

A Bibliography for the Morelia/PASI Lectures

This is a list of papers that would be useful to a more detailed understanding of the material that will be covered in my 5 lectures. They are not meant to be the ‘best’ sources for loop quantum gravity and loop quantum cosmology. Rather, my lectures are most closely related to this material.

LOOP QUANTUM GRAVITY REVIEWS

- Short Review from the Encyclopedia of Mathematical Physics.

Quantum Geometry and Its Applications, Abhay Ashtekar and Jerzy Lewandowski
<http://www.gravity.psu.edu/outreach/articles/qgfinal.pdf>

- Long Review: arXiv:gr-qc/0404018

Title: Background Independent Quantum Gravity: A Status Report, Abhay Ashtekar, Jerzy Lewandowski, *Class. Quant. Grav.* 21, R53 (2004)

- Monographs:

Carlo Rovelli, *Quantum Gravity*. (Cambridge University Press, Cambridge (2004))

Thomas Thiemann, *Introduction to Modern Canonical Quantum General Relativity*. (Cambridge University Press, Cambridge, (2007))

- The Strong Role of Diffeomorphism Invariance:

General conceptual issues: arXiv:0904.0184

Title: Some surprising implications of background independence in canonical quantum gravity, Abhay Ashtekar, *Gen. Rel. & Grav.* 41, 1927-1943 (2009)

Hard Uniqueness Theorem 1: arXiv:gr-qc/0504147

Uniqueness of diffeomorphism invariant states on holonomy-flux algebras, Jerzy Lewandowski, Andrzej Okolow, Hanno Sahlmann, Thomas Thiemann, *Commun. Math. Phys.* 267, 703-733 (2006)

Hard Uniqueness Theorem 2: arXiv:math-ph/0407006

Representations of the Weyl Algebra in Quantum Geometry, Christian Fleischhack, *Commun. Math. Phys.* 285, 67-140 (2009)

LOOP QUANTUM COSMOLOGY

- Reviews:

Short Review addressed to Cosmologists: arXiv:1005.5491

The Big Bang and the Quantum

Somewhat Longer Review: arXiv:0812.0177

Loop Quantum Cosmology: An Overview, Abhay Ashtekar, Gen. Rel. Grav. 41 707-741 (2009)

- Original papers:

Heavily used in lectures: arXiv:0710.3565, Robustness of key features of loop quantum cosmology, Abhay Ashtekar, Alejandro Corichi, Parampreet Singh, Phys. Rev. D77 024046 (2008) (Use the updated & clearer arXiv version)

Detailed paper on $k=0$ FLRW Model: arXiv:gr-qc/0607039

Quantum Nature of the Big Bang: Improved dynamics, Abhay Ashtekar, Tomasz Pawłowski, Parampreet Singh, Phys. Rev. D74 084003 (2006)

Detailed paper on $k=1$ FLRW Model: arXiv:gr-qc/0612104

Loop quantum cosmology of $k=1$ FRW models, Abhay Ashtekar, Tomasz Pawłowski, Parampreet Singh, Kevin Vandersloot, Phys. Rev. D75, 024035 (2007)

Reference that Cosmologists find illuminating: arXiv:0805.0136 Is loop quantization in cosmology unique? Alejandro Corichi, Parampreet Singh, Phys.Rev.D78 024034 (2008)

Relation to Spin-foams: arXiv:0909.????

Loop Quantum Cosmology and Spin Foams, Abhay Ashtekar, Miguel Campiglia Curcho, Adam Henderson

QFT on QST: arXiv:0901.0933

Quantum field theory on a cosmological, quantum space-time, Abhay Ashtekar, Wojciech Kaminski, Jerzy Lewandowski, Phys. Rev. D79, 064030 (2009)
(Use the updated & clearer arXiv version)