differential Equations	Operator Theory	Measure Theory
Set Theory	Spaces of Analytic Functions	Vedic Mathematics

Academic and Administrative Responsibilities

14 Mar 2025	Departmental SWAYAM Coordinator, CUJ.
14 Oct 2024	Departmental Examination Coordinator, CUJ.
10 May 2022	Member, Board of Studies, Department of Mathematics, CUJ.
16 Dec 2021	Assistant Director, Directorate of Physical Education, CUJ.
2 Jun 2021	Member, CSIR/UGC Scholarships and Fellowships Cell, CUJ.
10 Dec 2020	Member Secretary, Overseas Admission Advisory Committee,CUJ.
12 Oct 2020	Member, Career Advancement Scheme Committee, CUJ.
19 Jul 2020	Court Member, Third Court of CUJ.

Seminars, Conferences, Workshops, and University Activities Organized

1–5 Dec 2025	Programme Coordinator, Five-Day Faculty Development Programme on Mathematical Computations and Applications, Department of Mathematics, Central University of Jammu.
18–27 Dec 2024	Programme Coordinator, Faculty Development Programme under the UGC Malaviya Mission Teacher Training Programme, Central University of Jammu (online).
29 Nov 2024	Programme Coordinator, Departmental Alumni Meet 2024, Department of Mathematics, Central University of Jammu.
22 Dec 2024	Organising Secretary, National Mathematics Day 2024, Department of Mathematics, Central University of Jammu.
29 Jan–7 Feb 2024	Organizing Committee Member, Ten-Day Research Methodology Course, Department of Educational Studies, Central University of Jammu.
12–13 Mar 2022	Sub-Organizing Committee Member, International Conference on Frontiers of Space Technology and Applications for Humanity.
25–27 Feb 2022	Organizing Committee Member, Online Workshop on Introduction to LaTeX, Department of Mathematics, Central University of Jammu.

25–26 Mar 2021	Co-Convener, National Workshop on Enhancing Pedagogical Practices in Mathematics under PMMMNMTTS, Ministry of Education, Central University of Jammu.
4–5 Oct 2018	Organizing Secretary, National Conference on Recent Advances in Mathematics, Department of Mathematics, Central University of Jammu.
25–26 Mar 2016	Organizing Committee Member, Workshop in Computational Mathematics on SageMath, Department of Mathematics, Central University of Jammu.

Research Talks and Paper Presentations

23–25 Apr 2026	Carleson Measures on Dirichlet-Type Spaces in the Quaternionic Unit Ball, National Conference on Recent Trends in Topological Algebraic Analysis and Applications, University of Jammu.
16–18 Feb 2026	Weighted Composition Operators, International Conference on Recent Trends in Mathematics and Computing (ICRTMC 2026), Jamia Millia Islamia, New Delhi.
9–10 Feb 2026	Carleson Measures on Hardy Spaces with Bicomplex Scalars, National Conference on Interdisciplinary Advances in Mathematical, Statistical and Computational Science, University of Jammu.
30–31 Jan 2025	Boundedness and Compactness of Weighted Composition Operators on Spaces of Holomorphic Functions, National Conference on Recent Trends in Pure and Applied Mathematics, Kristu Jayanti College, Bengaluru.
23–26 Dec 2024	Essential Norm Estimates for Weighted Composition Operators, 90th Annual Conference of the Indian Mathematical Society, MIT-WPU, Pune.
2–3 Dec 2024	Carleson Measures on Spaces of Holomorphic Functions, International Seminar on Recent Advances in Mathematical Science 2024, Dr. Rammanohar Lohia Avadh University, Ayodhya.
20–22 Nov 2024	Weighted Composition Operators on Spaces of Analytic Functions, International Conference on Evolution in Pure and Applied Mathematics, Akal University, Talwandi Sabo.
11–14 Sep 2024	Slice Dirichlet Spaces and Their Applications, National Conference on Recent Trends in Analysis and Allied Areas, University of Jammu.
19–21 Jan 2024	Carleson Measures and Weighted Composition Operators, International Conference on Analysis and Its Applications, Jamia Millia Islamia, New Delhi.
22–25 Dec 2023	Spaces of Analytic Functions and Weighted Composition Operators, 89th Annual Conference of the Indian Mathematical Society, BITS Pilani Hyderabad Campus.
3–4 Mar 2023	Holomorphic Function Spaces and Weighted Composition Operators, International Conference on Space and Applied Sciences, NSCBM Government Degree College, Hamirpur.
6–8 Jan 2023	Carleson Measures and Generalized Composition Operators, International Conference on Algebra, Analysis and Applications, Manipal Institute of Technology.
30–31 Mar 2022	Essential Norm Estimates of Weighted Composition Operators, International Conference on Mathematical Analysis and Applications, BGSBU, Rajouri.
2–4 Nov 2020	Boundedness, Compactness and Essential Norm Estimates of Weighted Composition Operators on Dirichlet-Type Spaces, International Conference on Mathematical Analysis and Applications, NIT Jamshedpur (online).
16–18 Dec 2019	Schatten Class Weighted Composition Operators on Weighted Bergman Spaces of Bounded Symmetric Domains, ICAA 2019, University of Jammu.

20–22 Aug 2019	Slice Regular Besov Spaces of Hyperholomorphic Functions and Composition Operators, Mathematics Research Scholar Meet, University of Jammu.
18–21 Jun 2019	Weighted Composition Operators on Spaces of Holomorphic Functions, National Conference on Mathematics and Its Applications and Workshop on Algebra and Analysis, Central University of Kashmir.
22–24 Jan 2019	Weighted Composition Operators on D^p Spaces, ICNTPAM 2019, University of Kerala.
11–12 Jan 2019	Composition Operators on Slice Regular Bloch-Type Spaces, Conference on Recent Advances in Interdisciplinary Sciences, University of Jammu.
13–19 Dec 2018	Weighted Composition Operators on Dirichlet-Type Spaces and Related Q_p Spaces, OTOA 2018, Indian Statistical Institute, Bangalore.
15–17 Feb 2018	Order Bounded Weighted Composition Operators Mapping into Dirichlet-Type Spaces, Conference on Complex Analysis and Operator Theory, University of Jammu.
10–11 Sep 2017	Order Bounded Weighted Composition Operators Mapping into Dirichlet-Type Spaces, RMCSAP 2017, Government Degree College Kathua.
23–25 Feb 2012	Weighted Composition Operators on Dirichlet-Type Spaces and Related Q_p Spaces, Conference on Complex Analysis and Related Areas, University of Jammu.
26–30 Sep 2011	Weighted Composition Operators on Dirichlet-Type Spaces, Workshop on Operator Theory and Integrable Systems, Institut Mittag-Leffler, Sweden.
25–27 Feb 2011	Generalized Weighted Composition Operators, 21st Conference of the Jammu Mathematical Society, University of Jammu.
8–11 Aug 2010	Weighted Composition Operators between Spaces of Dirichlet Type, ICM Satellite Conference on Functional Analysis and Operator Theory, Indian Statistical Institute, Bangalore.
26–28 Feb 2010	Carleson Measures on Dirichlet-Type Spaces, Jammu Mathematical Society Conference, University of Jammu.
25–27 Feb 2009	Composition Operators on Besov Spaces, Jammu Mathematical Society Conference, University of Jammu.
26–28 Feb 2008	Weighted Composition Operators on Weighted Bergman Spaces, Jammu Mathematical Society Conference, University of Jammu.

Professional Development and Courses Attended

18–23 Aug 2025	National-level online FDP on R Programming, CSSR and SRRM Degree and PG College, Kamalapuram.
7–11 Apr 2025	Workshop on Graph Theory with Python, SageMath and LaTeXDraw, Indian Mathematics Professors Association and Infinity Research and Development Institute.
1–2 Mar 2025	National Summit of Institutional Leaders 2025, Doon University, Dehradun.
3–7 Feb 2025	Workshop on Exploring Linear Algebra and Graph Theory with SageMath, Indian Mathematics Professors Association and Infinity Research and Development Institute.
2 May 2025	SWAYAM-NPTEL Workshop conducted by IIT at Central University of Jammu.

27–29 Nov 2024	Workshop on Integrating Recent Pedagogical Skills into Teaching-Learning in Higher Education, Central University of Jammu.
20–26 Nov 2024	FDP on Modern Tools in Mathematics and Statistics, Rathinam College of Arts and Science, Coimbatore.
22–26 Oct 2024	Online Workshop on Graph Theory and Python.
14–19 Oct 2024	Six-Day National FDP on Python.
19 Feb–2 Mar 2024	Two-Week Refresher Course, Department of Mathematics, University of Jammu.
2–6 Jan 2024	FDP on Mathematics in Engineering and Science: Importance and Applications, VIT-AP University.
16–20 Feb 2023	International Workshop on Applied Mathematics for Science and Engineering - Recent Advances, VIT-AP University.
7–16 Nov 2022	UGC-Approved Professional Development Programme on Implementation of NEP 2020, IGNOU.
21 Sep–4 Oct 2022	International FDP on Current Trends in Applications of Mathematics.
16–22 Sep 2022	Workshop on Mathematics and Its Applications, University of Kashmir, South Campus.
8–12 Sep 2022	International Workshop on Trends in Analysis and Topology, MNIT Jaipur.
5–10 Jul 2021	FDP on Mathematics and Statistics in Emerging Fields.
3–6 Jun 2021	INDAM Workshop on Bergman Projections and Related Topics.
10–15 May 2021	FDP on Linear Algebra and Its Applications, BMS Institute of Technology and Management.
16–22 Mar 2021	PDP on Emerging Trends in Assessment and Evaluation for Teaching and Learning, Central University of Jammu.
22–28 Feb 2021	PDP on Innovation in Teaching, Central University of Jammu.
14–22 Dec 2020	Online Faculty Development Programme, Rathinam College of Arts and Science.
23–27 Nov 2020	International Workshop on Mathematics Without Boundaries, NIT Srinagar.
24–28 Feb 2020	Workshop on Applications of Analysis, University of Jammu.
8–13 Jun 2019	Short-Term Course on LaTeX Programming, NIT Jamshedpur.
20 May–10 Jun 2019	Refresher Course, Central University of Jammu.
25 May–8 Jun 2018	Interdisciplinary Refresher Course, Faculty Induction Development Cell, Central University of Jammu.
6 Dec 2017–8 Jan 2018	General Orientation Course/Faculty Induction Training Programme under PM-MMNMTT, Central University of Jammu.

Selected Conferences and Workshops Attended

8–10 Oct 2014	Workshop on Essential Computing Techniques, Central University of Jammu.
31 Jan–5 Feb 2012	Workshop on Recent Advances in Operator Theory and Operator Algebra, Indian Statistical Institute, Bangalore.
26–30 Sep 2011	Workshop on Operator Theory and Integrable Systems, Institut Mittag-Leffler, Sweden.
12–13 Sep 2011	Workshop on Univalent Functions and Control, Institut Mittag-Leffler, Sweden.
19–27 Aug 2010	International Congress of Mathematicians, Hyderabad.
8–11 Aug 2010	ICM Satellite Conference on Functional Analysis and Operator Theory, Indian Statistical Institute, Bangalore.
9–12 Jan 2008	International Conference on Operator Theory and Related Areas, Delhi.
28 Dec 2007–1 Jan 2008	10th Discussion Meeting in Harmonic Analysis, Indian Institute of Science, Bangalore.
31 Mar–3 Apr 2007	International Congress and 8th Conference of ISIAM, University of Jammu.
5–15 Jan 2006	International Workshop on Teichmuller Theory and Moduli Problems, Harish-Chandra Research Institute.

International Collaborations and Professional Service

International collaborators

China	Prof. Ze-Hua Zhou, School of Science, Tianjin.
China	Prof. Yuan Cheng, Tianjin University of Technology and Education.
China	Prof. Yong-Xin Gao, Tianjin University.

Professional memberships

Since 2023	Life Member, Indian Mathematical Society.
Since 2012	Life Member, Ramanujan Mathematical Society.
Since 2004	Life Member, Jammu Mathematical Society.

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