

1.	Record Nr.	UNIORUON00382285
	Autore	Voltaire <1694-1778>
	Titolo	Le philosophe ignorant / Voltaire ; édition critique par Roland Mortier
	Pubbl/distr/stampa	Oxford, : Voltaire Foundation, 2000
	ISBN	978-07-294-0723-6
	Descrizione fisica	XXI, 60 p. ; 22 cm.
	Disciplina	194
	Lingua di pubblicazione	Francese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
2.	Record Nr.	UNINA9910903795603321
	Autore	Gerhardt Claus
	Titolo	The Quantization of Gravity // by Claus Gerhardt
	Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2024
	ISBN	9783031679223 3031679229
	Edizione	[2nd ed. 2024.]
	Descrizione fisica	1 online resource (269 pages)
	Collana	Fundamental Theories of Physics, , 2365-6425 ; ; 194
	Disciplina	530.1
	Soggetti	Gravitation Cosmology Mathematical physics Particles (Nuclear physics) Quantum field theory Classical and Quantum Gravity Mathematical Physics Elementary Particles, Quantum Field Theory
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia

## Nota di contenuto

The quantization of a globally hyperbolic spacetime -- Interaction of gravity with Yang-Mills and Higgs fields -- The quantum development of an asymptotically Euclidean Cauchy hypersurface -- The quantization of a Schwarzschild-AdS black hole -- The quantization of a Kerr-AdS black hole -- A partition function for quantized globally hyperbolic spacetimes with a negative cosmological constant -- Appendix.

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## Sommario/riassunto

A unified quantum theory incorporating the four fundamental forces of nature is one of the major open problems in physics. The Standard Model combines electro-magnetism, the strong force and the weak force, but ignores gravity. The quantization of gravity is therefore a necessary first step to achieve a unified quantum theory. In this monograph a canonical quantization of gravity has been achieved by quantizing a geometric evolution equation resulting in a hyperbolic equation in a fiber bundle, where the base space represents a Cauchy hypersurface of the quantized spacetime and the fibers the Riemannian metrics in the base space. The hyperbolic operator, a second order partial differential operator, acts both in the fibers as well as in the base space. In this second edition new results are presented which allow the solutions of the hyperbolic equation to be expressed as products of spatial and temporal eigenfunctions of self-adjoint operators. These eigenfunctions form complete bases in appropriate Hilbert spaces. The eigenfunctions depending on the fiber elements are a subset of the Fourier kernel of the symmetric space  $SL(n, \mathbb{R})/SO(n)$ , where  $n$  is the dimension of the base space; they represent the elementary gravitons corresponding to the degrees of freedom in choosing the entries of Riemannian metrics with determinants equal to one. These are all the degrees of freedom available because of the coordinate system invariance: For any smooth Riemannian metric there exists an atlas such that in each chart the determinant of the metric is equal to one. In the important case  $n=3$  the Standard Model could also be incorporated such that one can speak of a unified quantization of all four fundamental forces of nature.

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