Actividades IFIC-TEO 2010 (Universitat de València - CSIC)

J W F Valle 22 Dic 2010

Promociones **CU/UV**: Bordes, Botella, Sanchis, Pérez, González & Vidal
Promocion **IC/CSIC** Hirsch
Oposicion **CT/CSIC**: Olga Mena
Recepcion del premio de la **RSEF** Mariam Tortola
LHCPhenoNet Initial Training Network **EU** Germán Rodrigo

En colaboración con el IFIC-EXP, hemos organizado el 16th International Symposium on Particles, Strings and Cosmology, celebrado en Valencia (Spain), July 19 - 23

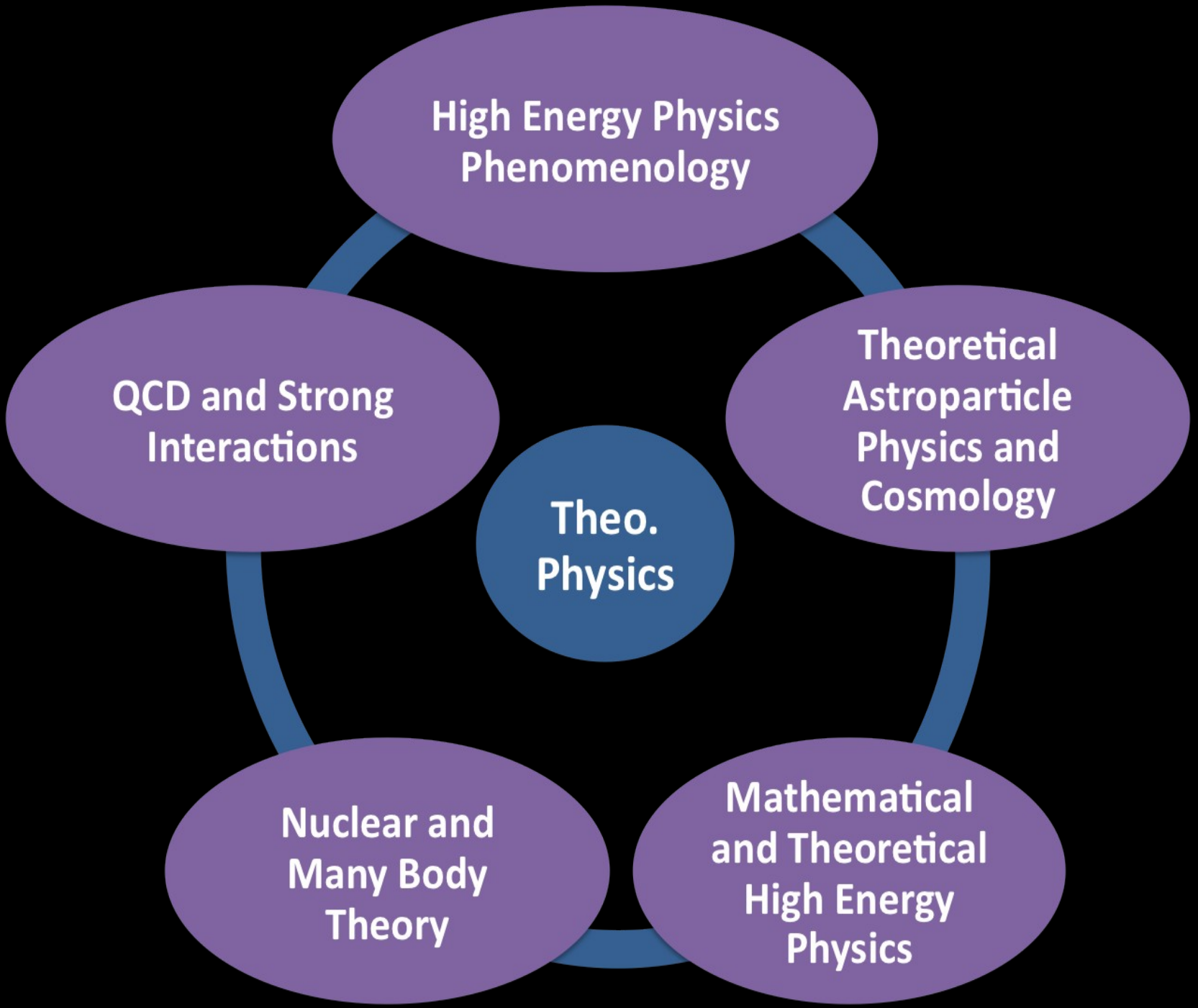
CERN Courier

CERN COURIER

Oct 26, 2010

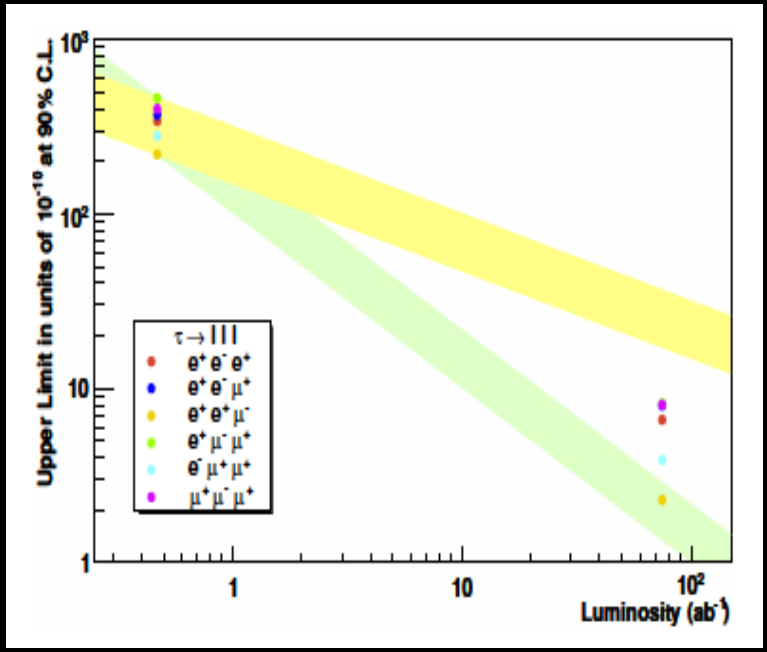
Microcosm meets macrocosm in Valencia

Experts in particle physics, string theory and cosmology gathered in Spain to exchange ideas at the latest meeting in the PASCOS series.


High Energy Physics Phenomenology
Theoretical Astroparticle Physics and Cosmology
Mathematical and Theoretical High Energy Physics
Nuclear and Many Body Theory
QCD and Strong Interactions
Theo. Physics

Interacciones fundamentales y sus implicaciones experimentales

G. Barenboim, J. Bernabeu, J. Bordes, F.J. Botella, M. Nebot, J. Papavassiliou, J. Peñarocha, M.A. Sanchís, J. Vidal, O. Vives, L. Boubekeur, R. Hodgkinson, G. Panotopoulos, R. Perez-Ramos, J.J. Fernandez, D. Ibañez, J. Jones-Perez, J. Rasero



Super$B$
Progress Reports
Physics

J. Bernabéu, F. Botella, M. Jung, N. Lopez March, F. Martinez Vidal, A. Oyanguren, A. Pich, M. A. Sanchis Lozano, J. Vidal, and O. Vives
IFIC, Universitat de Valencia-CSIC, E-46071 Valencia, Spain

ref. FPA2008-00319

Lisbon, Naples, Torino, Würzburg ..

AHEP Astroparticle and High Energy Physics Group

JWF Valle, M Hirsch, S Pastor, M Malinsky, SP Das, E Peinado,
MA Tórtola, R Lineros, S Morisi, M Taoso, U França,
A Vicente, L Reichert, C Arbelaez, S Boucenna, L Dorame, D Vanegas, V deRomeri

External: Romão, Kovalenko, Porod, Tomàs, Miele, Magro, Semikoz, Éboli, Raffelt, Pisanti, Nunokawa, de Campos, Miranda, Lesgourgues, Villanova, Fornengo, Bartl

MULTIDARK CSD2009-00064

Prometeo/2009/091TEO/2009/091

EU network **UNILHC PITN-GA-2009-237920**

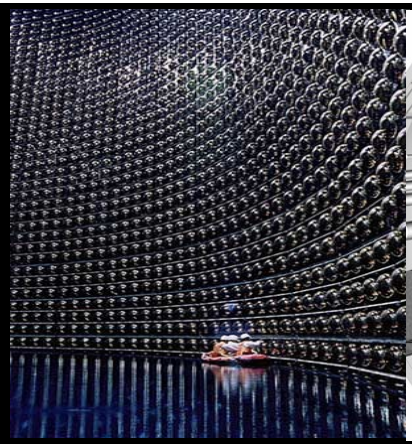
UNILHC 2009-13

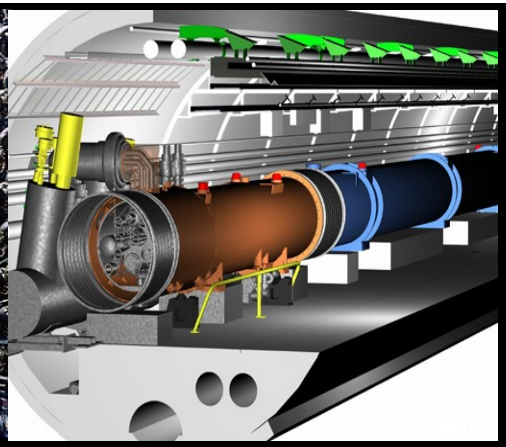
GENERALITAT VALENCIANA

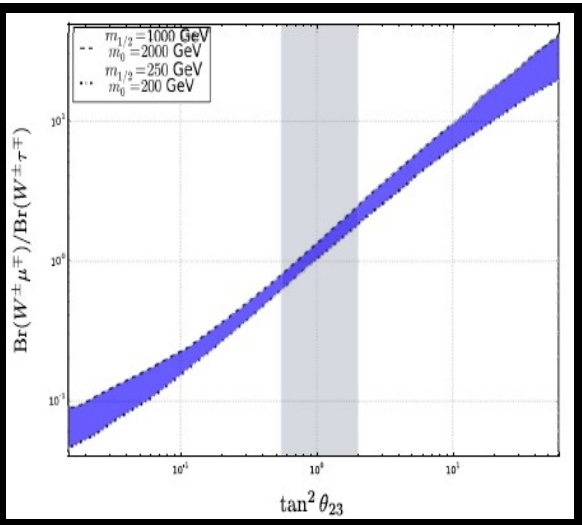
PHYSICAL REVIEW D **82,** 075002 (2010)

Probing neutrino oscillations in supersymmetric models at the Large Hadron Collider

F. de Campos,[1,*] O. J. P. Éboli,[2,†] M. Hirsch,[3,‡] M. B. Magro,[2,4,§] W. Porod,[5,3,‖] D. Restrepo,[6,¶] and J. W. F. Valle[3,**]





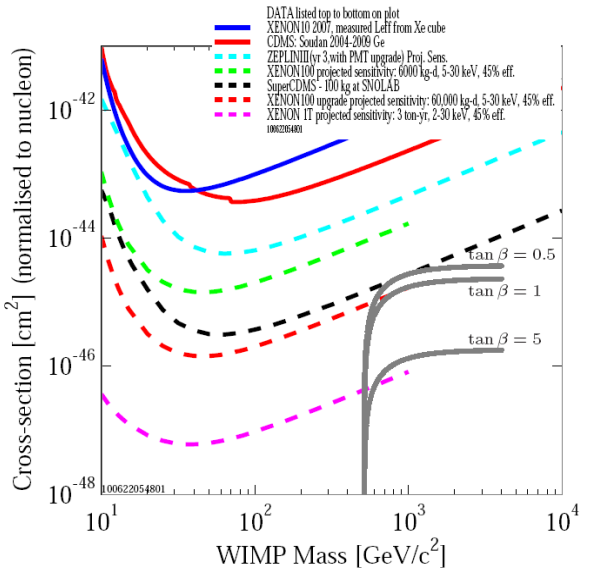


PHYSICAL REVIEW D **82,** 116003 (2010)

Discrete dark matter

M. Hirsch,* S. Morisi,† E. Peinado,‡ and J. W. F. Valle§

MULTIDARK Consolider



PRL **104,** 091101 (2010) PHYSICAL REVIEW LETTERS week ending 5 MARCH 2010

Measurement of the Depth of Maximum of Extensive Air Showers above 10^{18} eV

GEOMETRIA, GRUPOS,. TEORIAS DE CAMPOS Y SUPERSIMETRIA (titulo histórico desde 1977)
FIS- 2008-1980 (de cuatro años) IP: J.A. de Azcárraga

Trabajos (en negrita los miembros del proyecto)

° **J.A. de Azcárraga and J.M. Izquierdo**, Cohomology of Filippov algebras and an analogue of Whitehead's lemma J. Phys. Conf. Ser. 175, 012001-1-24 (2009) [arXiv:0905.3083[math-ph]]

* **J.A. de Azcárraga and J.M. Izquierdo**, An introduction to n-ary algebras and its physical applications, invited topical review, J. Phys. A (Math and Gen.), J.Phys.A43, 293001-1-117 (2010). [arXiv:1005.1028 [math-ph]]

° **José A. de Azcárraga, José M. Izquierdo**, On a class of n-Leibniz deformations of the simple Filippov algebras, J. Math. Phys.XXX [arXiv:1009.2709]

* **J.A. de Azcárraga, J. M. Izquierdo and M. Picón**, Contractions of Filippov algebras, arXiv:1009.0372 [math-ph]

° **A. Bandos** and C. Meliveo, Superfield equations for the interacting system of D=4 N=1 supermembrane and scalar multiplet, arXiv:1011.1818 [hep-th].

* **I. A. Bandos**, M(atrix) model interaction with 11D supergravity, arXiv:1010.1125 [hep-th].

* **I. A. Bandos**, Multiple M0-brane system in an arbitrary eleven dimensional supergravity background, Phys. Rev. D82, 105030 (2010) [arXiv:1009.3459]

* **I. A. Bandos**, Multiple M-wave interaction with fluxes, Phys. Rev. Lett. 105, 071602[1-4] (2010) [arXiv:1003.0399 [hep-th]].

°**I. .A. Bandos**, Spacetime Brout-Englert-Higgs effect in General Relativity interacting with p-brane matter, J.Phys.Conf.Ser. 229: 012017 (2010)

* **I. A. Bandos**, Superembedding approach to M0-brane and multiple M0-brane system, Phys. Lett. B687, 258?263 (2010) [arXiv:0912.5125 [hep-th]].

° **E. Borja**, J. Diaz-Polo, I. Garay and E. Livine, Dynamics for a 2-vertex Quantum Gravity Model, Class. Quantum Grav. 27, 235010-1-34 (2010) 1006.2451

* . I. Agullo, J. F. Barbero, **E. F. Borja**, J. Diaz-Polo, E. J. S. Villasenor ,Detailed black hole state counting in LQG, Phys. Rev. D82 084029 (2010)

° **E.F. Borja**, L.Freidel, I. Garay, and E. R. Livine, U(N) tools for Loop Quantum Gravity: The Return of the Spinor, [arXiv: 1010.5451[gr-qc]]

* A. Donos, J.P. Gauntlett, N. Kim and **O. Varela**,, Wrapped branes, consistent truncations and AdS/CMT_to appear in JHEP [arXiv:1009.3805 [hep-th]]

*J.P. Gauntlett and **O. Varela**, Universal K-K Ireductions of type IIB to N=4 supergravity in five dimensions, JHEP 1006, 081 (2010) [arXiv:1005.5642].

Seminarios y conferencias: demasiados para enumerar aqui

Divulgación científica:
J.A. de Azcárraga ha impartido una docena de conferencias de divulgación, con artículos recogidos en la web: http://www.uv.es/~azcarrag/ incluyendo el discurso de entrada en la Real Acad. de Ciencias de Zaragoza.

MEMORIA (2010) DEL PROYECTO:
"AGUJEROS NEGROS CUANTICOS Y SUPERGRAVEDAD", IP: Alessandro Fabbri

MIEMBROS: A. Fabbri (RyC), M.A. Lledó (IU), J. Navarro-Salas, (TU), G. Olmo (Postdoc CPAN), I. Agulló (Postdoc Penn State, USA), C. Mayoral (FPU), F. Nadal (JAE), P. Galli (FPI)

- Hawking radiation in acoustic black holes and white holes:

- I. Carusotto, R. Balbinot, A. Fabbri, and A. Recati, Density correlations and dynamical Casimir emission of Bogoliubov phonons in modulated atomic Bose-Einstein condensates, Eur. Phys. J. D56 (2010), 391
- A. Fabbri and C. Mayoral, Step-like discontinuities in Bose-Einstein condensates and Hawking radiation: the hydrodynamic limit, arXiv:1004.4876 [gr-qc], Phys. Rev. D
- R. Balbinot, I. Carusotto, A. Fabbri and A. Recati, Testing Hawking particle creation by black holes through correlation measurements (Honorable Mention in the GRF Essay Competition 2010), arXiv:1005.4000 [gr-qc], Int. J. Mod. Phys. D (2010), in press
- C. Mayoral, A. Fabbri and M. Rinaldi, Step-like discontinuities in Bose-Einstein condensates and Hawking radiation: dispersion effects, arXiv:1008.2125 [gr-qc], Phys. Rev. D
- C. Mayoral, A. Recati, A. Fabbri, R. Parentani, R. Balbinot, I. Carusotto, Acoustic white holes in flowing atomic Bose-Einstein condensats, arXiv:1009.6196 [gr-qc], New J. Phys.

-Semiclassical effects in gravity

- E. Carlson, P. Anderson, A. Fabbri, S. Fagnocchi, W. Hirsch, S. Klyap, Semiclassical gravity in the far field limit of stars, black holes and wormholes, arXiv:1008.1433 [gr-qc], Phys. Rev. D

-Hawking radiation and CFT

- I. Agullo, J. Navarro-Salas, G.J. Olmo and L. Parker, Hawking radiation by Kerr black holes and conformal symmetry, Phys. Rev. Lett. **105** (2010) 211305

-Hawking radiation and the Planck scale

- I. Agullo, J. Navarro-Salas, G.J. Olmo and L. Parker, Acceleration radiation, transition probabilities, and trans-Planckian physics, New J. Phys. 12: 095017 (2010)
- I. Agullo, J. Navarro-Salas, G.J. Olmo and L. Parker, Reply to 'Comment on 'Insensitivity of Hawking radiation to an invariant Planck-scale cutoff''. Phys. Rev. D81:108502, (2010).

-Inflationary cosmology

- I. Agulló, J. Navarro-Salas, G.J. Olmo and L. Parker, Revising the observable consequences of slow-roll inflation, Phys. Rev. D81:043514, (2010)
- I. Agulló, J. Navarro-Salas, G. J. Olmo and L. Parker, Inflation, Renormalization, and CMB Anisotropies, J. Phys. Conf. Ser. **229** (2010) 012058
- I.Agullo and L.Parker, Non-gaussianities and the Stimulated creation of quanta in the inflationary universe, arXiv:1010.5766 [astro-ph.CO]

-Supergravity

- M. A. Lledó y L Sommovigo "Torsion formulation of gravity." Class.Quant.Grav.27:065014,(2010).
- D. Cervantes, R. Fioresi, M. A. Lledó. "The quantum chiral Minkowski and conformal superspaces". e-Print: arXiv:1007.4469 [math.QA]

-Black hole entropy and quantum gravity

- I. Agulló, J. Fernando Barbero, E.F. Borja, J.Diaz-Polo and E.J.S. Villasenor, Detailed black hole state counting in loop quantum gravity, Phys. Rev. D **82** (2010) 084029.

-Modified gravity

- G. J. Olmo, Nonsingular Universes a la Palatini, Conf. Proc. ERE2010, Granada (Spain),6-10 Sept. 2010.
- G. J. Olmo and H. Sanchis-Alepuz, Hamiltonian Formulation of Palatini $f(R)$ theories a la Brans-Dicke, submitted Dec. 2010.

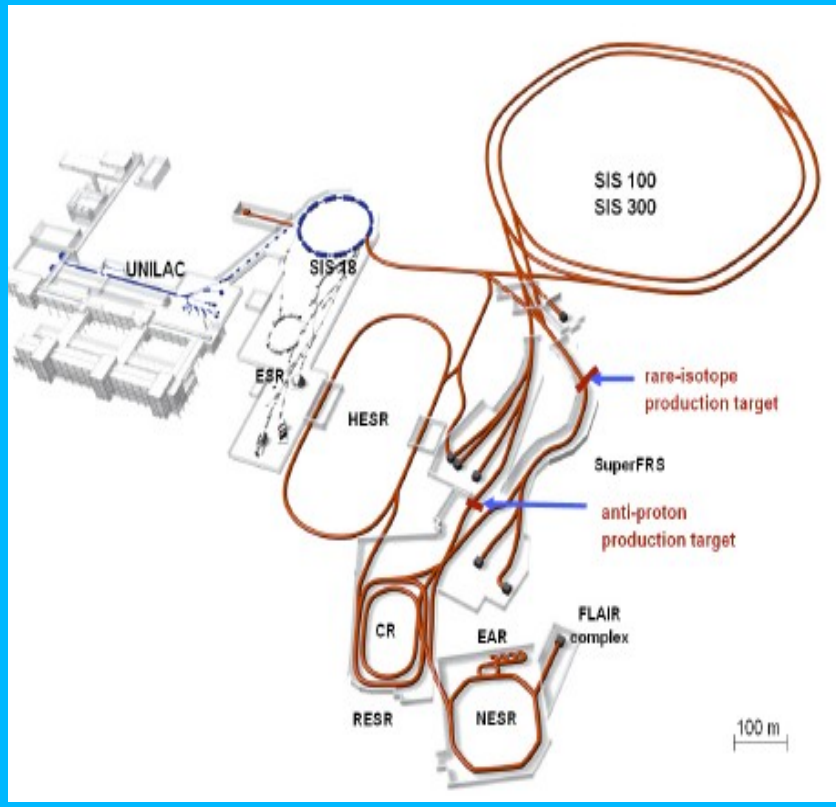
GRAVITY, BLACK HOLES, AND SUPERSYMMETRY
IP: A. Fabbri

- C. Barragan and G. J. Olmo, Isotropic and Anisotropic Bouncing Cosmologies in Palatini Gravity, Phys. Rev. D **82** (2010) 084015.
- G. J. Olmo, New Phenomenology for Palatini f(R) Theories: Non-singular Universes, AIP Conf. Proc. **1241** (2010) 1100.
- G. J. Olmo, H. Sanchis-Alepuz and S. Tripathi, Enriched Phenomenology in Extended Palatini Theories, arXiv:1002.3920 [gr-qc].
- C. Barragan, G. J. Olmo and H. Sanchis-Alepuz, Avoiding the Big Bang Singularity with Palatini f(R) Theories, arXiv:1002.3919 [gr-qc].

GRUPO FISICA NUCLEAR TEORICA

E. Oset, M.J. Vicente-Vacas, L. Alvarez-Ruso, J. Nieves, Raquel Peralta, Ignacio Ruiz, Javier Garzón, Jorge Martín-Camalich, Ju-Jun Xie, Manuel Pavón-Valderrama, Junko Yamagata-Sekihara, Bao Xi-Sun, Melahat Bayar.

- ✓ **Estructura e interacción entre hadrones en el espacio libre**
  - Teorías efectivas: simetría quiral, simetria de quarks pesados, límite de número de colores muy alto
  - Unitariedad y generación dinámica de resonancias
- ✓ **Modificación de las propiedades de hadrones en el seno de un medio nuclear**
  - Extrañeza y encanto en un medio denso
  - Respuestas nucleares a pruebas electrodébiles



Físca Hadrónica: Grupo de Modelos Quark

Miembros (Proyecto FPA2007-65748-C02-01

Funcionarios: P. González, S. Noguera, V. Vento

Contratados: J. Vijande (Ayudante Doc), V. Mathieu (Postdoc), A. Martí (Predoc)

Líneas de Investigación

Espectroscopía hadrónica. Multiquarks. Glueballs.
Lagrangianos quirales no locales.
Dispersión profundamente inelástica (GPD, TDA).
Materia hadrónica a alta densidad y temperatura.

Colaboraciones

U. Salamanca, U. Perugia, U. La Plata, Tandar, Dubna, U. Mons, U. Seoul, U. Chungnam.

Semileptonic decays of the Bc meson

C. Albertus, N. Carrasco, V. Giménez, J. Nieves and D. Palao

The study of the double heavy Bc meson is of great interest because it is the lowest bound state of two heavy quarks with open flavour. Large samples of Bc mesons, discovered at Tevatron by CDF in 1998 (RUN-II), are expected to be seen at **LHCB** (10^{10} events/year).

We are studying the semileptonic decays of the Bc meson using numerical simulations in which the c-quark is treated as a dynamical quark and the b-quark as a static HQET fermion. We are interested in the decays:

Bc --> $D^{(*)}$
Bc --> c c bar
Bc --> $Bd,s^{(*)}$

Particles and Interactions : Flavour and Colour Dynamics

FPA2007-60323 (Consolider C)

Parsifal

http://ific.uv.es/quiral

Investigadores del Grupo
Antonio Pich Zardoya
Pilar Hernández Gamazo
Isabella Bierenbaum
Oscar Catá
Petros Draggiotis
Francisco V. Flores Báez
Martin Jung
Xin-Qiang Li
Emilie Passemar
Carlos Peña Garay
Jorge Portolés Ibañez
Nuria Rius Dionís
Germán V. Rodrigo García
Ignasi Rosell Escribà
Roberto Ruiz de Austri
Olga Shekhovtsova

Doctorandos
Fabio Bernardoni **PhD**
Paola Ferrario **PhD**
Martín González Alonso **PhD**
Pablo Roig Garcés **PhD**
Sebastian Buchta
Alejandro Celis
Ling-Yun Dai
Alberto Filipuzzi
Zahara Gironés
Manuel Peña Jiménez
Paula Tuzón Marco
Francisco A. Villaescusa

Colaboradores externos
Vicenzo Cirigliano
Sacha Davidson
Pedro D. Ruiz Femenía

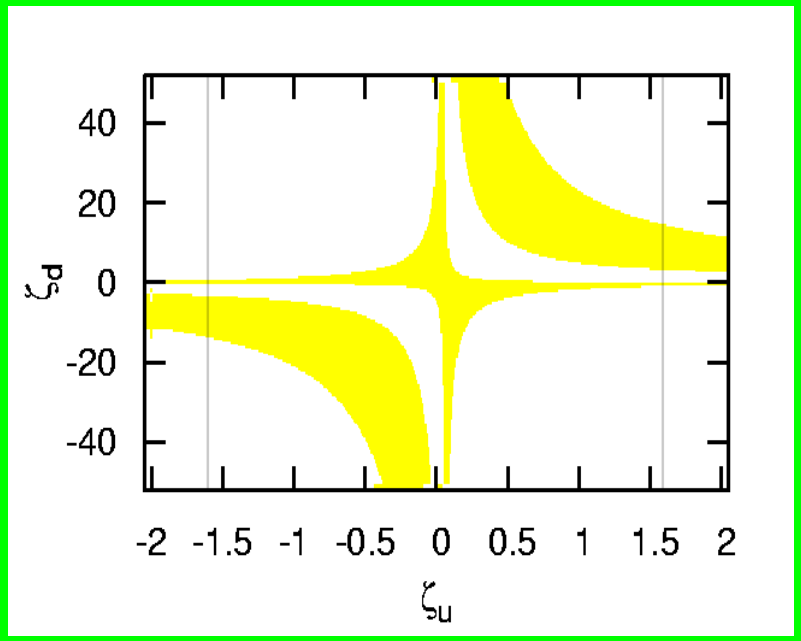
Redes Europeas
FLAVIAnet (coordinador)
LHCPhenoNet (coordinador)
EUROnu (nodo)

Coordinación del **CPAN:**
Centro Nacional
de Física de Partículas,
Astropartículas y Nuclear

PROMETEO/2008/069: Física del Large Hadron Collider: búsqueda de nuevas interacciones en la frontera de altas energías
PROMETEO/2009: SOM

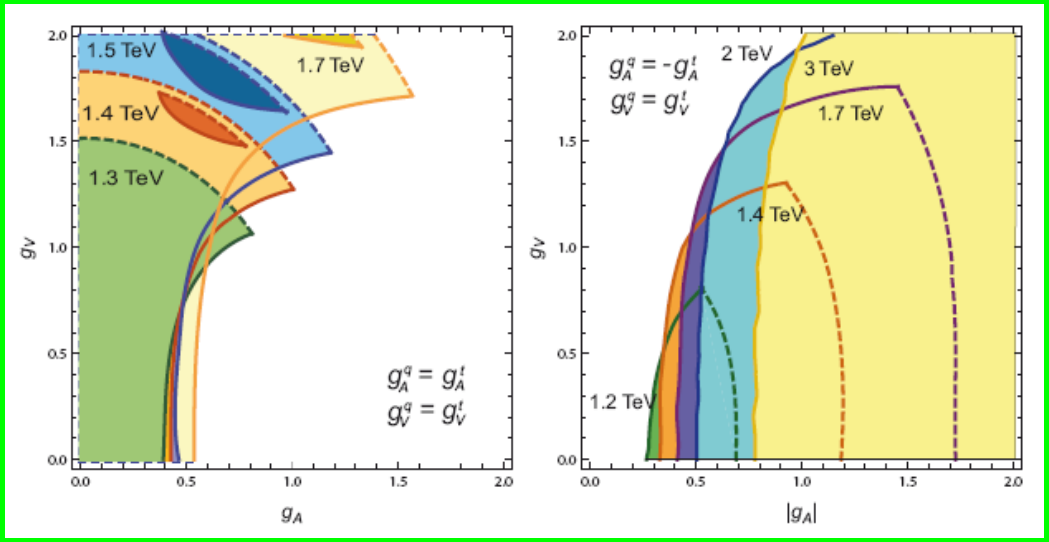
- Phenomenology of Quantum Field Theories : Effective Field Theories, Lattice, perturbative QCD
- Phenomenology of Electroweak Processes
- Neutrino and Astroparticle Physics

Higgs and top quark physics



Phenomenology of the Aligned two-Higgs-doublet model
M. Jung, A. Pich, P. Tuzón
Charged Higgs: JHEP 1011 (2010) 003
B decays arXiv:1011.5154 [hep-ph]

General 2HDM without tree-level FCNCs, but with new sources of CP violation. Many phenomenological implications



QCD prediction for the charge asymmetry [Kühn, Rodrigo]

$$A^{p\bar{p}} = \frac{N_t(y \geq 0) - N_{\bar{t}}(y \geq 0)}{N_t(y \geq 0) + N_{\bar{t}}(y \geq 0)} = 0.051(6)$$

Versus experimental measurements at **Tevatron**
(1.7 σ - 2 σ discrepancy)

P. Ferrario and G. Rodrigo,
Charge asymmetry: a theory appraisal, N Cim. C33 (2010) 04
Heavy colored resonances in top-antitop + jet at the LHC, JHEP 1002 (2010) 051

PROJECTE FPA2008-03373

Estudios perturbativos y no perturbativos del modelo estándar y sus extensione

- Vicent Giménez Gómez (Investigador principal)
- Arcadi Santamaría Luna
- Armando Pérez Cañellas
- Jorge Vidal Perona
- David Palao (FPI i POSTDOC ROMA2)
- Alberto Aparici (FPU)
- Nuria Carrasco (JAE-PREDOC)
- Margarida Hinarejos (Contracte laboral Prometeo)

ValènciaPLQ
Particles, Lattices and Qbits

PROMETEO 2009-128

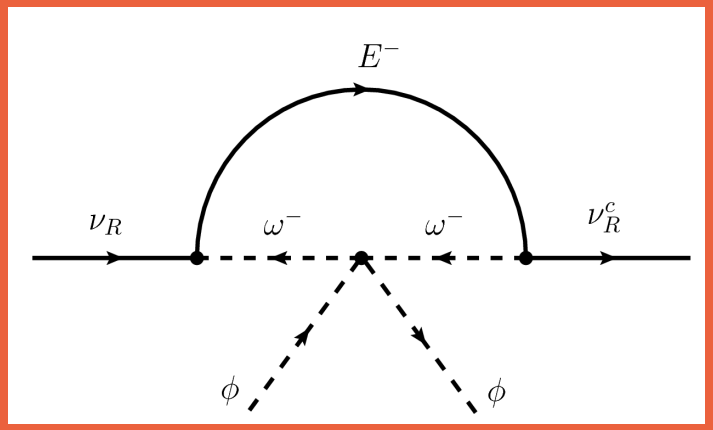
European Twisted Mass Collaboration

Lattice QCD with twisted mass fermions

The European Twisted Mass Collaboration (**ETMC**) is a big international Collaboration on large scale dynamical Lattice QCD numerical simulations with twisted fermions which has access to supercomputers like MareNostrum, Tirant, BG/L, BG/P, ApeNext and Altix.

Nueva física con neutrinos

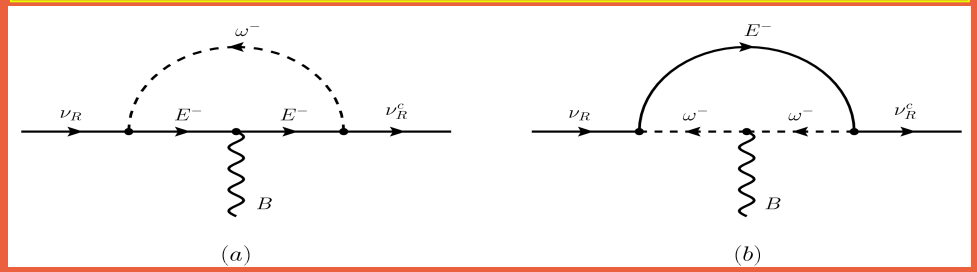
A. Aparici, A. Santamaria



Modelo con neutrinos dextrógiros no tan estériles y sus consecuencias fenomenológicas en astrofísica (gigantes rojas, SN), LEP y LHC

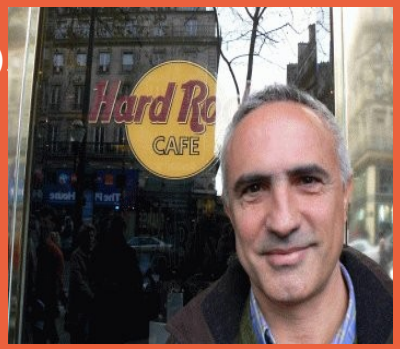
A. Aparici, A. Santamaria, J. Wudka

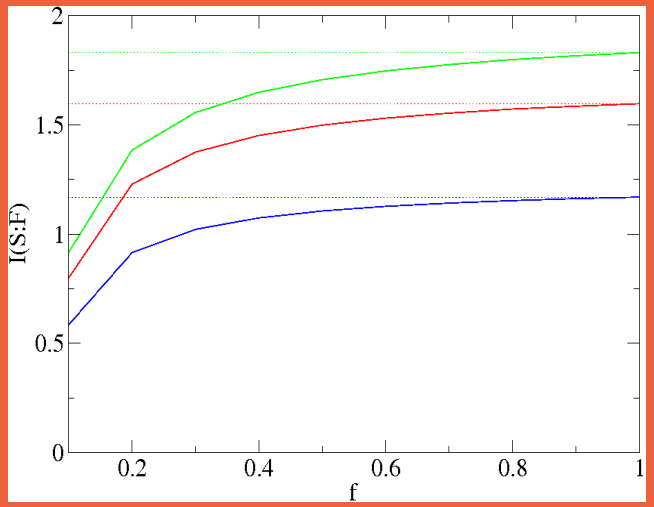
J. Phys.G37:075012,2010

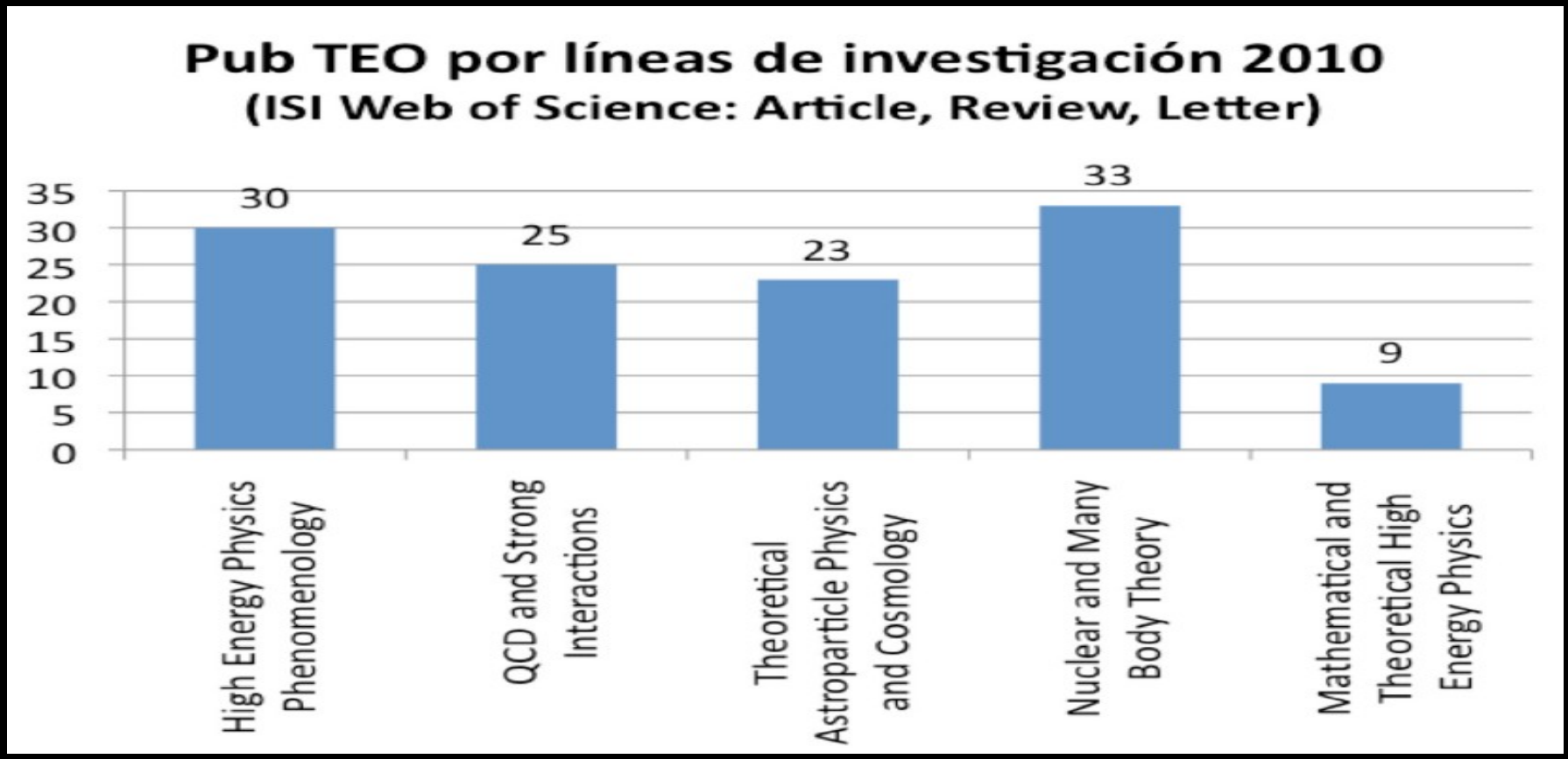


Quantum Information: open systems

A. Pérez : Information encoding of a qubit into a Multilevel Environment. Phys. Rev. A 81, (2010) 052326. Selected for the Virtual Journal of Quantum Information. Vol. 10, N6 (June 2010)






Pub TEO por líneas de investigación 2010
(ISI Web of Science: Article, Review, Letter)
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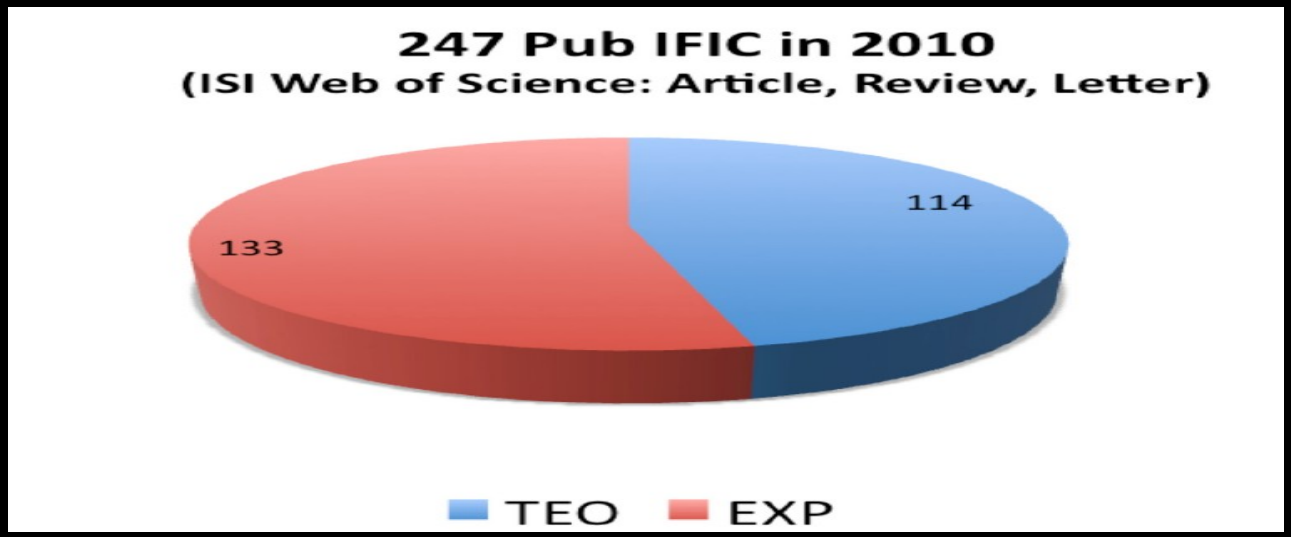
High Energy Physics Phenomenology
QCD and Strong Interactions
Theoretical Astroparticle Physics and Cosmology
Nuclear and Many Body Theory
Mathematical and Theoretical High Energy Physics


247 Pub IFIC in 2010
(ISI Web of Science: Article, Review, Letter)
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133
TEO
EXP