IGFAE Retreat

String Theory and related fields

Highlights from 2021

Members

Seniors:

Alfonso V. Ramallo
J. Luis Miramontes
José D. Edelstein
Javier Mas

Junior:

Riccardo Borsato

Postdocs:

Niall T. Macpherson
Sibylle Driezen

PhD students:

Ana Garbayo Peon ('22)

David Vázquez Rodríguez ('22)
Alberto Rivadulla Sánchez

David Travieso
Martí Berenguer Mimo
Juan Santos Suárez

<u>Updates regarding the group</u>

Alejandro Vilar López finished the PhD ==> postdoc at ULB/Solvay (Brussels)
Niall T. Macpherson joined in October 2021
Sibylle Driezen is finishing in January 2023 ==> postdoc at ETH Zurich
Anshuman Dey will join in Fall 2022 (from Hebrew U., Jerusalem)

Main research directions

Higher-curvature corrections to General Relativity

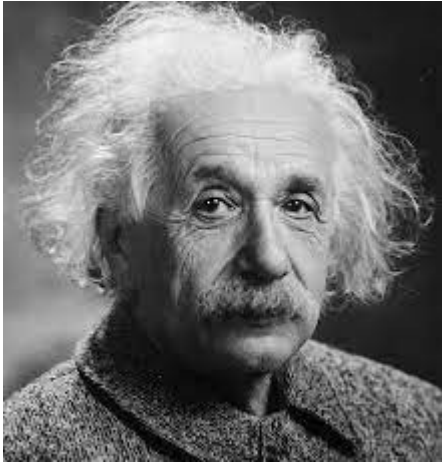Holographic duality and quantum systems at strong coupling

AdS/CFT correspondence: generalisations and exact methods

AdS/CFT and Quantum Computing

Higher-curvature corrections to General Relativity

$$L = R + \text{higher derivatives}$$

$$\sim \text{``} \alpha' R^2 + ... \text{''}$$

Small free field inflation in higher curvature gravity

José D. Edelstein *(Santiago de Compostela U., IGFAE)*, Robert B. Mann *(Waterloo U. and Perimeter Inst. Theor. Phys.)*, **David Vázquez Rodríguez** *(Santiago de Compostela U., IGFAE)*, **Alejandro Vilar López** *(Santiago de Compostela U., IGFAE)*

Universal renormalization procedure for higher curvature gravities in D ≤ 5

Ignacio J. Araya *(U. Arturo Prat, Iquique)*, **José D. Edelstein** *(Santiago de Compostela U., IGFAE)*, **Alberto Rivadulla Sanchez** *(Santiago de Compostela U., IGFAE)*, **David Vazquez Rodriguez** *(Santiago de Compostela U., IGFAE)*, **Alejandro Vilar López** *(Santiago de Compostela U., IGFAE)*

Causality constraints in Quadratic Gravity

José D. Edelstein *(Santiago de Compostela U., IGFAE)*, Rajes Ghosh *(Indian Inst. Tech., Gandhinagar)*, Alok Laddha *(Chennai Math. Inst.)*, Sudipta Sarkar *(Indian Inst. Tech., Gandhinagar)*

Building on:

Causality Constraints on Corrections to the Graviton Three-Point Coupling
Xian O. Camanho *(Potsdam, Max Planck Inst.)*, **José D. Edelstein** *(Santiago de Compostela U., IGFAE)*, Juan Maldacena *(Princeton, Inst. Advanced Study)*, Alexander Zhiboedov *(Princeton U.)*
e-Print: 1407.5597 [hep-th] Published in: JHEP 02 (2016), 020

Holographic superconductivity in Einsteinian Cubic Gravity

José D. Edelstein *(Santiago de Compostela U., IGFAE)*, Nicolás Grandi *(Buenos Aires, CONICET and La Plata U.)*, **Alberto Rivadulla Sánchez** *(Santiago de Compostela U., IGFAE)*
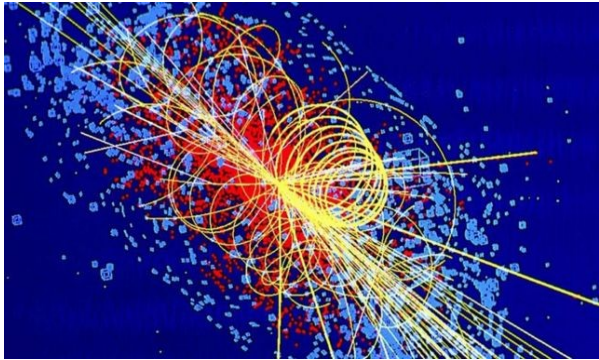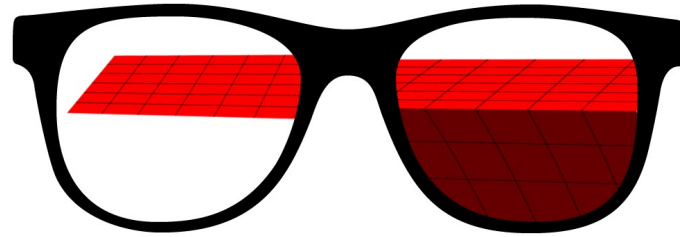
Are there Einsteinian gravities involving covariant derivatives of the Riemann tensor?

José D. Edelstein *(Santiago de Compostela U., IGFAE)*, **Alberto Sánchez Rivadulla** *(Santiago de Compostela U., IGFAE)*, **David Vázquez Rodríguez** *(Santiago de Compostela U., IGFAE)*

Holographic duality = AdS/CFT correspondence

Risking your NEC

Carlos Hoyos *(Brookhaven and ICTEA, Oviedo)*, Niko Jokela *(Helsinki U. and Helsinki Inst. of Phys.)*, José Manuel Penín *(Helsinki Inst. of Phys. and Helsinki U.)*, **Alfonso V. Ramallo** *(Santiago de Compostela U., IGFAE)*, Javier Tarrío *(Helsinki Inst. of Phys. and Helsinki U.)*

Periodic driving in Strongly Coupled Systems (Floquet Theory)

Past and ongoing work by **Javier Mas, Alfonso V. Ramallo, Ana Garbayo, David Travieso, Martí Berenguer**

N = (1, 1) supersymmetric AdS_3 in 10 dimensions

Niall T. Macpherson *(Oviedo U. and Santiago de Compostela U., IGFAE)*, Alessandro Tomasiello *(Milan Bicocca U. and INFN, Milan Bicocca)*

AdS_3 x S^2 in IIB with small N = (4, 0) supersymmetry

Niall T. Macpherson *(Santiago de Compostela U., IGFAE)*, Anayeli Ramirez *(Oviedo U. and Santa Barbara, KITP)*

On Type IIA AdS_3 solutions and massive GK geometries

Christopher Couzens *(Kyung Hee U., Suwon)*, **Niall T. Macpherson** *(Santiago de Compostela U., IGFAE)*, Achilleas Passias *(Athens Natl. Capodistrian U.)*
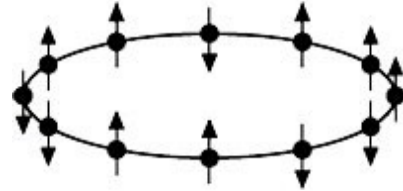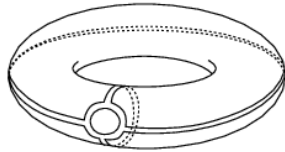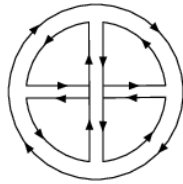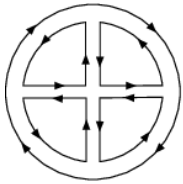
e-Print: 2203.09532 [hep-th]

New AdS_3/CFT_2 pairs in massive IIA with (0,4) and (4,4) supersymmetries

Yolanda Lozano *(Oviedo U.)*, **Niall T. Macpherson**, Nicolò Petri *(Ben-Gurion U.)*, Cristian Risco *(Oviedo U.)*

e-Print: 2206.13541 [hep-th]

Exact methods in AdS/CFT

Supergravity solution-generating techniques and canonical transformations of sigma-models from O(D,D)

Riccardo Borsato *(Santiago de Compostela U., IGFAE)*, **Sibylle Driezen** *(Santiago de Compostela U., IGFAE)*

An algebraic classification of solution generating techniques

Riccardo Borsato *(Santiago de Compostela U., IGFAE)*, **Sibylle Driezen** *(Santiago de Compostela U., IGFAE)*, Falk Hassler *(Santiago de Compostela U., IGFAE)*

Homogeneous Yang-Baxter deformations as undeformed yet twisted models

Riccardo Borsato *(Santiago de Compostela U., IGFAE)*, **Sibylle Driezen** *(Santiago de Compostela U., IGFAE)*, **J. Luis Miramontes** *(Santiago de Compostela U., IGFAE)*
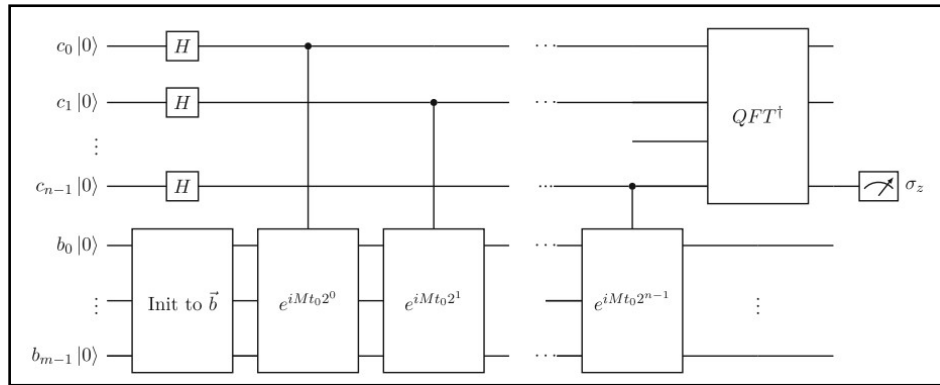
AdS/CFT and quantum computing

Hermitian Matrix Definiteness from Quantum Phase Estimation

Andrés Gómez *(CESGA, Santiago de Compostela)* and **Javier Mas** *(Santiago de Compostela., IGFAE)*

Work in progress (Floquet enhancement of Wormhole Inspired Teleportation) by **Javier Mas, Alfonso V. Ramallo, Juan Santos** in collaboration with David Herrera-Martí *(Grenoble U.)*

INTEGRABILITY DUALITIES AND DEFORMATIONS

SCHOOL

23 – 27 August 2021
Santiago de Compostela, Spain

Organizers

Riccardo Borsato (IGFAE/USC)
Saskia Demulder (Munich, Max Planck Inst.)
Sibylle Driezen (IGFAE/USC)
Fedor Levkovich-Maslyuk
(IPhT Saclay and IITP Moscow)
Emanuel Malek (Humboldt U. Berlin)

Speakers

Ana L. Retore (Trinity Coll., Dublin)
Gianluca Inverso (QMUL & INFN Padova)
Ben Hoare (Durham U.)
Sylvain Lacroix (Hamburg U.)
Eric Lescano (Buenos Aires U.)

Lectures

Introduction to classical and quantum integrability
Double and Exceptional Field Theory
Integrable deformations of sigma models
4-dimensional Chern-Simons theory & integrable field theories
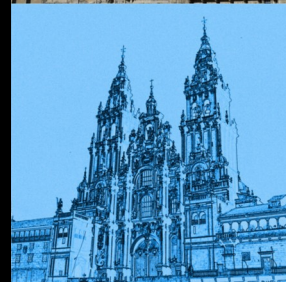**alpha'-corrections and their double formulation**

🐦 **igfae_hep**
🌐 **igfae.usc.es**

indico.cern.ch/e/IDD2021
intdualdef@gmail.com

Organized by:
EXCELENCIA MARÍA DE MAEZTU   IGFAE   USC   XUNTA DE GALICIA

Supported by:
galicia   Xacobeo 2021   UNIÓN EUROPEA   XUNTA DE GALICIA   "la Caixa" Foundation

Fondo Europeo de Desenvolvemento Rexional *"Unha maneira de facer Europa"*

INTEGRABILITY DUALITIES AND DEFORMATIONS

CONFERENCE

30 August– 3 September 2021
Santiago de Compostela, Spain

Speakers

Gleb Arutyunov (Hamburg U. and DESY)
Benjamin Basso (LPENS, Paris)
Olaf Hohm (Humboldt U. Berlin)
Gleb Kotousov (DESY)
Alexey Litvinov (Landau Inst. and Skoltech)
David Osten (ITMP, Moscow)
Ana L. Retore (Trinity Coll., Dublin)
Hubert Saleur (IPhT Saclay and Southern California U.)
Alessandro Sfondrini (Padova U.)
Konstantinos Siampos (Athens U.)
Jia Tian (Peking U.)
Benoit Vicedo (York U.)
Patrizia Vitale (INFN Naples)
Daniel Waldram (Imperial College London)
Linus Wulff (Masaryk U. Brno)
Leander Wyss (Surrey U.)
Konstantin Zarembo (NORDITA)
Yannik Zimmermann (Humboldt U. Berlin)

Scientific Advisory Board

Gleb Arutyunov (Hamburg U. and DESY)
Timothy J. Hollowood (Swansea U.)
Ctirad Klimčík (Marseille, Inst. Math.)
Yolanda Lozano (Oviedo U.)
Henning Samtleben (ENS Lyon)
Konstantinos Sfetsos (Athens U.)
Arkady Tseytlin (Imperial College London)

Organizers

Riccardo Borsato (IGFAE/USC)
Ben Hoare (Durham U.)
J. Luis Miramontes (IGFAE/USC)
Stijn J. van Tongeren (Humboldt U. Berlin)
Sibylle Driezen (local organiser – IGFAE/USC)

🐦 **igfae_hep**
🌐 **igfae.usc.es**

indico.cern.ch/e/IDD2021
intdualdef@gmail.com

Organized by:
EXCELENCIA MARÍA DE MAEZTU   IGFAE   USC   XUNTA DE GALICIA

Supported by:
galicia   Xacobeo 2021   UNIÓN EUROPEA   XUNTA DE GALICIA   "la Caixa" Foundation

Fondo Europeo de Desenvolvemento Rexional *"Unha maneira de facer Europa"*

Thank you!