

## Jorge P. Rodríguez

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Postdoctoral researcher, Instituto de Física Interdisciplinar y Sistemas Complejos (IFISC),  
CSIC-UIB, Palma (Mallorca), Spain

### 1. Keywords

Big data, complex networks, animal movement, marine megafauna, disease spreading,  
meteorology

### 2. Professional positions

**2014-2018** PhD researcher. Formación de Profesorado Universitario (FPU) fellowship, Spanish Ministry of Education, Culture and Sport. Instituto de Física Interdisciplinar y Sistemas Complejos IFISC (CSIC-UIB), Palma (Mallorca), Spain

**2018-2019** Postdoctoral researcher. Funding from project Coupled Animal and Artificial Sensing for Sustainable Ecosystems (CAASE). IFISC (CSIC-UIB), Palma (Mallorca), Spain

**2019-2020** Postdoctoral researcher. Sociopatterns collaboration. ISI Foundation, Turin, Italy

**2020-** Tutoring lecturer. Associated center in Balearic Islands, National Distance University UNED, Palma (Mallorca), Spain

**2020-2021** Postdoctoral researcher. Instituto de Biocomputación y Física de Sistemas Complejos BIFI, Universidad de Zaragoza, Spain

**2021-2023** Postdoctoral fellow. Juan de la Cierva Formación fellowship, Spanish Ministry of Science and Innovation. Instituto Mediterráneo de Estudios Avanzados (CSIC-UIB), Esporles (Mallorca), Spain

**2023-2024** Postdoctoral researcher/fellow. Projects Artificial Intelligence & Animal Movement (AIAM) and Modelling Island Ecological Complexity in the Context of Global Change (MISLAND), and Vicenç Mut fellowship (Govern de les Illes Balears). Instituto de Física Interdisciplinar y Sistemas Complejos IFISC (CSIC-UIB), Palma (Mallorca), Spain

**2024-** Staff meteorologist, Spanish Meteorological Agency (AEMET), Palma (Mallorca), Spain

### 3. Academic qualifications

**2018** PhD in Physics. University of Balearic Islands (Spain)

**2014** Master's Degree in Physics of Complex Systems (60 ECTS). University of Balearic Islands (Spain)

**2013** 5-year Degree in Physics (300 ECTS). University of Valencia (Spain). Erasmus at Imperial College London (9 months, United Kingdom)

**2018** Degree in Social and Cultural Anthropology (240 ECTS, 2018). National Distance Education University (Spain)

#### 4. Funded research projects (PI)

**2023** “Artificial Intelligence & Animal Movement (AIAM)”. Mar 2023-Jan 2024, funded by Sustainable Ocean Alliance. Amount: 10,000 USD

#### 5. Early-career researchers training

**2023-** PhD direction, Jorge Medina, PhD in Physics, University of Balearic Islands, Spain

**2021-2022** Co-direction of Master Thesis, Lina E. Navarro, Master’s Degree in Physics of Complex Systems, University of Balearic Islands, Spain

#### 6. Publications

**2024** Rodríguez, J.P., Arola-Fernández, L. Understanding following patterns among high-performance athletes, *Journal of Physics: Complexity* 5, 045007

**2024** Rodríguez, J.P., Klemm, K., Duarte, C.M., Eguíluz, V.M. Shipping traffic through the Arctic Ocean: spatial distribution, temporal evolution and its dependence on the sea ice extent, *iScience* 27, 110236

**2024** Rodríguez, J.P., Irigoien, X., Duarte, C.M., Eguíluz, V.M. Identification of suspicious behaviour through anomalies in the tracking data of fishing vessels. *EPJ Data Science* 13, 23

**2024** VanCompernelle, M., Morris, J., Calich, H.J., Rodríguez, J.P., Marley, S.A., *et al.* Vulnerability of marine megafauna to global at-sea anthropogenic threats. *Conservation Biology*, *in press*

**2024** Rodríguez, J.P., Aleta, A., Moreno, Y. Multilayer networks describing interactions in urban systems: a digital twin of five cities in Spain, arXiv preprint at arXiv:2409.04299

**2023** Belvís, F., Aleta, A., Pericas, J.M., Fernández-Gracia, J., Rodríguez, J.P., *et al.* Key epidemiological indicators and spatial autocorrelation patterns across five waves of COVID-19 in Catalonia. *Scientific Reports* 13, 9709

**2023** Rodríguez, J.P., Eguíluz, V.M. Coupling between infectious diseases leads to synchronization of their dynamics. *Chaos* 33, 021103

**2023** Rodríguez, J.P., Aleta, A., Moreno, Y. Digital cities and the spread of COVID-19: characterizing the impact of non-pharmaceutical interventions in five cities in Spain. *Frontiers in Public Health* 11, 1122230

**2022** Rodríguez, J.P., Paoluzzi, M., Levis, D., Starnini, M. Epidemic processes on self-propelled particles: Continuum and agent-based modeling. *Physical Review Research* 4, 043160

**2022** Lacasa, L., Rodríguez, J.P., Eguíluz, V.M. Correlations of network trajectories. *Physical Review Research* 4, L042008

**2021** Bates, A.E., *et al.* Global COVID-19 lockdown highlights humans as both threats and custodians of the environment. *Biological Conservation* 263,109175

**2021** Calich, H., Rodríguez, J.P., Eguíluz, V.M., Hammerschlag, N., *et al.* Comprehensive analytical approaches reveal species-specific search strategies in sympatric apex predatory sharks. *Ecography* 44, 1544

**2021** Ozella, L., Paolotti, D., Lichand, G., Rodríguez, J.P., Haenni, S., *et al.* Using wearable proximity sensors to characterize contact patterns in a village of rural Malawi. *EPJ Data Science* 10, 46

**2021** Rodríguez, J.P., Fernández-Gracia, J., Duarte, C.M., Irigoien, X., *et al.* The global network of ports supporting high seas fishing. *Science Advances* 7, eabe3470

**2021** Kazimierski, L.D., Rodríguez, J.P., Eguíluz, V.M. Design of deployment strategies to monitor the movement of animals with passive electronic devices. *Sensors* 21, 236

**2020** Eguíluz, V.M., Fernández-Gracia, J., Rodríguez, J.P., Pericas, J.M., Melián, C.M. Risk of secondary infection waves of COVID-19 in an insular region: the case of the Balearic Islands, Spain. *Frontiers in Medicine* 7, 563455

**2019** Sequeira, A.M.M., Hays, G.C., Sims, D.W., Eguíluz, V.M., Rodríguez, J.P., *et al.* Overhauling ocean spatial planning to improve marine megafauna conservation. *Frontiers in Marine Science* 6, 639

**2019** Rodríguez, J.P., Ghanbarnejad, F., Eguíluz, V.M. Particle velocity controls phase transitions in contagion dynamics. *Scientific Reports* 9, 6463

**2018** Melián, C.J., Matthews, B., de Andreazzi, C.S., Rodríguez, J.P., *et al.* Deciphering the interdependence between ecological and evolutionary networks. *Trends in Ecology and Evolution* 33, 504

**2018** Sequeira, A.M.M., Rodríguez, J.P., Eguíluz, V.M., Harcourt, R.G., *et al.* Convergence of marine megafauna movement patterns in coastal and open oceans. *Proceedings of the National Academy of Sciences* 115, 3072

**2018** Rodríguez, J.P., Liang, Y.H., Huang, Y.J., Juang, J. Diversity of hysteresis in a fully cooperative coinfection model. *Chaos* 28, 023107

**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., Fernández-Gracia, J., Thums, M., Hindell, M.A., *et al.* Big data analyses reveal patterns and drivers of the movements of southern elephant seals. *Scientific Reports* 7, 112

## **5. Citation Statistics**

Number of citations: 633 (Google Scholar)

h-index: 11 (Google Scholar)

## **6. Reviewing activity for peer-review journals**

Communications Physics, PLOS Computational Biology, Physical Review Research, PLOS ONE, JSTAT, Physical Review E, Journal of Physics: Complexity, Scientific Reports, PeerJ, Chaos, Complexity, Entropy, Frontiers in Marine Science, Science Progress, Social Science Computer Review, Frontiers in Physics, Chaos, Solitons and Fractals, Frontiers in Public Health, Ecological Complexity

## **8. Awards**

- 2<sup>nd</sup> National End-Of-Degree Award. Degree in Physics. Spanish Ministry of Education, Culture and Sport

- Selected photography "El árbol pendular" (The pendular tree) for national scientific photography exhibition, Fotciencia 14 (2017)

## **9. Conference presentations (oral communications)**

**2024** "Leveraging acoustic telemetry data to understand spreading processes on marine animal populations", European Tracking Network Symposium, Palma (Spain)

**2022** "Epidemic processes on self-propelled particles". Conference on Complex Systems, CCS22, Palma (Spain)

**2022** "Digital cities and COVID-19: modeling the impact of non pharmaceutical interventions". International Conference BIFI (online)

**2021** "Fishing at the High Seas: the Global Network Connecting Ports to Fishing Areas". Conference on Complex Systems, CCS21, Lyon (France)

**2021** "Big Data analytics for marine movement tracking data: a global picture". I Annual Meeting of the Spanish Tracking Network, Palma (Spain)

**2021** "The global network of ports supporting high seas fishing". FisEs Joven '21 (online)

**2019** "Structure and dynamics of contact patterns among structured populations in South Africa". Conference on Complex Systems, CCS19, Singapore

**2019** "Genome networks and the stability of diversification". Conference on Complex Systems, CCS19, Singapore

**2018** "Cooperative disease spreading in networks of mobile particles: how mobility can speed up, slow down and change the nature of the epidemic phase transition". Conference on Complex Systems, CCS18, Thessaloniki (Greece)

**2018** "Inferring intraspecific tracing behaviour in animal movement". Conference on Complex Systems, CCS18, Thessaloniki (Greece)

**2017** "Coinfection in the space: cooperative disease spreading in geometric and contact networks". COSTNET17 (Palma de Mallorca)

**2017** "Cooperative spreading diseases in temporal networks". 8<sup>th</sup> Conference on Complex Networks, CompleNet'17, Dubrovnik (Croatia)

## **10. Stays in Research centers**

**2018** Indian Ocean Marine Research Centre, University of Western Australia (Australia). Research stay with Dr. Ana Sequeira.

**2018** Department of Engineering Mathematics, University of Bristol (United Kingdom). Research stay with Dr. Naoki Masuda. Funding: COSTNET (EU COST Action)

**2016-2017** Eawag (Switzerland). Research stays with Dr. Carlos Melián. Funding (2016): Obra Social la Caixa

**2016** National Chiao-Tung University (Taiwan). Research stay with Prof. Jonq Juang. Funding: Ministry of Science and Technology of Taiwan

**2016** University of Western Australia (Australia). Research stay with Dr. Ana Sequeira