

CV OF THE EXPERIENCED RESEARCHER

1. PERSONAL INFORMATION

Name: Pedro José Parra Rivas (P. Parra-Rivas)
Researcher Unique identifier (ORCID): 0000-0003-1338-3963
ANECA accreditation: **Profesor Contratado Doctor**

2. PROFESIONAL EXPERIENCE

1. Marie Slowoska Curie fellowship Individual Fellowship 01/11/2021-31/10/2023
Università la Sapienza di Roma, Italy
2. Post-doctoral research fellow (Chargé de Recherche, FNRS) 01/10/2018-31/10/2021
Service Opera-Photonique, Université Libre de Bruxelles
3. Post-doctoral research fellow (PDM Internal fonds KU Leuven) 01/10/2017-30/09/2018
Laboratory of Dynamics in Biological Systems, KU Leuven Department of Cellular and Molecular
Medicine, Katholieke Universiteit Leuven
4. Pre-doctoral research fellow (FWO fellowship) 01/10/2013-30/09/2017
Applied Physics Research Group (APHY), Sciences and bioengineering faculty, Vrije Universiteit Brussel
5. Pre-doctoral research fellow 14/01/2013-30/09/2013
Applied Physics Research Group (APHY), Sciences and bioengineering faculty, Vrije Universiteit Brussel
6. Pre-doctoral research fellow in the project FIS200760327 (UIB) 01/05/2012-13/01/2013
Instituto de Física Interdisciplinar y Sistemas Complejos, IFISC, Universitat de les Illes Balears (UIB)
7. Pre-doctoral research fellow (CSIC) 10/10/2011-30/04/2012
Instituto de Física Interdisciplinar y Sistemas Complejos, IFISC, Consejo Superior de Investigaciones
Científicas (CSIC).

3. EDUCATION

1. Universidad Nacional de Educación a Distancia (UNED), Spain 01/10/2019-present
Master in Education
2. Vrije Universiteit Brussel, Belgium and Universitat de les Illes Balears, Spain 14/01/2013-03/03/2017
Joint PhD in Physics (Spain) and Science (Belgium)
Thesis: *Dynamics of dissipative localized structures in driven nonlinear optical cavities* (awarded in March
2017 with the highest honors and congratulations of the jury)
Advisors: Dr. D. Gomila, Prof. L. Gelens, and Prof. J. Danckaert
3. Universidad de Salamanca, Spain 01/10/2010-30/09/2011
Master in Mathematics, Program in advanced mathematical methods in Physics
Thesis: *Variational Formulation of Gauge Field Theories*
Advisor: Prof. C. Tejero Prieto
4. Universidad de Granada, Spain 01/10/2004-28/07/2010
Bachelor and Master in Physics (Licenciatura en Física)

4. CV SUMMARY

After finishing my degree in Physics (Universidad de Granada, Spain, 2010), I started a MSci. program in Mathematics (Universidad de Salamanca, Spain), which provided me with specific skills in advanced mathematics, particularly in differential geometry.

Later, in 2011, I had the opportunity to join the IFISC institute for interdisciplinary research and complex systems in Palma de Mallorca (Spain) under the supervision of D. Gomila to study the dynamics of localized structures (LSs) in spatially extended systems driven out of thermodynamic equilibrium. The outcome of that research was published in Physical Review Letters [Phys. Rev. Lett. 110, 064103]. During this period, I discovered the richness and beauty of behavior triggered by nonlinearity, and I decided to pursue this further.

In 2013, I was awarded with a Research Foundation Flanders (FWO) PhD fellowship, and in October the same year, I started a joint PhD between the Universitat de les Illes Balears (UIB, Spain) and the Vrije Universiteit Brussel (VUB, Belgium). At that time, my research project focused on the study of nonlinear spatiotemporal phenomena arising in driven dispersive Kerr cavities, with special attention to LSs formation and dynamics. In 2014, I spent two months working with E. Knobloch at the University of California, Berkeley (US), from whom I learned a great deal in bifurcation and applied dynamical systems theory that I have been using ever since. Applying this approach, I was able to unveil the bifurcation structure (BS) and stability of LSs arising in these systems, which led to a better understanding of their dynamics. I showed, for the first time, that dark states undergo a BS known as *collapsed snaking* [Op. Lett. 41, 2402 (2016); Phys. Rev. A 93, 063839 (2016)], while bright ones suffer a complex transition leading to the destruction of the so-called *homoclinic snaking* [Phys. Rev. A 89, 043813 (2014); Phys. Rev. E 97, 042204 (2018)]. These results were key to explain/guide different experimental observations (e.g., [Optica, 7, 1195–1203 (2020)]). In March 2017, I obtained my European PhD diploma in Physics by the UIB and my PhD diploma in Sciences by the VUB, both with honors (Cum Laude). By that time, I was the first author of 10 peer-review articles, most of them originated from my own ideas.

In September 2017, I was awarded a one-year postdoctoral grant at KU Leuven and a FNRS postdoctoral fellowship of three years at the Université libre de Bruxelles (ULB). This financial stability allowed me to pursue further my research in nonlinear optics and apply my knowledge to study spatial localization phenomena in other research fields. At KU Leuven, I started to investigate emergent nonlinear spatiotemporal dynamics in different reaction-diffusion systems describing, for example, plant population dynamics in dryland ecosystems [Phys. Rev. E 101 (5), 052214 (2020)], and the cell-division cycle. At ULB, my work focused on the theoretical characterization of LS formation in quadratic optical cavities. This research led to prolific scientific production [e.g., Phys. Rev. E 100 (3), 032219 (2019); Op. Lett. 44 (8), (2019), Phys. Rev. A 101, 063817 (2020); Op. Lett. 45, 20, 5856 (2020)], including two Nature Photonics publications [Nat. Phot. 15 (7), 536-541 (2021), Nat. Phot. 15 (11), 857-861 (2021)], where my theoretical findings were key to guide the experimental work carried out by the research group.

In 2021, I was awarded with an individual Marie Slowoska Curie fellowship (NOSTER), and in November the same year I joined the research group of S. Wabnitz at the Università la Sapienza di Roma (Italy). My goal in this project is to study the formation and stability of 3D spatiotemporal solitons, also called *light bullets* (LBs), in multimode (MM) waveguide systems (e.g., MM graded index fibers). Recently, we have theoretically demonstrated that dissipative LBs can be stabilized in diffractive-dispersive Kerr cavities in the presence of a parabolic potential [arXiv:2212.13052v1].

During the last 4 years I have developed strong leading skills and autonomy, which I have demonstrated by mentoring and training different researchers. At present, I am supervising two PhD students in my former group at the ULB [Phys. Rev. A 106 (1), 013512 (2022); Chaos 32, 083103 (2022); arXiv:2301.11746v1] and leading several research lines in collaboration with F. Al Saadi (Oman), which include plant ecology [Chaos, 33 (3), 033129 (2023)] and cancer virotherapy.

Furthermore, I have been teaching different Bachelor and Master courses in physics and engineering (> 140h), at VUB, ULB and La Sapienza.

At this moment, I have an h-index of 17 and >1090 citations (Google Scholar), 49 publications in peer-reviewed journals, 2 pre-prints, and a collaboration network of > 40 researchers distributed worldwide (see Figure 1). Furthermore, my research is strongly disseminated at international conferences and workshops (>30 peer-reviewed proceedings, >20 oral contributions, 6 invited).

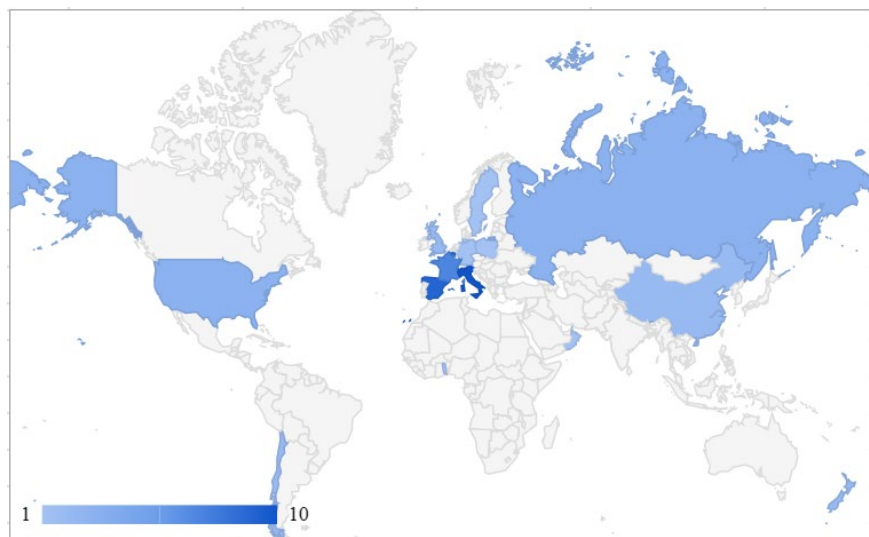


Figure 1. World map marking the 14 countries (5 continents) hosting Dr. Parra-Rivas's collaborators

5.SUPERVISION AND MONITORING

Edem Kossi Akakpo, PhD Student, Dynamique des structures dissipatives dans les cavités optiques non linéaires, Université libre de Bruxelles, Ongoing

- E. K. Akakpo, M. Haelterman, F. Leo, **P. Parra-Rivas**, *Emergence of collapsed snaking related dark and bright Kerr dissipative solitons with quartic-quadratic dispersion*, Phys. Rev. E, **108**, 014203 (2023).
<https://doi.org/10.1103/PhysRevE.108.014203>

Jesús Yelo-Sarrión, PhD Student, Couple nonlinear optical fibre cavities, Université libre de Bruxelles, Ongoing

- J. Yelo-Sarrión, **P. Parra-Rivas**, N. Englebert, C. Mas Arabí, F. Leo, and Simon-Pierre Gorza, *Self-pulsing in driven-dissipative photonic Bose-Hubbard dimers*, Phys. Rev. Research **3**, L042031 (2021).
<https://doi.org/10.1103/PhysRevResearch.3.L042031>
- J. Yelo-Sarrión, F. Leo, S.-P. Gorza, and **P. Parra-Rivas**, *Self-pulsing and chaos in the asymmetrically driven dissipative photonic Bose-Hubbard dimer: A bifurcation analysis*, Chaos **32**, 083103 (2022).
<https://doi.org/10.1063/5.0088597>
- J. Yelo-Sarrión, F. Leo, S.-P. Gorza, and **P. Parra-Rivas**, *Neuronlike spiking dynamics in asymmetrically driven dissipative nonlinear photonic dimers*, Phys. Rev. A **106**, 013512 (2022).
<https://doi.org/10.1103/PhysRevA.106.013512>

6.TEACHING ACTIVITIES

Vrije Universiteit Brussel, Burssels, Belgium

- **Solid state physics and electromagnetism** (2nd year Bachelor in Engineering and Physics), 20 hours, 2013-2014
- **Optical Materials** (Master in Photonics), 15 hours, 2015-2016
- **Quantum Physics** (3rd Bachelor in Engineering), 20 hours, 2015-2016
- **Optical Materials** (Master in Photonics), 15 hours, 2016-2017

Université libre de Bruxelles, Burssels, Belgium

- **Nonlinear optics** (PHYS-H-510), 2nd year master, 10 hours, 2018-2019
- **Nonlinear optics** (PHYS-H-510), 2nd year master, 10 hours, 2019-2020

- **Asymptotic methods for physicist** (PHYS-F427), 2nd year master, 24 hours, 2019-2020
- **Nonlinear optics** (PHYS-H-510), 10 hours, 2020-2021

Università la Sapienza di Roma, Rome, Italy

- **Nonlinear Optics**, Master in Optics and Quantum Information, 20 hours, 2021-2022
- **Nonlinear Optics**, Master in Optics and Quantum Information, 20 hours, 2022-2023
- **Nonlinear Optics**, PhD course, 20 hours, 2021-2022

7. FELLOWSHIPS AND RESEARCH PROJECTS

1. **Nonlinear spatiotemporal light bullets: origin and stability (NOSTER).**
Marie Skłodowska Curie Actions, European Commission.
Grant number: 101023717 (171 473,28 €).
Pedro Parra-Rivas (Individual Fellowship). Università La Sapienza di Roma.
01/11/2021-31/10/2023.
<https://cordis.europa.eu/project/id/101023717>
2. **Dynamiques des structures dissipatives et peignes de fréquences dans les cavités non-linéaires quadratiques dispersives.**
Fonds de la Recherche Scientifique (FNRS), Belgium.
Grant number : 1233318F.
Pedro Parra-Rivas (Personal Fellowship). Université libre de Bruxelles.
01/10/2018-31/10/2021
<https://app.dimensions.ai/details/grant/grant.8950040>
3. **Quadratic dispersive resonators for optical frequency combs (QUADRACOMB).**
European Research Council (ERC) starting grant. Horizon 2020, European Commission.
Grant number: 757800 (1.580.000 €).
François Leo. Université libre de Bruxelles. **Pedro Parra-Rivas**: Member of the team in charge of the theoretical work package WP1 and supervision/training of other researchers.
01/01/2018-31/12/2022
<https://cordis.europa.eu/project/id/757800>
4. **Dynamica van dissipatieve gelokaliseerde structuren in niet-lineaire optische caviteiten.**
Research Foundation Flanders (FWO), Belgium.
Grant number: 11O8416N.
Pedro Parra-Rivas (Personal Fellowship). Vrije Universiteit Brussel.
01/10/2015-30/09/2017.
<https://app.dimensions.ai/details/grant/grant.8503102>
5. **Dynamica van dissipatieve gelokaliseerde structuren in niet-lineaire optische caviteiten.**
Research Foundation Flanders (FWO), Belgium.
Grant number: 11O8414N.
Pedro Parra-Rivas (Personal Fellowship). Vrije Universiteit Brussel.
01/10/2013-30/09/2015
<https://app.dimensions.ai/details/grant/grant.8503101>

8. PUBLICATIONS

Remarks: According to Google Scholar I have more than 1091 citations, and an h-factor of 17 in Google Scholar.

8.1. INTERNATIONAL PEER-REVIEW JOURNALS

1. M. Ferraro, F. Mangini, M. Zitelli, R. Jauberteau, Y. Sun, **P. Parra-Rivas**, K. Krupa, A. Tonello, V. Couderc, S. Wabnitz, *Spatial Beam Cleaning in Multimode GRIN Fibers: Polarization Effects*, IEEE Photonics Journal, **15**, 5,1-6, 3000906 (2023). [Link](#)
2. Y. Sun, **P. Parra-Rivas**, M. Ferraro, F. Mangini, S. Wabnitz, *Dynamics of dissipative structures in coherently-driven Kerr cavities with a parabolic potential*, Chaos, Solitons & Fractals **176**, 114064 (2023) [Link](#)
3. **P. Parra-Rivas**, *Dissipative solitons characterization in singly resonant optical parametric oscillators: a variational formalism*, Optics Communications, **548**, 129820 (2023). [Link](#)
4. Y. Sun, S. Wabnitz, **P. Parra-Rivas**, *Multimode resonance transition to collapsed snaking in normal dispersion Kerr resonators: Bright versus dark solitons*, Optics Letters, **48** (20), 5403-5406 (2023). [Link](#)
5. Y. Sun, **P. Parra-Rivas**, C. Milian, Y. V. Kartashov, M. Ferraro, F. Mangini, M. Zitelli, R. Jauberteau, F. R. Talenti, S. Wabnitz, *Robust three-dimensional high-order solitons and breathers in driven dissipative systems: a Kerr cavity realization*, Physical Review Letters **131**, 137201 (2023) [Link](#)
6. E. K. Akakpo, M. Haelterman, F. Leo, **P. Parra-Rivas**, *Emergence of collapsed snaking related dark and bright Kerr dissipative solitons with quartic-quadratic dispersion*, Phys. Rev. E, **108**, 014203 (2023). [Link](#)
7. **P. Parra-Rivas**, Y. Sun, S. Wabnitz, (Invited) *Spatiotemporal soliton stability in multimode fibers: A Hamiltonian approach*, Optik, **287**, 171079 (2023). [Link](#)
8. F. Mangini, M. Ferraro, Y. Sun, M. Gervaziev, **P. Parra-Rivas**, D. S Kharenko, V. Couderc, S. Wabnitz, *Modal phase-locking in multimode nonlinear optical fibers*, Optics Letter, **48**, 3677-3680 (2023). [Link](#)
9. **P. Parra-Rivas**, Y. Sun, S. Wabnitz, *Dynamics of three-dimensional spatiotemporal solitons in multimode waveguides*, Optics Communication, **546**, 129749 (2023). [Link](#)
10. F. R. Talenti, Y. Sun, **P. Parra-Rivas**, T. Hansson, S. Wabnitz, *Control and stabilization of Kerr cavity solitons and breathers driven by chirped optical pulses*, Optics Communications **546**, 129773 (2023). [Link](#)
11. **P. Parra-Rivas**, A. R. Champneys, F. Al-Sahadi, D. Gomila, E. Knobloch, *Organization of spatially localized structures near a codimension-three cusp-Turing bifurcation*, SIAM Journal on Applied Dynamical Systems, **22**, 410.1137/22M1514234 (2023). [Link](#)
12. F. Al Saadi and **P. Parra-Rivas**, *Transitions between dissipative localized structures in the simplified Gilad-Meron model for dryland plant ecology*, Chaos **33**, 033129 (2023). [Link](#)
13. T. Hansson, **P. Parra-Rivas**, S. Wabnitz, *Modeling of dual frequency combs and bistable solitons in third-harmonic generation*, Communication Physics **6**, 59 (2023). [Link](#)
14. C. Mas Arabi, N. Englebert, **P. Parra-Rivas**, S.-P. Gorza, F. Leo, *Depletion-limited Kerr solitons in singly-resonant optical parametric oscillators*, Optics Letters **48**, 7, 1950-1953 (2023). [Link](#)
15. **P. Parra-Rivas**, D. Ruiz-Reynés, L. Gelens, *Cell cycle oscillations driven by two interlinked bistable switches*, Molecular Biology of the Cell, mbc.E22-11-0527 (2023). [Link](#)
16. M. Zitelli, V. Couderc, M. Ferraro, F. Mangini, **P. Parra-Rivas**, Y. Sun, and S. Wabnitz, *Spatiotemporal mode decomposition of ultrashort pulses in linear and nonlinear graded-index multimode fibers*, Photonics Research **11** (5), 750-756 (2023). [Link](#)
17. Y. Sun, **P. Parra-Rivas**, M. Ferraro, F. Mangini, M. Zitelli, R. Jauberteau, F. R. Talenti, S. Wabnitz, *Dissipative Kerr solitons, breathers, and chimera states in coherently driven passive cavities with parabolic potential*, Optics Letters, **47**, 6353-6356 (2022). [Link](#)
18. D. Gomila, **P. Parra-Rivas**, P. Colet, A. Coillet, G. Lin, T. Daugey, S. Diallo, J.-M. Merolla, and Y. K. Chembo, *Role of Eckhaus instability and pattern cracking in ultraslow dynamics of Kerr combs*, Physical Review A **106**, 053518 (2022). [Link](#)
19. J. Yelo-Sarrión, F. Leo, S.-P. Gorza, and **P. Parra-Rivas**, *Self-pulsing and chaos in the asymmetrically driven dissipative photonic Bose-Hubbard dimer: A bifurcation analysis*, Chaos **32**, 083103 (2022). [Link](#)
20. J. Yelo-Sarrión, F. Leo, S.-P. Gorza, and **P. Parra-Rivas**, *Neuronlike spiking dynamics in asymmetrically driven dissipative nonlinear photonic dimers*, Physical Review A **106**, 013512 (2022). [Link](#)
21. Y. Sun, M. Zitelli, M. Ferraro, F. Mangini, **P. Parra-Rivas**, S. Wabnitz, *Multimode soliton collisions in graded-index optical fibers*, Optics Express, **30**, 21710-21724 (2022). [Link](#)
22. **P. Parra-Rivas**, S. Hetzel, Y. V. Kartashov, P. Fernández de Córdoba, J. A. Conejero, A. Aceves, and C. Milián, *Quartic Kerr cavity combs: bright and dark solitons*, Optics Letters, **47**, 2438-2441 (2022). [Link](#)
23. **P. Parra-Rivas**, C. Mas Arabi, and F. Leo, *Dissipative localized states and breathers in phase-mismatched singly resonant optical parametric oscillators: Bifurcation structure and stability*, Physical Review Research, **4**, 013044 (2022). [Link](#)

24. **P. Parra-Rivas**, C. Mas Arabí, and F. Leo, *Dark quadratic localized states and collapsed snaking in doubly resonant dispersive cavity-enhanced second-harmonic generation*, Physical Review A, **104**, 063502 (2021). [Link](#)
25. J. Yelo-Sarrión, **P. Parra-Rivas**, N. Englebert, C. Mas Arabí, F. Leo, and Simon-Pierre Gorza, *Self-pulsing in driven-dissipative photonic Bose-Hubbard dimers*, Physical Review Research **3**, L042031 (2021). [Link](#)
26. N. Englebert, F. De Lucia, **P. Parra-Rivas**, C. Mas Arabí, P.-J. Sazio, S.-P. Gorza and F. Leo, *Parametrically driven Kerr cavity solitons*, Nature Photonics, **15**, 857-861 (2021). [Link](#)
27. **P. Parra-Rivas**, E. Knobloch, L. Gelens, D. Gomila, *Origin, bifurcation structure and stability of localized states in Kerr dispersive optical cavities*, IMA Journal of Applied Mathematics **86**, 856-895 (2021). [Link](#)
28. N. Englebert, C. Mas Arabí, **P. Parra-Rivas**, S.-P. Gorza and F. Leo, *Temporal solitons in a coherently driven active resonator*, Nature Photonics, **15**, 536-541 (2021). [Link](#)
29. **P. Parra-Rivas**, S. Coulibaly, M. G. Clerc, and M. Tlidi, *Influence of stimulated Raman scattering on Kerr domain walls and localized structures*, Physical Review A **103**, 013507 (2021). [Link](#)
30. C. Mas-Arabí, **P. Parra-Rivas**, T. Hansson, L. Gelens, S. Wabnitz, and F. Leo, *Localized structures formed through domain wall locking in cavity-enhanced second-harmonic generation*, Optics Letters, **45**, 5856-5859 (2020) [Link](#)
31. M. G. Clerc, S. Coulibaly, **P. Parra-Rivas**, and M. Tlidi, *Nonlocal Raman response in Kerr resonators: moving temporal localized structures and bifurcation structure*, Chaos **30**, 083111 (2020). [Link](#)
32. **P. Parra-Rivas**, C Mas-Arabí, and F Leo, *Parametric localized patterns and breathers in dispersive quadratic cavities*, Phys. Rev. A, **101**, 063817 (2020). [Link](#)
33. **P. Parra-Rivas** and C. Fernandez-Oto, *Formation of localized states in dryland vegetation: Bifurcation structure and stability*, Physical Review E **101**, 052214 (2020). [Link](#)
34. C. Mas-Arabí, **P. Parra-Rivas**, C. Ciret, S. P. Gorza, and F. Leo, *Modeling of quasi-phase-matched cavity-enhanced second-harmonic generation*, Physical Review A **101**, 043818 (2020). [Link](#)
35. **P. Parra-Rivas**, L. Gelens, and F. Leo, *Localized structures in dispersive and doubly resonant optical parametric oscillators*, Physical Review E **100** (3), 032219 (2019). [Link](#)
36. **P. Parra-Rivas**, L. Gelens, T. Hansson, S. Wabnitz, and F. Leo, *Frequency comb generation through the locking of domain walls in doubly resonant dispersive optical parametric oscillators*, Optics Letters **44** (8), 2004-2007 (2019). [Link](#)
37. T. Hansson, **P. Parra-Rivas**, M. Bernard, F. Leo, and L. Gelens, S. Wabnitz, *Quadratic soliton combs in doubly resonant second-harmonic generation*, Optics letters, **43** (24), 6033-6036 (2018). [Link](#)
38. **P. Parra-Rivas**, D. Gomila, L. Gelens, and E. Knobloch, *Bifurcation structure of periodic patterns in the Lugiato-Lefever equation with anomalous dispersion*, Physical Review E **98**, 042212 (2018). [Link](#)
39. **P. Parra-Rivas**, D. Gomila, L. Gelens, and E. Knobloch, *Bifurcation structure of localized states in the Lugiato-Lefever equation with anomalous dispersion*, Physical Review E **97**, 042204 (2018). [Link](#)
40. **P. Parra-Rivas**, D. Gomila, P. Colet, and L. Gelens, *Interaction of solitons and the formation of bound states in the generalized Lugiato-Lefever equation*, European Physics Journal D, **71**, 198 (1-13) (2017). [Link](#)
41. **P. Parra-Rivas**, D. Gomila, and L. Gelens, *Coexistence of stable dark- and bright-soliton Kerr combs in normal-dispersion resonators*, Physical Review A **95**, 053863 (2017). [Link](#)
42. **P. Parra-Rivas**, M. A. Matías, P. Colet, L. Gelens, D. Walgraef and D. Gomila, *Front interaction induces excitable behavior*, Physical Review E **95**, 020201(R) (1-4) (2017). [Link](#)
43. **P. Parra-Rivas**, D. Gomila, E. Knobloch, S. Coen, and L. Gelens, *Origin and stability of dark pulse Kerr combs in normal dispersion resonators*, Op. Lett. **41**, 2402-2405 (2016) [Link](#)
44. **P. Parra-Rivas**, D. Gomila, E. Knobloch, and L. Gelens, *Dark solitons in the Lugiato-Lefever equation with normal dispersion*, Physical Review A **93**, 063839 (1-17) (2016). [Link](#)
45. **P. Parra-Rivas**, D. Gomila, M. A. Matías, P. Colet, and L. Gelens, *Competition between drift and spatial defects leads to oscillatory and excitable dynamics of dissipative solitons*, Physical Review E **93**, 012211 (1-17) (2016). [Link](#)
46. **P. Parra-Rivas**, D. Gomila, M. A. Matías, P. Colet, and L. Gelens, *Effects of inhomogeneities and drift on the dynamics of temporal solitons in fiber cavities and microresonators*, Optics Express **22**, 30943-30954 (2014). [Link](#)
47. **P. Parra-Rivas**, D. Gomila, F. Leo, S. Coen, and L. Gelens, *Third-order chromatic dispersion stabilizes Kerr frequency combs*, Optics Letters **39**, 2971-2974 (2014). [Link](#)
48. **P. Parra-Rivas**, D. Gomila, M. A. Matías, S. Coen, and L. Gelens, *Dynamics of localized and patterned structures in the Lugiato-Lefever equation determine the stability and shape of optical frequency combs*, Physical Review A **89**, 043813 (1-12) (2014). [Link](#)
49. **P. Parra-Rivas**, D. Gomila, M. A. Matías, and P. Colet, *Dissipative soliton excitability induced by spatial inhomogeneities and drift*, Physical Review Letters **110**, 064103 (1-5) (2013). [Link](#)

8.2. BOOK CHAPTERS

1. M. Ferraro, F. Mangini, Y. Sun, **P. Parra-Rivas**, M. Zitelli, S. Wabnitz, *Complex nonlinear multimode fiber systems*,

2. Y. Sun, **P. Parra-Rivas**, M. Zitelli, F. Mangini, M. Ferraro and S. Wabnitz, *An introduction to guided wave nonlinear ultrafast photonics*, *Advances in Nonlinear Photonics*, Editors: G. Righini, L. Sirleto, Elsevier (2023).
[Advances in Nonlinear Photonics - 1st Edition \(elsevier.com\)](https://doi.org/10.1016/B978-0-323-99444-4)
3. **P. Parra-Rivas**, D. Gomila, L. Gelens, M. A. Matías, and P. Colet, *Dynamics of dissipative solitons in presence of inhomogeneities and drift*, *Nonlinear Optical Cavity Dynamics: From microresonators to fiber Lasers*, Editor: Ph. Grelu, Wiley, 107-128 (2015)
<https://doi.org/10.1002/9783527686476.ch5>

8.3. INTERNATIONAL CONFERENCES PROCEEDINGS AND PAPERS

1. Y. Sun, **P. Parra-Rivas**, C. Milián, Y. V. Kartashov, M. Ferraro, F. Mangini, M. Zitelli, R. Jauberteau, F. R. Talenti, S. Wabnitz, "Spatiotemporal light bullets, breathers, and collapse in coherently driven passive nonlinear cavities with parabolic potentials," *Proc. SPIE 12406, Real-time Measurements, Rogue Phenomena, and Single-Shot Applications VIII*, 1240602 (14 March 2023);
<https://doi.org/10.1117/12.2652173>
2. T. Hansson, **P. Parra-Rivas**, S. Wabnitz, "Bistable solitons in third-harmonic generation frequency combs," *Proc. SPIE 12407, Laser Resonators, Microresonators, and Beam Control XXV*, 1240707 (15 March 2023);
<https://doi.org/10.1117/12.2652243>
3. M. Ferraro, F. Mangini, R. Jauberteau, M. Zitelli, Y. Sun, **P. Parra-Rivas**, K. Krupa, A. Tonello, V. Couderc, and S. Wabnitz "Spatial beam self-cleaning in multimode fibers: the role of light polarization", *Proc. SPIE 12407, Laser Resonators, Microresonators, and Beam Control XXV*, 124070E (15 March 2023);
<https://doi.org/10.1117/12.2652260>
4. Y. Sun, **P. Parra-Rivas**, C. Milián, M. Ferraro, F. Mangini, M. Zitelli, R. Jauberteau, and S. Wabnitz, "Dissipative light bullets in externally driven multimode Kerr cavity with parabolic 3D potential," in *Optica Advanced Photonics Congress 2022*, Technical Digest Series (Optica Publishing Group, 2022), paper NpTh2G.6.
<https://opg.optica.org/abstract.cfm?URI=NP-2022-NpTh2G.6>
5. M. Zitelli, Y. Sun, M. Ferraro, F. Mangini, **P. Parra-Rivas**, and S. Wabnitz, "Walk-off Solitons and Single-mode Spatiotemporal Attractor in Multimode Fibers," in *Optica Advanced Photonics Congress 2022*, Technical Digest Series (Optica Publishing Group, 2022), paper NpTu1F.2.
<https://opg.optica.org/abstract.cfm?URI=NP-2022-NpTu1F.2>
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8.4. PRE-PRINTS

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10. INVITED ORAL CONTRIBUTIONS

Speaker underlined.

1. **Pedro Parra-Rivas**, **Dissipative structures in dispersive cavities: bifurcation structure and stability (Invited oral contribution)**, Workshop in Frequency combs: fundamentals and applications, Brussels (Belgium), 12-13 September 2022. <https://www.frequencycomb.be/>
2. **Y. Sun**, **P. Parra-Rivas**, C. Milián, M. Ferraro, F. Mangini, M. Zitelli, R. Jauberteau, and S. Wabnitz, **Dissipative light bullets in externally driven multimode Kerr cavity with parabolic 3D potential** (Oral contribution), Optica Advanced Photonics Congress, Maastricht (Netherlands), 24–28 July 2022.
<https://doi.org/10.1364/NP.2022.NpTh2G.6>
3. **P. Parra-Rivas**, **Dissipative localized states in dispersive quadratic cavities: Bifurcation structure and stability (Invited oral contribution)**, Minisymposium in Field dynamics in microresonators and active cavities, Roma (Italy), 29 October 2021. <https://mocca.astonphotonics.uk/mini-symposium-on-field-dynamics-in-microresonators-and-active-cavities/>
4. **P. Parra-Rivas**, C. Mas-Arabí, F. Leo, **Dynamics of localized patterns in doubly resonant dispersive optical parametric oscillators** (Oral contribution), Advance Photonics Congress, Online, 23-27 June 2019.
[10.1109/CLEOE-EQEC.2019.8871641](https://doi.org/10.1109/CLEOE-EQEC.2019.8871641)

5. **P. Parra-Rivas**, **Localized structures and frequency combs in dispersive optical parametric oscillators** (Oral contribution), Workshop on Optical Solitons and Frequency Comb Generation (OSC19), Berlin (Germany), 18-20 September 2019. [OSC19 \(wias-berlin.de\)](https://osc19.wias-berlin.de)
6. **P. Parra-Rivas**, D. Gomila, E. Knobloch, S. Coen, and L. Gelens, **Bifurcation structure of localized states in the Lugiato-Lefever equation with anomalous dispersion (Invited oral contribution)**, Kerr frequency combs-from models to experiments and back, Conference in Mathematics of Wave Phenomena, Karlsruhe (Germany), 23-27 July 2018. https://conference18.waves.kit.edu/?page_id=350
7. **L. Gelens**, **P. Parra-Rivas**, D. Gomila, F. Leo, S. Coen, and E. Knobloch, **Localized Structures in Nonlinear Optical Resonators (Invited oral contribution)**. SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah (USA), 24 May 2017. https://meetings.siam.org/sess/dsp_programsess.cfm?SESSIONCODE=61746
8. D. Gomila, **P. Parra-Rivas**, L. Gelens, and E. Knobloch, **Patterns vs. Localized Structures, (Invited oral contribution)**. SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah (USA), 24 May 2017. https://meetings.siam.org/sess/dsp_programsess.cfm?SESSIONCODE=61746
9. **P. Parra-Rivas**, D. Gomila, E. Knobloch, L. Gelens, **S. Coen**, **Origin and stability of dark pulse Kerr frequency combs in normal dispersion microresonators** (Oral contribution), Nonlinear Photonics Conference, Sydney (Australia), 5-8 September 2016. <https://doi.org/10.1364/NP.2016.NM5A.5>
10. **P. Parra-Rivas**, D. Gomila, E. Knobloch, S. Coen, and L. Gelens, **Bright and dark localized structures in the Lugiato-Lefever equation (Invited oral contribution)**, International conference on structural nonlinear dynamics and diagnosis, Marrakech (Marrocco), 23-15 May 2016.

11. RESEARCH EXPEDITIONS

1. Research Group of Prof. A. Champneys, Department of Mathematical Engineering, University of Bristol, UK, 21/10/2019-25/10/2019.
2. IFISC (Instituto de Física Interdisciplinar y Sistemas Complejos), Palma de Mallorca, Spain, 27/05/2019-19/06/2019.
3. Research Group of Prof. A. Champneys, Department of Mathematical Engineering, University of Bristol, UK, 19/11/2018-25/11/2018.
4. IFISC (Instituto de Física Interdisciplinar y Sistemas Complejos), Palma de Mallorca, Spain, 01/07/2014-30/09/2016.
5. Research Group of Prof. E. Knobloch, Department of Physics, University of California, Berkeley, USA, 01/10/2014-20/12/2014.
6. IFISC (Instituto de Física Interdisciplinar y Sistemas Complejos), Palma de Mallorca, Spain 01/04/2014-15/09/2014.

12. GRANTS

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