

Kaushlendra Kumar

Curriculum Vitae

School of Mathematical Sciences
Queen Mary University of London
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Personal

Full name **Kaushlendra Kumar.**
Date of Birth **6 May, 1993.**
Place of Birth **Varanasi, India.**
Nationality **Indian.**
Family status **Married with one child.**
Research **Noncommutative geometry, Yang–Mills theory, IKKT matrix model.**

Positions

01 Mar, 2024 –14 Nov 2027 **DFG Walter-Benjamin Research Staff**, *School of Mathematical Sciences*, Queen Mary University of London, Includes 8.5 months of parental break starting June 2024 with DFG approval.
01 Jul, 2023 –29 Feb, 2024 **Postdoc**, *Institute of Physics*, Humboldt University of Berlin, Germany. Funded by VW stiftung of the host, Nichol Furey.
2023 –2024 (4 months) **Junior Research Fellow**, *Erwin Schrodinger Institute for Mathematics and Physics*, University of Vienna.
05 May, 2022 –30 Jun, 2023 **Postdoc**, *Institute for Theoretical Physics*, Leibniz University Hannover (ITP-LUH), Germany. Funded by DAAD and ITP-LUH.

Education

01 Oct, 2018–04 May, 2022 **PhD Theoretical Physics**, *Institute for Theoretical Physics*, Leibniz University Hannover, Germany.
Thesis title Solutions of Yang–Mills theory in four-dimensional de Sitter space
Grade Magna cum Laude
Defense date 4 May, 2022
01 Jun, 2018–30 Sep, 2018 **German language**, *Carl Duisberg Centrum Berlin*, mandatory pre-PhD language course funded by DAAD, Level reached: B1 (Intermediate).
23 Jul, 2015–31 May, 2018 **MSc Physics**, *Department of Physical Sciences*, Indian Institute of Science Education & Research, Kolkata (IISER-K), India.
Grade 9.25/10
Defense date 20 Jul, 2017
23 Jul, 2010–08 May, 2015 **BTech & MTech Biochemical Engineering**, *School of Biochemical Engineering*, Indian Institute of Technology, Banaras Hindu University (IIT-BHU), Varanasi, India.
Grade 7.88/10
Defense date 27 Apr, 2015

List of publications

(a) Regular articles

2024 **Kaushlendra Kumar** and Harold C. Steinacker. Modified Einstein equations from the 1-loop effective action of the IKKT model. *Classical and Quantum Gravity*, volume 41, page 185007, 2024. DOI: 10.1088/1361-6382/ad6e4b.

- 2024 Savan Hirpara, **Kaushlendra Kumar**, Olaf Lechtenfeld, and Gabriel Picanço Costa. Exact gauge fields from anti-de Sitter space. *Journal of Mathematical Physics*, volume 65, page 072903, 2024. DOI: 10.1063/5.0150027.
- 2022 **Kaushlendra Kumar**, Olaf Lechtenfeld, Gabriel Picanço Costa, and Jona Röhrig. Yang–Mills solutions on Minkowski space via non-compact coset spaces. *Physics Letters B*, volume 835, page 137564, 2022. DOI:10.1016/j.physletb.2022.137564.
- 2022 **Kaushlendra Kumar**, Olaf Lechtenfeld, and Gabriel Picanço Costa. Trajectories of charged particles in knotted electromagnetic fields. *Journal of Physics A: Mathematical and Theoretical*, volume 55, page 315401, 2022. DOI:10.48550/arXiv.2202.00169.
- 2022 Lukas Hantzko, **Kaushlendra Kumar**, and Gabriel Picanço Costa. Conserved charges for rational electromagnetic knots. *The European Physical Journal Plus*, volume 137, page 407, 2022. DOI:10.1140/epjp/s13360-022-02563-4.
- 2021 **Kaushlendra Kumar**, Olaf Lechtenfeld, and Gabriel Picanço Costa. Instability of cosmic Yang–Mills fields. *Nuclear Physics B*, volume 973, page 115583, 2021. DOI:10.1016/j.nuclphysb.2021.115583.
- 2020 **Kaushlendra Kumar** and Olaf Lechtenfeld. On rational electromagnetic fields. *Physics Letters A*, volume 384, page 126445, 2020. DOI:10.1016/j.physleta.2020.126445.
- 2018 **Kaushlendra Kumar** and Biswajit Chakraborty. Spectral distances on the doubled Moyal plane using Dirac eigenspinors. *Physical Review D*, volume 97, page 086019, 2018. DOI:10.1103/PhysRevD.97.086019.
- 2018 Yendrembam Chaoba Devi, **Kaushlendra Kumar**, Biswajit Chakraborty, and Frederik G. Scholtz. Revisiting Connes' finite spectral distance on noncommutative spaces: Moyal plane and fuzzy sphere. *International Journal of Geometric Methods in Modern Physics*, volume 15, page 1850204, 2018. DOI:10.1142/S0219887818502043.
- 2015 **Kaushlendra Kumar**, Shivraj Prajapat, and Biswajit Chakraborty. On the role of Schwinger's $su(2)$ generators for simple harmonic oscillator in 2D Moyal plane. *The European Physical Journal Plus*, volume 130, page 120, 2015. DOI:10.1140/epjp/i2015-15120-7.
- (b) [Conference proceedings](#)
- 2023 **Kaushlendra Kumar**. $SO(1,3)$ Yang–Mills solutions on Minkowski space via cosets. *SciPost Physics Proceeding*, volume 14, page 033, 2023. DOI: 10.21468/scipostphysproc.14.033.
- 2023 **Kaushlendra Kumar**. On Yang–Mills fields from anti-de Sitter spaces. *Journal of Physics Conference Series*, volume 2667, page 012018, 2023. DOI: 10.1088/1742-6596/2667/1/012018.
- (c) [Preprints](#)
- 2026 **Kaushlendra Kumar** and Shahn Majid. Geodesic flows on a black-hole background. *arXiv:2603.03222 [gr-qc]*, 2026.

Teaching

- Spring, 2020 **Introduction to Quantum Theory**, *intensive 1-week revision course*, ITP-LUH.
- Fall, 2019 **Mathematical Methods of Physics**, *intensive 1-week revision course*, ITP-LUH.
- Spring, 2019 **Lie groups, Algebra and their Representations**, *teaching assistant*, ITP-LUH.
- Fall, 2017 **Advanced Mathematical Methods of Physics**, *teaching assistant*, IISER-K.
- Spring, 2017 **Intermediate Electricity and Magnetism**, *teaching assistant*, IISER-K.

Talks

- 5 Mar, 2024 **Quantum Algebras seminar, London**, Emergence of modified Einstein equation from 1-loop result in IKKT matrix model.
- 28 May, 2024 **Quantum Algebras seminar, London**, Octonions and the Standard Model.

- 18 Aug, 2023 **Balachandran's room 316 meeting (online)**, Emergent gravity from the 1-loop effective action of the IKKT matrix model.
- 27 Jul, 2023 **QTS12 conference, Prague**, Exact gauge fields from Anti-de Sitter space.
- 28 Jun, 2023 **Lechtenfeld's group seminar, Hannover**, Emergent gravity from the 1-loop effective action of the IKKT matrix model.
- 4 May, 2023 **ESI talk, Vienna**, Exact gauge fields from Anti-de Sitter space.
- 15 Mar, 2023 **Solitons@Work (online)**, Exact gauge fields from anti-de Sitter space.
- 23 Aug, 2022 **String Theory Journal Club DESY, Hamburg**, Yang–Mills solutions on Minkowski space via non-compact coset spaces.
- 18 Jul, 2022 **GROUP34 conference, Strasbourg**, Yang–Mills solutions on Minkowski space via non-compact coset spaces.
- 16 Mar, 2022 **Solitons@Work (online)**, Yang–Mills solutions on Minkowski space via non-compact coset space.
- 1 Jun, 2022 **Lechtenfeld's group seminar, Hannover**, U(1) gauge theory in noncommutative geometry, pedagogical talk based on Dungen & Suijlekom, Rev.Math.Phys **24** (2012) 1230004.
- 20 Apr, 2022 **Lechtenfeld's group seminar, Hannover**, Spectral triple with real structure on fuzzy sphere, review talk based on Chakraborty et. al., J.Math.Phys. **63** (2022) 023504.
- 1 Dec, 2021 **Lechtenfeld's group seminar, Hannover**, New Yang-Mills solution on positive light-cone.
- 7 Jul, 2017 **S.N. Bose Center, Kolkata**, Spectral distances on doubled Moyal plane.
- 4 Nov, 2016 **DPS journal club IISER, Kolkata**, Angular momentum & simple harmonic oscillator in noncommutative Moyal plane.
- 11 Jul, 2016 **S.N. Bose Center, Kolkata**, Connes spectral distance on non-commutative spaces: fuzzy sphere & double Moyal plane.

Schools/Conferences

- 24–28 Jul, 2023 **QTS12**, The 12th International Symposium on Quantum Theory and Symmetries at Prague, Czech Republic.
- 06–17 Feb, 2023 **Vort2023**, Vortex Moduli workshop at ICTS, Bangalore, India. online participation
- 29 Aug–9 Sep, 2022 **Saalburg28**, The 28th W.E.Heraeus Saalburg Summer School for Graduate Students focused on "Modern methods in quantum field theory" at Bayrischzell, Germany.
- 18–22 Jul, 2022 **GROUP34**, The 34th International Colloquium on Group Theoretical Methods in Physics at Strasbourg, France.
- 30 Aug–10 Sep, 2021 **Saalburg27**, The 27th W.E.Heraeus Saalburg Summer School for Graduate Students focused on "Gravitational waves and Black holes" at Heigenbrücken, Germany.
- 02–07 Aug, 2021 **ICMP**, International Congress on Mathematical Physics preceded by Young Researchers Symposium at Geneva, Switzerland.
- 31 Aug–11 Sep, 2020 **Saalburg26**, The 26th W.E.Heraeus Saalburg Summer School for Graduate Students focused on "QFT, Integrable systems and String field theory" at Heigenbrücken, Germany.
- 23–27 Sep, 2019 **SHGP**, Summer School on the topic of "Special Holonomy – Geometry and Physics" at Freiburg, Germany.
- 02–13 Sep, 2019 **Saalburg25**, The 25th W.E.Heraeus Saalburg Summer School for Graduate Students focused on "Asymptotic symmetries and Hamiltonian formulation of Gravity" at Heigenbrücken, Germany.
- 15-19 Jan, 2018 **QGNCG**, Conference on "Quantum Groups & Noncommutative Geometry" at National Institute of Science Education & Research (NISER), Bhubaneswar, India.

06-24 Nov, 2017 **GGD2018**, Preschool + Advanced school on the topic of "Geometry, Groups and Dynamics" at International Centre for Theoretical Sciences (ICTS) Bangalore, India.

Fellowships

01 Mar, 2024–14 Nov, 2027 **Deutsche Forschungsgemeinschaft (DFG)**, Fellowship to work with Shahn Majid at Queen Mary University of London.

01 Oct, 2018–31 Aug, 2022 **Deutscher Akademischer Austauschdienst (DAAD)**, Scholarship to carry out (mostly doctoral) research work at ITP-LUH.

17 Oct, 2016–31 May, 2018 **Council for Scientific and Industrial Research (CSIR)**, Junior Research Fellowship (JRF) to carry out research work at IISER-K.

Language skills

Indic Maithili, Hindi and Bengali.
English Fluent in all aspect.
German Intermediate level (B1).

Computer skills

Languages C, HTML, CSS.
Applications \LaTeX , Mathematica, GnuPlot, Amber, Matlab.
Systems Linux, Mac, Windows.