

PUBLICATIONS

- [1] P. Banerjee, A. Laddha and P. Raman, “Stokes Polytopes : The positive geometry for $??4$ interactions” [arXiv:1811.05904 [hep-th]].*
- [2] M. Campiglia and A. Laddha, “Asymptotic charges in massless QED revisited: A view from Spatial Infinity ,” [arXiv:1810.04619 [hep-th]].*
- [3] A. Ashtekar, M. Campiglia and A. Laddha, “Null infinity, the BMS group and infrared issues ,” Gen.Rel.Grav. **50** (2018) no.11, 140-163 doi: 10.1007/s10714-018-2464-3 [arXiv:1808.07093 [gr-qc]].*
- [4] A. Laddha and A. Sen, “Observational Signature of the Logarithmic Terms in the Soft Graviton Theorem ,” [arXiv:1806.01872 [hep-th]].*
- [5] A. Laddha and A. Sen, “Logarithmic terms from soft expansion in Four dimensions,” JHEP **1810** 056 (2018) doi: 10.1007/JHEP10(2018)056 [arXiv:1804.09193 [hep-th]].*
- [6] A. Laddha and A. Sen, “Gravity waves from Soft theorems in General dimensions,” JHEP **1809**, 105 (2018) doi: 10.1007/JHEP05(2018)132 [arXiv:1801.07719 [hep-th]].*
- [7] A. Laddha and A. Sen, “Sub-subleading Soft Graviton Theorem in Generic Theories of Quantum Gravity,” JHEP **1710**, 065 (2018) doi: 10.1007/JHEP10(2017)065 [arXiv:1706.00759 [hep-th]].*
- [8] A. Laddha, P. Mitra, “Asymptotic Symmetries and Subleading Soft Photon Theorem in Effective Field Theories” JHEP **1805** (2018) 132 doi: 10.1007/JHEP05(2018)132 [arXiv:1709.03850 [hep-th]].*
- [9] M. Campiglia and A. Laddha, “Sub-subleading soft gravitons and large diffeomorphisms,” JHEP **1701**, 036 (2017) doi:10.1007/JHEP01(2017)036 [arXiv:1608.00685 [gr-qc]].*
- [10] M. Campiglia and A. Laddha, “Sub-subleading soft gravitons: New symmetries of quantum gravity?,” Phys. Lett. B **764**, 218 (2017) doi:10.1016/j.physletb.2016.11.046 [arXiv:1605.09094 [gr-qc]].*
- [11] M. Campiglia and A. Laddha, “Subleading soft photons and large gauge transformations,” JHEP **1611**, 012 (2016) doi:10.1007/JHEP11(2016)012 [arXiv:1605.09677 [hep-th]].*
- [12] M. Campiglia and A. Laddha, “Asymptotic symmetries of gravity and soft theorems for massive particles,” JHEP **1512**, 094 (2015) doi:10.1007/JHEP12(2015)094 [arXiv:1509.01406 [hep-th]].*
- [13] M. Campiglia and A. Laddha, “Asymptotic symmetries of QED and Weinberg’s soft photon theorem,” JHEP **1507**, 115 (2015) doi:10.1007/JHEP07(2015)115 [arXiv:1505.05346 [hep-th]].*
- [14] M. Campiglia and A. Laddha, “New symmetries for the Gravitational S-matrix,” JHEP **1504**, 076 (2015) doi:10.1007/JHEP04(2015)076 [arXiv:1502.02318 [hep-th]].*

- [15] M. Campiglia and A. Laddha, “Asymptotic symmetries and subleading soft graviton theorem,” *Phys. Rev. D* **90**, no. 12, 124028 (2014) doi:10.1103/PhysRevD.90.124028 [arXiv:1408.2228 [hep-th]].*
- [16] A. Laddha, “Hamiltonian constraint in Euclidean LQG revisited: First hints of off-shell Closure,” arXiv:1401.0931 [gr-qc].*
- [17] A. Henderson, A. Laddha and C. Tomlin, “Constraint algebra in loop quantum gravity reloaded. II. Toy model of an Abelian gauge theory: Spatial diffeomorphisms,” *Phys. Rev. D* **88**, no. 4, 044029 (2013) doi:10.1103/PhysRevD.88.044029 [arXiv:1210.3960 [gr-qc]].*
- [18] A. Henderson, A. Laddha and C. Tomlin, “Constraint algebra in loop quantum gravity reloaded. I. Toy model of a $U(1)^3$ gauge theory,” *Phys. Rev. D* **88**, no. 4, 044028 (2013) doi:10.1103/PhysRevD.88.044028 [arXiv:1204.0211 [gr-qc]].
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- [20] A. Laddha and M. Varadarajan, “The Diffeomorphism Constraint Operator in Loop Quantum Gravity,” *Class. Quant. Grav.* **28**, 195010 (2011) doi:10.1088/0264-9381/28/19/195010 [arXiv:1105.0636 [gr-qc]].
- [21] A. Laddha and M. Varadarajan, “The Hamiltonian constraint in Polymer Parametrized Field Theory,” *Phys. Rev. D* **83**, 025019 (2011) doi:10.1103/PhysRevD.83.025019 [arXiv:1011.2463 [gr-qc]].
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- [23] A. Laddha and M. Varadarajan, “Polymer Parametrised Field Theory,” *Phys. Rev. D* **78**, 044008 (2008) doi:10.1103/PhysRevD.78.044008 [arXiv:0805.0208 [gr-qc]].
- [24] A. Laddha, “Polymer quantization of the CGHS model: II,” *Class. Quant. Grav.* **24**, 4989 (2007). doi:10.1088/0264-9381/24/20/006
- [25] A. Laddha, “Polymer quantization of CGHS model. I,” *Class. Quant. Grav.* **24**, 4969 (2007) doi:10.1088/0264-9381/24/20/005 [gr-qc/0606069].

BOOK CHAPTERS [1] Laddha, A., and Varadarajan, M. Quantum Dynamics. In: A. Ashtekar and J. Pullin (Eds), *Loop Quantum Gravity, The First 30 Years*, ch. 3, pp. 69–96, 2017.

INVITED TALKS

- [1] *Asymptotic Symmetries and Soft Theorems*. In: International Strings Meeting, IISER Pune, 2016.
- [2] *Aspects of Hamiltonian Constraint in Loop Quantum Gravity*. In: International Conference of Loop Quantum Gravity, Loops’ 15, Erlangen, Germany, 2015

- [3] *Loop Quantum Gravity, a Constructive Approach*. In: FTAG 2013, IIT Gandhinagar, 2013
- [4] *Spacetime Covariance in Loop Quantum Gravity*. In IAGRG 27, H N Bahuguna Garhwal University, 2013

CONFERENCE TALKS AND SEMINARS

- [1] Physics Seminar at IMSc, July 2017 titled "Are Soft Theorems Generic in Quantum Gravity ?"
- [2] Series of four seminars on Asymptotic Symmetries, HRI, 2017
- [3] Speaker at Quantum Space-time seminar in TIFR, Mumbai, 2016
- [4] Series of seminars at the Institute for gravity, Louisiana State university, 2014
- [5] Semester long seminar on Chern-Simons theory at Penn State University, Joint Speaker with [Professor Nigel Higson](#), 2011
- [6] Regular speaker at Fundamental Theory Seminar, Penn State University, 2010-12
- [7] *Polymer Parametrized Field theory*, Audio Talk at International Loop Quantum gravity seminar, 2009.
- [8] Six lectures on Loop Quantum Gravity, School on Loop Quantum Gravity at Institute of Mathematical Sciences, 2009
- [9] *Polymer Scalar Field Theory*. In: International conference on Loop Quantum Gravity, Loops 09, Beijing Normal University, Beijing, China, 2009
- [10] *Loop quantization of CGHS model*. In: 24th IAGRG Meeting Centre for Theoretical Physics, Jamia Millia Islamia, New Delhi, 2007
- [11] *Loop Quantization of Parameterized Field theory*. In: International conference on "Einstein's Legacy in the New Millennium", December, Puri, 2005
- [12] *Polymer Parametrized Field Theory*. In: The 6th International Conference on Gravitation and Cosmology, IUCAA, Pune, 2007
- [13] *Canonical Dynamics of Weyl tensor*. In: Pacific Coast Gravity meeting-19, University of Utah, USA, 2003

RESEARCH GUIDANCE

Graduate Students

- **P.V. Athira**, PhD Student, Chennai Mathematical Institute, 2016–
- **Anupam A. H.**, PhD Student, Institute of Mathematical Science, 2016–
- **Arpan Kundu**, Ph.D. Student, Institute of Mathematical Science, 2017–

Masters Thesis/Projects

- **Semanti Dutta**,2016-2017, IMSc , Chennai
Thesis topic: Interacting Quantum field theories in AdS.
- **Akshay Khadse**,2015-2016, IISER , Pune
Thesis topic: Asymptotic symmetries in Gravity at Null and spatial infinity.
- **Himanshu Badhani**,2015-2016, IISER , Pune
Thesis topic: S Matrix formalism in De-Sitter spacetime
- **Anupam S.**,2015-2016, IMSc, Chennai
Thesis topic: Eikonal Approximation for scattering amplitudes in gravity
- **Prasanth S.**,2013-2014, CMI, Chennai
Thesis topic: Infrared stability of interacting field theories in De Sitter space
- **Nana Siddharth**,2012-2013, CMI, Chennai
Thesis topic: Quantum field theory in Rindler Spacetime

Undergraduate Research

- **Kishor Salunkhe**, 2013-2014
Thesis topic: Introduction to Scattering matrix for QED

TEACHING
EXPERIENCE

- Taught Analytic structure of S matrix as an elective course to students from CMI and IMSc, 2017.
- Taught General Relativity to graduate students at CMI, Spring 2017.
- Taught Advanced Quantum field theory , graduate course, Spring 2016.
- Reading seminar on Gravitational waves and Black holes for graduate students, Spring 2016.
- Taught a graduate level elective on Analytic structure of S-matrix at University of Monte-Video, Uruguay, Fall 2016.
- Taught graduate level General Relativity to Master's and Integrated Ph.D students at Chennai Mathematical Institute, Spring, 2015.
- Taught graduate level Statistical Mechanics , Fall 2015.
- Taught graduate level General Relativity to Master's and Integrated Ph.D students at Chennai Mathematical Institute, Spring, 2014.
- Taught undergraduate Classical Mechanics to first year Bachelor's students at Chennai Mathematical Institute, Fall, 2014.
- Taught Quantum field theory I to Masters students and graduate students at Chennai Mathematical Institute in spring, 2013.
- Taught Advanced topics in Quantum field theory to Ph.D students at Chennai Mathematical Institute in Spring, 2013.
- Taught graduate level Quantum mechanics to Master's and Integrated Ph.D Students at Chennai Mathematical Institute in Fall, 2013.
- Taught Quantum field theory - II for graduate students at Chennai Mathematical Institute in fall, 2012.
- Teaching Assistant for introductory physics courses at University of Utah for all the semester from Fall 2000-spring 2003

LIST OF
REFERENCES

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