CURRICULUM VITAE:

CRISTIAN JOANA

Institute of Theoretical Physics, CAS,
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ACADEMIC RECORDS:

- **2023/present** **Postdoctoral researcher**
at Institute of Theoretical Physics – Chinese Academy of Science (ITP-CAS), Beijing, P. R. China.

- **2019/22** **PhD in Physics (FRNS - FRIA)**
at IRMP, CURL, University of Louvain, Louvain-la-Neuve, Belgium.

- **2014/16** **Master's degree in Physics, major in QFT and Gauge theories**
at RWTH Aachen University, Aachen, Germany.

- **2009/13** **Degree (EEES) in Physic**s, **mention in Fundamental Physics**
at Autonomous University of Barcelona, Catalonia/Spain.

RESEARCH EXPERIENCE:

- **2019/22** **PhD in Physics at CP3/CURL, University of Louvain** ***(Belgium)***
Supervisors: **Christophe Ringeval** (UCLouvain), **Sebastien Clesse** (ULB)
Keywords: Inflation, Reheating, Primordial black holes, Numerical-GR

- **2016/19** **Research assistant at the Institute of Neuroscience and Medicine (INM-6), Juelich Research Centre** ***(Germany)***
Lab PI: **Sonja Gruen** (FZ-Juelich)
Keywords: Neural data analysis, visual cortex, electrophysiology, spike-sorting

- **2013/14** **Internship researcher at the National Institute Informatics, Tokyo**, ***(Japan)***
Lab PI: **Tim Byrnes** (currently at NYU Shanghai)
Keywords: Continuous-Variables Quantum Computing, Quantum optics

SCIENTIFIC GRANDS AND AWARDS:

- **2022** **ICERM visiting grant, Brown University (Rhode Island)**
National Science Foundation and ICERM's Federal funds, **NSF,** USA

- **2020** **ICERM visiting grant** – cancelled due to Covid-19,
National Science Foundation and ICERM's Federal funds, **NSF,** USA

- **2020/21** **Co-I, PRACE Tier-0 No. 2018194669** (6 months),
30M CPU/hrs, Computational Grant

- 2019/22	**FNRS - FRIA grant** (bourse de doctorat, 4 years), Fonds de la Reserche Scientifique, **FRS-FNRS,** Belgium
- 2013	**NII International Internship Program** (6 month) National Institute of Informatics, **Sokendai**, Japan

TEACHING EXPERIENCE:

- 2019/20/21	**Tutor** in **Quantum Mechanics II** (UCLouvain)
- 2017/18	**Tutor** in **Computational Neuroscience** (RWTH Aachen)
- 2017	**Tutor** in the **Advanced Neural Data Analysis '17** school (FZ-Juelich)

OTHER EDUCATION AND TRAINING:

- 2021	**Tonale winter school of cosmology 2021** at Paso del Tonale, (Italy), organized by Heidelberg University (Germany)
- 2020	**Advances in Computational Relativity workshop (online)** at ICERM, Brown University, Providence (USA)
- 2019	**Gravitational wave astronomy summer school** at ICTS, Bangalore (India)
- 2017	**(Tutor) Advanced Neural Data Analysis 2017 summer school** at Juelich Research Center, Juelich (Germany)
- 2016	**Workshop 'Cosmology after Planck: what is next?'** at Ecole de Physique des Houches (France)
- 2014	**ESI-EMS-IAMP Summer school on Mathematical Relativity** Erwin Schrödinger Institute, Vienna (Austria)

PERSONAL DETAILS AND SKILLS:

Nationality:	Catalan, Spanish
Date of birth:	01-05-1990
Status:	Single
Languages:	Native in Catalan and Spanish, Proficiency in English Intermediate level in French Beginner in Chinese and German.
ICT Skills:	Debian GNU/Linux based Operative Systems, Programming in C/C++ and Python, *Mathematica™, LaTeX*
Hobbies:	Reading, playing chess, traveling and hiking.

RESEARCH ACHIEVEMENTS:

LIST OF PUBLICATIONS: (PUBLISHED)

GR-QC, ASTRO-CO, HEP-Th, COND-MAT:

1. Joana, C., van Loock, P., Deng, H., Byrnes, T. (2016). "Steady-state generation of negative-Wigner-function light using feedback". Phys. Rev. A, 94, 063802 (2016). arXiv:1612.00629

2. Joana, C., Clesse, S. "Inhomogeneous pre-inflation accross Hubble scales in full general relativity", Phys. Rev. D 103, 083501 (2021). arXiv:2011.12190

3. Joana, C. "Gravitational dynamics of Higgs inflation: Preinflation and preheating with an auxiliary", Phys. Rev. D, vol. 106, pp. 023504 (2022). arXiv:2202.07604

4. Andrade, T., Joana C. et, al. "GRChombo: An adaptable numerical relativity code for fundamental physics", Journal of Open Source Software (JOSS), 6(68), 3703, https://doi.org/10.21105/joss.0370

5. Auclair, P., Bacon, D., Joana, C, et. al. [LISA Collaboration], "Cosmology with the Laser Interferometer Space Antenna", Living Rev Relativ 26, 5 (2023). https://doi.org/10.1007/s41114-023-00045-2

6. Bagui, E., Clesse, S., Joana, C., et. al. [LISA Collaboration], "Primordial black holes and their gravitational wave signatures", arXiv:2310.XXXX ***(submitted Liv Rev Rel)***

INTERDICIPLINARY:

7. Yamane, Y., Ito, J., Joana, C., Fujita, I., Tamura, H, Maldonado, P., Gruen, S., "Neuronal population activity in macaque visual cortices dynamically changes through repeated fixations in active free viewing", eNeuro 5 October 2023, ENEURO.0086-23.2023; doi:10.1523/ENEURO.0086-23.2023.

8. Ito, J., Joana, C., Yamane, Y., Fujita, I., Tamura, H, Maldonado, P., Gruen, S. (2022), "Latency shortening with enhanced sparseness and responsiveness in V1 during active visual sensing", Sci Rep **12,** 6021 (2022)

SELECTION OF MANUSCRIPTS IN PROGRESS: (IN PROGRESS)

9. Dumpui, E., Clesse, S., Joana, C., Escriva A., "Baryogenesis from sub-threshold curvature perturbations", ***(in preparation for submission to PRL)***

10. C. Joana, S. Clesse, “Primordial black hole formation after collapse of asymmetric curvature perturbations”, ***(in progress)***

11. C. Joana, “Beginning inflation in non-conformally flat spacetimes”, ***(in progress)***

GIVEN AND CONTRIBUTED TALKS:

***** Underline names refers to the author who gave the presentation

- On Primordial Black Hole Formation
  Cristian Joana
  PCFT/ICTS seminars, USTC, Hefei, P.R. China, 19th October 2023

- Introduction to Numerical Relativity in Cosmology
  Cristian Joana
  College of Physics seminars, Chongqing U., P.R. China, 26h April 2023

- GR-Simulations of the Early Universe
  Cristian Joana
  Chinese GW annual meeting, Chongqing, P.R. China, 24h April2023

- Numerical relativity in Cosmology
  Cristian Joana
  Gravity-matters seminars, University of Oslo, Norway, 28th November 2022

- Visualitzation tools for GRChombo: Yt and Visit
  Cristian Joana
  GRChombo meeting ‘22 (I), Cambridge U., UK, 30th March 2022

- Dynamics of pre- and post- Higgs inflation
  Cristian Joana
  GRChombo meeting ‘22 (I), Cambridge U., UK, 29th March 2022

- Gravitational dynamics of Higgs pre-inflation and preheating
  Cristian Joana
  Oxford gr-qc JC, Oxford U., UK 3th March 2022

- Simulations of the early Universe with numerical General Relativity
  Cristian Joana
  Tonale winter school of cosmology, Tonale, Italy, 8th December 2021

- Exploring the early Universe with numerical General Relativity
  Cristian Joana
  Belgian Gravitational Wavel Seminars, ULB, Brussels, Belgium, 3rd November 2021

- The inhomogeneous pre-inflationary era: A numerical relativity approach
  Cristian Joana
  GRChombo workshop ‘20 II, Oxford U., Oxford, UK, 2nd December 2020

- Graviational waves from the inhomogeneous pre-inflationary era
  Cristian Joana
  Belgian Gravitational Wave Seminars, KU-Leuven, Leuven, Belgium, 25th November 2020

- The inhomogeneous pre-inflationary era
  Cristian Joana
  Advances in Computational Relativity, ICERM, Brown University, USA, 12th November 2020

- Layer specific modulation of response latency in V1 under active and passive viewing conditions
  Junji Ito, Cristian Joana, Yukako Yamane, Pedro Maldonado, Sonja Grün
  EITN workshop, Paris, France, 26th November 2019

- Activity of visual cortex neurons differs between passive stimulation and active free viewing
  Junji Ito, Cristian Joana, Yukako Yamane, Pedro Maldonado, Sonja Grün
  ECVP, Leuven , Belgium, 28th August 2019

- GR-Hidrodynamics (perfect fluid) simulations with GRChombo
  Cristian Joana
  GRChombo workshop ‘19 II, KCL, London, UK, 11th June 2019

- Inhomogeneous scalar field dynamics and backreactions in non-conformally flat spacetimes
  Cristian Joana
  GRChombo workshop ‘19 I, QMUL, London, UK, 19th February 2019

- Neural correlates in macaque V1 and IT during active and passive vision
  Cristian Joana, Junji Ito, Yukako Yamane, Pedro Maldonado, Sonja Grün
  Universidad de Chile, BNI - Neurosistemas, Santiago de Chile, Chile, 18th March 2018

- Steady-state generation of negative Wigner function light with exciton-polaritons
  Cristian Joana, Peter van Loock, Hui Deng, Tim Byrnes
  Quantum Manipulations of Atoms and Photons 2015, Shanghai, P.R. China, 27th Oct 2015

- Negative Wigner function distribution light generated by coherent excitation of polaritons
  Cristian Joana, Peter van Loock, Hui Deng, Tim Byrnes
  WE-Heraeus-Seminar: Continuous Variable Entanglement in Atomic Systems: Fundamentals and Applications, Bad Honnef, Germany, 11th May 2015

- Steady-state negative Wigner function light from exciton-polaritons condensates
  Cristian Joana, Peter van Loock, Hui Deng, Tim Byrnes
  University of Tokyo, Tokyo, Japan, February 2014