Producción científica derivada de las tesis defendidas en el programa de Doctorado en Física

Línea de investigación: Relatividad y astrofísica

Año de defensa	Doctorando/a	Título de la tesis
2018	David Martínez Gómez	High-frequency waves and instabilities in multi-fluid partially ionized solar plasmas

Contribuciones científicas derivadas:

Martínez-Gómez, David; Soler, Roberto; Terradas, Jaume. (2015). «Onset of the Kelvin-Helmholtz instability in partially ionized magnetic flux tubes». *Astronomy and Astrophysics*, 578, A104. <https://doi.org/10.1051/0004-6361/201525785>.

Martínez-Gómez, David; Soler, Roberto; Terradas, Jaume. (2016). «Multi-fluid approach to high-frequency waves in plasmas.I. Small-amplitude regime in fully ionized medium». *The Astrophysical Journal*, 832:101. <https://doi.org/10.3847/0004-637X/832/2/101>.

Martínez-Gómez, David; Soler, Roberto; Terradas, Jaume. (2017). «Multi-fluid approachto high-frequency waves in plasmas. II. Small-amplitude regime in partially ionized media». *The Astrophysical Journal*, 837:80. <https://doi.org/10.3847/1538-4357/aa5eab>.

Martínez-Gómez, David; Soler, Roberto; Terradas, Jaume. (2018). «Multi-fluid approachto high-frequency waves in plasmas. III. Nonlinear regime and plasma heating». *The Astrophysical Journal*, 856:16. <https://doi.org/10.3847/1538-4357/aab156>.

Maciej Zapiór and David Martínez-Gómez (2016). «Direct detection of the helical magneticfield geometry from 3D reconstruction of prominence knot trajectories». *The Astrophysical Journal,* 817:123. <https://doi.org/10.3847/0004-637X/817/2/123>.

Año de defensa	Doctorando/a	Título de la tesis
2019	Samuel Rial Lesaga	Temporal evolution of MHD waves in solar coronal arcades

Contribuciones científicas derivadas:

Rial, S.; Arregui, I., Oliver, R.; Terradas, J. (2019). «Determining nor- mal mode features from numerical simulations using CEOF analysis: I. Test case using transverse oscillations of a magnetic slab». *ApJ* 876(1), 86. DOI:10.3847/1538-4357/ab1417.

Rial, S.; Arregui, I.; Terradas, J.; Oliver, R.; Ballester, J. L. (2010). «Three-dimensional Propagation of Magnetohydrodynamic Waves in Solar Coronal Arcades». *ApJ* 713, 651661. DOI:10.1088/0004-637X/713/1/651.

Rial, S., Arregui, I., Terradas, J., Oliver, R. and Ballester, J. L. (2013). «Wave Leakage and Resonant Absorption in a Loop Embedded in a Coronal Arcade». *ApJ* 763, 16. DOI:10.1088/0004-637X/763/1/16.

Año de defensa	Doctorando/a	Título de la tesis
2019	Miquel Oliver Almiñana	Gravitational wave data analysis for the advanced detector era

Contribuciones científicas derivadas:

Oliver, Miquel; Keitel, David; Sintes, Alicia M. (2019). «The Adaptive Transient Hough method for long-duration gravitational wave transients». *Physical Review D*, 99, 104067. DOI: <https://doi.org/10.1103/PhysRevD.99.104067>.

Driggers, J. C. [et al.]. (2019). «Improving astrophysical parameter estimation via offline noise subtraction for Advanced LIGO». *Physical Review D*, 99, 042001. DOI: 10.1103/PhysRevD.99.042001.

Oliver, Miquel [et al.]. (2019). «Matched-filter study and energy budget suggest no detectable gravitational-wave 'extended emission' from GW170817». *Monthly Notices of the Royal Astronomical Society*, Volume 485, Issue 1, Pages 843–850. DOI: 10.1093/mnras/stz439.

Abbott, B. P. [et al.]. (2018). «Search for gravitational waves from a long-lived remnant of the binary neutron star merger GW170817». *The Astrophysical Journal Letters*, Volume 851, Number 1. DOI: 10.3847/2041-8213/aa9a35.

Covas, P. B. [et al.]. (2018). «Identification and mitigation of narrow sectral artifacts that degrade searches for persistent gravitational waves in the first two observing runs of Advanced LIGO». *Physical Review D*, 97, 082002. DOI: 10.1103/PhysRevD. 97.082002.

Abbott, Benjamin P. [et al.]. (2018). «Full Band All-sky Search for Periodic Gravitational Waves in the O1 LIGO Data». *Physical Review D*, 97, 102003. DOI: 10.1103/PhysRevD.97.102003.

Walker, M. [et al.]. (2017). «Effects of transients in LIGO suspensions on searches for gravitational waves». En: *Rev. Sci. Instrum*. 88.12, p. 124501. DOI: 10.1063/1. 5000264.

Abbott, Benjamin P. [et al.] (2017). «All-sky Search for Periodic Gravitational Waves in the O1 LIGO Data». *Physical Review D*, 96, 062002. DOI:10.1103/PhysRevD.96.062002.

Walsh, Sinead [et al.]. (2016). «Comparison of methods for the detection of gravitational waves from unknown neutron stars». *Physical Review D*, 94, 124010. DOI: 10. 1103/PhysRevD.94.124010.

Año de defensa	Doctorando/a	Título de la tesis
2019	Miguel Ángel Andrés Bezares Figueroa	Coalescence of Exotic Compact Objects in the new era of gravitational wave astronomy

Contribuciones científicas derivadas:

Bezares, M.; Palenzuela, C.; Bona, C. (2017). «Final fate of compact boson star mergers». *Physical Review D*, 95, Issue 12, p. 124005. DOI: 10.1103/PhysRevD.95.124005.

Palenzuela, C.; Pani, P.; Bezares, M.; Cardoso, V.; Lehner, L.; Liebling, S. (2017). «Gravitational Wave Signatures of Highly Compact Boson Star Binaries». *Physical Review D*, 96, Issue 10, p. 104058. DOI: 10.1103/PhysRevD.96.104058.

Palenzuela, C.; Miñano, B.; Vigano, D.; Arbona, A.; Bona-Casas, C.; Rigo, A.; Bezares, M.; Bona, C.; Massó, J. (2018). «A Simflowny-based finite-difference code for high-performance computing in Relativity», *Classical and Quantum Gravity*, Volume 32, Number 18, 185007. DOI: 10.1088/1361-6382/aad7f6.

M. Bezares and C. Palenzuela (2018). «Gravitational Waves from Dark Boson Star binary mergers», *Classical and Quantum Gravity*, Volume 35, Number 23, 234002. DOI: 10.1088/1361-6382/aae87c.

M. Bezares, D. Vigano and C. Palenzuela (2019). «Signatures of dark matter cores in binary neutron star mergers», *Physical Review D*, Volume 100, Issue 4, id. 044049. DOI: 10.1103/PhysRevD.100.044049.

Raposo, G.; Pani, P.; Bezares, M.; Palenzuela, C.; Cardoso, V. (2019). «Anisotropic stars as ultracompact objects in General Relativity». *Physical Review D* 99, 104072. DOI: https://doi.org/10.1103/PhysRevD.99.104072.

Bona, C.; Bezares, M.; Pons, B.; Vigano, D. (2019). «3 + 2 Cosmology: unifying FRW metrics in the bulk». *Physical Review D* 99, 043530. DOI: 10.1103/PhysRevD.99.043530.

Bona, C.; Bezares, M. (2019). «Kaluza-Klein Cosmology: the bulk metric». *Physical Review D* 100, 043509. DOI: https://doi.org/10.1103/PhysRevD.100.043509.

Línea de investigación: Meteorología, oceanografía física y física del clima

Año de defensa	Doctorando/a	Título de la tesis
2016	Juan Manuel Sayol España	On the complexity of upper ocean mesoscale Dynamics

Contribuciones científicas derivadas:

Sayol, J. M.; Orfila, A.; Simarro, G.; López, C.; Renault, L.; Galán, A.; Conti, D. (2013). «Sea surface transport in the Western Mediterranean Sea: a Lagrangian perspective». *Journal of Geophysical Research: Oceans* 118(12), 6371-6384.

Sayol, J. M.; Orfila, A.; Oey, L. Y. (2016) «Wind induced energy-momentum distribution along the Ekman-Stokes layer. Application to the Western Mediterranean Sea climate». *Deep Sea Research: part I* 111, 34-49.

Sayol, J. M.; Orfila, A.; Simarro, G.; Conti, D.; Renault, L.; Molcard, A. «A Lagrangian model for tracking surface spills and SaR operations in the ocean». *Environmental Modelling & Software* 52(2), 74-82.

Bellomo, L.; Griffa, A.; Cosoli, S.; Falco, P.; Gerin, R.; Iermano, I.; Kalampokis, A.; Kokkini, Z.; Lana, A.; Magaldi, G.; Mamoutos, I.; Mantovani, C.; Marmain, J.; Potiris, E.; Sayol, J. M.; Barbin, Y.; Berta, M.; Borghini, M.; Bussani, A.; Corgnati, L.; Dagneaux, Q.; Gaggelli, J.; Guterman, P.; Mallarino, D.; Mazzoldi, A.; Molcard, A.; Orfila, A.; Poulain, P. M.; Quentin, C.; Tintoré, J.; Uttieri, M.; Vetrano, A.; Zambianchi, E.; Zervakis, V. (2015). «Toward an integrated HF radar network in the Mediterranean Sea to improve search and rescue and oil spill response: the TOSCA project experience». *Journal of Operational Oceanography* 8(2), 95-107.

Orfila, A.; Molcard, A.; Sayol, J. M.; Marmain, J.; Bellomo, L.; Quentin, C.; Barbin, Y. (2015). «Empirical Forecasting of HF-Radar Velocity Using Genetic Algorithms». *Geoscience and Remote Sensing, IEEE Transactions* 53(5), 2875-2886.

Hodges, B.; Orfila, A.; Sayol, J. M.; Hou, X. (2015). «Operational oil spill modelling: from science to engineering applications in the presence of uncertainty». Book title: *Mathematical Modelling and Numerical Simulation of Oil Pollution Problems*. Series: The Reacting Atmosphere vol. 2. Springer Verlag, Heidelberg. ISBN: 978-3-319- 16458-8.

Sayol, J. M.; Balaguer, P.; Conti, D.; Rietz, A.; García-Sotillo, M.; Simarro, G.; Tintoré J.; Orfila, A. (2014). «Towards an Integrated Oil Spill System: from Modelling to the Decision Support Tool». Book title: *Oil Spills: Environmental Prevention and Ecological Impacts*. Nova Science Publishers, New York. ISBN: 978-1-63321-548-1.

Año de defensa	Doctorando/a	Título de la tesis
2017	Josep Llasses Gascón	Study of the uncertainties of Mediterranean Sea Climate Monitoring and Projections

Contribuciones científicas derivadas:

Llasses, J.; Jordà, G.; Gomis, D. (2015). «Skills of different hydrographic networks in capturing changes in the Mediterranean Sea at climate scales». *Climate Research*, 63, 1 18. DOI: 10.3354/ cr01270.

Llasses, J.; Jordà, G.; Gomis, D.; Adloff, F.; Macías, D.; Harzallah, A.; Arsouze, T.; Akthar, N.; Li, L.; Elizalde, A.; Sannino, G. (2016). «Heat and salt redistribution within the Mediterranean Sea in the Med CORDEX model ensemble». *Climate Dynamics*, 1 25. DOI: 10.1007/s003820163242 0.

Llasses, J.; Jordà, G.; Gomis, D. (2015). «Reliability of uncertainty estimates from climate projection ensembles». *Journal of Black Sea/Mediterranean Environment*. Special Issue, 21-24.

Gomis, D.; Álvarez Fanjul, E.; Jordà, G.; Marcos, M.; Aznar, R.; Rodríguez Camino, E.; Sánchez Perrino, J. C.; Rodríguez González, J. M.; Martínez Asensio, A.; Llasses, J.; Pérez, B.; Sotillo, M. G. (2016). «Regional marine climate scenarios in the NE Atlantic sector close to the Spanish shores». *Scientia Marina* 80(S1): 215234. DOI: 10.3989/scimar.04328.07A.

Año de defensa	Doctorando/a	Título de la tesis
2018	Gemma Simó Diego	Effect of the surface thermal heterogeneities on the Atmospheric Boundary Layer

Contribuciones científicas derivadas:

Simó, G.; Cuxart, J.; Jiménez, M. A.; Martínez-Villagrasa, D.; Picos, R.; López-Grifol, A.; Martí, B. (2019). «Observed Atmospheric and Surface Variability on Heterogeneous Terrain at the Hectometer Scale and Related Advective Transports». *Journal of Geophysical Research: Atmospheres*, 124(16), 9407-9422. DOI: <https://doi.org/10.1029/2018JD030164>.

García-Santos, V.; Cuxart, J.; Jiménez, M. A.; Martínez-Villagrasa, D.; Simó, G.; Picos, R.; Caselles, V. (2018). «Study of Temperature Heterogeneities at Sub-Kilometric Scales and Influence on Surface–Atmosphere Energy Interactions». *IEEE Transactions on Geoscience and Remote Sensing*, 57(2), 640-654. DOI: 10.1109/TGRS.2018.2859182.

Simó, G. ; Martínez-Villagrasa, D. ; Jiménez, M. A. ; Caselles, V. ; Cuxart, J. (2019). «Impact of the surface–atmosphere variables on the relation between air and Land Surface Temperatures». En: *Meteorology and Climatology of the Mediterranean and Black Seas* (219-233). Birkhäuser, Cham. DOI: <https://doi.org/10.1007/s00024-018-1930-x>.

Azeñas, V.; Cuxart, J.; Picos, R.; Medrano, H.; Simó, G.; López-Grifol, A.; Gulías, J. (2018). «Thermal regulation capacity of a green roof system in the mediterranean region: The effects of vegetation and irrigation level». *Energy and Buildings*, 164, 226-238. DOI: <https://doi.org/10.1016/j.enbuild.2018.01.010>.

Simó, G.; García-Santos, V.; Jiménez, M. A.; Martínez-Villagrasa, D.; Picos, R.; Caselles, V.; Cuxart, J. (2016). «Landsat and local land surface temperatures in a heterogeneous terrain compared to modis values». *Remote Sensing*, 8(10), 849. DOI: <https://doi.org/10.3390/rs8100849>.

Jiménez, M. A.; Simó, G.; Wrenger, B.; Telisman-Prtenjak, M.; Guijarro, J. A.; Cuxart, J. (2016). «Morning transition case between the land and the sea breeze regimes». *Atmospheric research*, 172, 95-108. DOI: <https://doi.org/10.1016/j.atmosres.2015.12.019>.

Año de defensa	Doctorando/a	Título de la tesis
2019	Alejandra Rodríguez Enríquez	Physical and economic impacts due to sea level changes and wind-waves around the Balearic Islands

Contribuciones científicas derivadas:

Enríquez, A. R.; Marcos, M.; Alvarez-Ellacuría, A.; Orfila, A.; Gomis, D. 2017. «Changes in beach shoreline due to sea level rise and waves under climate change scenarios application to the Balearic Islands». *Natural Hazards and Earth System Sciences*, 17, 1075-1089.

Enríquez, A. R.; Marcos, M.; Falqués, A.; Roelvink, D. 2019. «Assessing beach and dune erosion and vulnerability under sea level rise: a case study in the Mediterranean Sea». *Frontiers in Marine Science*, 6:4.

Enríquez, A. R.; Bujosa, A. 2019. «Measuring the economic impact of climateinduced environmental changes on sun-and-beach tourism.» Under review in *Climatic change*.

Año de defensa	Doctorando/a	Título de la tesis
2019	Diego Saúl Carrió Carrió	Implementation of a high-resolution ensemble Kalman filter system for the Western Mediterranean

Contribuciones científicas derivadas:

Carrió, D. S.; Homar, V. (2016). «Potential of sequential EnKF for the short-range prediction of a maritime severe weather event». *Atmospheric research*, 178, 426-444. DOI: <https://doi.org/10.1016/j.atmosres.2016.04.011>.

Amengual, A.; Carrió, D. S.; Ravazzani, G.; Homar, V. (2017). «A comparison of ensemble strategies for flash flood forecasting: The 12 october 2007 case study in Valencia, Spain». *Journal of Hydrometeorology*, 18(4), 1143-1166. DOI: <https://doi.org/10.1175/JHM-D-16-0281.1>.

Carrió, D. S.; Homar, V.; Jansa, A.; Romero, R.; Picornell, M. A. (2017). «Tropicalization process of the 7 November 2014 Mediterranean cyclone: Numerical sensitivity study». *Atmospheric Research*, 197, 300-312. DOI: <https://doi.org/10.1016/j.atmosres.2017.07.018>.

Carrió, D. S.; Homar, V.; Wheatley, D. M. (2019). «Potential of an EnKF Storm-Scale Data Assimilation System Over Sparse Observation Regions with Complex Orography». *Atmospheric Research*, 216, 186-206. DOI: <https://doi.org/10.1016/j.atmosres.2018.10.004>.

Año de defensa	Doctorando/a	Título de la tesis
2020	Maria Esther Capó Truyols	Submesoscale dynamics in the western Mediterranean Sea

Contribuciones científicas derivadas:

Capó, E.; Orfila, A.; Sayol, J. M.; Juza, M.; Sotillo, M. G.; Conti, D.; Simarro, G. (2016). «Assessment of operational models in the Balearic Sea during a MEDESS-4MS experiment». *Deep Sea Research Part II: Topical Studies in Oceanography* 133, 118-131 9.

Sotillo, M. G.; Orfila, A.; Rodríguez-Rubio, P.; Cristóbal Maraver, J.; Conti, D.; Padorno, E.; Jiménez, J. A.; Capó, E.; Pérez, F.; Sayol, J. M.; De Los Santos, F. J.; Amo, A.; Rietz, A.; Troupin, C.; Tintoré, J.; Álvarez-Fanjul, E. (2016). «The MEDESS-GIB database: tracking the Atlantic water inflow». *Earth System Science Data* 8, 141-149 5.

Capó, E.; Orfila, A.; Mason, E.; Ruiz, S. (2019). «Energy conversion routes in the Western Mediterranean Sea estimated from eddy–mean flow interactions». *Journal of Physical Oceanography* 49 (1), 247-267.

Línea de investigación: Física de materiales y aplicaciones en la ingeniería

Año de defensa	Doctorando/a	Título de la tesis
2016	Beatriz Roselló Batle	Análisis de la energía consumida y las emisiones de CO2 durante el ciclo de vida de edificios del sector terciario y residencial situados en las Islas Baleares

Contribuciones científicas derivadas:

Rosselló-Batle, B.; Ribas, C.; Moià-Pol, A.; Martínez-Moll, V. (2015). «An assessment of the relationship between embodied and thermal energy demands in dwellings in a Mediterranean climate». *Energy and Buildings*, 109, 230-244. DOI: <https://doi.org/10.1016/j.enbuild.2015.10.007>.

Rosselló-Batle, B.; Ribas, C.; Moià-Pol, A.; Martínez-Moll, V. (2015). «Saving potential for embodied energy and CO2 emissions from building elements: A case study». *Journal of Building Physics*, 39(3), 261-284. DOI: <https://doi.org/10.1177/1744259114543982>.

Rosselló-Batle, B.; Moià, A.; Cladera, A.; Martínez, V. (2010). «Energy use, CO2 emissions and waste throughout the life cycle of a sample of hotels in the Balearic Islands». *Energy and Buildings*, 42(4), 547-558. DOI: <https://doi.org/10.1016/j.enbuild.2009.10.024>.

Año de defensa	Doctorando/a	Título de la tesis
2019	Julian David Hertel	Study on the general applicability of the collector efficiency model to solar process heat collectors

Contribuciones científicas derivadas:

Hertel, J. D.; Martínez-Moll, V.; Pujol-Nadal, R. (2015). «Estimation of the influence of different incidence angle modifier models on the biaxial factorization approach». *Energy conversion and management*, 106, 249-259. DOI: <https://doi.org/10.1016/j.enconman.2015.08.082>.

Hertel, J. D.; Martínez-Moll, V.; Pujol-Nadal, R. (2016). «Influence of thermal losses on the incidence angle modifier factorization approach». *Solar Energy*, 135, 50-58. DOI: <https://doi.org/10.1016/j.solener.2016.05.035>.

Hertel, J. D.; Bonnín-Ripoll, F.; Martínez-Moll, V.; Pujol-Nadal, R. (2018). «Incidence-angle-and wavelength-resolved ray-tracing simulations of a linear Fresnel collector using the in-house software OTSun». *Journal of Solar Energy Engineering*, 140(3). DOI: <https://doi.org/10.1115/1.4039329>.

Año de defensa	Doctorando/a	Título de la tesis

2019	Nicolás Pérez de la Mora	Generation and supply optimisation of a power plant and DHC network

Contribuciones científicas derivadas:

Pérez-Mora, N.; Lazzeroni, P.; Martínez-Moll, V.; Repetto, M. (2017). «Optimal management of a complex DHC plant». *Energy Conversion and Management*, 145, 386-397. DOI: <https://doi.org/10.1016/j.enconman.2017.05.002>.

Pérez-Mora, N.; Bava, F.; Andersen, M.; Bales, C.; Lennermo, G.; Nielsen, C.; Martínez-Moll, V. [et al.]. (2018). «Solar district heating and cooling: A review». *International Journal of Energy Research*, 42(4), 1419-1441. DOI: <https://doi.org/10.1002/er.3888>.

Pérez-Mora, N.; Lazzeroni, P.; Martínez-Moll, V.; Repetto, M. (2018). «Optimal DHC energy supply harnessing its thermal mass». *Applied Thermal Engineering*, 133, 520-531. DOI: <https://doi.org/10.1016/j.applthermaleng.2018.01.072>.

Año de defensa	Doctorando/a	Título de la tesis
2019	Joan Maria Rius Gibert	Active shear strengthening of reinforced concrete beams using Ni-Ti-Nb shape memory alloys

Contribuciones científicas derivadas:

Rius, J. M.; Cladera, A.; Ribas, C.; Mas, B. (2019). «Shear strengthening of reinforced concrete beams using shape memory alloys». *Construction and Building Materials*, 200, 420-435. DOI: <https://doi.org/10.1016/j.conbuildmat.2018.12.104>.

ES2592554 (B1). Cladera Bohigas, Antoni; Ribas González, Carlos Rodrigo; Mas Gracia, Benito; Rius Gibert, Joan Maria. «Método de refuerzo activo frente a esfuerzo cortante o punzonamiento en elementos portantes estructurales, y sistema de refuerzo activo». España. Universidad de las Illes Balears, 2016. Patente : <https://patents.google.com/patent/ES2592554A1>.

Línea de investigación: Física cuántica y física estadística

Año de defensa	Doctorando/a	Título de la tesis

2017	Maria Isabel Alomar Bennàssar	Spin and charge transport in thermally and ac driven nanodevices

Contribuciones científicas derivadas:

Alomar, M. A.; Lim, J. S. ; Sánchez, D. (2016). «Coulomb-blockade effect in nonlinear mesoscopic capacitors». *Phys. Rev. B* 94, 165425. DOI: 10.1103/PhysRevB.94.165425.

Alomar, M. A.; Serra, L.; Sánchez, D. (2016). «Interplay between resonant tunneling and spin precession oscillations in all-electric all-semiconductor spin transistors». *Phys. Rev. B* 94, 075402. DOI: <https://doi.org/10.1103/PhysRevB 94.075402>.

Alomar, M. A.; Serra, L.; Sánchez, D. (2015). «Seebeck effects in two-dimensional spin transistors». *Phys. Rev. B* 91, 075418. DOI: <https://doi.org/10.1103/PhysRevB.91.075418>.

Alomar, M. A.; Sánchez, D. (2014). «Thermoelectric effects in graphene with local spin-orbit interaction». *Phys. Rev. B* 89, 115422. DOI: <https://doi.org/10.1103/PhysRevB.89.115422>.

Año de defensa	Doctorando/a	Título de la tesis
2019	Guillem Rosselló Rosselló	Heat and charge transport in nanostructures: interference, AC-driving, environment, and feedback

Contribuciones científicas derivadas:

Rosselló, G.; Battista, F.; Moskalets, M.; Splettstoesser, J. (2015). «Interference and multiparticle effects in a Mach-Zehnder interferometer with single-particle sources». *Physical Review B* 91 (11), 115438. DOI: <https://doi.org/10.1103/PhysRevB.91.115438>.

Rosselló, G. ; López, R. ; Sánchez, R. (2017). «Dynamical Coulomb blockade of thermal transport». *Physical Review B* 95 (23), 235404. DOI: <https://doi.org/10.1103/PhysRevB.95.235404>.

Rosselló, G. ; López, R. ; Lim, J. S. (2015). «Time-dependent heat flow in interacting quantum conductors». *Physical Review B* 92 (11), 115402. DOI: <https://doi.org/10.1103/PhysRevB.92.115402>.

Rosselló, G.; López R.; Platero, G. (2017). «Chiral Maxwell demon in a quantum Hall system with a localized impurity». *Physical Review B* 96 (7), 075305. DOI: <https://doi.org/10.1103/PhysRevB.96.075305>.

Año de defensa	Doctorando/a	Título de la tesis
2019	Miguel Ambrosio Sierra Seco de Herrera	Electrically and thermally driven transport in interacting quantum dot structures

Contribuciones científicas derivadas:

Sierra, M. A.; Sánchez, D. (2014). «Strongly nonlinear thermovoltage and heat dissipation in interacting quantum dots» *Phys. Rev. B* 90, 115313. DOI: <https://doi.org/10.1103/PhysRevB.90.115313>.

Sierra, M. A.; López, R.; Sánchez, D. (2017). «Fate of the spin-1/2 Kondo effect in the presence of temperature gradients». *Phys. Rev. B* 96, 085416. DOI: <https://doi.org/10.1103/PhysRevB.96.085416>.

Sierra, M. A. ; Sánchez, D. (2015). «Nonlinear Heat Conduction in Coulomb-blockaded Quantum Dots». *Materials Today*: Proceedings 2, 483. DOI: <https://doi.org/10.1016/j.matpr.2015.05.066>.

Sierra, M. A.; Saiz-Bretin, M.; Domínguez-Adame, F.; Sánchez, D. (2016). «Interactions and thermoelectric effects in a parallel-coupled double quantum dot». *Phys. Rev. B* 93, 235452. DOI: <https://doi.org/10.1103/PhysRevB.93.235452>.

Sierra, M. A.; Sánchez, D. (2017). «Heat current through an artificial Kondo impurity beyond linear response». *J. Phys.*: Conf. Ser. 969, 012144. DOI: 10.1088/1742-6596/969/1/012144.

Sierra, M. A.; Sánchez, D.; Garrigues, A. R.; Del Barco, E.; Wang, L.; Nijhuis, C. A. (2018). «How to distinguish between interacting and noninteracting molecules in tunnel junctions». *Nanoscale* 10, 3904. DOI: 10.1039/C7NR05739C.

Sierra, M. A.; López, R.; Lim, J. S. (2018). «A thermally driven out-of-equilibrium two-impurity Kondo system». *Phys. Rev. Lett.* 121, 096801. DOI: <https://doi.org/10.1103/PhysRevLett.121.096801>.

Sierra, M. A.; Sánchez, D.; Jauho, Antti-Pekka; Kassbjerg, K. (2009). «Fluctuation-driven Coulomb drag in interacting quantum dot systems». *Phys. Rev. B* 100, 081404. DOI: <https://doi.org/10.1103/PhysRevB.100.081404>.

Sierra, M. A. ; Sánchez, D. ; Gutiérrez, R. ; Cuniberti, G. ; Domínguez-Adame, F. ; Díaz, E. (2020). «Spin-polarized electron transmission in DNA-like systems». *Biomolecules* 10, 49 (2020). DOI: <https://doi.org/10.3390/biom10010049>.

Año de defensa	Doctorando/a	Título de la tesis
2020	Daniel Chaparro González	Study of the Generation of Optical Pulses by Mode-Locking in Semiconductor Lasers for Applications in LiDAR Systems

Contribuciones científicas derivadas:

Chaparro, D.; Balle, S. (2018). «Optical Addressing of Pulses in a Semiconductor-Based Figure-of-Eight Fiber Laser». *Physical Review Letters*, 120, 064101. DOI: 10.1103/PhysRevLett.120.064101.

Chaparro, D.; Furfaro, L.; Balle, S. (2017). «247 fs Time-localized structures from a passively mode-locked figure-of-eight semiconductor laser». Conference on Lasers and Electro-Optics Europe & European Quantum Electronics Conference (CLEO/Europe-EQEC). DOI: 10.1109/CLEOE-EQEC.2017.8087528.

Chaparro, D.; Furfaro, L.; Balle, S. (2017). «Subpicosecond pulses in a selfstarting mode-locked semiconductor-based figure-of-eight fiber laser». *Photonics Research* 5, 37-40. DOI: 10.1364/PRJ.5.000037.

Marconi, M.; Camelin, P.; Barland, S.; Giudici, M.; Javaloyes, J.; Chaparro, D.; Balle, S. (2015). «Temporal localized states in semiconductors (II): from mode-locking to localized pulses». *Spatiotemporal Complexity in Nonlinear Optics* (SCNO). DOI: 10.1109/SCNO.2015.7324011.

Marconi, M.; Camelin, S.; Giudici, M.; Javaloyes, J.; Chaparro, D.; Balle, S. (2016). «Localized pulses in passively mode-locked semiconductor lasers». *Photonics North* (PN). DOI: 10.1109/PN.2016.7537880.

Marconi, M.; Javaloyes, J.; Camelin, P.; González, D. C.; Balle, S.; Giudici, M. (2015). «Control and Generation of Localized Pulses in Passively Mode-Locked Semiconductor Lasers». *IEEE Journal of Selected Topics in Quantum Electronics*, 21, 30. DOI: 10.1109/JSTQE.2015.2435895.

Línea de investigación: Física interdisciplinar y física no lineal

Año de defensa	Doctorando/a	Título de la tesis
2018	Eder Batista Tchawou Tchuisseu	Complex dynamics in power grids

Contribuciones científicas derivadas:

Tchuisseu, E. T. ; Gomila, D. ; Brunner, D. ; Colet, P. (2017). «Effects of dynamic-demand-control appliances on the power grid frequency». *Physical Review E*, 96(2), 022302. DOI: <https://doi.org/10.1103/PhysRevE.96.022302>.

Tchuisseu, E. T.; Gomila, D.; Colet, P.; Witthaut, D.; Timme, M.; Schäfer, B. (2018). «Curing Braess' paradox by secondary control in power grids». *New Journal of Physics*, 20(8), 083005. DOI: <https://doi.org/10.1088/1367-2630/aad490>.

Tchuisseu, E. T.; Gomila, D.; Colet, P. (2019). «Reduction of power grid fluctuations by communication between smart devices». *International Journal of Electrical Power & Energy Systems*, 108, 145-152. DOI: <https://doi.org/10.1016/j.ijepes.2019.01.004>.

Año de defensa	Doctorando/a	Título de la tesis
2019	Julián Bueno Moragues	Photonic Information Processing

Contribuciones científicas derivadas:

Bueno, J.; Brunner, D.; Soriano, M. C.; Fischer, I. (2017). «Conditions for reservoir computing performance using semiconductor lasers with delayed optical feedback». *Optics express*, 25(3), 2401-2412. DOI: <https://doi.org/10.1364/OE.25.002401>.

Bueno, J.; Maktoobi, S.; Froehly, L.; Fischer, I.; Jacquot, M.; Larger, L.; Brunner, D. (2018). «Reinforcement learning in a large-scale photonic recurrent neural network». *Optica*, 5(6), 756-760. DOI: <https://doi.org/10.1364/OPTICA.5.000756>.

Argyris, A.; Bueno, J.; Fischer, I. (2018). «Photonic machine learning implementation for signal recovery in optical communications». *Scientific reports*, 8(1), 1-13. DOI: <https://doi.org/10.1038/s41598-018-26927-y>.

Línea de investigación: Física de sistemas complejos

Año de defensa	Doctorando/a	Título de la tesis
2018	Jorge Pablo Rodríguez García	The complexity of movement: empirical data analysis and modelling of dynamical processes

Contribuciones científicas derivadas:

Rodríguez, J. P.; Fernández-Gracia, J.; Thums, M; Hindell, M. A.; Sequeira, A. M. M.; Meekan, M. G.; Costa, D. P.; Guinet, C.; Harcourt, R. G.; McMahon, C. R.; Muelbert, M.; Duarte, C. M.;. Eguíluz, V. M. «Big data analyses reveal patterns and drivers of the movements of southern elephant seals». *Scientific Reports*, 7(1): 112, 2017.

Rodríguez, J. P.; Ghanbarnejad, F.; Eguíluz, V. M. «Risk of Coinfection Outbreaks in Temporal Networks: A Case Study of a Hospital Contact Network». *Frontiers in Physics*, 5: 46, 2017.

Rodríguez, J. P.; Liang, Y. H.; Huang, Y. J.; Juang, J. «Diversity of hysteresis in a fully cooperative coinfection model». *Chaos*, 28(2): 023107, 2018.

Sequeira, A. M. M. [et al.]. «Convergence of marine megafauna movement patterns in coastal and open oceans». *Proceedings of the National Academy of Sciences*, 115(12): 3072-3077, 2018.

Año de defensa	Doctorando/a	Título de la tesis
2019	Pedro Monroy Pérez	Lagrangian studies of sedimentation and transport. Impact on marine ecosystems

Contribuciones científicas derivadas:

Monroy, P.; Drotos, G.; Hernández-García, E.; López, C. (2019). «Spatial inhomogeneities in the sedimentation of biogenic particles in ocean flows: Analysis in the Benguela region». *Journal of Geophysical Research: Oceans, 124*(7), 4744-4762. DOI: <https://doi.org/10.1029/2019JC015016>.

Hidalgo, M.; Rossi, V.; Monroy, P.; Ser-Giacomi, E.; Hernández-García, E.; Guijarro, B.; Reglero, P. [et al.]. (2019). «Accounting for ocean connectivity and hydroclimate in fish recruitment fluctuations within transboundary metapopulations». *Ecological Applications*, *29*(5), e01913. DOI: <https://doi.org/10.1002/eap.1913>.

Drótos, G.; Monroy, P.; Hernández-García, E.; López, C. (2019). «Inhomogeneities and caustics in the sedimentation of noninertial particles in incompressible flows». *Chaos: An Interdisciplinary Journal of Nonlinear Science*, *29*(1), 013115. DOI: <https://doi.org/10.1063/1.5024356>.

Monroy, P.; Hernández-García, E.; Rossi, V.; López, C. (2016). «Modeling the dynamical sinking of biogenic particles in oceanic flow». *arXiv preprint arXiv:1612.04592*.

Monroy, P.; Rossi, V.; Ser-Giacomi, E.; López, C.; Hernández-García, E. (2017). «Sensitivity and robustness of larval connectivity diagnostics obtained from Lagrangian Flow Networks». *ICES Journal of Marine Science*, *74*(6), 1763-1779. DOI: <https://doi.org/10.1093/icesjms/fsw235>.

Año de defensa	Doctorando/a	Título de la tesis
2019	Daniel Ruiz Reynés	Dynamics of Posidonia oceanica meadows

Contribuciones científicas derivadas:

Ruiz-Reynés, D.; Gomila, D.; Sintes, T.; Hernández-García, E.; Marbà, N.; Duarte, C. M. (2017). «Fairy circle landscapes under the sea». *Science advances, 3*(8), e1603262. DOI: <https://doi.org/10.1126/sciadv.1603262>.

Ruiz-Reynés, D.; Gomila, D. (2019). «Distribution of growth directions in meadows of clonal plants». *Physical Review E, 100*(5), 052208. DOI: <https://doi.org/10.1103/PhysRevE.100.052208>.

Ruiz-Reynés, D.; Schönsberg, F.; Hernández-García, E.; Gomila, D. (2019). «A simple model for pattern formation in clonal-growth plants». *arXiv preprint arXiv:1908.04603*. <https://arxiv.org/abs/1908.04603>.

Año de defensa	Doctorando/a	Título de la tesis
2019	Aleix Bassolas Esteban	A journey across the multiple scales of human mobility

Contribuciones científicas derivadas:

Lenormand, M.; Bassolas, A.; Ramasco, J. J. (2016). «Systematic comparison of trip distribution laws and models». *Journal of Transport Geography*, 51, 158-169. DOI: <https://doi.org/10.1016/j.jtrangeo.2015.12.008>.

Bassolas, A.; Lenormand, M.; Tugores, A.; Gonçalves, B.; Ramasco, J. J. (2016). «Touristic site attractiveness seen through Twitter». *EPJ Data Science*, 5(1), 12. DOI: <https://doi.org/10.1140/epjds/s13688-016-0073-5>.

Bassolas, A.; Ramasco, J. J.; Herranz, R.; Cantú-Ros, O. G. (2019). «Mobile phone records to feed activity-based travel demand models: MATSim for studying a cordon

toll policy in Barcelona». Transportation Research Part A: Policy and Practice, 121, 56-74. DOI: <https://doi.org/10.1016/j.tra.2018.12.024>.

Mazzoli, M.; Molas, A.; Bassolas, A.; Lenormand, M.; Colet, P.; Ramasco, J. J. (2019). «Field theory for recurrent mobility». *Nature communications*, 10(1), 1-10. DOI: <https://doi.org/10.1038/s41467-019-11841-2>.

Bassolas, A.; Barbosa-Filho, H.; Dickinson, B.; Dotiwalla, X.; Eastham, P.; Gallotti, R.; Kucuktunc, O. [et al.]. (2019). «Hierarchical organization of urban mobility and its connection with city livability». *Nature communications*, 10(1), 1-10. DOI: <https://doi.org/10.1038/s41467-019-12809-y>.

Bassolas, A.; Gallotti, R.; Lamanna, F.; Lenormand, M.; Ramasco, J. J. (2020). «Scaling in the recovery of urban transportation systems from massive events». *Scientific reports*, 10(1), 1-13. DOI: <https://doi.org/10.1038/s41598-020-59576-1>.