Chiara Caprini

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Current position:

CNRS researcher

September 2016 – now, at Laboratoire Astroparticule et Cosmologie APC, Paris
October 2008 – August 2016, at Institut de Physique Théorique, CEA Saclay

Employment and education:

Université Paris 7 Diderot
December 2018
Habilitation à Diriger des Recherches
Thesis title: "Cosmological Stochastic Backgrounds of Gravitational Waves"

Institut de Physique Théorique, CEA Saclay
October 2007 – September 2008
Postdoc researcher

University of Geneva
November 2004 – September 2007
Postdoc researcher and teaching assistant

University of Oxford
October 2001 – October 2004
Ph.D. in Astrophysics
Thesis advisor: Dr. Pedro G. Ferreira
Thesis title: "The Observational Consequences of Primordial Fields"
Graduate Scholar of Oriel College (2002 – 2004)
Dan David Prize Scholar (2003)

University of Parma and University of Geneva
October 1995 – April 2001
Laurea in fisica. Final result: 110/110 *cum laude*
Thesis advisors: Prof. Ruth Durrer, Prof. Massimo Pauri
Thesis title: "Limiti sull'intensità del campo magnetico primordiale dallo spettro di onde gravitazionali indotte"

Research interests:

Cosmology and Gravitational Waves

gravitational wave background of cosmological origin; gravitational waves from compact binaries and their propagation through the universe; primordial magnetic fields (generation and constraints); cosmological applications of turbulence in plasmas; primordial phase transitions; dark energy and scalar fields in cosmology; physics of the Cosmic Microwave Background; cosmological perturbation theory

Research management:

- **Member of the Astronomy Working Group** of the European Space Agency, since 2020. Activities: scientific advice, mainly to the Space Science Advisory Committee, about ESA's space science programme, in the field of Astronomy.
- **Coordinator of the "Science Interpretation" work-package of the LISA Science Group** within the LISA Consortium, since 2019. Activities: definition of the scientific strategy, priorities and deliverables of the LISA Consortium; management and monitoring of the research activities towards the deliverables; nomination of the sub-work-package leaders responsible for the deliverables.
- **Coordinator of the Cosmology Working Group of the LISA Consortium**, 2014-2020 (270 members). Activities: management of the Working Group activities, members, and documents; management of the Working Group science projects; organisation of the Working Group workshops (two per year) and teleconferences; report of the Working Group activities at the LISA Science Group and Consortium board.
- **Director of the *Groupement de Recherche Ondes Gravitationnelles*** of the *Institut national de physique nucléaire et de physique des particules* (CNRS), since 2017 (220 members). Activities: general management of the GdR (financing, budget, members, working groups, website); organisation of the GdR activities (general meetings, working group workshops, orientation of the scientific strategy of the GdR and input to the national community).
- **Member of the *Groupe thématique* "Astroparticle physics"** for the prospective 2020-2030 of the *Institut national de physique nucléaire et de physique des particules* (CNRS). Activities: review of the scientific input of the French community to the field of astroparticle physics and gravitational waves, and contribution to the decision of the national priorities in the field for the decade 2020-2030.
- **Member of the *Groupe de Travail Physique Fondamentale* of the French Space Agency CNES**, 2017-2019. Activities: selection of funding requests from French laboratories, in the field of Fundamental Physics in space; review of the allocated budgets; regular reports to the CNES boards about the science advancements concerning Fundamental Physics in space, and about the positioning of the French community.
- **Member of the Advisory Board of the Mainz Institute for Theoretical Physics**, 2018-2020. Activities: selection of MITP long-term programs and short conferences.

- **Member of the *conseil scientifique* of the *Programme National* GRAM** (INSU, INP, CNES), 2010-2017. Activities: selection of funding requests from French laboratories, in the field of Gravitation, Reference systems, Astronomy and Metrology; review of the allocated budgets.
- **Member of the *conseil scientifique* of the LABEX P2IO**, 2014-2016. Activities: selection of postdoc funding requests from French laboratories.
- **Member of the *conseil de laboratoire* of IPhT CEA-Saclay**, 2010-2012. Activities: managing of the every-day life of the IPhT laboratory .

Grants:

- Grant of the *Agence Nationale de la Recherche* for the project "Opening new windows on the early universe with multi-messenger astronomy", 2019-2023
- Grant of the *Institut national de physique nucléaire et de physique des particules* for one post-doctoral position on the subject "Cosmology with LISA", 2020-2022
- "International Emerging Action" grant of the CNRS, for the projet "Ondes gravitationnelles générées par les transitions de phase dans l'univers primordial: ondes sonores, turbulence, et leurs interactions" in collaboration with Helsinki University, 2019-2021
- Grant of the LABEX P2IO for one post-doctoral position on the subject "Gravitational Waves as a New Probe of the Dark Side of the Universe", 2014-2017

Teaching:

- "Cosmology from Gravitational waves", IV Joint ICTP-Trieste/ICTP-SAIFR School on Cosmology: Challenges for the Standard Cosmological Model (online), Jan 2021
- "Gravitational waves", lectures for the Annual Retreat of the University of Mainz, Mainz (Germany), Sep 2017
- "Gravitational waves", lectures for the Tenth TRR33 Winter School in Cosmology, Passo del Tonale (Italy), Dec 2016
- "Gravitational waves", theoretical physics mini-course at the Centre de Physique Théorique, Université Aix-Marseille, July 2016
- "Gravitational waves", theoretical physics course of the Institut de Physique Théorique, CEA-Saclay, academic year 2015/2016
- "Gravitational waves", master level course at the University of Bielefeld (Germany), academic year 2014/2015
- "Precéptorat de mathématique I", Ecole supérieure de Physique et Chimie Industrielles (Paris), academic years 2011-2014
- "Cosmologie II", teaching assistant to Prof. Ruth Durrer, University of Geneva, academic year 2006/2007
- "Relativité Générale", teaching assistant to Prof. Ruth Durrer, University of Geneva, academic year 2005/2006
- "Méthodes Mathématiques en Physique", teaching assistant to Prof. Martin Kunz, University of Geneva, academic year 2004/2005 and 2005/2006

Student advisor:

- Dàm Quang Nam: Ph.D. student, Ecole doctorale STEP'UP, Université de Paris, academic years 2019-2022
  "Simulation and associated data analysis for realistic LISA configuration"
- Pierre Auclair: Ph.D. student, Ecole doctorale STEP'UP, Université de Paris and Programme Doctoral de l'Ecole Polytechnique, academic years 2018-2021
  "Cosmology with Gravitational Waves"
- Philip Cherian: stage Master 2, Ecole Normale Supérieure (Paris), academic year 2016/2017
  "Gravitational waves from first order phase transitions"
- Maria Chiara Guzzetti: five months visit in the context of her Ph.D. in the University of Padova, academic year 2016/2017
  "Inflationary magnetogenesis with added helicity: constraints from non-gaussianities"
- Patric Hoelscher: two months visit in the context of his Ph.D. in the University of Bielefeld, academic year 2015/2016
  "Astrophysical gravitational waves in conformal gravity"
- Paul Caucal: stage Master 2, Ecole Normale Supérieure (Paris), academic year 2015/2016
  "The stochastic gravitational wave background from sound waves generated by a first-order phase transition"
- Emmanuel Frion: stage Master 2, Observatoire de Paris, academic year 2014/2015
  "Champs magnétiques primordiaux générés pendant l'inflation: contraintes par les non-gaussianités dans le Fond Diffus Cosmologique"
- Renaud Boussarie: stage Master 1, Ecole Polytechnique (Palaiseau), academic year 2011/2012
  "Génération d'un champ magnétique hélicoïdal pendant l'inflation, effets sur les perturbations de la métrique"
- Simon Bonnefoy: stage Master 2 "Cosmos, Champs et Particules", Université Montpellier II, academic year 2010/2011
  "Fond stochastique d'ondes gravitationnelles générées par collisions de bulles lors d'une transition de phase de premier ordre"

Conference and seminar organisation:

- "Gravitational waves: a new messenger to explore the Universe", long-term workshop at the Centre Emile Borel of the Institut Henri Poincaré (Paris), March-April 2021
- "LISA Cosmology Working Group Workshop", regular meetings taking place twice a year: CERN (April 2015), University of Stavanger (September 2015), DESY Hamburg (October 2016), MITP Mainz (October 2017), University of Helsinki (June 2018), Universidad Autonónoma de Madrid (January 2019), Università di Padova (September 2019), APC Paris - in remote (July 2020)
- *"Assemblée Générale du GdR Ondes Gravitationnelles"*, regular annual meeting of the *Groupement de Recherche Ondes Gravitationnelles*: APC Paris (October 2018), IPNL Lyon (October 2019), IAP Paris - in remote (October 2020), IHP Paris - in remote (March 2021)

- "PONT d'Avignon – Progress on Old and New Themes in cosmology", regular conferences taking place every three years in Avignon (France): April 2011, April 2014, April 2017, December 2020
- "School on Gravitational Waves for Cosmology and Astrophysics", Benasque (Spain), May 2017
- "Journées LISA France", APC (Paris), October 2017
- "Journées Scientifiques de l'Action Spécifique GRAM", APC (Paris), June 2016
- Journal Club on Gravitational Waves, regular meeting, IAP and APC (Paris) 2016-2017
- 17th Itzykson Meeting "Heart of Darkness: Dark Energy and Modified Gravity", IPhT (CEA Saclay), June 2012
- Organiser of the Particle Physics and Cosmology seminar in IPhT (CEA Saclay), 2009-2012
- *SOC or parallel session convener*: 28th Texas Symposium on relativistic astrophysics (Geneva, December 2015), TeV Particle Astrophysics (CERN, September 2016), XI LISA Symposium (Zurich, September 2016), XII LISA Symposium (Chicago, July 2018), CosmoGold IAP 2019 (Paris, June 2019), 22nd International Conference on General Relativity and Gravitation & 13th Edoardo Amaldi Conference on Gravitational Waves (Valencia, July 2019)

Outreach:

- "La cosmologie et les ondes gravitationnelles", seminar for high school students in the context of the initiative *"Elle & l'infini: mathématiques, nom féminin?"*, Cité de la Science, Paris 2020
- "Ondes gravitationnelles", seminar for high-school students, Lycée de La Plaine de Neauphle, Trappes en Yvelines (France), 2016; Lycée Albert Schweitzer, Le Raincy (France), 2017
- "Gravitation, Virgo et trous noirs", Bar de Sciences, Paris 2017
- "Le onde gravitazionali", seminar, Seconda festa dell'astronomia, Verona 2017; Associazione Culturale Wunderkammer, Verona 2016
- "Cosmology and gravitational waves", seminar for high-school professors, APC Paris 2016
- "eLISA et la détection d'ondes gravitationnelles", seminar, Festival Pint of Science, Paris 2016
- "Les ondes gravitationnelles et l'univers primordial", Conférénce Cyclope du CEA-Saclay, 2016
- "Gravitational waves", seminar for the non-scientific staff, IPhT CEA-Saclay, 2016
- Conference "9th Swiss biennial on science, technics and aesthetics", participation, Luzern, Switzerland 2012
- "L'espace et le temps en cosmologie", popular article, Scintillations N. 79, June 2009 (Journal de l'IRFU, CEA Saclay)

Other professional activities:

- **Training**:
  - CNRS training course: "Phyton", 2018
  - CNRS training course: "Agir pour l'égalité professionnelle dans la recherche, programme SPRINGBOARD", 2015
- **Member of Ph.D. and recruitment committees**:
  - *Rapporteur* for the Ph.D. of Adrien Kuntz, Université Aix-Marseille, academic year 2019/2020
  - "Maître de conférence" committee at Paris 6 Sorbonne Université, academic year 2018/2019
  - Ph.D. committee of Lionel Martellini, Université Côte d'Azur (Nice), academic year 2016/2017
  - *Rapporteur* for the Ph.D. of Mauro Pieroni, APC (Paris), academic year 2015/2016
  - "Maître de conférence" committee at Aix-Marseille University, academic year 2014/2015
  - Ph.D. committee of Marc Volhanten, University of Geneva, academic year 2011/2012
  - Ph.D. committee of Elisa Fenu, University of Geneva, academic year 2010/2011
- **Journal Referee**:
  - Since 2004, referee for Physical Review D, Physical Review Letters, JCAP, MNRAS, Physics Letters B, GRG, IJMP
  - Member of the "Nature reader advisory panel" in the year 2010/2011

List of publications:

57. A. Toubiana et al., "Detectable environmental effects in GW190521-like black-hole binaries with LISA", [arXiv:2010.06056 [astro-ph.CO]]

56. A. Neronov et al., arXiv: [pdf, other] astro-ph.CO astro-ph.HE "NANOGrav signal from MHD turbulence at the QCD phase transition in the early universe", [arXiv:2009.14174 [astro-ph.CO]]

55. E. Barausse et al., "Prospects for Fundamental Physics with LISA", Gen. Rel. Grav. **52** (2020) 8, 81 [arXiv:2001.09793 [gr-qc]]

54. C. Caprini et al., "Detecting gravitational waves from cosmological phase transitions with LISA: an update", JCAP **03** (2020) 024, [arXiv:1910.13125 [astro-ph.CO]]

53. A. Sesana et al, "Unveiling the Gravitational Universe at μ-Hz Frequencies", [arXiv:1908.11391 [astro-ph.IM]]

52. Manuel Arca Sedda et al., "The Missing Link in Gravitational-Wave Astronomy: Discoveries Waiting in the Decihertz Range", Class. Quant. Grav. **37** (2020) 21, 215011, [arXiv:1908.11375 [gr-qc]]

51. N. Tamanini et al., "The peculiar acceleration of stellar-origin black hole binaries: measurement and biases with LISA", Phys. Rev. D **101** (2020) no.6, 063002, [arXiv:1907.02018 [astro-ph.IM]]

50. C. Caprini et al., "Reconstructing the spectral shape of a stochastic gravitational wave background with LISA", JCAP **1911** (2019) no.11, 017, LISA-CosWG-19-02 [arXiv:1906.09244 [astro-ph.CO]]

49. B.S. Sathyaprakash et al., "Cosmology and the Early Universe", [arXiv:1903.09260 [astro-ph.HE]]

48. L. Barack et al., "Black holes, gravitational waves and fundamental physics: a roadmap", Class. Quant. Grav. **36** (2019) no.14, 143001 [arXiv:1806.05195 [gr-qc]].

47. M. Fitz Axen, S. Banagiri, A. Matas, C. Caprini, V. Mandic, "Multi-wavelength observations of cosmological phase transitions using LISA and Cosmic Explorer", Phys. Rev. D **98** (2018) no.10, 103508 [arXiv:1806.02500 [astro-ph.IM]].

46. C. Caprini, P. Hölscher and D.J. Schwarz, "Astrophysical Gravitational Waves in Conformal Gravity", Phys. Rev. D **98**, (2018) 084002 [arXiv:1804.01876 [gr-qc]].

45. C. Caprini and D. G. Figueroa, "Cosmological Backgrounds of Gravitational Waves", Class. Quant. Grav. **35** (2018) no.16, 163001 [arXiv:1801.04268 [astro-ph.CO]].

44. C. Caprini, M. C. Guzzetti and L. Sorbo, "Inflationary magnetogenesis with added helicity: constraints from non-gaussianities", Class. Quant. Grav. **35** (2018) no.12, 124003 [arXiv:1707.09750 [astro-ph.CO]].

43. K. Inayoshi, N. Tamanini, C. Caprini and Z. Haiman, "Probing stellar binary black hole formation in galactic nuclei via the imprint of their center of mass acceleration on their gravitational wave signal", Phys. Rev. D **96**, (2017) 063014 [arXiv:1702.06529 [astro-ph.HE]].

42. K. Danzmann *et al*, "LISA – Laser Interferometer Space Antenna", proposal in response to the ESA call for L3 mission concepts, `https://www.elisascience.org/files/publications/LISA_L3_20170120.pdf`

41. N. Bartolo *et al*, "Science with the space-based interferometer LISA. IV: Probing inflation with gravitational waves", JCAP **1612** (2016) no.12, 026 [arXiv:1610.06481 [astro-ph.CO]].

40. C. Bonvin, C. Caprini, R. Sturani and N. Tamanini, "The effect of matter structure on the gravitational waveform", Phys. Rev. D **95**, (2017) 044029 [arXiv:1609.08093 [astro-ph.CO]].

39. C. Caprini and N. Tamanini, "Constraining early and interacting dark energy with gravitational wave standard sirens: the potential of the eLISA mission", JCAP **1610** (2016) no.10, 006 [arXiv:1607.08755 [astro-ph.CO]].

38. N. Tamanini, C. Caprini, E. Barausse, A. Sesana, A. Klein and A. Petiteau, "Science with the space-based interferometer eLISA. III: Probing the expansion of the Universe using gravitational wave standard sirens", JCAP **1604** (2016) no.04, 002 [arXiv:1601.07112 [astro-ph.CO]].

37. C. Caprini *et al.*, "Science with the space-based interferometer eLISA. II: Gravitational waves from cosmological phase transitions", JCAP **1604** (2016) no.04, 001 [arXiv:1512.06239 [astro-ph.CO]].

36. C. Caprini and S. Gabici, "Gamma-ray observations of blazars and the intergalactic magnetic field spectrum", Phys. Rev. D **91** (2015) no.12, 123514 [arXiv:1504.00383 [astro-ph.CO]].

35. C. Caprini, "Stochastic background of gravitational waves from cosmological sources", J. Phys. Conf. Ser. **610** (2015) no.1, 012004, [arXiv:1501.01174 [gr-qc]] (proceedings of the X LISA Symposium)

34. C. Caprini and L. Sorbo, "Adding helicity to inflationary magnetogenesis", JCAP **1410** (2014) no.10, 056 [arXiv:1407.2809 [astro-ph.CO]].

33. C. Caprini, "Gravitational waves from first order phase transitions," PoS EPS **-HEP2013** (2013) 477.

32. C. Bonvin, C. Caprini and R. Durrer, "Magnetic fields from inflation: The CMB temperature anisotropies", Phys. Rev. D **88** (2013) 083515 [arXiv:1308.3348 [astro-ph.CO]].

31. The eLISA Consortium, "The Gravitational Universe", submitted to the European Space Agency on May 24th, 2013 for the L2/L3 selection of ESA's Cosmic Vision program [arXiv:1305.5720 [astro-ph.CO]].

30. C. Caprini, "Magnetic fields from inflation: the transition to the radiation era," proceedings of the conference "Moriond cosmology session 2012".

29. P. Amaro-Seoane, S. Aoudia, S. Babak, P. Binetruy, E. Berti, A. Bohe, C. Caprini and M. Colpi *et al.*, "Low-frequency gravitational-wave science with eLISA/NGO," proceedings of the 9th Amaldi Conference on Gravitational Waves, Class. Quant. Grav. **29** (2012) 124016 [arXiv:1202.0839 [gr-qc]].

28. P. Amaro-Seoane, S. Aoudia, S. Babak, P. Binetruy, E. Berti, A. Bohe, C. Caprini and M. Colpi *et al.*, "eLISA/NGO: Astrophysics and cosmology in the gravitational-wave millihertz regime," GW Notes **6**, 2013 [arXiv:1201.3621 [astro-ph.CO]].

27. P. Binetruy, A. Bohe, C. Caprini and J. -F. Dufaux, "Cosmological Backgrounds of Gravitational Waves and eLISA/NGO: Phase Transitions, Cosmic Strings and Other Sources," JCAP **1206** (2012) 027 [arXiv:1201.0983 [gr-qc]].

26. C. Bonvin, C. Caprini and R. Durrer, "Magnetic fields from inflation: the transition to the radiation era," Phys. Rev. D **86** (2012) 023519 [arXiv:1112.3901 [astro-ph.CO]].

25. C. Caprini and J. M. No, "Supersonic Electroweak Baryogenesis: Achieving Baryogenesis for Fast Bubble Walls," JCAP **1201** (2012) 031 [arXiv:1111.1726 [hep-ph]].

24. C. Caprini, "Limits for primordial magnetic fields," proceedings of the conference 'Texas Symposium 2010', PoS TEXAS **2010** (2010) 222 [arXiv:1103.4060 [astro-ph.CO]].

23. C. Caprini, R. Durrer and X. Siemens, "Detection of gravitational waves from the QCD phase transition with pulsar timing arrays," Phys. Rev. D **82** (2010) 063511 [arXiv:1007.1218 [astro-ph.CO]].

22. C. Caprini, "Gravitational waves from cosmological phase transitions," proceedings of the conference 'Moriond cosmology session 2010' [arXiv:1005.5291 [astro-ph.CO]].

21. C. Bonvin and C. Caprini, "CMB temperature anisotropy at large scales induced by a causal primordial magnetic field," JCAP **1005** (2010) 022 [arXiv:1004.1405 [astro-ph.CO]].

20. C. Caprini, R. Durrer and G. Servant, "The stochastic gravitational wave background from turbulence and magnetic fields generated by a first-order phase transition," JCAP **0912** (2009) 024 [arXiv:0909.0622 [astro-ph.CO]].

19. C. Caprini, R. Durrer and E. Fenu, "Can the observed large scale magnetic fields be seeded by helical primordial fields?," JCAP **0911** (2009) 001 [arXiv:0906.4976 [astro-ph.CO]].

18. C. Caprini, F. Finelli, D. Paoletti and A. Riotto, "The cosmic microwave background temperature bispectrum from scalar perturbations induced by primordial magnetic fields," JCAP **0906** (2009) 021 [arXiv:0903.1420 [astro-ph.CO]].

17. C. Caprini, R. Durrer, T. Konstandin and G. Servant, "General Properties of the Gravitational Wave Spectrum from Phase Transitions," Phys. Rev. D **79** (2009) 083519 [arXiv:0901.1661 [astro-ph]].

16. E. Babichev, P. Brax, C. Caprini, J. Martin and D. A. Steer, "Dirac Born Infeld (DBI) Cosmic Strings," JHEP **0903** (2009) 091 [arXiv:0809.2013 [hep-th]].

15. M. Douspis, P. G. Castro, C. Caprini and N. Aghanim, "Optimising large galaxy surveys for ISW detection," Astron. Astrophys. **485** (2008) 395 [arXiv:0802.0983 [astro-ph]].

14. L. Hollenstein, C. Caprini, R. Crittenden and R. Maartens, "Challenges for creating magnetic fields by cosmic defects," Phys. Rev. D **77** (2008) 063517 [arXiv:0712.1667 [astro-ph]].

13. C. Caprini, R. Durrer and G. Servant, "Gravitational wave generation from bubble collisions in first-order phase transitions: An analytic approach," Phys. Rev. D **77** (2008) 124015 [arXiv:0711.2593 [astro-ph]].

12. C. Bonvin, C. Caprini and R. Durrer, "Superluminal motion and closed signal curves," arXiv:0706.1538 [astro-ph].

11. C. Caprini, R. Durrer and R. Sturani, "On the frequency of gravitational waves," Phys. Rev. D **74** (2006) 127501 [astro-ph/0607651].

10. C. Bonvin, C. Caprini and R. Durrer, "A no-go theorem for k-essence dark energy," Phys. Rev. Lett. **97** (2006) 081303 [astro-ph/0606584].

9. C. Caprini and R. Durrer, "Gravitational waves from stochastic relativistic sources: Primordial turbulence and magnetic fields," Phys. Rev. D **74** (2006) 063521 [astro-ph/0603476].

8. C. Caprini, "Primordial magnetic fields and gravitational waves,' proceedings of the conference 'The origin and evolution of cosmic magnetism,' A. N. **327**, (2006) 5-6, 422

7. C. Caprini, " Effects of tensor perturbations induced by a primordial magnetic field,' proceedings of the conference 'Nonlinear Cosmology', ICTP Trieste. To appear in Int. J. Mod. Phys. **D** (2006)

6. C. Caprini and R. Durrer, "Limits on stochastic magnetic fields: A Defense of our paper," Phys. Rev. D **72** (2005) 088301 [astro-ph/0504553].

5. C. Caprini and P. G. Ferreira, "Constraints on the electrical charge asymmetry of the universe," JCAP **0502** (2005) 006 [hep-ph/0310066].

4. C. Caprini, R. Durrer and T. Kahniashvili, "The Cosmic microwave background and helical magnetic fields: The Tensor mode," Phys. Rev. D **69** (2004) 063006 [astro-ph/0304556].

3. R. Durrer and C. Caprini, "Primordial magnetic fields and causality," JCAP **0311** (2003) 010 [astro-ph/0305059].

2. C. Caprini, S. H. Hansen and M. Kunz, "Observational constraint on the fourth derivative of the inflaton potential," Mon. Not. Roy. Astron. Soc. **339** (2003) 212 [hep-ph/0210095].

1. C. Caprini and R. Durrer, "Gravitational wave production: A Strong constraint on primordial magnetic fields," Phys. Rev. D **65** (2001) 023517 [astro-ph/0106244].

Seminars:

- *Gravitational waves from primordial phase transitions*
  NANOGrav Astronomy Working Group seminar, online 2020
- *Gravitational waves and cosmology: the potential of the LISA observatory*
  - CERN Theory Colloquium, CERN 2020
  - KITP Workshop "From Inflation to the Hot Big Bang", Santa Barbara 2020
  - Third annual symposium of the innovative area "Gravitational Wave Physics and Astronomy: Genesis", Kobe 2020
- *LISA Cosmology Working Group*
  - Meeting "LISA France", CNES Paris 2020
- *Cosmological Backgrounds*
  - Conference "Quantum gases, fundamental interactions and cosmology", Pisa 2019
- *Challenges in cosmology with gravitational waves*
  - Conference "CosmoGold", IAP Paris 2019
- *Constraining the Early Universe with Gravitational Waves*
  - Conference "String Phenomenology", CERN 2019
- *Gravitational waves from phase transitions*
  - Workshop "The mysterious universe: dark matter, dark energy and cosmic magnetic fields", MITP Mainz 2019
- *Cosmology Working Group*
  - LISA Consortium meeting, Hannover 2019
  - Workshop "Enabling LISA science exploitation" Lorentz Center, Leiden 2019
- *Observing gravitational waves from space with LISA*
  - Physics Colloquium, University of Mainz, 2019 - Physics Colloquium, Universidad Autónoma de Madrid, 2019
- *Cosmology with the Gravitational Wave interferometer LISA*
  - IAP Paris, 2019
  - LAM Marseille, 2018
  - LISA Fundamental Physics Working Group Workshop, Florence 2018
  - Conference COSMO17, Paris 2017
  - DESY Theory meeting, DESY Hamburg, Germany 2017
- *GW sources and Cosmology*
  - 29th Texas Symposium on Relativistic Astrophysics, CTICC Cape Town, South Africa 2017
- *Primordial magnetic fields*
  - CTA day, Paris Observatory, 2017
- *Testing cosmology with gravitational waves at LISA*
  - CERN TH-Institute "Probing the dark sector and general relativity at all scales", 2017

- *LISA Science Performance*
  - CEA Saclay, France 2017
- *Probing the expansion of the universe using GW standard sirens at LISA*
  - Colloque national "Dark Energy", LAL Orsay 2017
  - TeVPA, CERN 2016
- *Cosmology with gravitational wave detection*
  - Université de Louvain, Belgium 2019
  - SAP (CEA Saclay), France 2017
  - University of Geneva, Switzerland 2017
  - LTP Orsay, France 2017
  - University of Amsterdam, Netherlands 2017
  - Max Planck Institute for Gravitational Physics, Potsdam, Germany 2015
  - CERN, Switzerland 2015
  - University of Portsmouth, UK 2015
  - OCA Nice, France 2015
  - University of Sussex, UK 2015
  - University of Cardiff, UK 2015
  - University of Helsinki, Finland 2015
  - University of Oslo, Norway 2015
  - University of Bielefeld, Germany 2014
  - St Cugat Forum on Astrophysics, Barcelona 2014
  - X LISA Symposium, University of Florida Gainesville 2014
  - Cajagwr seminars, Caltech, Pasadena 2014
- *The effect of matter perturbations on the chirp signal*
  - Gravitational-wave astronomy meeting in Paris, IAP 2016
- *Smoking guns of phase transitions and primordial magnetic fields*
  - Les Houches school "Cosmology after Planck: what is next?", France 2016
- *Gravitational waves: discovery and future*
  - GGI workshop "Theoretical Cosmology in the Era of Large Surveys", Florence 2016
  - IPhT Séminaire Général, CEA-Saclay 2016
- *Cosmology with gravitational waves*
  - University of Heidelberg, Germany 2016
  - CTP Université Aix-Marseille, France 2016
  - Conference "Hot topics in Modern Cosmology", Cargèse, France 2016
  - YITP Kyoto, Japan 2016
  - APC Journal Club, Paris 2016
- *Gamma-ray observations of blazars and the intergalactic magnetic field spectrum*
  - Workshop "Origin, evolution and signatures of cosmological magnetic fields", NORDITA Stockholm 2015
- *Theoretical aspects of GW stochastic backgrounds*
  - Virgo TEONGRAV meeting, Pisa 2015
- *Gravitational waves from the early universe*
  - Fourth Dutch Gravitational Wave Meeting, Leiden 2015
- *Magnetic fields from inflation*
  - GReCO seminar series, IAP Paris 2014
  - Frontiers of Fundamental Physics, Marseille 2014
- *Theory beyond the BICEP2 measurement*
  Journal Club of the François Arago Centre, Paris 2014

- *Gravitational waves from first order phase transitions*
  - 6th Iberian Gravitational-Wave Meeting, Madrid 2016
  - Workshop "Particlegenesis", KITP Santa Barbara 2014
  - EPS meeting, Stockholm 2013
  - IFAE, Universitat Autònoma de Barcelona, Spain 2012
  - Université Libre de Bruxelles, Belgium 2012
  - DAMPT General relativity seminar, Cambridge 2012
  - University of Utrecht, Netherlands 2012
  - Max Planck Institute for gravitational physics, Hannover 2011
  - University of California Santa Cruz 2010
  - University of Wisconsin, Milwaukee 2010
  - Workshop 'Gravitational Waves 2010', University of Minnesota 2010
  - Cajagwr seminars, Caltech, Pasadena 2010
- *Stochastic backgrounds of gravitational waves of cosmological origin*
  - Workshop 'Stochastic backgrounds of gravitational waves', Nice, France 2013
  - NGO science day, IAP Paris 2012
- *Primordial magnetic fields: initial conditions and CMB anisotropy at large scales*
  - Department of Astrophysics, University of Oxford, 2012
  - SISSA particle physics seminar, Trieste 2012
- *Magnetic fields from inflation: the transition to the radiation era*
  - 'Cosmo coffee' meeting, CERN 2012
  - Conference 'Moriond Cosmology', La Thuile, Italy 2012
- *Gravitational waves*
  - Workshop 'Electroweak baryogenesis in the era of the LHC', Weizmann Institute Israel 2011
- *Cosmological models of seed fields*
  - Workshop 'Theory and observations of extragalactic magnetic fields', APC Paris 2010
- *Limits for primordial magnetic fields*
  - Texas Symposium 2010, Heidelberg
- *Cosmological gravitational wave backgrounds*
  - Université Catholique de Louvain 2010
  - University College London 2010
  - GPhys workshop, IAP Paris 2010
- *Gravitational waves from cosmological sources*
  - Journées LISA France, ONERA France 2010
- *CMB anisotropy at large scales induced by a causal primordial magnetic field*
  - IAP, Paris 2010
  - LPT, Orsay 2010
- *Primordial magnetic fields and gravitational waves*
  - Conference 'Cosmological Magnetic Fields', Ascona, Switzerland 2009
- *Cosmological magnetic fields*
  - Jet propulsion Laboratory, Pasadena 2010
  - SPP Journal Club, CEA Saclay 2009
  - IPN-X seminar series, Orsay 2009
  - LPNHE Jussieu, Paris 2009
  - IPhT, CEA Saclay 2008
- *Magnetic fields in the universe*
  - LAL Workshop, Orsay 2011
  - Conference 'PONT', Avignon, France 2008

- *Gravitational waves from phase transitions*
  - Conference 'Moriond Cosmology', La Thuile, Italy 2010
  - Conference 'COSMO09', CERN 2009
  - Workshop 'The electroweak phase transition', Nordita, Stockholm 2009
  - APC, Paris 2008
  - Perimeter Institute, Waterloo, Canada 2008
  - Institut d'Astrophysique de Paris, Paris 2008
  - Journées LISA France, APC, Paris 2008
  - Institut de Physique Théorique, CEA Saclay 2008
  - Instituto Superior Técnico, Universidade Técnica de Lisboa, Portugal 2007
  - Istituto di Astrofisica Spaziale e Fisica Cosmica, INAF Bologna, Italy 2007
  - Theoretisch-Physikalisches Institut, University of Jena, Germany 2007
  - ICTP Trieste, Italy 2007
  - Conference: 'Cosmology: Facts and Fictions' Sils Maria, Switzerland 2007
  - Laboratoire de Physique Théorique d'Orsay, France 2007
  - U.K. Cosmology Meeting, King's College London, UK 2006
- *No-go theorem for k-essence dark energy*
  - 'Cosmo Coffee' meeting, CERN, 2006
  - GGI workshop 'Astroparticle and Cosmology', Florence, Italy 2006
- *Gravitational waves from stochastic relativistic sources: primordial turbulence and magnetic fields*
  - Laboratoire d'Annecy-Le-Vieux de Physique Théorique, France 2006
  - Conference '10^{eme} Journée des Lacs Alpins de Cosmologie', CERN, 2006
  - Conference 'Cosmology: Facts and Fictions', Sils Maria, 2006
- *Primordial magnetic fields and gravitational waves*
  - Institut d'Astrophysique Spatiale, Paris France 2006
- *Primordial magnetic fields*
  - 'Cosmo Coffee' meeting, CERN, 2005
- *Magnetic field perturbations*
  - Conference 'Cosmology: Facts and Fictions', Sils Maria, 2005
- *Constraints on the electrical charge asymmetry of the universe*
  - Institute of Cosmology and Gravitation, University of Portsmouth, UK 2004
  - Conference 'Cosmology: Facts and Fictions', Sils Maria, 2004
- *Magnetic fields in the early universe*
  - Department of Astrophysics, University of Oxford, UK 2004
- *Primordial magnetic fields and charge asymmetry in the universe*
  - Department of Astronomy, University of Sussex, UK 2003
  - Department of Theoretical Physics, Imperial College London, UK 2003
  - Department of Astronomy, Università di Padova, Italy 2003
- *The cosmic microwave background and helical magnetic fields: the tensor mode*
  - Conference 'Cosmology: Facts and Fictions', Sils Maria, 2003
  - Oxford-Princeton meeting, University of Oxford, 2004
  - Conference 'Nonlinear Cosmology', ICTP Trieste, 2005
- *Observational constraint on the fourth derivative of the inflaton potential*
  - Department of Theoretical Physics, University of Geneva, Switzerland 2002
- *Consequences of causality on the spectrum of a primordial magnetic field*
  - Conference '5^{eme} Journée des Lacs Alpins de Cosmologie', Laboratoire d'Annecy-Le-Vieux de Physique Théorique, 2002

- *Gravitational wave production: a strong constraint on primordial magnetic fields*
  - U.K. Cosmology Meeting, University of Sussex, 2001
  - Institute of Cosmology and Gravitation, University of Portsmouth, 2002

Selection of conferences:

- *From Inflation to the Hot Big Bang*, KITP Santa Barbara 2020 [invited talk]
- *Third annual symposium of the innovative area "Gravitational Wave Physics and Astronomy: Genesis"*, Kobe 2020 [invited talk - in remote]
- *Quantum gases, fundamental interactions and cosmology*, Pisa 2019 [invited talk]
- *String Phenomenology*, CERN 2019 [invited talk]
- *GdR Ondes Gravitationnelles*, APC Paris 2018, IPNL Lyon 2019 [organisation]
- *LISA Cosmology Working Group Workshop*, CERN 2015, University of Stavanger 2015, DESY Hamburg 2016, MITP Mainz 2017, University of Helsinki 2018, Universidad Autónonoma de Madrid 2019, Universitá di Padova 2019 [organisation]
- *PONT, Progress on Old and New Themes in cosmology*, Avignon, France 2011, 2014, 2017, 2020 [organisation]
- *22nd International Conference on General Relativity and Gravitation & 13th Edoardo Amaldi Conference on Gravitational Waves*, Valencia 2019 [session convener]
- *CosmoGold*, Colloque de l'IAP, Paris 2019 [SOC and invited talk]
- *The mysterious universe: dark matter, dark energy and cosmic magnetic fields*, MITP Mainz 2019 [invited talk]
- *Enabling LISA Science Exploitation Workshop*, Lorentz Centre, Leiden 2019 [invited talk]
- *LISA Fundamental Physics Working Group Workshop*, GGI Florence 2018 [invited talk]
- *XII LISA Symposium*, Chicago 2018 [SOC]
- *DESY Theory meeting*, DESY Hamburg, Germany 2017 [invited talk]
- *COSMO17*, Paris, France 2017 [invited talk]
- *XI LISA Symposium*, Zurich 2016 [session convener]
- *TeVPA*, CERN 2016 [talk and session convener]
- *Gravitational-wave astronomy meeting in Paris*, IAP Paris 2016 [talk]
- *Hot topics in Modern Cosmology, SW10*, Cargèse, France 2016 [invited talk]
- *Cosmology after Planck: what is next?*, Les Houches school, France 2016 [invited lecture]
- *Theoretical Cosmology in the Era of Large Surveys*, GGI Florence, 2016 [invited talk]
- *Origin, evolution and signatures of cosmological magnetic fields*, NORDITA Stockholm, 2015 [talk]
- *28th Texas Symposium on relativistic astrophysics*, Geneva, 2015 [session convener]

- *Frontiers of Fundamental Physics*, Marseille, 2014 [talk]
- *Workshop "Particlegenesis"*, KITP Santa Barbara, 2014 [invited talk]
- *X LISA Symposium*, University of Florida Gainesville, 2014 [invited talk]
- *St Cugat Forum on Astrophysics*, St Cugat (Barcelona), 2014 [invited talk]
- *European Physical Society meeting*, Stockholm, 2013 [invited talk]
- *Stochastic backgrounds of gravitational waves*, Workshop in Nice, France, 2013 [invited talk]
- *17th Itzykson Meeting*, IPhT CEA Saclay, 2012-2014 [organisation]
- *Rencontres de Moriond - Cosmology Session*, La Thuile, Italy 2012 [talk]
- *Electroweak baryogenesis in the era of the LHC*, workshop at the Weizmann Institute, Israel 2011 [invited talk]
- *Theory and observations of extragalactic magnetic fields*, workshop, APC Paris 2010 [invited talk]
- *Texas Symposium 2010* Heidelberg (Germany) 2010 [invited talk]
- *Gravitational Waves 2010*, workshop at the University of Minnesota 2010 [invited talk]
- *Rencontres de Moriond - Cosmology Session*, La Thuile, Italy 2010 [talk]
- *COSMO09*, CERN 2009 [talk]
- *The electroweak phase transition*, workshop at Nordita, Stockholm 2009 [invited talk]
- *Cosmological Magnetic Fields*, Ascona Switzerland 2009 [invited talk]
- *Gravitational Wave Astronomy*, Aspen, USA 2008 [talk]
- *PONT, Progress on Old and New Themes in cosmology*, Avignon, France 2008 [invited talk]
- *Cosmology: Facts and Fictions*, Sils Maria, Switzerland, yearly since 2003 to 2007 [invited talk]
- *Astroparticle and Cosmology*, Galileo Galilei Institute, Florence, 2006 [talk]
- *Nonlinear cosmology: turbulence and fields*, ICTP Trieste, 2005 [invited talk]