

FLAG

Fields And Gravity

<i>Ugo</i> Moschella	PO (Insubria)	Fis02 FISICA TEORICA, MODELLI E METODI MAT.
<i>Sergio</i> Luigi Cacciatori	PA (Insubria)	Fis02 FISICA TEORICA, MODELLI E METODI MAT.
<i>Remo</i> Garattini	PA (Unibg)	Fis02 FISICA TEORICA, MODELLI E METODI MAT.
<i>Oliver</i> Piattella	RUTB (Insubria)	Fis02 FISICA TEORICA, MODELLI E METODI MAT.
<i>Anthony</i> Massidda	Dottorando	Intersection theory methods for Feynman integrals in QFT
<i>Federico</i> Scali	Dottorando	Quantum aspects of cosmology
<i>Matteo</i> Fontana	Dottorando	General relativistic models for the dynamics of galaxies
<i>Maria</i> Conti	Dottoranda	Asymptotic safety in Quantum Gravity
<i>Angelo</i> Da Silva Hartmann	Dottorando	Gravitational waves in different theories of gravity



**LAKE COMO SCHOOL
OF ADVANCED STUDIES**

**LAKE COMO SCHOOL
IN CONTEMPORARY
RELATIVITY
AND GRAVITATIONAL
PHYSICS,
XIV EDITION**

DE MULTIS SIDEREIS NUNCIIS Multi-messenger Astrophysics

**VILLA DEL GRUMELLO, COMO, ITALY
28 JUNE - 2 JULY
2021**

THE SCHOOL IS DIRECTED TO HIGH-LEVEL STUDENTS AND POSTGRADUATE RESEARCHERS, ASTRONOMY AND MATHEMATICS WHO ARE INTERESTED IN WIDENING THEIR KNOWLEDGE IN THE FIELDS OF PHYSICAL COSMOLOGY, RELATIVISTIC ASTROPHYSICS, QUANTUM GRAVITY, COSMOLOGICAL OBSERVATION AND THE MODERN QUANTUM THEORY OF GRAVITATION. LECTURERS WILL REPORT ON THEORETICAL, OBSERVATIONAL AND EXPERIMENTAL ASPECTS OF THE RESEARCH, REVIEWING LATEST ACHIEVEMENTS IN THE FIELD.

COURSES

ENRICO BARABESE, SISSA TRIESTE
Gravitational waves from compact objects
ANTONIO CAPONE, ROMA LA SAPIENZA
Astrophysical Neutrinos: sources and detectors
DM SALAFIA, INFN BRESCIA, MILANO
Multi-messenger Astrophysics:
multicolored light from LIGO-Virgo sources
GABRIELE GHOSELLINI, INFN BRESCIA, MILANO
Astrophysical processes in extreme gravity
ZOLTAN HAJMAN, COLUMBIA UNIVERSITY, NEW YORK
Multi-messenger Astrophysics at large
scales and the electromagnetic sky
ALBERTO PEREGO, UNIVERSITA DI TRENTO
Binary neutron star mergers as laboratories
for fundamental physics

SPECIALIZED LECTURES

LARISSA CARLOS DE OLIVEIRA SANTOS, YANKEE UNIVERSITY, YONGSUNG
Foreground removal in future CMB and 21 cm experiments
MARIAFELICIA DE LAURENTIS, UNIVERSITA DI NAPOLI
The black hole shadow of M87
ANTONIO MARCIANO, FUDAN UNIVERSITY, SHANGHAI
Gravitational footprints of massive neutrinos and leptons number breaking
DAVID RADICE, PENNSYLVANIA STATE UNIVERSITY
Numerical relativity simulations of merging neutron stars:
recent results and open problems
MISAO SAGAKI, KAVLI INSTITUTE, UNIVERSITY OF TOKYO
Primordial black holes from inflation and gravitational waves

SPONSORS



PROGRAM

In 2015 the birth of a new astronomy revealed to us a yet unknown Universe, where pairs of stellar black holes in collision create violent disturbances in the curvature of space-time that reach us as gravitational waves. The detection of the first gravitational wave signal from two colliding neutron stars followed by the emission of multi-colored light also heralded the era of Multi-Messenger Astrophysics. Multi-messenger studies aim to find the answer to some of the most important problems in high-energy astrophysics, fundamental physics and cosmology and to discover new phenomena by merging the information from the world's leading observatories sensitive to light, gravitational waves and neutrinos. The School intends to disseminate knowledge on these new themes, exploring how multi-messenger astrophysics informs us about the nature of the most extreme objects in the Universe and about the Universe itself.

Scientific and Organizing Committee: Ugo Moschella (Chair), Sergio Cacciatori, Monica Colpi, Massimo Dotti, Vittorio Gorini, Francesco Haardt, Aldo Treves

Registration forms are available on the web.
For information also contact directly the Organizing Secretariat at **Fondazione Alessandro Volta**, tel. +39 031 579011, fax +39 031 573395.
Further information about the School (course abstracts, schedule of lectures, etc.) is also available at the web page <https://lakecomoschool.org/INMAP>

**STUDIES IN HIGH ENERGY PHYSICS,
COSMOLOGY AND GRAVITATION**

Edited by
P. Fré, V. Gorini, G. Magli and U. Moschella

Classical and Quantum Black Holes

Astrophysics and Space Science Library 370

**Sabino Matarrese
Monica Colpi
Vittorio Gorini
Ugo Moschella Editors**

Dark Matter and Dark Energy

A Challenge for Modern Cosmology

**AS
SL**

HOEPLI.IT

Springer



**Tra Scienza
e Letteratura**

VILLA DEL GRUMELLO, COMO, ITALY
In memoria di Giulio Giorello
VISIONI DEL MONDO
25-29 OTTOBRE, 2021

Direzione:
Ugo Macchella (direttore)
Nuccio Ordine (coordinatore)
Gianmarco Gaspari
Nicola Sabadini

Per informazioni e iscrizioni:
Chiara Stellavelli
Fondazione Villa
chiara.stellavelli@fondazionevillagrumello.it
<https://vici2.lakecomomuseum.org/>

PROGRAMMA

Remi Brague (Université de Paris Panthéon-Sorbonne, Institut de France)
La sagesse du monde

Alain Connes (Collège de France, IHES)
Mathématiques, formes et inspiration artistique

Miguel Angel Granada (Università di Barcellona)
Copernico, Bruno, Kepler, Galilei: aspetti della rivoluzione cosmologica
e la "libertas philosophandi"

Nuccio Ordine (Università della Calabria)
L'utilità dell'inutile

Olivier Roy (Université de Paris Panthéon-Sorbonne)
De la chute de Constantinople à la technologie moderne

Lucio Russo (Università di Roma - Tor Vergata)
Archimede

**LAKE COMO SCHOOL
OF ADVANCED STUDIES**

DISAT





with the support of

DOMOSCH∞L

International Alpine School of Mathematics and Physics

JULY 17/21 2023 MELLERI ROEMER COLLEGE OF DOMODOSSOLA

EINSTEIN EQUATION in the DARK SIDE of the UNIVERSE

LECTURERS

Alice BOGNER
Pavel CRANE
Enrico BARRER
Stefano...

REGISTRATION

EARN FREE OF CHARGE

REGULAR FEE: € 220,00
due payment by June 30th

The participation fee covers the registration, the materials, the meals and the accommodation.

SHORT TALKS

Deadline July 30th 2023

A limited number of participants (up to 10) will be reserved to university PhD students and young researchers.

Title and a short abstract should be mailed to the Organizing Committee for approval by the SCIENTIFIC BOARD.

FELLOWSHIPS

The organization, thanks to FONDAZIONE CRT, has provided some grants consisting of FREE HOSPITALITY (B&B in shared room) for participants, on July 20/22.

A limited number of fellowships (up to a maximum of 20) will be assigned in priority order of request or indicated reasons.

The request of the grant must be made by participants and in the REGISTRATION FORM and SENT BY JUNE 30th.

TOPICS

LECTURERS

SUBSCRIBE

SCIENTIFIC BOARD:

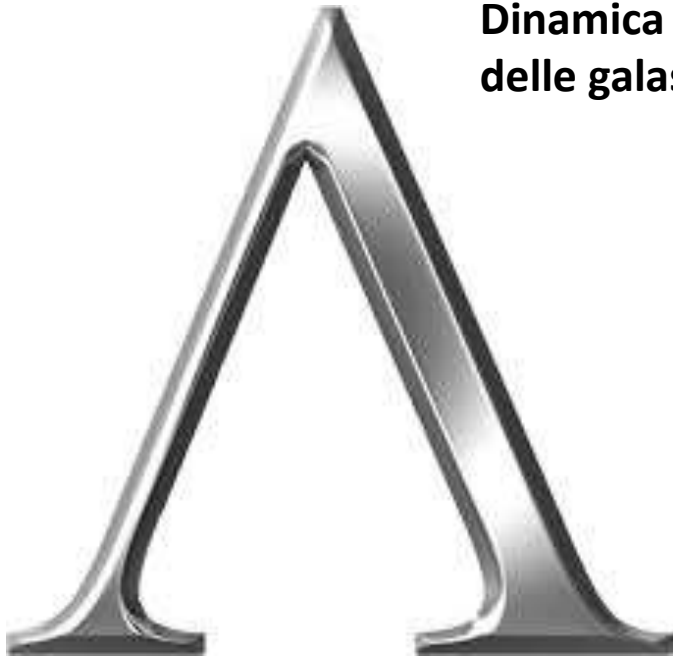
Chairman: ...

ORGANIZING BOARD: ...

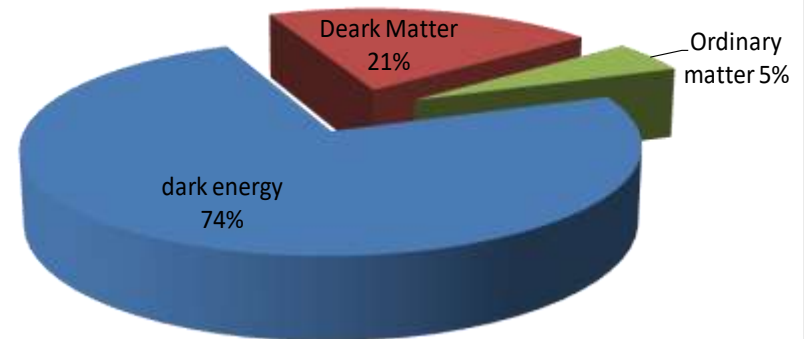
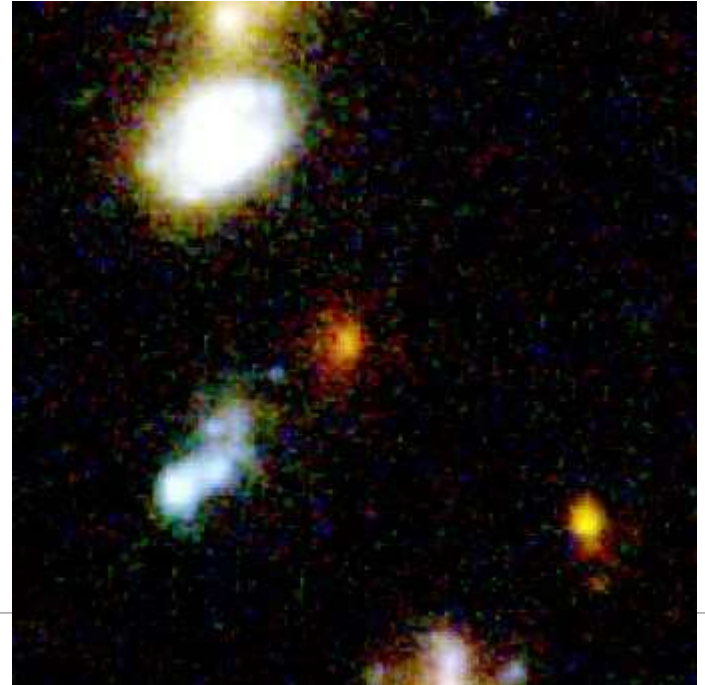
CONTACTS: ...

Ricerca scientifica: Fisica su spazi curvi

Cosmologia classica e quantistica

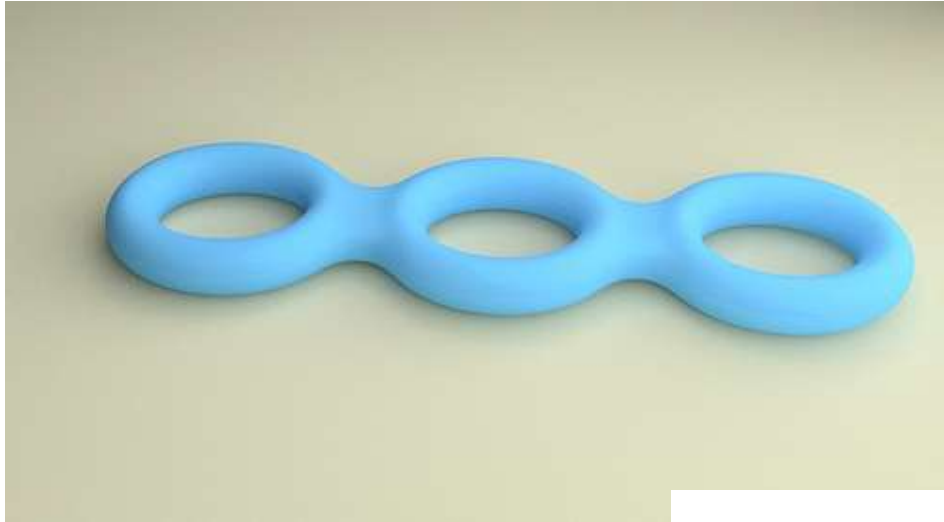


**Dinamica relativistica
delle galassie**



Teorie alternative alla GR

Calcolo delle ampiezze

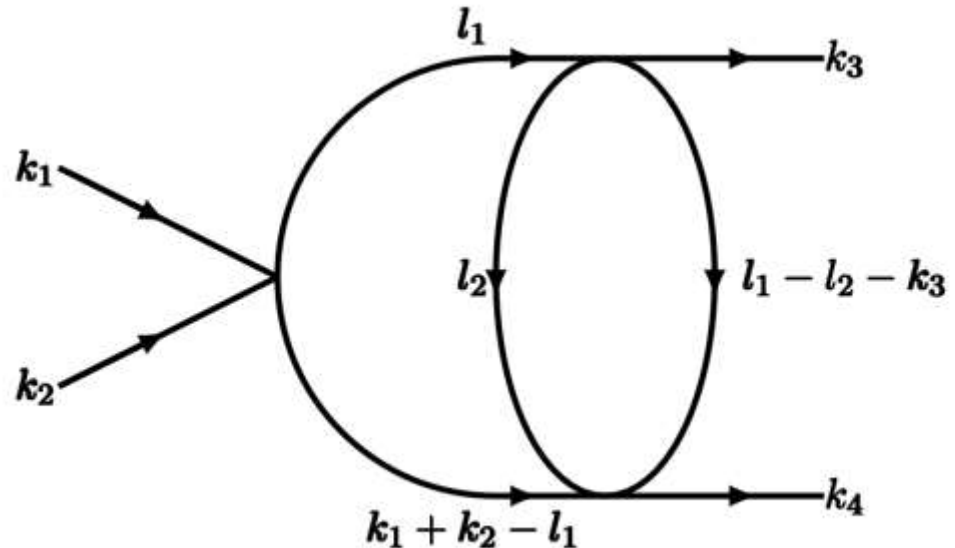


Ampiezze di super stringa

In collaborazione con:
SCGP, Stony Brook;
University of Minnesota

Ampiezze di Feynman

In collaborazione con:
IHES, Bures sur Yvettes;
Università di Padova



Soluzioni esatte Skyrmioniche

Collaborazione con CECS, Valdivia

$$S = \frac{1}{4} \int d^4x \sqrt{-g} \operatorname{tr} (R^\mu R_\mu + \frac{\lambda}{8} F_{\mu\nu} F^{\mu\nu})$$

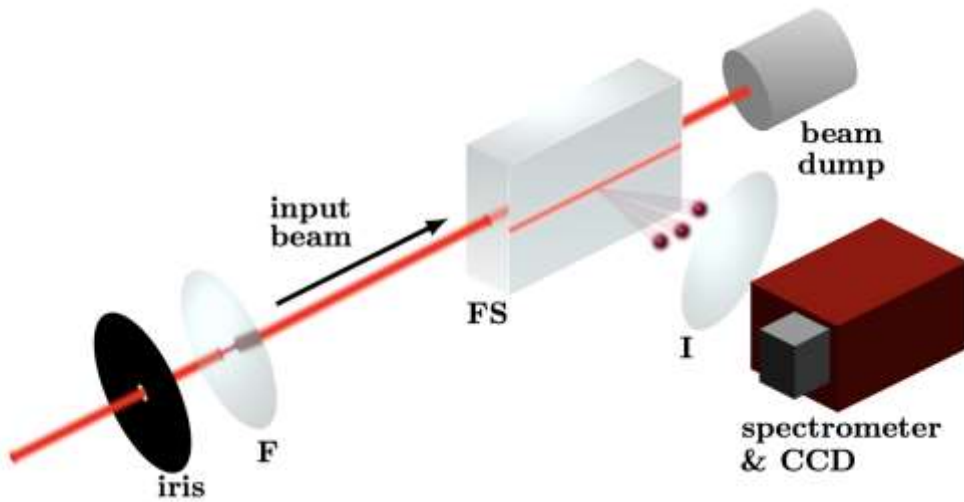
$$R_\mu = U^{-1} \partial_\mu U$$

$$U \in SU(N)$$

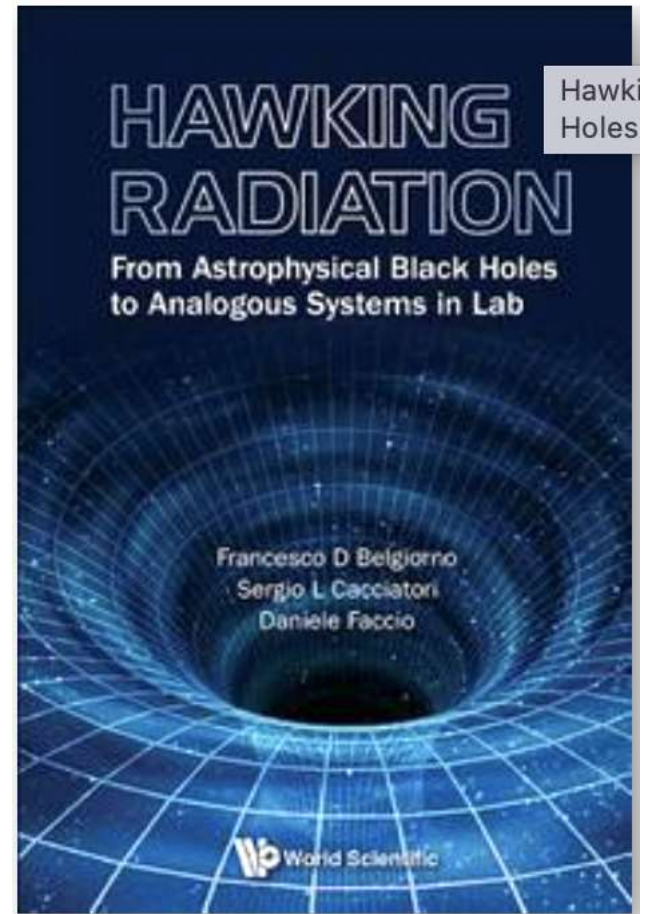
$$F_{\mu\nu} = [R_\mu, R_\nu]$$



Gravità analoga



**Riproduzione di effetti
quantistici su spazi curvi in
laboratorio. Effetto Hawking.**



Gravità quantistica

Collaborazione: Università di Catania; Specola Vaticana

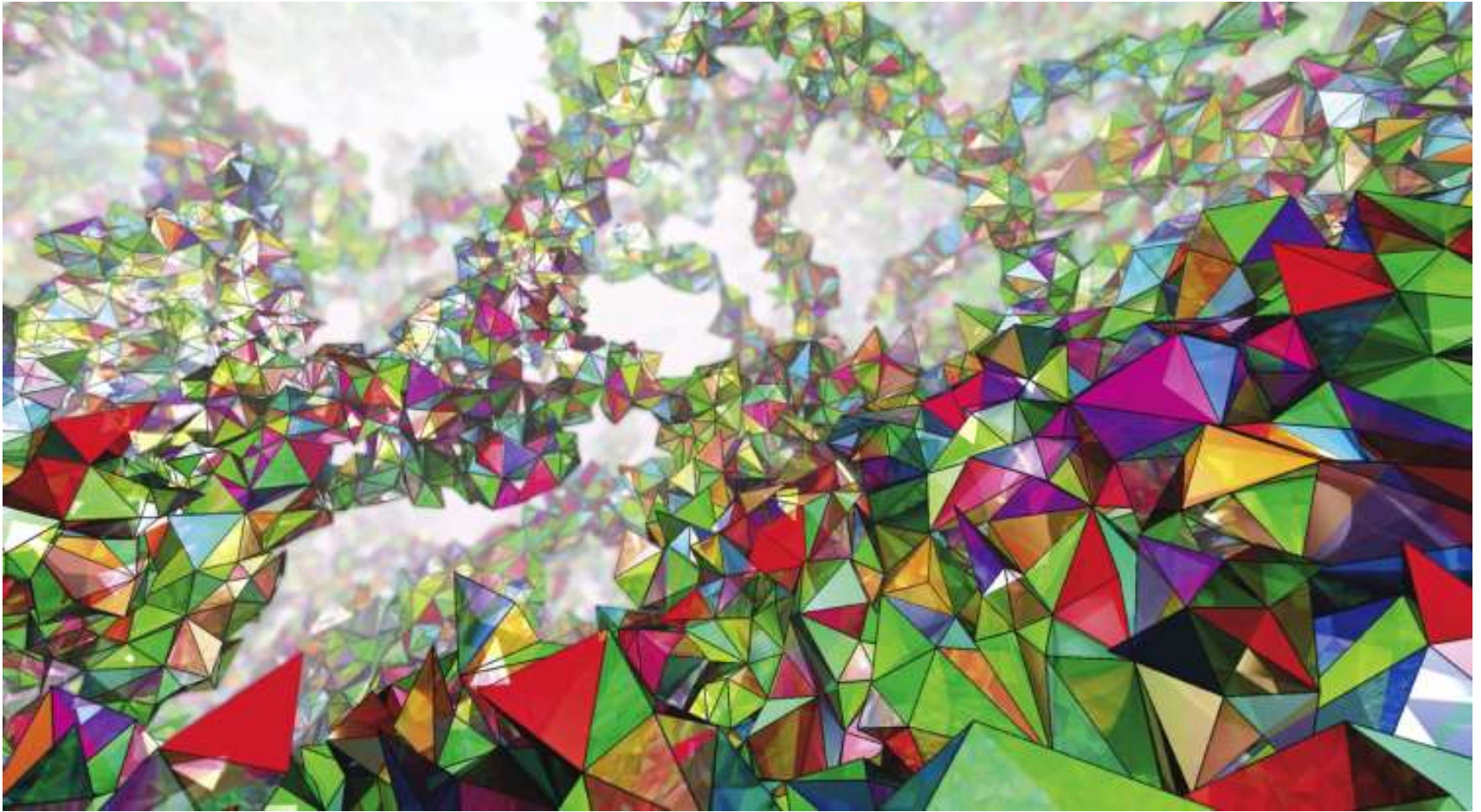
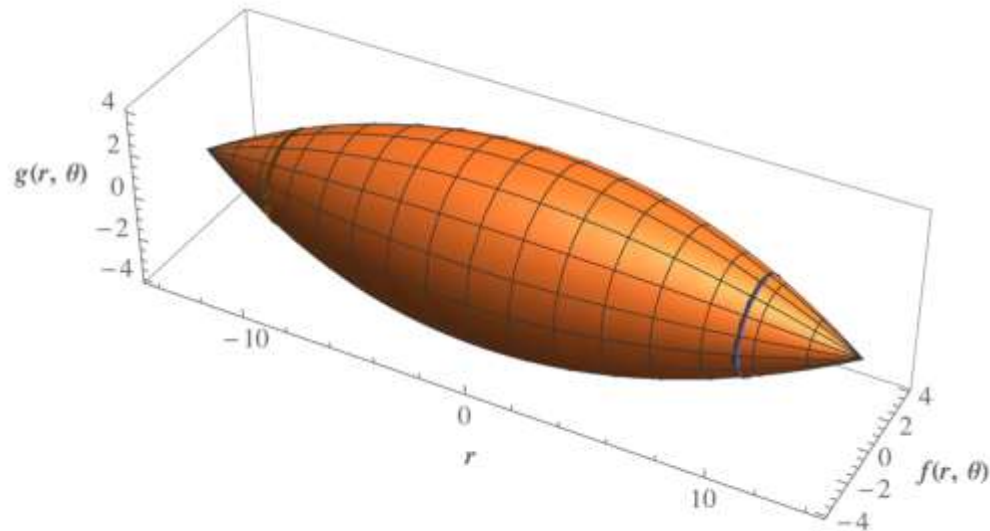
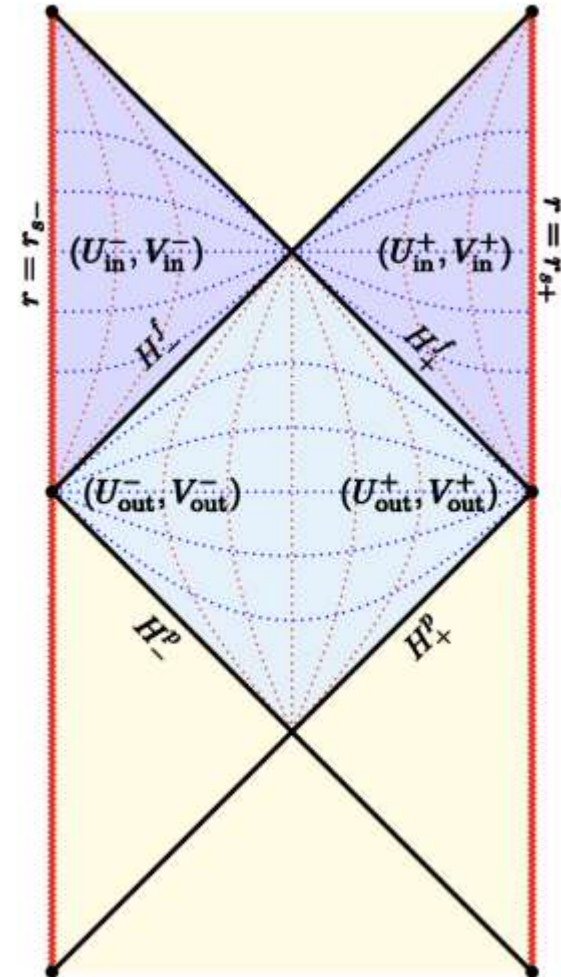


Immagine presa da:
<https://www.elisascience.org/>

Buchi neri supersimmetrici-AdS/CFT



Geometrie a più orizzonti



Principali collaborazioni

- Institute des Hautes Etudes Scientifiques, Bures sur Yvettes, France
- Simons Center of Geometry and Physics, Stony Brook, USA
- Università degli Studi di Padova, Padova, Italia
- University of Minnesota, Minneapolis, USA
- Centros de Estudios Científicos, Valdivia, Chile
- Università degli Studi di Milano Bicocca, Milano, Italia
- Technische Universität Chemnitz-Zwickau, Chemnitz, Germany
- Ruprecht-Karls-Universität Heidelberg, Heidelberg, Germany
- Centro Brasileiro de Pesquisas Físicas (CBPF) Rio de Janeiro, Brazil
- Fudan University (Fudan), Shanghai, China
- Universidade Federal do Espírito Santo (UFES), Vitória, Brazil