# Jerome Quintin (he/him/his) — Curriculum Vitæ

Email: jquintin@uwaterloo.ca Citizenship: Canadian Website: https://jerome-quintin.github.io/ Languages: French, English Perimeter Institute for Theoretical Physics (PI), Waterloo (ON), Canada EMPLOYMENT Associate Postdoctoral Researcher Dec 2022-present University of Waterloo (UWaterloo), Waterloo (ON), Canada William T. Tutte Fellow, Dept. of Applied Math Dec 2022-present Associate Postdoc, Waterloo Centre for Astrophysics (WCA) Dec 2022-present Joint postdoc with Fields (see below) July 2022-Nov 2022 Fields Institute, University of Toronto, Toronto (ON), Canada Fields Postdoctoral Fellow, jointly affiliated with UWaterloo July 2022-Nov 2022 Max Planck Institute for Gravitational Physics (Albert Einstein Institute), Potsdam, Germany (AEI-Potsdam) Postdoctoral Researcher Sep 2019-Jun 2022 **EDUCATION** Ph.D. and M.Sc. in Physics, McGill U. Sep 2013-Jun 2019 Thesis Supervisor: Robert Brandenberger GPA: 4.0/4.0 B.Sc. in Physics and Mathematics, Bishop's U. Sep 2010-Apr 2013 Research Advisor: Lorne Nelson GPA: 95.74/100 Recipient of the Governor General's Silver Medal (student graduating with the highest grade point average in the university at the undergraduate level) RESEARCH UWaterloo/Perimeter/Fields, independent postdoctoral research 2022-EXPERIENCE AEI-Potsdam, postdoctoral research with Jean-Luc Lehners 2019-2022 McGill, doctoral research with Robert Brandenberger 2015-19 ETH-ITS Zurich, Visiting Graduate Research Student Oct-Nov 2015 McGill, M.Sc. Student with Robert Brandenberger & Yi-Fu Cai 2013-15 Bishop's, Honors Student with Lorne Nelson & Saul Rappaport (MIT) 2011-13 Mont-Megantic Observatory, Visiting Scientist Aug 2011-12-13, May 2012 MIT, Visiting Undergraduate Research Student May 2011 SELECTED UWaterloo Faculty of Mathematics William T. Tutte Fellowship 2022-**HONORS AND** Fields Postdoctoral Fellowship, Fields Institute (U. of Toronto) 2022 AWARDS AARMS Postdoctoral Fellowship, UNB (declined) **NSERC** Postdoctoral Fellowship 2019-21 FRONT Postdoctoral Research Scholarship 2019-21 Kavli IPMU Postdoctoral Fellowship, Tokyo (declined) Nordita Postdoctoral Fellowship, Stockholm (declined) Vanier Canada Graduate Scholarship, NSERC 2016-19 Reinhardt C. Fellowship, McGill 2017 Walter C. Sumner Memorial Fellowship, McGill 2015-17 NSERC Alexander Graham Bell Graduate Scholarship - CGS D (declined) FRONT Doctoral Research Scholarship 2015-16 FRQNT Masters Research Scholarship 2014-15 NSERC Alexander Graham Bell Graduate Scholarship - CGS M 2013-14Lorne Trottier Accelerator Award, McGill 2013 NSERC Undergraduate Student Research Award (USRA, 3 times) 2011-13 Captain Melville Greenshields Memorial Scholarship, Bishop's 2011-12

### **PUBLICATIONS**

- 29. E. Moghtaderi, B. R. Hull, **J. Quintin** and G. Geshnizjani, *How much NEC breaking can the Universe endure?*, arXiv:2503.19955 [gr-qc]
- 28. A. Dehghani, G. Geshnizjani and **J. Quintin**, Cuscuton bounce beyond the linear regime: bispectrum and strong coupling constraints, arXiv:2503.01992 [hep-th]
- 27. R. Liu, J. Quintin and N. Afshordi, Conformal cores of quantum black holes in quadratic gravity, PRD 111, 044031, arXiv:2411.19311 [hep-th]
- 26. **J. Quintin**, X. Chen and R. Ebadi, Fingerprints of a non-inflationary universe from massive fields, JCAP **2409**, 026, arXiv:2405.11016 [astro-ph.CO]
- 25. J. L. Lehners and **J. Quintin**, Delicate curvature bounces in the no-boundary wave function and in the late universe, JCAP **2501**, 027, arXiv:2403.15205 [gr-qc]
- 24. J. L. Lehners and **J. Quintin**, A small Universe, Phys. Lett. B **850** (2024) 138488, arXiv:2309.03272 [hep-th]
- 23. G. Geshnizjani, E. Ling and **J. Quintin**, On the initial singularity and extendibility of flat quasi-de Sitter spacetimes, JHEP 10, 182 (2023), arXiv:2305.01676 [gr-qc]
- 22. C. Jonas, J. L. Lehners and J. Quintin, Uses of complex metrics in cosmology, JHEP 08, 284 (2022), arXiv:2205.15332 [hep-th]
- 21. C. Ganguly and **J. Quintin**, Microphysical manifestations of viscosity and consequences for anisotropies in the very early universe, PRD **105**, 023532, arXiv:2109.11701 [gr-qc]
- 20. **J. Quintin**, H. Bernardo and G. Franzmann, Cosmology at the top of the  $\alpha'$  tower, JHEP **07**, 149 (2021), arXiv:2105.01083 [hep-th]
- 19. C. Jonas, J.-L. Lehners and **J. Quintin**, Cosmological consequences of a principle of finite amplitudes, PRD **103**, 103525, arXiv:2102.05550 [hep-th]
- 18. J.-L. Lehners and **J. Quintin**, Quantum circuit complexity of primordial perturbations, PRD **103**, 063527, arXiv:2012.04911 [hep-th]
- 17. Y. Sakakihara, D. Yoshida, K. Takahashi and J. Quintin, Theories with limited extrinsic curvature and a nonsingular anisotropic universe, PRD 102, 084004, arXiv:2005.10844 [gr-qc]
- 16. **J. Quintin** and D. Yoshida, Cuscuton gravity as a classically stable limiting curvature theory, JCAP **2002**, 016, arXiv:1911.06040 [gr-qc]
- 15. **J. Quintin**, R. H. Brandenberger, M. Gasperini and G. Veneziano, *Stringy black-hole gas in*  $\alpha'$ -corrected dilaton gravity, PRD **98**, 103519, arXiv:1809.01658 [hep-th]
- 14. D. Yoshida and J. Quintin, Maximal extensions and singularities in inflationary spacetimes, CQG 35, 155019, arXiv:1803.07085 [gr-qc]
- 13. C. Lin, J. Quintin and R. H. Brandenberger, Massive gravity and the suppression of anisotropies and gravitational waves in a matter-dominated contracting universe, JCAP 1801, 011, arXiv:1711.10472 [hep-th]
- L. Santos, W. Zhao, E. G. M. Ferreira and J. Quintin, Constraining interacting dark energy with CMB and BAO future surveys, PRD 96, 103529, arXiv:1707.06827 [astro-ph.CO]
- D. Yoshida, J. Quintin, M. Yamaguchi and R. H. Brandenberger, Cosmological perturbations and stability of nonsingular cosmologies with limiting curvature, PRD 96, 043502, arXiv:1704.04184 [hep-th]
- Y. B. Li, J. Quintin, D. G. Wang and Y. F. Cai, Matter bounce cosmology with a generalized single field: non-Gaussianity and an extended no-go theorem, JCAP 1703, 031, arXiv:1612.02036 [hep-th]

- 9. B. Kalomeni, L. Nelson, S. Rappaport, M. Molnar, **J. Quintin** and K. Yakut, *Evolution of cataclysmic variables and related binaries containing a white dwarf*, ApJ **833**, 83, arXiv:1610.03051 [astro-ph.SR]
- 8. **J. Quintin** and R. H. Brandenberger, *Black hole formation in a contracting universe*, JCAP **1611**, 029, arXiv:1609.02556 [astro-ph.CO]
- 7. **J. Quintin**, Z. Sherkatghanad, Y. F. Cai and R. H. Brandenberger, Evolution of cosmological perturbations and the production of non-Gaussianities through a nonsingular bounce: Indications for a no-go theorem in single field matter bounce cosmologies, PRD **92**, 063532, arXiv:1508.04141 [hep-th]
- 6. Y. F. Cai, E. G. M. Ferreira, B. Hu and **J. Quintin**, Searching for features of a string-inspired inflationary model with cosmological observations, PRD Rapid Communications **92**, 121303, arXiv:1507.05619 [astro-ph.CO]
- S. F. Bramberger, R. H. Brandenberger, P. Jreidini and J. Quintin, Cosmic string loops as the seeds of super-massive black holes, JCAP 1506, 007, arXiv:1503.02317 [astro-ph.CO]
- 4. Y. F. Cai, F. Chen, E. G. M. Ferreira and J. Quintin, New model of axion monodromy inflation and its cosmological implications, JCAP 1606, 027, arXiv:1412.4298 [hep-th]
- 3. E. G. M. Ferreira, **J. Quintin**, A. A. Costa, E. Abdalla and B. Wang, *Evidence for interacting dark energy from BOSS*, PRD **95**, 043520, arXiv:1412.2777 [astro-ph.CO]
- 2. **J. Quintin**, Y. F. Cai and R. H. Brandenberger, *Matter creation in a nonsingular bouncing cosmology*, PRD **90**, 063507, arXiv:1406.6049 [gr-qc]
- 1. Y. F. Cai, **J. Quintin**, E. N. Saridakis and E. Wilson-Ewing, *Nonsingular bouncing cosmologies in light of BICEP2*, JCAP **1407**, 033, arXiv:1404.4364 [astro-ph.CO]

INVITED TALKS (long-term visits of  $\gtrsim 2$  weeks denoted by \*\*)

44. Carlton U. Particle Physics Theory Seminar	Jan 2025
43. Bishop's U. Physics & Astronomy Seminar	Nov 2024
42. Majorana-Raychaudhuri Seminar	Nov 2024
41. IBS Workshop on Cosmological Collider	Jun 2024
40. Canadian Association of Physicists (CAP) Congress	May 2024
39. DIAS, School of Theoretical Physics Seminar	Apr 2024
38. <b>KU Leuven</b> , Institute for Theoretical Physics Seminar	Apr 2024
37. U. de Sherbrooke, SAG (Math) Seminar	Oct 2023
36. AnLy Strings and Fields Online Seminar	Oct 2023
35. U. de Montréal, CRM Mathematical Physics Seminar	Sep 2023
34. Copernicus Webinar Series	Jul 2023
33. Canadian Mathematical Society (CMS) Meeting	Jun 2023
32. **McGill U. Theoretical High Energy Journal Club	Dec 2021
31. Perimeter Institute Cosmology Seminar	Nov 2021
30. U. of New Brunswick Gravity Group Meeting	Nov 2021
${\bf 29.~Lisbon~U.}$ Institute of Astrophysics and Space Science Semi	nar Nov 2021
28. Copernicus Webinar Series	Oct 2021
27. <b>Jagiellonian U.</b> Theoretical Cosmology Group Meeting	Jul 2021
26. CAP Congress	Jun 2021
25 II of Science and Technology of China Particle Cosmol	ogy Webinar Feb 2021

24	I. ICTS Workshop - Physics of the Early Universe	Sep $2020$
25	3. Quantum Aspects of Space-Time and Matter (QASTM) Online Tall	Apr 2020
22	2. U. of Cambridge DAMTP Cosmology Journal Club	Nov 2019
21	. Warsaw U. Autumn Workshop on Gravity and Cosmology	Nov 2019
20	Dartmouth College Cosmology Seminar	Apr 2019
19	O. Ohio State U. High Energy Physics Seminar	Oct 2018
18	3. **Harvard-ITC Luncheon	Sep 2018
17	7. **Harvard-ITC Prof. Avi Loeb Group Meeting	Sep 2018
16	i. <b>Princeton U.</b> New Directions in Cosmology and Gravitational Theory Talk	Jan 2018
15	i. Institut d'Astrophysique de Paris (IAP) GRECO Seminar	$\mathrm{Sep}\ 2017$
14	. Imperial College London 3-PAC Seminar	May 2017
15	3. U. of Cambridge DAMTP Cosmology Journal Club	May 2017
12	2. King's College London Theoretical Particle Physics & Cosmology Semina	ar May 2017
11	. Queen Mary U. of London Cosmology and Relativity Seminar	May 2017
10	. Portsmouth U. Institute of Cosmology and Gravitation Seminar	May 2017
(	7. Tufts U. Institute of Cosmology Seminar	Apr 2017
8	8. U. of Pennsylvania Astrophysics and Cosmology Group Talk	Apr 2017
7	7. **U. of Tokyo Research Center for the Early Universe Seminar	$\mathrm{Jun}\ 2016$
(	5. **U. of Science and Technology of China Astronomy Colloquium	$\mathrm{Jun}\ 2016$
Ę	5. Fundan U. Cosmology Seminar	Jun 2016
4	. Tokyo Institute of Technology Cosmology Seminar	Jun 2016
	8. U. of Geneva Cosmology and Astroparticle Physics Journal Club	${\rm Oct}\ 2015$
	2. **ENS-Lyon Centre de Recherche Astrophysique de Lyon Seminar	Oct $2015$
1	. Bishop's U. Physics Seminar	Sep 2015
CONTRIBUTED 11 TALKS	. Workshop on Mathematical Relativity, Scalar Curvature and Synthetic Lor ometry as part of the Thematic Program on Nonsmooth Riemannian and Geometry at the Fields Institute	
10	O. Atlantic General Relativity Conference	$\mathrm{May}\ 2022$
(	. YITP (Kyoto U.) Quantum Cosmology Workshop	Nov 2021
8	3. Alternative Gravities and Fundamental Cosmology Conference	$\mathrm{Sep}\ 2021$
7	7. Northeast Cosmology Workshop at McGill U.	Mar 2018
(	3. COSMO-17 at Paris U.	$\mathrm{Sep}\ 2017$
Ę	5. Beyond ΛCDM Conference	$\mathrm{Jan}\ 2015$
4	. Centre for Research in Astrophysics of Qubec (CRAQ) Meeting	May 2013
9	3. American Astronomical Society (AAS) Meeting #221	Jan 2013
2	2. Canadian Undergraduate Physics Conference (CUPC)	Oct 2012
1	. Centre for Research in Astrophysics of Qubec (CRAQ) Meeting	May 2012

# LOCAL TALKS (number of presentations given inside parenthesis)

- 2022-present: UWaterloo/PI/WCA (8), CITA (1), Fields (1; link)
- 2019-2022: AEI-Potsdam (7)
- 2013-2019: McGill U. Centre for High Energy Physics (14), McGill Space Institute (2)
- 2013: Bishop's U. Department of Physics (3)

# SELECTED WORKSHOPS, SCHOOLS AND ADDITIONAL CONFERENCES ATTENDED

50 Years of Horndeski Gravity: Exploring Modified Gravity @ PI	Jul 2024
Puzzles in the Quantum Gravity Landscape, conference @ PI	Oct 2023
Gravity, Strings and Fields, conference @ CRM	Jul 2023
Quantum Simulators of Fundamental Physics, meeting @ PI	Jun 2023
Quantum Spacetime in the Cosmos, workshop @ PI	May 2023
Gender Equity in Academia: A First Aid Kit, Online Workshop	Sep $2022$
First Meeting of the International Society for Quantum Gravity, Online	Oct 2021
Cosmological Frontiers in Fundamental Physics, Online Conference	May 2021
Gravitational-Wave Primordial Cosmology, Online Workshop	May 2021
Current Challenges in Gravitational Physics, Online Workshop	April 2021
Quantum Gravity, Higher Derivatives and Nonlocality, Online Workshop	Mar 2021
10th Central European Relativity Seminar, conference @ AEI	Feb 2020
Advanced Winter School on Theoretical Cosmology @ Nordita	Jan 2020
Workshop on Geometry and Duality @ AEI	Dec 2019
Symposium on History for Physics: Quantum Gravity @ AEI	Nov 2019
XI International Symposium: Quantum Theory and Symmetries @ UdeM	Jul 2019
XIX International Congress on Mathematical Physics @ Montréal	Jul 2018
Northeast Cosmology Workshop @ McGill	Mar 2018
Gravity in the Early Universe, workshop @ Princeton-PCTS	Jan 2018
McGill-Dartmouth Cosmology Day, workshop @ McGill	May 2017
Einstein Symposium @ ETH Zurich	Nov 2015
AdS/CFT and the Resolution of Cosmological Singularities, workshop @ CRM	Jul 2015
Summer School on Cosmology @ ICTP	Aug 2014
Theory Canada 8, conference @ Bishop's	May 2013
AAS Meeting @ Boston	May 2011

## OUTREACH TALKS

- Talk to Cegep students, *Unveiling the Big Bang* @ Marianopolis College Jan 2024
- Talk (in French) for the Club mathématique de l'Université de Sherbrooke, Les mathmatiques du Big Bang (The mathematics of the Big Bang)

Oct 2023
Tap) L'univers

- Public talk (in French) as part of "Astronomie en Fût" (Astronomy on Tap), L'univers a-t-il eu un commencement? (Did the universe have a beginning?) @ Montréal Apr 2017
- Speaker and guide for tours at the Bishop's University Observatory

2011-13

### PRESS COVERAGE

- What If The Universe DID NOT Start With The Big Bang? by PBS Space Time on YouTube
- Roger Penrose refutes his critics: defending the singularity theorem by Phil Halper on YouTube
- How big is the universe? The shape of space-time could tell us by Leah Crane for the NewScientist
- Applied Math research featured in Quanta Magazine by the UWaterloo Applied Math news office
- Mathematicians Attempt to Glimpse Past the Big Bang by Steve Nadis for Quanta Magazine
- Initial singularity and extendibility of spacetimes by NiklasOPF on YouTube
- The Case for a Small Universe by Brian Koberlein for Universe Today

- The Case for a Small Universe on Phys.org
- How large is our Universe? by Elke Müller of the AEI Press Office
- The hunt for black holes older than the universe itself by Bernard Carr for the NewScientist
- Did the Universe Begin? Rethinking the Penrose Hawking & BGV theorems by Phil Halper on YouTube
- Semeando buracos negros supermassivos (Sowing supermassive black holes) by Rua Josephine for Cientistas Feministras (in Portuguese)
- Evolution of cataclysmic variables and related binaries containing accreting white dwarfs on Phys.org
- The 'Dark' Universe May Be Full of Strange Interactions by Charles Q. Choi for NOVA

# PROFESSIONAL ACTIVITIES AND COMMUNITY

- Member of the SOC for the conference 50 Years of Horndeski Gravity: Exploring Modified Gravity
   Jul 2024
  - applied for and secured funding from the Gravity Theory Trust
- Reviewer for the Newton International Fellowships of the Royal Society May 2024
- Institute of Physics (IOP) Trusted Reviewer status Sep 2023
- Review Editor for Frontiers in Astronomy and Space Sciences and Frontiers in Physics,
   Cosmology section
   Jan 2023-present
- Writing reviews for the American Mathematical Society's
   Mathematical Reviews Database
   Sep 2021-present
- Member of the SOC for the Nordita Winter School on Theoretical Cosmology Jan 2020
- Reviewed a grant proposal for the National Science Center of Poland Dec 2018
- McGill HEP-th Journal Club organizer Sep 2017-Dec 18
- Helped with the organization of the Northeast Cosmology Workshop Mar 2018
- Helped with the organization of the McGill-Dartmouth Cosmology Day May 2017
- Helped with the organization of the Theory Canada 8 Conference May 2013
- Referee for Phys. Rev. Lett., Phys. Rev. D, JCAP, Phys. Lett. B, Class. Quantum Gravity, Eur. Phys. J. C, Eur. Phys. J. Plus, Nucl. Phys. B, Int. J. Mod. Phys. D, Int. J. Mod. Phys. A, Mod. Phys. Lett. A, MDPI (Universe, Symmetry, Entropy, Astronomy), Physica Scripta, Commun. Theor. Phys., LHEP, Astrophys. Space Sci., and INJP

### SUPERVISION AND TEACHING

### UWaterloo/PI

• Fundamentals of University Teaching Certificate	Sep 2024-Feb 2025
• Instructor  MATH 237 - Calculus 3 for Honours Mathematics - Online	Sep-Dec 2024
• Substitute Lecturer PHYS 444 - Introduction to Particle Physics	Feb 2024
• Mentoring MSc student Ruolin Liu	2024-2025
• Participation in the Math Teaching Seminar	Sep 2023-present
• Mentoring PhD student Brayden Hull	2023-2025
• Mentoring MMath student Elly Moghtaderi	2022-2025
• Mentoring PhD student Amir Dehghani	2021-2025

#### AEI-Potsdam

• Mentoring PhD student Caroline Jonas

2019-2022

#### McGill U.

ullet Substitute Lecturer  $Very\ Early\ Universe$  Sep 2017

• Mentor for the MGAPS mentorship program

Sep-Dec 2016

• Teaching Assistant Sep 2013-Apr 2017 General Relativity and Cosmology, Modern Physics and Relativity, Electromagnetic Waves, Introductory Physics – Mechanics, Honours Classical Mechanics 2, Honours Classical Mechanics 1, Topics in Classical Mechanics, Modern Physics and Relativity

### Bishop's U.

• Tutor at the Bishop's University Physics Help Centre

Sep 2012-Apr 13

• Teaching Assistant Jan 2012-Apr 2013 Introduction to Mechanics, Differential Equations, Thermal and Fluid Physics

Private mathematics and physics tutor (high school and college level)

2009-11, 2015

#### **PROGRAMMING**

- Languages I have had experience with: Python (incluing NumPy, SciPy, Matplotlib, etc.), Fortran, C/C++, Java, UNIX shell scripts, Perl, Mathematica, Maple
- Some codes I have run and/or modified over the years: CAMB, MultiModeCode, MathGR, xAct, PyTransport, CosmicPy, Pyflation, MESA