

# Jerome Quintin (he/him) — Curriculum Vitæ

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Website: <https://jerome-quintin.github.io/>

Citizenship: Canadian

Languages: French, English

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

## PUBLICATIONS

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. Lehnert and **J. Quintin**, *Delicate curvature bounces in the no-boundary wave function and in the late universe*, [arXiv:2403.15205 \[gr-qc\]](#)
24. J. L. Lehnert 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. Lehnert 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. Lehnert and **J. Quintin**, *Cosmological consequences of a principle of finite amplitudes*, [PRD \*\*103\*\*, 103525, arXiv:2102.05550 \[hep-th\]](#)
18. J.-L. Lehnert 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 \[hep-th\]](#)
12. 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 \[astro-ph.CO\]](#)
11. 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 \[hep-th\]](#)
10. 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 \[astro-ph.CO\]](#)
5. 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 \*\*)

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|--|----------|
| 41. <a href="#">IBS Workshop on Cosmological Collider</a>                            | Jun 2024 |
| 40. <a href="#">Canadian Association of Physicists (CAP) Congress</a>                | May 2024 |
| 39. <a href="#">DIAS, School of Theoretical Physics Seminar</a>                      | Apr 2024 |
| 38. <a href="#">KU Leuven, Institute for Theoretical Physics Seminar</a>             | Apr 2024 |
| 37. <a href="#">U. de Sherbrooke, SAG (Math) Seminar</a>                             | Oct 2023 |
| 36. <a href="#">AnLy Strings and Fields Online Seminar</a>                           | Oct 2023 |
| 35. <a href="#">U. de Montréal, CRM Mathematical Physics Seminar</a>                 | Sep 2023 |
| 34. <a href="#">Copernicus Webinar Series</a>  | Jul 2023 |
| 33. <a href="#">Canadian Mathematical Society (CMS) Meeting</a>                      | Jun 2023 |
| 32. <b>**McGill U.</b> Theoretical High Energy Journal Club                          | Dec 2021 |
| 31. <a href="#">Perimeter Institute Cosmology Seminar</a>                            | Nov 2021 |
| 30. <a href="#">U. of New Brunswick Gravity Group Meeting</a>                        | Nov 2021 |
| 29. <a href="#">Lisbon U. Institute of Astrophysics and Space Science Seminar</a>    | Nov 2021 |
| 28. <a href="#">Copernicus Webinar Series</a>  | Oct 2021 |
| 27. <a href="#">Jagiellonian U. Theoretical Cosmology Group Meeting</a>              | Jul 2021 |
| 26. <a href="#">CAP Congress</a>   | Jun 2021 |
| 25. <a href="#">U. of Science and Technology of China Particle Cosmology Webinar</a> | Feb 2021 |
| 24. <a href="#">ICTS Workshop - Physics of the Early Universe</a>                    | Sep 2021 |
| 23. <a href="#">Quantum Aspects of Space-Time and Matter (QASTM) Online Talk</a>     | Apr 2020 |
| 22. <a href="#">U. of Cambridge DAMTP Cosmology Journal Club</a>                     | Nov 2019 |
| 21. <a href="#">Warsaw U. Autumn Workshop on Gravity and Cosmology</a>               | Nov 2019 |
| 20. <a href="#">Dartmouth College Cosmology Seminar</a>                              | Apr 2019 |
| 19. <a href="#">Ohio State U. High Energy Physics Seminar</a>                        | Oct 2018 |
| 18. <b>**Harvard-ITC Luncheon</b>  | Sep 2018 |
| 17. <b>**Harvard-ITC Prof. Avi Loeb Group Meeting</b>                                | Sep 2018 |

16. [Princeton U.](#) New Directions in Cosmology and Gravitational Theory Talk Jan 2018
15. [Institut d'Astrophysique de Paris \(IAP\)](#) GRECO Seminar Sep 2017
14. [Imperial College London](#) 3-PAC Seminar May 2017
13. [U. of Cambridge](#) DAMTP Cosmology Journal Club May 2017
12. [King's College London](#) Theoretical Particle Physics & Cosmology Seminar 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
9. [Tufts U.](#) Institute of Cosmology Seminar Apr 2017
8. [U. of Pennsylvania](#) Astrophysics and Cosmology Group Talk Apr 2017
7. [\\*\\*U. of Tokyo](#) Research Center for the Early Universe Seminar Jun 2016
6. [\\*\\*U. of Science and Technology of China](#) Astronomy Colloquium Jun 2016
5. [Fundan U.](#) Cosmology Seminar Jun 2016
4. [Tokyo Institute of Technology](#) Cosmology Seminar Jun 2016
3. [U. of Geneva](#) Cosmology and Astroparticle Physics Journal Club Oct 2015
2. [\\*\\*ENS-Lyon](#) Centre de Recherche Astrophysique de Lyon Seminar Oct 2015
1. [Bishop's U.](#) Physics Seminar Sep 2015

#### CONTRIBUTED TALKS

11. [Workshop on Mathematical Relativity, Scalar Curvature and Synthetic Lorentzian Geometry as part of the Thematic Program on Nonsmooth Riemannian and Lorentzian Geometry at the Fields Institute](#) Oct 2022
10. Atlantic General Relativity Conference May 2022
9. [YITP \(Kyoto U.\) Quantum Cosmology Workshop](#) Nov 2021
8. [Alternative Gravities and Fundamental Cosmology Conference](#) Sep 2021
7. [Northeast Cosmology Workshop at McGill U.](#) Mar 2018
6. [COSMO-17 at Paris U.](#) Sep 2017
5. [Beyond  \$\Lambda\$ CDM Conference](#) Jan 2015
4. Centre for Research in Astrophysics of Qubec (CRAQ) Meeting May 2013
3. [American Astronomical Society \(AAS\) Meeting #221](#) Jan 2013
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   |
| 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 mathématiques du Big Bang (The mathematics of the Big Bang)* Oct 2023
- 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
- [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

## PROFESSIONAL ACTIVITIES AND COMMUNITY

- *Semeando buracos negros supermassivos (Sowing supermassive black holes)* by Rua Josephine for Cientistas Feministas (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
- 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

- Instructor Sep-Dec 2024  
*MATH 237 - Calculus 3 for Honours Mathematics*
- Substitute Lecturer Feb 2024  
*PHYS 444 - Introduction to Particle Physics*
- Mentoring MSc student [Ruolin Liu](#) Jan 2024-present
- Participation in the [Math Teaching Seminar](#) Sep 2023-present
- Mentoring PhD student [Brayden Hull](#) Jan 2023-present
- Mentoring MMath student [Elly Moghtaderi](#) Sep 2022-present
- Mentoring PhD student [Amir Dehghani](#) Sep 2021-present

AEI-Potsdam

- Mentoring PhD student [Caroline Jonas](#) Oct 2019-Jun 2022

McGill U.

- Substitute Lecturer Sep 2017  
*Very Early Universe*
- 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 (including 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