

Departamento de Física Moderna

Facultad de Ciencias
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Director: Ángel Mañanes Pérez
Subdirector: J. Ignacio González Serrano

PERSONAL DOCENTE E INVESTIGADOR

Área de conocimiento Física Atómica, Molecular y Nuclear

Catedráticos de Universidad

María Teresa Barriuso Pérez
Saturnino Marcos Marcos
Teresa Rodrigo Anoro
Alberto Ruiz Jimeno
Francisco Matorras Weinig

Profesores Titulares de Universidad

Ángel Mañanes Pérez
Ramón Niembro Bárcena

Profesores Asociados

Fernando Duque Calvo

Profesores Contratados Doctores

Rocío Vilar Cortabitarte

Contratados Ramón y Cajal

Marcos Fernández García

Profesores Visitantes

L.N. Savushkin (Instituto de Telecomunicaciones de St. Petersburgo. Rusia)

Área de conocimiento Astronomía y Astrofísica

Catedráticos de Universidad

Ignacio González Serrano

Profesores Titulares de Universidad

Luis Julián Goicoechea Santamaría
Francisco Carrera Troyano
Diego Herranz Muñoz

Profesores Contratados Doctores

Barreiro Vilas, Belén

Contratados Ramón y Cajal

Patricio Vielva Martínez

Investigadores Visitantes

Vyacheslav Shalyapin (National Academy of Sciences of Ukraine)

Área de conocimiento Física Teórica

Catedráticos de Universidad

Luis Pesquera González
Emilio Santos Corchero
Horacio Wio Beitelmajer

Profesores Titulares de Universidad

Rafael Blanco Alcañiz

Ángel Valle Gutiérrez

BECARIOS

Clara Beatriz Picallo González

Ana Quirce Teja

Pier Paolo Ponente

Luis Fernando Lanz Oca

Biuse Casaponsa Galí

Raúl Fernández Cobos

Pablo Pérez García

ESTUDIANTES DE DOCTORADO

Amalia Corral Ramos

Hector Otí Floranes

PERSONAL DE ADMINISTRACIÓN Y SERVICIOS

Fernando Gómez Casademunt

Alberto Gómez Coterillo

Martín López Fernández

CENTROS EN LOS QUE IMPARTE DOCENCIA

Alumnos	1 ^{er} y 2 ^o ciclo	Grado	Posgrado
Facultad de Ciencias	84	53	17

LÍNEAS GENERALES DE INVESTIGACIÓN

Estudio teórico y experimental de microláseres y de sus aplicaciones. Física de sistemas complejos. Fundamentos de Física Cuántica.

Participación en el diseño del instrumento ISSIS en el telescopio espacial ultravioleta WSO-UV. Astronomía Óptica. Astronomía de rayos-X. Espectroscopia de rayos-X de fuentes de flujo intermedio. Propiedades de rayos X de las galaxias hiperluminosas en el infrarrojo. Astronomía de microondas. Fondo Cósmico de Microondas y Cosmología observacional. Radiofuentes y fuentes extragalácticas en el infrarrojo lejano. Formación de galaxias y núcleos galácticos activos. Sistemas lente gravitatoria y materia oscura

Participación en el experimento CDF (Tevatron-Fermilab). Estudio de las interacciones fundamentales de la materia. Estudio de la asimetría materia-antimateria. Estudios de la Tercera Generación, como prueba de física no estándar. Participación en el experimento CMS (LHC, CERN). Instalación de los sistemas optomecánicos de precisión para el alineamiento global de CMS. Desarrollo de cómputo de entornos GRID. Búsqueda del bosón de Higgs, rotura espontánea de simetría. Detectores de silicio para el Linear Collider. Participación en I+D para el Futuro Colisionador Lineal Internacional ILC.

Propiedades de núcleos atómicos y estrellas de neutrones utilizando modelos relativistas, en los que la interacción nucleón-nucleón se genera mediante el intercambio de mesones. Los estados de un nucleón se representan mediante espinores que son soluciones de una ecuación de Dirac.

Nanoagregados atómicos, nanocables, nanotubos de carbono y grafeno: estudio de las propiedades electrónicas y estructurales mediante el método del Funcional de la Densidad. Propiedades magnéticas de nanoagregados en nanotubos de carbono y en grafeno. Materiales formados por agregados atómicos.

Simulación computacional de moléculas, complejos y materiales puros e impurificados. Estructura electrónica y propiedades ópticas y magnéticas de iones de transición en materiales iónicos y semiconductores. Influencia de la presión química e hidrostática. Inestabilidades de impurezas de metales de transición en materiales aislantes: Origen de los desplazamientos on-center y off-center. Origen del color en minerales que contienen impurezas de metales de transición. Estudio teórico de sistemas alejados del equilibrio, en particular asociados a fenómenos de formación de estructuras espacio-temporales, crecimiento de superficies, etc. Estudios de fenómenos inducidos por fluctuaciones tales como resonancia estocástica, motores

Brownianos, transiciones de fase inducidas por ruido, obtención de energía de fluctuaciones medio ambientales. Aplicaciones a sistemas complejos de tipo social y económico (modelos de formación y propagación de opinión, comportamiento de mercados).

PROYECTOS DE INVESTIGACIÓN

Título: Deformaciones estructurales espontáneas en sólidos aislantes y moléculas biológicas.

Investigador Principal: Miguel Moreno Más.

Periodo: Diciembre 2009/Diciembre 2012

Equipo investigador: María Teresa Barriuso Pérez, J. A. Aramburu-Zabala, P. García Fernández, J. M. García-Lastra, A. Trueba.

Proyecto de Investigación Fundamental del Plan Nacional de I+D+i. Referencia: FIS2009-070831.

Título: Fenómenos Inducidos por Ruido y Sistemas Complejos Extendidos, Investigador Principal: Horacio S. Wio Beitelmajer

Título: "Nanopartículas y nanotubos de carbono".

Investigador principal: Angel Mañanes Pérez, Universidad de Cantabria.

Periodo: 01/01/2009-31/12/2011.

Equipo investigador: E. Santos Corchero. Proyecto Coordinado con grupos de las universidades de Valladolid (J. A. Alonso) y Burgos (N. Cordero).

Entidad financiadora: MICINN, Referencia: MAT2008-06483-C03-03

Título: Colaboración IFCA-LPNHE en el proyecto europeo EUDET y SILC

Equipo Investigador: A. Ruiz Jimeno y resto grupo Altas Energías

Entidad Financiadora: CICYT FPA2008-03902-E/IN2P3

Título: Física en Colisionadores Hadrónicos (Experimentos CMS y CDF)

Investigador Principal: Teresa Rodrigo Anoro

Equipo investigador: B. Casal, J. Duarte, M. Fernández, R. González, C. Jordá, P. Lobelle, A. López Virto, P. Martínez, F. Matorras, T. Rodrigo, A. Ruiz Jimeno, M. Sobrón, R. Vilar

Entidad Financiadora: CICYT, FPA2008-06112-C02-01

Título: I+D para detectores de partículas para el futuro colisionador lineal

Investigador Principal: Iván Vila

Equipo investigador: J. Duarte, M. Fernández, A. López Virto, C. Martínez-Rivero, A. Ruiz Jimeno,,I. Vila

Entidad Financiadora: CICYT, FPA2007-66387

Título: EUDET: Detector R&D towards the International Linear Collider

Investigador Principal: Iván Vila

Equipo investigador: A. López Virto, C. Martínez-Rivero, A. Ruiz Jimeno, I. Vila

Entidad Financiadora: Unión Europea, Contrato 026126

Título: Center for Particle and Nuclear Physics

Investigador Principal: A. Pich (IFCA IP: A. Ruiz-Jimeno)

Equipo investigador: B. Casal, J. Duarte, M. Fernández, R. González, C. Jordá, P. Lobelle, A. López Virto, P. Martínez, F. Matorras, T. Rodrigo, A. Ruiz Jimeno, M. Sobrón, R. Vilar Entidad Financiadora: MCyT. Consolider Ingenio 2010. Referencia: (CSD2007-0042)

Título: Participación española en los futuros aceleradores lineales para altas energías

Investigador principal: A. Ruiz Jimeno

Equipo investigador: A. López Virto, C. Martínez-Rivero, A. Ruiz Jimeno, I. Vila

Entidad Financiadora: MCyT. Referencia: FPA2008-03564-E/FPA

Título: Participación en el Global Design Effort (GDE) del futuro Colisionador Lineal Internacional (CAC-2007-39)

Investigador principal: A. Ruiz Jimeno

Equipo investigador: A. Ruiz Jimeno

Entidad financiadora: MCyT.

Título: Lentes Gravitatorias y Materia Oscura (GLEDAMA V)

Investigador Principal: Luis J. Goicoechea

Equipo investigador: V. N. Shalyapin. Proyecto coordinado con otros proyectos del Instituto de Astrofísica de Canarias y la Universidad de Valencia, y con participación de investigadores en varios centros americanos y europeos

Entidad financiadora: MICINN. Referencia: AYA2010-21741-C03-03

Título: Comprendiendo el Universo Activo: desde detectores a Núcleos Activos Investigador principal: Francisco J. Carrera Troyano

Equipo investigador: F.J. Carrera Troyano, X. Barcons Jáuregui, M.T. Ceballos Merino, L. Ballo, N. Castelló Mor, S. Falocco, S. Mateos Ibáñez

Entidad Financiadora: MCyT, Referencia: AYA2010-21490-C02-01/ESP

Título: Fenómenos Inducidos por Ruido y Sistemas Complejos Extendidos, Investigador

Principal: Horacio S. Wio Beitelmajer

Entidad financiadora: MICINN. Referencia: FIS2010-18023

Título: Descripción Relativista de la Estructura Nuclear

Investigador Principal: Saturnino Marcos Marcos

Entidad Financiadora: M.C.e I., Referencia: FPA2009-13183

LIBROS PUBLICADOS

Dynamic and static Jahn-Teller effect in impurities: determination of the tunneling splitting.

Capítulo del libro titulado "*Vibronic Interactions and The Jahn-Teller effect*" editado por

M. Atanason, C. Daul and Ph. Treguena-Piggot

Serie Progress in Theoretical Chemistry and Physics 23, pages 105-141,

ISBN 978-3-642-03432-9, Springer Verlag (2012)

P. Garcia-Fernandez, A. Trueba, M.T. Barriuso, J.A. Aramburu and M. Moreno

Autores: R. Gil-Merino, L. J. Goicoechea y ISSIS Science Working Group

Título: The Imaging and Slitless Spectroscopy Instrument for Surveys (ISSIS) for the World Space Observatory-Ultraviolet (WSO-UV)

Colección, Editorial: Editorial Complutense S.A.

ISBN: 978-84-9938-105-3

Fecha: 2012

CLIC Collaboration (...A. Ruiiz...): Physics and Detectors at CLIC - CLIC Conceptual Design

Report, ANL-HEP-TR-12-01, CERN-2012-003, DESY 12-008, KEK Report 2011-7 (14 February 2012)

ISBN 978-92-9083-372-7, ISSN 0007-8328

ARTÍCULOS PUBLICADOS EN REVISTAS INTERNACIONALES

Transition metal impurities in fluorides: role of electronic structure of fluorine on spectroscopic properties, *Journal of Fluorine Chemistry* 132, 747 (2011) A. Trueba, P. Garcia-Fernandez,

J.M. García-Lastra, J.A. Aramburu, M.T. Barriuso and M. Moreno

Cr³⁺-doped fluorides and oxides: Role of internal fields and limitations of the Tanabe-Sugano

approach, *J. Phys. Chem A* 115, 13399 (2011), A. Trueba, J.M. García-Lastra, P. Garcia-

Fernandez, J.A. Aramburu, M.T. Barriuso and M. Moreno

Insulators containing CuCl₄X₂²⁻ (X = H₂O, NH₃) units: Origin of the orthorhombic distortion

observed only for CuCl₄(H₂O)₂²⁻, *Phys. Rev. B* 85, 094110 (2012). P. García-Fernández,

J.M. García-Lastra, A. Trueba, M.T. Barriuso, J.A. Aramburu and M. Moreno

Internal electric fields and color shift in Cr³⁺-based gemstones, *Phys. Rev. B* 85, 245118 (2012),

J.A. Aramburu, P. García-Fernández, J.M. García-Lastra, M.T. Barriuso and M. Moreno.

Isotopic Dependence of the Nuclear Charge Radii and Binding Energies in the Relativistic

Hartree-Fock Formalism. S. Marcos, M. López-Quelle, R. Niembro and L. N. Savushkin. *Yad.*

Fiz. 75 (2012) 1-16

Isotopic Dependence of the Nuclear Charge Radii and Binding Energies in the Relativistic

Hartree-Fock Formalism. S. Marcos, M. López-Quelle, R. Niembro and L. N. Savushkin. *Phys.*

At. Nucl. 75 (2012) 269-284

E.Santos. On the stability of slightly relativistic stars in $f(R)$ gravity. *Physics Letters A*, (2012)

E.Santos. Neutron stars in generalized $f(R)$ gravity. *Astrophys Space Sci* (2012)

E.Santos. Dark energy as space-time curvature induced by quantum. *Astrophys Space Sci*, 332: 423-435 (2011)

E.Santos. Space-Time Curvature Induced by Quantum Vacuum Fluctuations as an Alternative to Dark Energy. *Int.J.Theor.Phys* 50: 2125-2133 (2011)

Stochastic Resonance Between Counter-propagating Walls in a Neighborhood of a Nonequilibrium Ising-Bloch Bifurcation, M.G. dell'Erba, G.G. Izús, R.R. Deza and H.S. Wio, *Eur. Phys. J. D* 62, 103-108 (2011) DOI: 10.1140/epjd/e2010-00269-2

On the role of Galilean invariance in KPZ, H.S.Wio, J.A.Revelli, R.R.Deza, C.Escudero and M.S. de La Lama, in *NONEQUILIBRIUM STATISTICAL PHYSICS TODAY: Proc. 11th Granada Seminar on Computational and Statistical Physics (La Herradura)*, P. Garrido, J. Marro, F. de los Santos, Eds., AIP Conf.Proc. 1332, 195(2011).

Stochastic resonance between counter propagating Bloch walls, M.G. dell'Erba, G.G. Izús, R.R. Deza & H.S. Wio, in *NONEQUILIBRIUM STATISTICAL PHYSICS TODAY: Proc. 11th Granada Seminar on Computational and Statistical Physics (La Herradura)*, P. Garrido, J. Marro, F. de los Santos, Eds., AIP Conf.Proc. 1332, 215 (2011).

Recent developments on the KPZ surface-growth equation, H.S. Wio, C. Escudero, J.A. Revelli, R.R. Deza and M.S. de la Lama, *Phil. Trans. Royal Soc. A* (special issue: invited) 369, 396-411 (2011).

Stochastic Resonance in a Realistic Model for Surface Adsorption, J.A. Sierra and H.S. Wio, *Central European Journal of Physics*, special issue: New trends in Modern Statistical Mechanics; Guest Editors G. Kaniadakis, A.M. Scarfone, F. Seno, DOI 10.2478/s11534-012-0021-3 (2012)

P. Pérez, A. Quirce, L. Pesquera, A. Valle. "Polarization resolved nonlinear dynamics induced by orthogonal optical injection in long-wavelength VCSELs". *IEEE Journal of Selected Topics in Quantum Electronics*. vol. 17, no. 5, pp. 1228-1235 (2011).

H. Lin, D. W. Pierce, A. J. Basnet, A. Quirce, Y. Zhang, A. Valle. "Two-frequency injection on a multimode vertical-cavity surface-emitting laser". *Optics Express* vol. 19, no. 23, pp. 22437-22442 (2011).

A. Quirce, P. Perez, A. Valle, L. Pesquera. "Correlation properties and time resolved dynamics of linear polarizations emitted by single-mode VCSELs subject to orthogonal optical injection". *Journal of the Optical Society of America B*, vol. 28, no. 11, pp. 2765-2776 (2011).

A. Quirce, J. R. Cuesta, A. Valle, A. Hurtado, L. Pesquera, M. J. Adams. "Polarization bistability induced by orthogonal optical injection in 1550-nm multimode VCSELs". *IEEE Journal of Selected Topics in Quantum Electronics*. vol. 18, no. 2, pp. 772-778 (2012).

A. Quirce, J. R. Cuesta, A. Hurtado, K. Schires, A. Valle, L. Pesquera, M. J. Adams. "Dynamic characteristics of an all-optical inverter based on polarization switching in long-wavelength VCSELs". *IEEE Journal of Quantum Electronics*. vol. 48, no. 5, pp. 588-595 (2012).

H. Lin, Y. Zhang, D. W. Pierce, A. Quirce, A. Valle. "Polarization dynamics of a multimode VCSEL subject to orthogonal optical injection". *Journal of the Optical Society of America B*. vol. 29, no. 4, pp. 867-873 (2012).

A. Quirce, A. Valle. "High-frequency microwave signal generation using multi-transverse mode VCSELs subject to two-frequency optical injection". *Optics Express*, vol. 20, no. 12, pp. 13390-13401 (2012).

A. Quirce, P. Perez, A. Valle, L. Pesquera. "Optical spectral analysis of the nonlinear dynamics in long-wavelength VCSELs subject to orthogonal optical injection". *SPIE Proceedings (Physics and simulation of optoelectronic devices (XX))*. vol. 8255. Eds. B. Witzigmann, F. Henneberger, Y. Arakawa, A. Freundlich (SPIE, Washington, D.C.), ISBN: 9780819488985. art. 825509 (2012).

A. Quirce, A. Valle, H. Lin, Y. Zhang, D.W. Pierce. "Polarization switching of transverse modes in VCSELs subject to two-frequency orthogonal optical injection". *SPIE Proceedings, "Semiconductor lasers and laser dynamics V"*, Eds. K. Panajotov, M. Sciamanna, A. Valle, R. Michalzik, vol. 8432 (SPIE, Washington, DC), ISBN: 9780819491244. art. 84321C (2012).

P. Pérez, A. Quirce, A. Valle, and L. Pesquera. "Deterministic and stochastic dynamics of linear polarizations emitted by single-mode VCSELs subject to orthogonal optical injection". *SPIE Proceedings, "Semiconductor lasers and laser dynamics V"*, Eds. K. Panajotov, M. Sciamanna, A. Valle, R. Michalzik, vol. 8432 (SPIE, Washington, DC), ISBN: 9780819491244. art. 84321B (2012).

Autores: L. J. Goicoechea, V. N. Shalyapin, R. Gil-Merino
 Título: Gravitationally lensed QSOs in the ISSIS/WSO-UV era
 Revista, volumen, páginas [año]: Astrophysics and Space Science, 335, 237-242 [2011]

Autores: R. Gil-Merino, L. J. Goicoechea, V. N. Shalyapin, V. F. Braga
 Título: Accretion onto the Supermassive Black Hole in the High-redshift Radio-loud AGN 0957+561
 Revista, volumen, identificador [año]: The Astrophysical Journal, 744, 47 [2012]

Autores: V. N. Shalyapin, L. J. Goicoechea, R. Gil-Merino
 Título: A 5.5-year robotic optical monitoring of Q0957+561: substructure in a non-local cD galaxy
 Revista, volumen, identificador [año]: Astronomy & Astrophysics, 540, A132 [2012]

Autores: L. J. Goicoechea, V. N. Shalyapin
 Título: Time-Domain Studies of Gravitationally Lensed Quasars
 Revista, volumen, páginas [año]: Proceedings of the International Astronomical Union, 285, 315-317 [2012]

Autores: V. N. Shalyapin, L. J. Goicoechea, R. Gil-Merino
 Título: Multi-wave Monitoring of the Gravitational Lensed Quasar Q0957+561
 Revista, volumen, páginas [año]: Proceedings of the International Astronomical Union, 285, 406-407 [2012]

CDF Coll. (...A.Ruiz,...)
 Search for a Heavy Particle Decaying to a Top Quark and a Light Quark in $p\bar{p}$ Collisions at $\sqrt{s}=1.96$ TeV
 PHYSICAL REVIEW LETTERS, 108 (21):10.1103/PhysRevLett.108.211805 MAY 23 2012

CDF Coll. (...A.Ruiz,...)
 Search for Dark Matter in Events with One Jet and Missing Transverse Energy in $p\bar{p}$ Collisions at $\sqrt{s}=1.96$ TeV
 PHYSICAL REVIEW LETTERS, 108 (21):10.1103/PhysRevLett.108.211804 MAY 23 2012

CDF Coll. (...A.Ruiz,...)
 Evidence for the Charmless Annihilation Decay Mode $B_s(0) \rightarrow \pi^+\pi^-$
 PHYSICAL REVIEW LETTERS, 108 (21):10.1103/PhysRevLett.108.211803 MAY 23 2012

CDF Coll. (...A.Ruiz,...)
 Search for a Dark Matter Candidate Produced in Association with a Single Top Quark in $p\bar{p}$ Collisions at $\sqrt{s}=1.96$ TeV
 PHYSICAL REVIEW LETTERS, 108 (20):10.1103/PhysRevLett.108.201802 MAY 15 2012

CDF Coll. (...A.Ruiz,...)
 Measurement of $B_s(0) \rightarrow D_s^{(*)}D^{(*)} + (s) \bar{c} \bar{c}$ Branching Ratios
 PHYSICAL REVIEW LETTERS, 108 (20):10.1103/PhysRevLett.108.201801 MAY 14 2012

CDF Coll. (...A.Ruiz,...)
 Measurement of the masses and widths of the bottom baryons $\Sigma^{+/-}(b)$ and $\Sigma^{*+/-}$ therefore)(b)
 PHYSICAL REVIEW D, 85 (9):10.1103/PhysRevD.85.092011 MAY 16 2012

CDF Coll. (...A.Ruiz,...)
 Search for anomalous production of multiple leptons in association with W and Z bosons at CDF
 PHYSICAL REVIEW D, 85 (9):10.1103/PhysRevD.85.092001 MAY 3 2012

CDF Coll. (...A.Ruiz,...)
 Study of substructure of high transverse momentum jets produced in proton-antiproton collisions at $\sqrt{s}=1.96$ TeV
 PHYSICAL REVIEW D, 85 (9):10.1103/PhysRevD.85.091101 MAY 3 2012

CDF Coll. (...A.Ruiz,...)
 Search for a Low-Mass Standard Model Higgs Boson in the $\tau\tau$ Decay Channel in $p\bar{p}$ Collisions at $\sqrt{s}=1.96$ TeV
 PHYSICAL REVIEW LETTERS, 108 (18):10.1103/PhysRevLett.108.181804 MAY 2 2012

CMS Coll. (...A.Ruiz,...)
 Search for large extra dimensions in dimuon and dielectron events in pp collisions at $\sqrt{s}=7$ TeV
 PHYSICS LETTERS B, 711 (1):15-34; 10.1016/j.physletb.2012.03.029 MAY 1 2012

CDF Coll. (...A.Ruiz,...)

Measurement of the CP-violating phase $\beta(s)J/\psi\phi$ in $B\text{-}s(0) \rightarrow J/\psi\phi$ decays with the CDF II detector
 PHYSICAL REVIEW D, 85 (7):10.1103/PhysRevD.85.072002 APR 24 2012
 CDF Coll. (...A.Ruiz,...)

Combination of CDF and D0 measurements of the W boson helicity in top quark decays
 CDF Collaboration; D0 Collaboration
 Source:
 PHYSICAL REVIEW D, 85 (7):10.1103/PhysRevD.85.071106 APR 27 2012
 CMS Coll. (...A.Ruiz,...)

Search for the standard model Higgs boson decaying into two photons in pp collisions at $\sqrt{s}=7$ TeV
 PHYSICS LETTERS B, 710 (3):403-425; 10.1016/j.physletb.2012.03.003 APR 12 2012
 CMS Coll. (...A.Ruiz,...)

Inclusive b-jet production in pp collisions at $\sqrt{s}=7$ TeV
 JOURNAL OF HIGH ENERGY PHYSICS, (4):10.1007/JHEP04(2012)084 APR 2012
 CMS Coll. (...A.Ruiz,...)

Search for microscopic black holes in pp collisions at $\sqrt{s}=7$ TeV
 JOURNAL OF HIGH ENERGY PHYSICS, (4):10.1007/JHEP04(2012)061 APR 2012
 CMS Coll. (...A.Ruiz,...)

Search for a Higgs boson in the decay channel $H \rightarrow ZZ^{(*)} \rightarrow q(\bar{q})l^{(+)}l^{(-)}$ in pp collisions at $\sqrt{s}=7$ TeV
 JOURNAL OF HIGH ENERGY PHYSICS, (4):10.1007/JHEP04(2012)036 APR 2012
 CMS Coll. (...A.Ruiz,...)

Search for $B\text{-}S(0) \rightarrow \mu^{(+)}\mu^{(-)}$ and $B\text{-}0 \rightarrow \mu^{(+)}\mu^{(-)}$ decays
 JOURNAL OF HIGH ENERGY PHYSICS, (4):10.1007/JHEP04(2012)033 APR 2012
 CMS Coll. (...A.Ruiz,...)

Search for the standard model Higgs boson decaying to bottom quarks in pp collisions at $\sqrt{s}=7$ TeV
 PHYSICS LETTERS B, 710 (2):284-306; 10.1016/j.physletb.2012.02.085 APR 4 2012
 CDF Coll. (...A.Ruiz,...)

An additional study of multi-muon events produced in $p(\bar{p})$ collisions at $\sqrt{s}=1.96$ TeV
 PHYSICS LETTERS B, 710 (2):278-283; 10.1016/j.physletb.2012.02.081 APR 4 2012
 CMS Coll. (...A.Ruiz,...)

Measurement of isolated photon production in pp and PbPb collisions at $\sqrt{s(NN)}=2.76$ TeV
 PHYSICS LETTERS B, 710 (2):256-277; 10.1016/j.physletb.2012.02.077 APR 4 2012
 CMS Coll. (...A.Ruiz,...)

Search for the standard model Higgs boson decaying to $W+W^{-}$ in the fully leptonic final state in pp collisions at $\sqrt{s}=7$ TeV
 PHYSICS LETTERS B, 710 (1):91-113; 10.1016/j.physletb.2012.02.076 MAR 29 2012
 CMS Coll. (...A.Ruiz,...)

Combined results of searches for the standard model Higgs boson in pp collisions at $\sqrt{s}=7$ TeV
 PHYSICS LETTERS B, 710 (1):26-48; 10.1016/j.physletb.2012.02.064 MAR 29 2012
 CMS Coll. (...A.Ruiz,...)

Search for the standard model Higgs boson in the $H \rightarrow ZZ \rightarrow l^{(+)}l^{(-)}\tau^{(+)}\tau^{(-)}$ decay channel in pp collisions at $\sqrt{s}=7$ TeV
 JOURNAL OF HIGH ENERGY PHYSICS, (3):10.1007/JHEP03(2012)081 MAR 2012
 CMS Coll. (...A.Ruiz,...)

Search for the standard model Higgs boson in the $H \rightarrow ZZ \rightarrow 2l2\nu$ channel in pp collisions at $\sqrt{s}=7$ TeV
 JOURNAL OF HIGH ENERGY PHYSICS, (3):10.1007/JHEP03(2012)040 MAR 2012
 CMS Coll. (...A.Ruiz,...)

J/ψ and $\psi(2S)$ production in pp collisions at $\sqrt{s}=7$ TeV
 JOURNAL OF HIGH ENERGY PHYSICS, (2):10.1007/JHEP02(2012)011 FEB 2012
 CDF Coll. (...A.Ruiz,...)

Precise Measurement of the W-Boson Mass with the CDF II Detector
 PHYSICAL REVIEW LETTERS, 108 (15):10.1103/PhysRevLett.108.151803 APR 12 2012
 CDF Coll. (...A.Ruiz,...)

Measurements of the Angular Distributions of Muons from gamma Decays in $p(\bar{p})$ Collisions at $\sqrt{s}=1.96$ TeV
 PHYSICAL REVIEW LETTERS, 108 (15):10.1103/PhysRevLett.108.151802 APR 11 2012
 CMS Coll. (...A.Ruiz,...)

Measurement of the charge asymmetry in top-quark pair production in proton-proton collisions at $\sqrt{s}=7$ TeV
 PHYSICS LETTERS B, 709 (1-2):28-49; 10.1016/j.physletb.2012.01.078 MAR 13 2012
 CMS Coll. (...A.Ruiz,...)

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TESIS DOCTORALES

Título: Medida de la sección eficaz de producción del quark top y búsqueda del bosón de Higgs del SM en estados finales dileptónicos con el detector CMS del LHC a $s=7$ TeV.
 Autora: Patricia Lobelle Pardo
 Director: Javier Cuevas Maestro
 Tutor: Alberto Ruiz Jimeno

Título: Caracterización espectral en rayos X del crecimiento y oscurecimiento en Galaxias Activas
 Autora: Amalia Corral Ramos
 Directores: Xavier Barcons Jáuregui y Francisco Carrera Troyano

Título: Estudio del Universo a Alto Redshift con Simulaciones de N-cuerpos
 Autor: Pier Paolo Ponente
 Director: José María Diego Rodríguez

Título: Origen y Naturaleza de Radio-Cuásares con Líneas de Absorción Anchas: Un Estudio Multi-Longitud de Onda
 Autor: Gabriele Bruni

Director: José Ignacio González Serrano

CURSOS DEL MÁSTER: FÍSICA Y TECNOLOGÍAS FÍSICAS

Título: Análisis y Modelización de Datos con Técnicas no Lineales

Profesores: D. Herranz, F. Matorras, L. Pesquera

Título: Diodos láser: caracterización y aplicaciones

Profesores: L. Pesquera, A. Valle (responsable)

Título: Astrofísica Extragaláctica

Profesores: J. Gallego, L. J. Goicoechea, J. I. González (responsable)

Título: Métodos estadísticos en investigación científica

Profesores: Francisco J. Carrera (responsable), Xavier Barcons, Ángel Valle, Francisco Matorras, Francisco González

Título: Técnicas Observacionales en Astrofísica

Profesores: Francisco J. Carrera (responsable), Xavier Barcons, Lucia Ballo, Silvia Mateos, Marc Ribó

Título: Técnicas Experimentales en investigación

Profesores: Francisco J. Carrera

Título: Conceptos y Técnicas en Física de Altas Energías

Profesores: A. Ruiz, J. Cuevas, G. Gómez-Ceballos, S. Heinemeyer, J. Marco

Título: Cosmología

Profesores: E. Martínez-González, D. Herranz, B. Barreiro, J.M. Diego, M. López Caniego, P. Vielva, A. Sánchez, V. Martínez

Título: Fenómenos No-lineales y efectos cooperativos en Física

Profesores: J.M. López, D. Pazo

Título: Taller de Altas Energías I

Profesor: F. Matorras

Título: Taller de Altas Energías II

Profesor: A. Ruiz.

Título: Fluctuaciones en Física: Fundamentos y aplicaciones

Profesor: H.S. Wio

CURSOS DEL MÁSTER DE COMPUTACIÓN

Título: Técnicas Computacionales en Física

Profesores: I. González, R.B. Barreiro, J.M. Diego, J. Fernández

CURSOS DEL MÁSTER DE NUEVOS MATERIALES

Título: Simulación y Modelización de Nuevos Materiales

Profesores: A. Mañanes Pérez (responsable), D. Ferreño Blanco (UC), A. García Arribas (EHU-UPV), E. Ogando Arregui (EHU-UPV)

Créditos: 5

CURSOS DEL MÁSTER DE QUÍMICA TEÓRICA Y MODELIZACIÓN COMPUTACIONAL

Profesor Responsable: M. Teresa Barriuso

PARTICIPACIÓN EN EL MÁSTER UNIVERSITARIO EN INVESTIGACIÓN EN CIBERNÉTICA DE LA UNIVERSIDAD DE LEÓN

Asignatura: Nanotecnología

Profesor participante: A. Mañanes Pérez

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CONGRESOS ORGANIZADOS POR EL DEPARTAMENTO

Alberto Ruiz Director de las Jornadas sobre la Participación Española en el "International Linear Collider", Zaragoza, Diciembre 2011, Santander, Junio 2012.

Alberto Ruiz Director de la XXXIII Reunión Bienal de Física, Palacio de la Magdalena, Santander, 19-23 Septiembre 2011.

Alberto Ruiz Co-chairman LCWS11, International Workshop on Future Linear Colliders, Granada, 26-30 September 2011.

Angel Mañanes, Miembro del comité organizador local de "NanoSpain Conf 2012", Santander, 27 Febrero, 1 de Marzo, 2012.