

## Special Issue

# Quantum Field Theory in Curved Spacetime and Its Implications for Cosmology, Blackholes and Quantum Gravity

### Message from the Guest Editors

After the colossal success of the quantum field theory and general relativity (GR), the next big thing, having puzzled generations of physicists, is the “quantum field theory in curved spacetime (QFTCS)”. The main objective of the QFTCS is to understand how quantum fields behave when gravity is involved and how spacetime fluctuations can be quantum mechanical in nature. This endeavor has, thus far, uncovered striking questions related to the well-known problems of unitarity and information loss in the contexts of de Sitter’s spacetime and Schwarzschild’s black hole. Although the QFTCS has had its success in predicting CMB correlations through cosmic inflation and Hawking radiation, it has, nevertheless, remained incomplete due to the lack of an S-matrix construction and a unique choice of vacuum, a situation that entails many conceptual conundrums. We hope to receive significant contributions, making this Special Issue a significant driving force for further advancements in the field of the QFTCS and quantum gravity.

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### Guest Editors

Dr. Korumilli Sravan Kumar

Institute of Cosmology and Gravitation, University of Portsmouth,  
Portsmouth PO1 3DE, UK

Dr. Joao Marto

Departamento de Física e Centro de Matemática e Aplicações,  
Universidade da Beira Interior, Rua Marquês D’Ávila e Bolama, 6201-  
001 Covilhã, Portugal

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### Deadline for manuscript submissions

closed (20 March 2025)



## Universe

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Editorial Office  
MDPI, Grosspeteranlage 5  
4052 Basel, Switzerland  
Tel: +41 61 683 77 34  
[universe@mdpi.com](mailto:universe@mdpi.com)

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## About the Journal

### Message from the Editor-in-Chief

The multidisciplinary journal *Universe* is aiming to follow and, hopefully, to lead to the largest extent as possible the ever-self renovating threads which weave mathematical theories with our understanding of the magnificent natural world. On behalf of all the distinguished members of the Advisory and Editorial Boards, I extend my welcome to this journal and look forward to hearing from the interested contributors and learning about their valuable research.

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### Editor-in-Chief

Prof. Dr. Lorenzo Iorio  
Ministero dell' Istruzione e del Merito, Viale Unità di Italia 68, 70125 Bari,  
Italy

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