



## RESUMEN DE LA ACTIVIDAD INVESTIGADORA DEL DEPARTAMENTO DE SISTEMAS FÍSICOS, QUÍMICOS Y NATURALES. CURSO 2019/2020

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### **LISTA DE ARTÍCULOS PUBLICADOS:**

#### **Área de Cristalografía y Mineralogía**

- J. Becerra, A.P. Zaderenko, R. Ortiz, I. Karapanagiotis, P. Ortiz. Comparison of the performance of a novel nanolime doped with ZnO quantum dots with common consolidants for historical carbonate stone buildings. *Applied Clay Science*. 2020, In press.
- G.M. Contreras, J. Becerra. Técnicas analíticas para la caracterización de documentos: una revisión bibliográfica. *Ge-Conservación*. 2020. In press
- Gómez-Morón, R. Ortiz, F. Colao, R. Fantoni, J. Becerra, P. Ortiz. Laser-Induced Fluorescence mapping of pigments in a secco painted murals. *Ge-Conservación*. 2020 In press.
- Turbay, R. Ortiz, M. Arana, P. Ortiz. La incidencia de la opinión social en el grado de vulnerabilidad de los edificios patrimoniales. El caso del centro histórico de Popayán (Colombia). *Ge-Conservación*, 2020. In press.
- Turbay, J.M. Martín, I. Carrasco, A. Fernández-Ugalde, J. Becerra\*, R. Ortiz, P. Ortiz. Quarry identification and characterization of 2nd century A.D. Roman granite columns from Ecija (Spain), *Mediterranean Archaeology and Archaeometry*, Vol. 19, No 3, 2019, pp. 157-172. DOI: 10.5281/zenodo.3583069



- J. Becerra\*, A.P. Zaderenko, P. Ortiz. Basic protocol for on-site testing consolidant nanoparticles on stone Cultural Heritage. *Heritage*. Vol. 2, No 4, 2019, pp. 2712-2724. DOI: 10.3390/heritage2040168
- J. Becerra\*, A.P. Zaderenko, M.A. Gómez-Morón, P. Ortiz. Nanoparticles applied to stone buildings. *International Journal of Architectural Heritage*, 2019, pp. 1-16. DOI: 10.1080/15583058.2019.1672828
- J. Becerra\*, M.P. Mateo, P. Ortiz, G. Nicolás, A.P. Zaderenko. Evaluation of the applicability of nano-biocide treatments on limestones used in cultural heritage. *Journal of Cultural Heritage*, Vol. 38, 2019, pp. 126-135. DOI: 10.1016/j.culher.2019.02.010
- M.P. Mateo, J. Becerra, A.P. Zaderenko, P. Ortiz, G. Nicolás\*. Laser-induced breakdown spectroscopy applied to the evaluation of penetration depth of bactericidal treatments based on silver nanoparticles in limestones. *Spectrochimica Acta Part B: Atomic Spectroscopy*, Vol. 152, 2019, pp.44-51. DOI: 10.1016/j.sab.2018.11.010
- J. Becerra\*, P. Ortiz, J.M. Martín, A.P. Zaderenko. Nanolimes doped with quantum dots for stone consolidation assessment. *Construction and building materials*. Vol. 199, 2019, pp.581-593. DOI: 10.1016/j.conbuildmat.2018.12.077
- Moropoulou, E. Zendri, P. Ortiz, E. Delegou, I. Ntoutsis, E. Balliana, J. Becerra, R. Ortiz. Scanning microscopy techniques as an assessment tool of materials and interventions for the protection of built cultural heritage. *Scanning*, Article ID 5376214, 2019, pp. 1-20. DOI: 10.1155/2019/5376214
- J. Becerra\*, P. Ortiz, A.P. Zaderenko, I. Karapanagiotis. Assessment of nanoparticles/nanocomposites to inhibit micro-algal fouling on limestone façades. *Building research and information*, Vol. 48, No 2, 2020, pp. 180-190. DOI: 10.1080/09613218.2019.1609233
- A.J. Prieto, J.M. Macías, A. Silva, P. Ortiz. (2019): Fuzzy Decision-Support System for Safeguarding Tangible and Intangible Cultural Heritage, *Sustainability*, 11(14), 3953. DOI: 10.3390/su11143953
- Torres-Barzabal, L.M., Ortiz, P. & Barcia-Tirado, D.M. (2019) Quality Indicators for Auditing on-Line Teaching in European Universities, *TechTrends* 63 (3), 330-40. DOI: 10.1007/s11528-018-0365-7
- Ferrazza, Livio; Pastor Valls, María T.; Contreras Zamorano, Gemma M.; Barber, David Juanes; Radvan, Roxana; Chelmus, Alexandru; Ratoiu, Lucian; Ghervase, Luminita; Ortiz-Calderón, Pilar, Multidisciplinary Approach Applied to the Diagnosis of the Facade of the Arciprestal Church of Santa María de Morella (Castellón, Spain), *Scanning* (2019)
- Gil-Torrano, A., Gómez-Morón, A., Martín, J.M., Ortiz, R., Fuertes Santos, M.C. and Ortiz, P. "Characterization of Roman and Arabic Mural Paintings of the Archaeological Site of Cercadilla



(Cordoba, Spain),"Scanning, vol. 2019, Article ID 3578083, 14 pages, 2019. <https://doi.org/10.1155/2019/3578083>. Factor impacto 1.242 (2018), 1.272 (5 años) Q3 (Instruments & Instrumentation).

- Kriznar, F J. Ager, C. Caliri, F. P. Romano, M. A. Respaldiza, M. A. Gómez-Morón, L. Núñez, R. Magdaleno: "Study of two large dimension Murillo's paintings by means of Macro X-ray fluorescence (MA-XRF) imaging, point XRF analysis and stratigraphic studies".X-Ray Spectrometry.Vol 48, num. 5, 2019; pp. 482-489, <https://doi.org/10.1002/xrs.2990>. ISSN:1097-4539. Impact factor:1.385 (2018) 1.095 (5 años) Q3 (Spectroscopy).

## Área de Ecología

- Cardador, L., Tella, J.L., Anadón, J.D., Abellán, P. & Carrete, M. 2019. The European trade ban on wild birds reduced invasion risks. *Conservation Letters* 12: e12631.
- Luna, A., Palma, A., Sanz-Aguilar, A., Tella, J.L. & Carrete, M. 2019. Personality-dependent breeding dispersal in rural but not urban burrowing owls. *Scientific Reports* 9, 2886.
- Sebastián-González, E., Hiraldo, F., Blanco, G., Hernández-Brito, D., Romero-Vidal, P., Carrete, M., Gómez-Llanos, E., Pacífico, E.C., Díaz-Luque, J.A., Denés, F.V., Tella, J.L. 2019. The extent, frequency and ecological functions of food wasting by parrots. *Scientific Reports* 9, 15280.
- Ribeiro, J., Reino, L., Schindler, S., Strubbe, D., Vall-llosera, M., Bastos Araújo, M., Capinha, C., Carrete, M., Mazzoni, S., Monteiro, M., Moreira, F., Rocha, R., Tella, J.L., Vaza, A., Vicente, J. & Nuno, A. 2019. Trends in legal and illegal trade of wild birds: a global assessment based on expert knowledge. *Biodiversity and Conservation* 28, 3343–3369.
- Luna, A., Palma, A., Sanz-Aguilar, A., Tella, J.L. & Carrete, M. 2020. Sex, personality and conspecific density influence natal dispersal with lifetime fitness consequences in urban and rural burrowing owls. *Plos One* 15, e0226089.
- Ascensão, F., Latombe, G., Anadón, J.D., Abellán, P., Cardador, L., Carrete, M., Tella, J.L. & Capinha, C. 2020. Drivers of compositional dissimilarity for native and alien birds: the relative roles of human activity and environmental suitability. *Biological Invasions* 22, 1447–1460.
- Mueller, J.C., Carrete, M., Boerno, S., Kuhl, H., Tella, J.L. & Kempenaers, B. 2020. Synaptic genes as early targets of selection during urban colonization. *Molecular Ecology*.
- Hernández-Brito, D., Blanco, G., Tella, J.L. & Carrete, M. 2020. A protective nesting association with native species counteracts biotic resistance for the spread of an invasive parakeet from urban into rural habitats. *Journal of Zoology* 17, 13.
- Morinha, F., Carrete, M., Tella, J.L. & Blanco, G. 2020. High prevalence of a novel circovirus in sympatric invasive parakeets introduced in Spain from India and South America. *Diversity* 12, 192.



- Jiménez-Rodríguez, A., Serrano, T. Benjumea, R. Borja, M. El Kaoutit & F.G. Fermoso. Decreasing Microbial Fuel Cell Start-Up Time Using Multi-Walled Carbon Nanotubes. *Emerging Science Journal* 3 (2):109-114 (2019).
- V. Wymana,b, A. Serrano, R. Borja, A. Jiménez, A. Carvajal, M. Lenze, J. Bartacek & F.G. Fermoso. Effects of barium on the pathways of anaerobic digestion. *Journal of Environmental Management* 232: 397–403 (2019)
- M.J. Fernández-Rodríguez, D. De la Lama Calvente; A. Jiménez-Rodríguez; R. Borja & B. Rincon Llorente. Anaerobic co-digestion of olive mill solid waste and microalga *Scenedesmus quadricauda*: Effect of different carbon to nitrogen ratios on process performance and kinetics, *Journal of Applied Phycology* 31(6)DOI: 10.1007/s10811-019-01858-x (2019)
- M.J. Fernández-Rodríguez, D. De la Lama Calvente; A. Jiménez-Rodríguez; R. Borja & B. Rincon Llorente. Influence of the cell wall of *Chlamydomonas reinhardtii* on anaerobic digestion yield and on its anaerobic co-digestion with a carbon-rich substrate. *Process Safety and Environmental Protection*, 128:167-175 (2019)
- Mirco Garuti; Paolo Mantovi; Mariangela Soldano; Alessandra Immovilli; Fabrizio Ruozzi; Fernando G. Fermoso; Antonia Jiménez & Fabbri Claudio. Towards sustainable energy-crop cultivation: feasibility of biomethane production using a double-cropping system with various sorghum phenotypes. *Biofuels Bioproducts and Biorefining* DOI: 10.1002/bbb.2099 (March 2020)
- M. J. Fernández-Rodríguez, D. de la Lama-Calvente, A. Jiménez-Rodríguez, R. Pino-Mejías, R. Borja & B. Rincón. Impact of soft hydrothermal pre-treatments on the olive mill solid waste characteristics and its subsequent anaerobic digestion. *Biomass Conversion and Biorefinery* DOI: 10.1007/s13399-020-00759-1 (June 2020)
- Delgado-Baquerizo, M., Reich, P. B., Trivedi, C., Eldridge, D. J., Abades, S., Alfaro, F. D., Bastida, F., Berhe, A. A., Cutler, N. A., Gallardo, A., García-velázquez, L., Hart, S. C., Hayes, P. E., He, J., Hseu, Z., Hu, H., Kirchmair, M., Neuhauser, S., Perez, C. A., ... Singh, B. K. (2020). Multiple elements of soil biodiversity drive ecosystem functions across biomes. *Nature Ecology & Evolution*, 4(February), 210–220.
- Bastida, F., García, C., Fierer, N., Eldridge, D. J., Bowker, M. A., Abades, S., Alfaro, F. D., Asefaw Berhe, A., Cutler, N. A., Gallardo, A., García-Velázquez, L., Hart, S. C., Hayes, P. E., Hernández, T., Hseu, Z.-Y., Jehmlich, N., Kirchmair, M., Lambers, H., Neuhauser, S., ... Delgado-Baquerizo, M. (2019). Global ecological predictors of the soil priming effect. *Nature Communications*, 10(1), 3481.
- Gallardo, A., Fernández-Palacios, J. M., Bermúdez, A., de Nascimento, L., Durán, J., García-Velázquez, L., Méndez, J., & Rodríguez, A. (2020). The pedogenic Walker and Syers model under high atmospheric P deposition rates. *Biogeochemistry*, 148(3), 237–253.



- Bastida, F., Eldridge, D. J., Abades, S., Alfaro, F. D., Gallardo, A., García-Velázquez, L., García, C., Hart, S. C., Pérez, C. A., Santos, F., Trivedi, P., Williams, M. A., & Delgado-Baquerizo, M. (2020). Climatic vulnerabilities and ecological preferences of soil invertebrates across biomes. *Molecular Ecology*, 29(4), 752–761.
- Sánchez-Salguero, R., Colangelo, M., Matías, L., Ripullone, F., Camarero, J.J. 2020. Shifts in growth responses to climate and surpassed drought-vulnerability thresholds characterize dieback in two Mediterranean deciduous oaks. *Forests* (in press)
- Hevia, A., Campelo, F., Chambel, R., Vieira, J., Alía, R., Majada, J., Sánchez-Salguero, R. 2020. Which matters more for wood traits in *Pinus halepensis* Mill., provenance or climate? *Annals of Forest Science* <https://doi.org/10.1007/s13595-020-00956-y>
- Camarero, J.J., Gazol, A., Sánchez-Salguero, R., Sangüesa-Barreda, G., Díaz-Delgado, R. and Casals, R. 2020. Dieback and mortality of junipers caused by drought: dissimilar growth and wood isotope patterns preceding shrub death. *Agricultural and Forest Meteorology* (in press).
- Gazol, A., Camarero, J.J., Sánchez-Salguero, R., Vicente-Serrano, S.M., Serra-Maluquer, X., Gutiérrez, E., De Luis, M., Sangüesa-Barreda, G., Novak, K., Rozas, V., Tíscar, P.A., Linares, J.C., Martínez del Castillo, E., Ribas, M., García-González, I., Silla, F., Camisón, A., Génova, M., Olano, J.M., Hereş, A.-M., Curiel Yuste, J., Longares, L.A., Hevia, A., Tomàs-Burguera, M. and Galván, J.D. 2020. Drought legacies are short, prevail in dry conifer forests and depend on growth variability. *Journal of Ecology* DOI: 10.1111/1365-2745.13435
- Sánchez-Salguero, R. and Camarero, J.J. 2020. Greater sensitivity to hotter droughts underlies juniper dieback and mortality in Mediterranean shrublands. *Science of the Total Environment* DOI: 10.1016/j.scitotenv.2020.137599
- Bose, A.K., Gessler, A., Bolte, A., Bottero, A., Buras, A., Cailleret, M., Camarero, J.J., Haeni, M., Hereş, A.-M., Hevia, A., Lévesque, M., Linares, J.C., Martinez-Vilalta, J., Matías, L., Menzel, A., Sánchez-Salguero, R., Saurer, M., Vennetier, M., Ziche, D. and Rigling, A. 2020. Growth and resilience responses of Scots pine to extreme droughts across Europe depend on pre-drought growth conditions. *Global Change Biology* DOI: 10.1111/gcb.15153.
- Akhmetzyanov, L., Sánchez-Salguero, R., García-González, I., Buras, A., Dominguez-Delmás, M., Mohren, F., den Ouden, J., Sass-Klaassen, U. 2020. Towards a new approach for dendroprovenancing pines in the Mediterranean Iberian Peninsula. *Dendrochronologia*. 60. 125688.
- Hevia, A., Sánchez-Salguero, R., Camarero, J.J., Querejeta, J.I., Sangüesa-Barreda, G. and Gazol, A. 2019. Long-term nutrient imbalances linked to drought-triggered forest dieback. *Science of the Total Environment* 690: 1254-1267.



- Björklund J, von Arx G, Nievergelt D, Wilson R, Van den Bulcke J, Günther B, Loader NJ, Rydval M, Fonti P, Scharnweber T, Andreu-Hayles L, Büntgen U, D'Arrigo R, Davi N, De Mil T, Esper J, Gärtner H, Geary J, Gunnarson BE, Hartl C, Hevia A, Song H, Janecka K, Kaczka RJ, Kirdyanov AV, Kochbeck M, Liu Y, Meko M, Mundo I, Nicolussi K, Oelkers R, Pichler T, Sánchez-Salguero R, Schneider L, Schweingruber F, Timonen M, Trouet V, Van Acker J, Verstege A, Villalba R, Wilmking M, Frank D. 2019. Scientific merits and analytical challenges of tree-ring densitometry. *Reviews of Geophysics*. 57 (4) 1224-1264.
- Vicente-Serrano, S.M., Martín-Hernández, N., Camarero, J.J., Gazol, A., Sánchez-Salguero, R., Peña-Gallardo, M., El Kenawy, A., Domínguez-Castro, F., Tomas-Burguera, M., Gutiérrez, E., De Luis, M., Sangüesa-Barreda, G., Novak, K., Rozas, V., Tíscar, P.A., Linares, J.C., Martínez del Castillo, E., Ribas, M., García-González, I., Silla, F., Camisón, A., Génova, M., Olano, J.M., Longares, L.A., Hevia, A. and Galván, J.D. 2019. Linking tree-ring growth and satellite-derived gross primary growth in multiple forest biomes. *Temporal-scale matters. Ecological Indicators* 108
- Sangüesa-Barreda, G., Camarero, J.J., Sánchez-Salguero, R., Gutiérrez, E., Linares, J.C., Génova, M., Ribas, M., Tíscar, P.A. and López-Sáez, J.A. 2019. Droughts and climate warming desynchronize Black pine growth across the Mediterranean Basin. *Science of the Total Environment* 697
- Gut, U., Árvai, M., Bijak, S., Camarero, J.J., Cedro, A., Cruz-García, R., Garamszegi, B., Hackett-Pain, A., Hevia, A., Huang, W., Isaac-Renton, M., Kaczka, R., Kazimirović, M., Kędziora, W., Kern, Z., Klisz, M., Kolar, T., Körner, M., Kuznetsova, V., Montwé, D., Petritan, A.M., Petritan, I.C., Plavcová, L., Rehschuh, R., Rocha, E., Rybníček, M., Sánchez-Salguero, R., Schröder, J., Schwab, N., Stajic, B., Tomusiak, R., Wilmking, M., Sass-Klaassen, U., and Buras, A. 2019. No systematic effects of sampling direction on climate-growth relationships in a large-scale, multi-species tree-ring data set. *Dendrochronologia* 57.
- Hevia, A., Sánchez-Salguero, R., Camarero, J.J., Querejeta, J.I., Sangüesa-Barreda, G. and Gazol, A. 2019. Long-term nutrient imbalances linked to drought-triggered forest dieback. *Science of the Total Environment* 690: 1254-1267.
- Serra-Maluquer, X., Gazol, A., Sangüesa-Barreda, G., Sánchez-Salguero, R., Rozas, V., Colangelo, M., Gutiérrez, E. and Camarero, J.J. 2019. Geographically structured growth decline of rear-edge Iberian *Fagus sylvatica* forests after the 1980s shift toward a warmer climate. *Ecosystems* doi 10.1007/s10021-019-00339-z
- Sánchez-Salguero, R, Camarero, J.J., Hevia, A., Sangüesa-Barreda, G., Galván, JD.; Gutiérrez, E. 2019. Testing annual tree-ring chemistry by X-ray fluorescence for dendroclimatic studies in high-elevation forests from the Spanish Pyrenees, *Quaternary International* doi.org/10.1016/j.quaint.2018.09.007.



- Sánchez-Salguero, R., Camarero, J.J., Gutiérrez, E., Gazol, A., Sangüesa-Barreda, G., Moiseev, P. and Linares, J.C. 2019. Climate warming alters age-dependent growth sensitivity to temperature in Eurasian alpine treelines. *Forests* 9: 688.
- Camarero J.J., Mendivelso H.A., Sánchez-Salguero R. (2020) How Past and Future Climate and Drought Drive Radial-Growth Variability of Three Tree Species in a Bolivian Tropical Dry Forest. In: Pompa-García M., Camarero J. (eds) Latin American Dendroecology. Springer, Cham [https://link.springer.com/chapter/10.1007%2F978-3-030-36930-9\\_7](https://link.springer.com/chapter/10.1007%2F978-3-030-36930-9_7).
- Gazol, A., Camarero, J.J., Sánchez-Salguero, R., Vicente-Serrano, S.M., Serra-Maluquer, X., Gutiérrez, E., De Luis, M., Sangüesa-Barreda, G., Novak, K., Rozas, V., Tíscar, P.A., Linares, J.C., Martínez del Castillo, E., Ribas, M., García-González, I., Silla, F., Camisón, A., Génova, M., Olano, J.M., Hereş, A.-M., Curiel Yuste, J., Longares, L.A., Hevia, A., Tomàs-Burguera, M. and Galván, J.D. 2020. Drought legacies are short, prevail in dry conifer forests and depend on growth variability. *Journal of Ecology*. <https://doi.org/10.1111/1365-2745.13435>.
- Bose, A.K., Gessler, A., Bolte, A., Bottero, A., Buras, A., Cailleret, M., Camarero, J.J., Haeni, M., Hereş, A.-M., Hevia, A., Lévesque, M., Linares, J.C., Martinez-Vilalta, J., Matías, L., Menzel, A., Sánchez-Salguero, R., Saurer, M., Vennetier, M., Ziche, D. and Rigling, A. 2020. Growth and resilience responses of Scots pine to extreme droughts across Europe depend on pre-drought growth conditions. *Global Change Biology*. <https://doi.org/10.1111/gcb.15153>.
- Kattge et al. 2020 TRY plant trait database – enhanced coverage and open access. *Global Change Biology* 26(1):119-188. <https://doi.org/10.1111/gcb.14904>.
- DeSoto et al. 2020. Low growth resilience to drought is related to future mortality risk in trees. *Nature Communications*. 11:545. <https://doi.org/10.1038/s41467-020-14300-5>.
- Cobo-Simon I, Méndez-Cea B, Jump AS, Seco Gordillo JI, Gallego Rodríguez FJ, Linares JC .2020. Understanding genetic diversity of relict forests. Linking long-term isolation legacies and current habitat fragmentation in *Abies pinsapo* Boiss. *Forest Ecology and Management*. 461. <https://doi.org/10.1016/j.foreco.2020.117947>.
- Cailleret, M. 2019. Early-warning signals of individual tree mortality based on annual radial growth. *Frontiers in Plant Science* 9(1964):1-14. <https://doi.org/10.3389/fpls.2018.01964>.
- Alba-Sánchez, F. 2019. The impact of climate and land-use changes on the most southerly fir forests (*Abies pinsapo*) in Europe. *The Holocene*, 29(7), 1176–1188. <https://doi.org/10.1177/0959683619838043>.
- Méndez-Cea, B. Cobo-Simón, I. García-García, I. Linares, J.C. Gallego-Rodríguez, F.J. 2019. DNA Extraction and Amplification from PINACEAE Wood. *Silvae Genetica*. 68: 55-57. <https://doi.org/10.2478/sq-2019-0010>.



- Sangüesa-Barreda G., Camarero J. J., Sánchez-Salguero R., Gutiérrez E., Linares J. C., Génova M., Ribas M., Tíscar P. A., López-Sáez J. A. 2019. Droughts and climate warming desynchronize Black pine growth across the Mediterranean Basin. *Science of the Total Environment*. 697 (2019) 133989. <https://doi.org/10.1016/j.scitotenv.2019.133989>.
- Vicente-Serrano, S M et al. 2019. Linking tree-ring growth and satellite-derived gross primary growth in multiple forest biomes. Temporal-scale matters. *Ecological Indicators* 108:105753. <https://doi.org/10.1016/j.ecolind.2019.105753>.
- Lechuga V, Carraro V, Viñegla B, Carreira JA, Linares JC. 2019. Carbon Limitation and Drought Sensitivity at Contrasting Elevation and Competition of *Abies pinsapo* Forests. Does Experimental Thinning Enhance Water Supply and Carbohydrates? *Forests* 10:1132. <https://doi.org/10.3390/f10121132>.
- Federico Morelli, Yanina Benedetti, Leszek Jerzak, Jan Kubecka, Juan D Delgado. Combining the potential resilience of avian communities with climate change scenarios to identify areas of conservation concern. *Ecological Indicators*. 116, pp. 106509. Elsevier, 2020.
- Rodrigo Riera; Juan D. Delgado; Leopoldo Moro; Rogelio Herrera; Mikel Becerro. Difficulties to identify global and local key biodiversity areas in diverse and isolated marine jurisdictions. *Journal of Coastal Conservation*. 24 - 13, pp. 1 - 9. Springer, 2020.
- Rodrigo Riera; Juan D. Delgado. Identifying integrative management needs for regional marine policies in a context of human impact in an oceanic archipelago. *CBM-Cahiers de Biologie Marine*. 61, pp. 61 - 71. Station Biologique de Roscoff, 2020.
- Ricardo A Rodríguez Rodrigo Riera Ada M Herrera; Janelle M Duncan, Michael J Vanni, Juan D Delgado; María J González. Degrees of freedom: Definitions and their minimum and most meaningful combination for the modelling of ecosystem dynamics with the help of physical principles. *Ecological Modelling*. 392, pp. 226 - 235. Elsevier, 2019.
- Ricardo A. Rodríguez de la Vega; Rodrigo Riera; Israel Reyes; Juan D. Delgado. Entropy vs. human ontogeny: the Shannon information measure: a reliable general indicator of human health?. *Interdisciplinary Science Reviews*. 10.1080/03080188.20, pp. 1 - 21. Routledge, 2019.
- Juan D. Delgado; Durán J. Rodríguez A., Rosal. A.; Palenzuela V., Morelli F. Arroyo N.; Rodríguez Sánchez J. DGP. The spatial distribution of animal casualties within a road corridor: Implications for roadkill monitoring in the southern Iberian rangelands. *Transportation Research Part D. Transport and Environment*, 67, pp. 119 - 130. Elsevier, 2019.
- José R. Arévalo, José M. Fernández-Palacios; Rüdiger Otto, Rubén Barone, Lea de Nascimento; Agustín Naranjo Cigala, Juan D. Delgado. Los sabinares canarios. *Rincones del Atlántico*. 10, pp. 138 - 155. Rincones del Atlántico, 2020.



- Antonio Rosal, Juan D. Delgado, Zoilo González, Eduardo Espinosa Víctor, I. Bascón-Villegas, A. Rodriguez. 2019. Use of Banana Tree Residues as Pulp for Paper and Combustible. Chapter 11. In: Theory and Applications of Physical Science Vol. 2. Pp. 133-145.

### Área de Física Aplicada

- Gordillo M.C., Mazzanti F. and Boronat. J. "One-dimensional harmonically confined SU(N) fermions" Phys. Rev. A 100 023603 1-7 (2019).
- Gordillo M.C. "One-dimensional SU(N) clusters of fermions in optical lattices", New. J. Phys. 21 103020 1-8 (2019).
- Gordillo M.C. and Boronat J. "Superfluid and supersolid phases of  $^4\text{He}$  on the second layer of graphite", Phys. Rev. Lett. 124 205301 (2020) 1-5.
- Yang G., Ping J. and Segovia J., "Doubly charmed pentaquarks", Phys. Rev. D101 074030, 2020, 16pp.
- Ortega P.G., Segovia, J., Entem D.R. and Fernández F., "Spectroscopy of  $\text{Bc}$  mesons and the possibility of finding exotic  $\text{Bc}$ -like structures", Eur. Phys. J. C80 223, 2020, 7pp
- Yang G., Ping J. and Segovia J., "Doubly-heavy tetraquarks", Phys. Rev. D101 014001, 2020, 15pp.
- Brambilla N., Lai W.-K, Segovia J. and Tarrús-Castellà J., "QCD spin effects in the heavy hybrid potentials and spectra", Phys. Rev. D101 054040, 2020, 29pp.
- Yang G., Ping J. and Segovia J., "Triply-heavy baryons in a constituent quark model", Chinese Phys. C44 023102, 2020, 9pp.
- Segovia, Jorge (50 additional authors not shown), "Pion and Kaon structure at Electron-Ion Collider", Eur. Phys. J. A55 190, 2019, 16pp.
- Lu Y., Chen C., Cui Z.-F., Roberts C.D., Schmidt S.M., Segovia J. and Zong H.-S., "Transition form factors:  $\gamma^* + \text{p} \rightarrow \Delta(1232), \Delta(1600)$ ", Phys. Rev. D100 034001, 2019, 13pp.
- Yin P.-L., Chen C., Krein G., Roberts C.D., Segovia J. and Xu S.-S., "Masses of ground-state mesons and baryons, including those of heavy quarks", Phys. Rev. D100 034008, 2019, 19pp
- Chen C., Krein G., Roberts C.D., Schmidt S.M. and Segovia J., "Spectrum and structure of octet and decuplet baryons and their positive parity excitations", Phys. Rev. D100 054009, 2019, 19pp.
- C. Aguilar, F. De Soto, M. N. Ferreira, J. Papavassiliou, J. Rodríguez-Quintero & S. Zafeiropoulos, "Gluon propagator and three-gluon vertex with dynamical quarks". European Physical Journal C volume 80, Article number: 154 (2020)



- Z.-F. Cui, J.-L. Zhang, D. Binosi, F. De Soto, C. Mezrag, J. Papavassiliou, C. D. Roberts, J. Rodríguez-Quintero, J. Segovia, S. Zafeiropoulos. "Effective charge from lattice QCD". *Chinese Physics C* Vol. 44, No. 8 (2020) 083102

### Área de Física de la Tierra

- Casas-Gómez, P.; Sánchez-Salguero, R.; Ribera, P.; Linares, J.C. "Contrasting Signals of the Westerly Index and North Atlantic Oscillation over the Drought Sensitivity of Tree-Ring Chronologies from the Mediterranean Basin". *Atmosphere*, 11, 644, 2020.
- Hidalgo P., Gallego, D., "A historical climatology of the easterly winds in the strait of Gibraltar", *Atmósfera* 32(3), 181-195, 2019. doi: 0.20937/ATM.2019.32.03.02
- Materia, S., Á. G. Muñoz, M. C. Álvarez-Castro, S. J. Mason, F. Vitart, S. Gualdi. "Multimodel Subseasonal Forecasts of Spring Cold Spells: Potential Value for the Hazelnut Agribusiness". *Weather Forecasting*, 35, 237–254, 2020. DOI:<https://doi.org/10.1175/WAF-D-19-0086.1>.
- Peña-Ortiz Cristina; Elisa Manzini; Marco A. Giorgetta. "Tropical Deep Convection Impact on Southern Winter Stationary Waves and Its Modulation by the Quasi-Biennial Oscillation", *J. Climate*, 32(21), 7453–7467, 2019. DOI:<https://doi.org/10.1175/JCLI-D-18-0763.1>
- Pons, F.M.E, G. Messori, M. C. Alvarez-Castro, D. Faranda, 2020. "Sampling Hyperspheres via Extreme Value Theory: Implications for Measuring Attractor Dimensions". *Journal of Statistical Physics*, 2020, DOI: <https://doi.org/10.1007/s10955-020-02573-5>
- Ribera, P., Ordóñez, P., Gallego, D. Peña-Ortiz, C., "Internal variability and external forcings in the ocean-atmosphere multidecadal oscillator over the North Atlantic", *Climate Dynamics*, 2020. DOI: <https://doi.org/10.1007/s00382-020-05300-8>
- Ruggieri, P., M. C. Alvarez-Castro, P. Athanasiadis, A. Bellucci, S. Materia, and S. Gualdi. "North Atlantic Circulation Regimes and Heat Transport by Synoptic Eddies". *Journal of Climate*, 33, 4769–4785, 2020. DOI:<https://doi.org/10.1175/JCLI-D-19-0498.1>.
- Vicedo-Cabrara, A.M., [...], Huber, V., et al. Short term association between ozone and mortality: global two stage time series study in 406 locations in 20 countries. *BMJ*, 2020;368:m10, doi: 10.1136/bmj.m108.

### Área de Geodinámica Externa

- Delgado, J., Barba-Brioso, C., Ayala, D. Boski, T., Torres, S., Calderón, E. y López, F. 2019. Remediation experiment of Ecuadorian acid mine drainage: geochemical models of dissolved species and secondary minerals saturation. *Environmental Science and Pollution Research*. pp. 34854–34872.



- Fernández-Ayuso, A.; Aguilera, H.; Guardiola-Albert, C.; Rodriguez-Rodriguez, M.; Heredia, J. y Naranjo-Fernández, N. 2019. Unraveling the Hydrological Behavior of a Coastal Pond in Doñana National Park (Southwest Spain). *Groundwater*, 57(6): 895-906.
- Moral, F. y Balanyá, J.C. 2020. Recent fault-controlled glacis deformation and its role in the fluvial capture of the Guadix-Baza basin (Betic Cordillera, southern Spain). *Geomorphology*, 363.
- Naranjo-Fernández, N.; Guardiola-Albert, C.; Aguilera, H.; Serrano-Hidalgo, C.; Rodriguez-Rodriguez, M; Fernández-Ayuso, A.; Ruiz-Bermudo, F. y Montero-González, E. 2020. Relevance of spatio-temporal rainfall variability regarding groundwater management challenges under global change. Case study in Doñana (SW Spain). *Stochastic Environmental Research and Risk Assessment*.
- Rodríguez-Rodríguez, M., Fernández-Ayuso, A. Moral, F. y Caro, R. 2020. Aplicación de un modelo de flujo y del método de Darcy segmentado al cálculo de la descarga en una laguna somera. Caso de la laguna de Santa Olalla. *Geogaceta* 67.
- Sousa, C., Delgado, J., Szalaj, D. y Boski, T. 2019. Holocene background concentrations and actual enrichment factors of metals in sediments from Ria Formosa, Portugal. *Marine Pollution Bulletin* 149: 110533

### Área de Geodinámica Interna

- Azor, A., Días da Silva, I., Gómez-Barreiro, J., González-Clavijo, E., Martínez-Catalán, J.R., Simancas. J.F., Martínez-Poyatos., D., Pérez-Cáceres, I., González-Lodeiro, F., Expósito, I., Casas, J.M., Clariana, P., García-Sansegundo. J. y Margalef, A. (2019). Deformation and Structure. En Quesada, C. y Oliveira, J.T. (ed.): *The Geology of Iberia: A Geodynamic Approach* (Vol. 2). Springer Nature, Suiza, 544pp.
- Balanyá J.C., Expósito, I., Jiménez-Bonilla A. y Díaz-Azpiroz M. (2020) Estiramiento paralelo a los ejes de los pliegues en la Unidad de las Nieves (Dominio de Alborán, Béticas Occidentales). *Geogaceta* 67, 7-10.
- Díaz Azpiroz M., Asencio Almansa R., Senín Andrades J.R. y Jiménez Bonilla A. (2020) Shape preferred orientation of dolostone bodies of a Triassic broken formation at the western External Betics. *Geogaceta* 67, 11-14.
- Fuentes P., Fernández C., Díaz-Alvarado J. y Díaz-Azpiroz M. (2019). Using 3D kinematic models in subduction channels. The case of the Chañaral tectonic mélange, Coastal Cordillera, northern Chile. *Gondwana Research* 74, 251-270.
- Jiménez-Bonilla A., Crespo-Blanc A., Balanyá J.C., Expósito I., y Díaz-Azpiroz M. (2020). Analog Models of Fold-and-Thrust Wedges in Progressive Arcs: A Comparison with the Gibraltar Arc External Wedge. *Frontiers in Earth Science*, (Vol. 8, Art. 72), doi:10.3389/feart.2020.00072.



- Moral F. y Balanyá J.C. (2019). Alta actividad de la incisión fluvial y de los procesos de laderas en el valle del río Guadalentín (Pozo Alcón, Jaén). *Geogaceta*, 66, 3-6.
- Moral F. and Balanyá J.C. (2020). Recent fault-controlled glacis deformation and its role on the fluvial capture of the Guadix-Baza basin (Betic Cordillera, southern Spain). *Geomorphology*, <https://doi.org/10.1016/j.geomorph.2020.107226>.
- Yanes-Conde, J.L., Expósito. I., Jiménez-Bonilla A., Moral, F. Balanyá J.C., García-Navarro, E. (2019). Neo-tectonic reactivation and relief rejuvenation in the western Betics foreland (Viar catchment). *Geogaceta*, 66, 107-110.

### Área de Química Física

- F. J. Lobo-Cabreara, F. Govantes, A. Cuetos. *Pseudomonas putida LapA: A Molecular Dynamics study*. European Biophysics Journal With Biophysics Letters 48-1 (2019) Páginas: S194-S194 Abstract de reunión: P-468
- A. Cuetos and A. Patti. *Dynamics of hard colloidal cuboids in nematic liquid crystals* Phys. Rev. E 101 (2020), 052702.
- A. Cuetos, N. Morillo, B. Martínez-Haya, Coadsorption of Counterionic Colloids at Fluid Interfaces: A Coarse-Grained Simulation Study of Gibbs Monolayers. Langmuir 36 (2020), 2877-2885
- J.R. Avilés-Moreno, G. Berden, J. Oomens, B. Martínez-Haya, 2019 “*Insights into the Recognition of Phosphate Groups by Peptidic Arginine from Action Spectroscopy and Quantum Chemical Computations*” Journal of Physical Chemistry B, 123, 7528-7535.
- J.R. Avilés-Moreno, G. Berden, J. Oomens, B. Martínez-Haya, 2019 “[A Cl- Hinge for Cycloen Macrocycles: Ionic Interactions and Tweezer-Like Complexes](#)” Frontiers in Chemistry 7, 143

### Área de Zoología

- Bouhala, Zineb, Chakri, Kemissa, Márquez-Rodríguez, Joaquín, Ferreras-Romero, Manuel, Samraoui, Farrah, Samraoui, Boudjéma, “Ecological correlates of odonate assemblages of a Mediterranean stream, Wadi Cherf, northeastern Algeria: implications for conservation”, International Journal of Odonatology, 22, 2019, 181-197.
- Bouhala, Zineb, Márquez-Rodríguez, Joaquín, Chakri, Kemissa, Samraoui, Farrah, El-Serehy, Hamed, Ferreras-Romero, Manuel, Samraoui, Boudjéma, “The life history of the Ibero-Maghrebian endemic *Oligoneuriopsis skhounate* Dakki and Guidicelli (Ephemeroptera: Oligoneuriidae)”, Limnologica - Ecology and Management of Inland Waters, 81, 2020, 1-16.
- Casanueva Gómez, Patricia, Santamaría, Tomás, Hernández, María Ángeles, Sánchez-Sastre, Luis Fernando, Texeira, Amilcar, Bennas, Nard, El-Haissoufi, Mohamed, Ferreras-Romero, Manuel, Campos, Francisco, “Biometric differences between several populations of *Cordulegaster*



*boltonii* (Odonata: Cordulegastridae) in Ibero-Maghrebian area”, European Journal of Entomology, 117, 2020, 260-264.

- Bouhala, Zineb, Márquez-Rodríguez, Joaquín, Chakri, Kémissa, Samraoui, Farrah, El-Serehy, Hamed, Ferreras-Romero, Manuel, Samraoui, Boudjéma, “The life cycle of the Maghrebian endemic *Ecdyonurus rothschildi* Navás, 1929 (Ephemeroptera: Heptageniidae) and its potential importance for environmental monitoring”, Limnology, 21, 2020. 1-7.
- Martínez-Pita, Inés, Moreno, Óscar. “Improving bivalve fishery management: The development of a tool to forecast bivalve reproductive season based on environmental data from satellite remote sensing observations”. Fisheries Oceanography 28, 2019, 698-707.