CV at February 2022

Full name: M. Teresa M-Seara Alonso.
Date of birth: 15 July 1961, Ourense, Spain.
Marital status: Married, 3 adult children.
Present Appointment: Full Professor.
Departament: Departament de Matemàtiques
University: Universitat Politècnica de Catalunya (UPC).
ORCID: 0000-0001-8421-8717.
personal WEB page: *https* : *//web.mat.upc.edu/tere.m − seara/*

Academic qualifications

Bachelor inn Mathematics: U. B. 30 june 1984.
Master thesis: U. B. 27 January 1986.
PhD. in Mathematics: U. B. 11 October 1991.

Teaching:

Infinitessimal calculus, Differential equations, Numerical calculus, Dynamical systems, Finite elements.
Master courses: Analyticity and integrability, Introduction to Resurgence Theory, Geometric and algebraic methods in Dynamical Systems, Asymptotic methods in Dynamical Systems, Qualitative and Quantitative methods in Dynamical Systems, Hamiltonian Systems.

Committees and responsibility positions:

President of the "Comité de Selecció i d'Avaluació del Personal Docent i Investigador de la UPC" (CSAPDIU): 2016-2017 (member 2013-2017).
Director of the Departament de Matemàtica Aplicada I (UPC): 2009–2012.
Member of the Research committee of the UPC: 2010–2012.
Member of the Economy committee of the UPC: 2010–2012.
Member of the Consell de Govern of the UPC: 2010–2012.
Treasurer of the Catalan Mathematical Society: 2007–2011.
Member of the Doctorate committee of the UPC: 2007–2009
Coordinator of the Doctorate program of Applied mathematics, UPC: 2004–2007.
Director of the Màster of Applied mathematics, UPC: 2006–2007.
President of the committee for the creation of the Màster of Applied mathematics, UPC: 2004-2005

Research/evaluation Committees:

Member of the scientific Committe of the "premi Ferran Sunyer i Balaguer 2019-2020", Institut d'Estudis Catalans.
President of the Commitee of the "Premio Antonio Valle al Joven investigador", 2018/2019.
Member of the Committee of the "Premio Antonio Valle al Joven investigador", 2017.
Member of the Scientific Committee of the Catalan Mathematical Society: from 2016
Member of the Comité de acreditación de Profesorado de Ciencias Experimentales, Agencia de Calidad del Sistema Universitario Vasco: from 2016.
Coordinator of the Spanish net of Dynamical Systems DANCE (http://www.dance-net.org/): 2014-2018.
Member of the Scientific Committee of the Barcelona Graduate School of Mathematics (BGSMATH): 2013–2016.

Member of the Comisión de acreditación nacional para el acceso al Cuerpo de Catedráticos de Universidad (prog. ACADEMIA, ANECA): 2013–2016.
President of the Committee for the "Premi Evariste Galois" of the Catalan Mathematical Society.
Member of the Comité Asesor de la Comisión Nacional Evaluadora de la Actividad Investigadora (CNEAI) de Matemáticas y Física: 2012–2013.
SIAG-DS Advisory Committee (SIAM, Dynamical Systems): 2012–2013
AGAUR (Agència de Gestió d'Ajuts Universitaris i de Recerca): 2011, 2015.
Proyectos de Investigación de la Dirección General de Investigación y Gestión del Plan Nacional de I+D+i Ministerio de Ciencia e Innovación: 2011, 2017.
ANEP (Agencia Nacional de Evaluación y prospectiva): 2010, 2016.
EPSRC, Research Councils UK: Excellence with Impact: 2007.
The Netherlands Organisation for Scientific Research (NWO): Research grants to stimulate most promising research.

Research

Researcher ID: G-1702-2015 Orcid code: 0000-0001-8421-8717
Some quantitative data:

- **Publications: 73.**
  Publications in refereed journals: 56, among them 45 at 1st. quartile (23 at first decile) in the JCR classification. Other publications: 15.
  Main journals where I have published: Advances in Mathematics, Communications in Matematical Physics, Chaos, Communications in Pure and Applied Mathematics, Discrete and Continuous Dynamical Systems, Ergodic Theory and Dynamical Systems, Inventiones Mathematicae, Journal of Differential Equations, Journal of Dynamics and Differential Equations, Journal of Nonlinear Science, Memoirs of the A.M.S., Nonlinearity, Physica D, Siam Journal of Applied Dynamical Systems.
- **Preprints: 3**
- **Citations: 2057 (Google Scholar), 986 (Scopus)**
- **h index: 24 (Google Scholar), 16 (Scopus)**
- **Invited International seminars: 38**
- **Plenary talks in International Conferences: 40**
- **Invited Advanced International Courses: 12**
- **Supervised Thesis: 9**
- **Current PhD. students: 4**
- **postdocs: 2**
- **Grants as PI: 18**
- **8 cientific committees and 34 organizing committees in International Conferences.**

Awards and Prizes

- Barcelona Dynamical Systems Prize 2015, for the paper:
  Oscillatory motions for the restricted planar circular three body problem.
  M. Guàrdia, P. Martín, T. M. Seara.
  Inventiones Mathematicae. 203, 417-492, 2016. DOI: 10.1007/s00222-015-0591-y, 2015.
- Eisenbud Professorship (Simons Foundation), fall 2018 at MSRI (U. Berkeley).

- Icrea academia award (Generalitat de Catalunya) 2019-2024

Editorial boards

- Siam Journal of Applied Dynamical Systems (SIADS): 2010–2021.
- Nonlinearity.
- SEMA-SIMAI Springer series.
- Nonlinear Differential Equations and Applications (NoDEA).

PhD. Students

- Carme Olivé Farré (Associated Professor at URV, Spain).
  Càlcul de l'escissió de separatrius usant tècniques de matching complex i ressurgència aplicades a l'equació de Hamilton-Jacobi.
  July 10, 2006. UPC
- Marcel Guàrdia Munárriz (ERC Starting grant, Associated Professor at UPC, Spain).
  From non-smooth to analytical Dynamical Systems: low codimension bifurcations and exponentially small splitting of separatrices.
  July 19, 2010. UPC.
- Oswaldo Larreal Barreto (Associated Professor at U. Técnica de Manabí).
  Calculo de la escisión de separatrices y regiones de estabilidad usando multi-precisión: El microtrón y la singularidad Hopf-Zero.
  July 21, 2011. UPC
- Albert Granados Corsellas (Professor d'ensenyament secundari, Spain).
  Local and global phenomena in piece-wise defined systems: from big bang bifurcations to splitting of heteroclinic manifolds.
  September 17, 2012. UPC
- Abraham de la Rosa Ibarra (GeoNumerics, S.L, Spain).
  Global instability in the elliptic restricted three body problem.
  June 16, 2014. UPC
- Oriol Castejón Company (cyberclick, Spain).
  Study of invariant manifolds in two different problems: the Hopf-zero singularity and neural synchrony.
  July 16, 2015. UPC
- Juliana Fernandes Larrosa (Associated Professor at UFSM, Brazil).
  Generic bifurcations in planar Filippov systems.
  November 27, 2015. Universidade estatual de Campinas
- Alberto Perez Cervera
  On the role of oscillatory dynamics in neural communication
  April 4, 2019. Universitat Politècnica de Catalunya
- Otávio Marçal Leandro Gomide
  Sobre Condiçes de Estabilidade para Sistemas de Filippov e Sistemas Hamiltonianos
  July 1, 2019. Univeridade estatual de Campinas

Actual PhD. Students

- Jaime Paradela Díaz.
  Instabilities in Hamiltonian Systems and celestial mechanics
- Roman Moreno Gonzalez
  Arnold diffusion through resonances

- José Lamas Rodriguez
  Collisions in the three body problem
- David Reyner Parra
  On the study of systems with multiple time scales with applications to neuroscience

Post-docs

- Marina Gonchenko. **Juan de la Cierva Incorporación**, 2018-2019.
- Jianlu Zhang. **postdoc at MSRI**, fall 2018

Main publications in the last 10 years

- T. M-Seara, J. Zhang Oscillatory orbits in the restricted planar four body problem. **Nonlinearity** 33(12): 6985–7015, 2020.
  doi:https://doi.org/10.1088/1361-6544/abaf5f
- A. Pérez-Cervera, T. M-Seara, G. Huguet Global phase-amplitude description of oscillatory dynamics via the parameterization method
  Chaos: An Interdisciplinary Journal of Nonlinear Science 2020.
  doi:https://doi.org/10.1063/5.0010149
- Marian Gidea, Rafael de la Llave, Tere M-Seara A general mechanism of instability in Hamiltonian systems: Skipping along a normally hyperbolic invariant manifold
  Discrete and continuous dynamical systems (DCDS) 2020.
  doi: https://doi.org/10.3934/dcds.2020166
- Otavio M. L. Gomide, Marcel Guardia, Tere M-Seara Critical velocity in kink-defect interaction models: rigorous results
  Journal of Differential Equations (JDE) 269(4): 3282–3346, 2020.
  doi:https://doi.org/10.1016/j.jde.2020.02.030
- Marian Gidea, Rafael de la Llave, Tere M-Seara A General Mechanism of Diffusion in Hamiltonian Systems: Qualitative Results
  Communications in Pure and Applied Mathematics (CPAM) 73 (1): 150–209, 2019.
  doi:https://doi.org/10.1002/cpa.21856
- I. Baldomá, S. Ibañez, Tere M-Seara Hopf-Zero singularities truly unfold chaos
  Communications in Nonlinear Science and Numerical Simulation (CNSNS) 2020.
  doi:https://doi.org/10.1016/j.cnsns.2019.105162
- A. Pérez-Cervera, T. M-Seara, G. Huguet A Geometric Approach to Phase Response Curves and Its Numerical Computation Through the Parameterization Method
  Journal of Nonlinear Sience29(6): 2877–2910, 2019.
  doi:https://doi.org/10.1007/s00332-019-09561-4
- A. Delshams, V. Kaloshin, A. de la Rosa, T. M. Seara Global Instability in the Restricted Planar Elliptic Three Body Problem.
  Communication in Mathematical Physics (CMP)366(3):1173-1228, 2019.
  DOI:https://doi.org/10.1007/s00220-018-3248-z
- I. Baldomá, O. Castejón, T. M. Seara Breakdown of a 2D Heteroclinic Connection in the Hopf-Zero Singularity (I)
  Journal of Nonlinear Science (JNLS) 28(5): 1551-1627, 2018.
  DOI:https://doi.org/10.1007/s00332-018-9458-x
- I. Baldomá, O. Castejón, T. M. Seara. Breakdown of a 2D Heteroclinic Connection in the Hopf-Zero Singularity (II)

Journal of Nonlinear Science (JNLS) 28(4): 1489–1549, 2018 DOI:https://doi.org/10.1007/s00332-018-9459-9

- C. Bonet,J. Larrosa, T. M. Seara. A Regularization around a generic codimension one fold-fold singularity
  Journal of Differential Equations (JDE) 265: 1761-1838, 2018. DOI: https://doi.org/10.1016/j.jde.2018.04.047
- C. Bonet, E. Fossas, M. R. Jeffrey, T. M. Seara. A unified approach to explain contrary effects of hysteresis and smoothing in nonsmooth systems.
  Communications in Nonlinear Science and Numerical Simulations (CNSNS) 50: 142–168, 2017. DOI:http://doi.org/10.1016/j.cnsns.2017.02.014
- M. Guardia, P. Martin, T.M. Seara, L. Sabbagh. Oscillatory orbits in the restricted elliptic planar three body problem.
  Discrete and continuous dynamical systems (DCDS) 37 (1): 229–256, 2017. DOI: 10.3934/dcds.2017009.
- M. Aguareles, I. Baldomá, T.M. Seara. On the asymptotic wavenumber of spiral waves in $\lambda - \omega$ systems.
  Nonlinearity 30: 90–114, 2017. DOI:10.1088/1361-6544/30/1/90.
- M. Guardia, P. Martin, T.M. Seara. Oscillatory motions for the restricted planar circular three body problem.
  Inventiones Mathematicae 203 (2): 417–492, 2016. DOI: 10.1007/s00222-015-0591-y.

Paper awarded with the Barcelona Dynamical Systems price 2015

- A. Delshams, R. de la Llave, T.M. Seara. Instability of high dimensional Hamiltonian Systems: Multiple resonances do not impede diffusion.
  Advances of Mathematics 294: 689–755, 2016. DOI:10.1016/j.aim.2015.11.010.
- C. Bonet-Revés, T. M-Seara. Regularization of sliding global bifurcations derived from the local fold singularity of Filippov systems.
  Discrete and continuous dynamical systems (DCDS) 36(7): 3545–3601, 2016. DOI:10.3934/dcds.2016.36.3545.
- A. Granados, S.J. Hogan, T.M. Seara. The scattering map in two coupled piecewise-smooth systems, with numerical application to rocking blocks.
  Phys. D: Nonlinear Phenomena 269: 1–20, 2014. DOI: 10.1016/j.physd.2013.11.008
- M. Guàrdia, T. M. Seara. Exponentially and non-exponentially small splitting of separatrices for the pendulum with a fast meromorphic perturbation.
  Nonlinearity 25: 1367–1412, 2012. DOI:10.1088/0951-7715/25/5/1367
- A. Granados, S.J. Hogan, T.M. Seara. The Melnikov method and subharmonic orbits in a piecewise smooth system.
  SIAM J. App. Dyn. Sys. 11(3): 801–830,2012. DOI:10.1137/110850359
- I. Baldomá, E. Fontich, M. Guàrdia, T. M. Seara. Exponentially small splitting of separatrices beyond Melnikov analysis: rigorous results.
  Journal of Differential Equations (JDE) 253: 3304–3439, 2012. DOI:10.1016/j.jde.2012.09.003
- M. Guardia, T. M. Seara. M. A. Teixeira. Generic bifurcations of low codimension of planar Filippov Systems.
  Journal of Differential Equations (JDE) 250: 1967–2023, 2011. DOI:10.1016/j.jde.2010.11.016
- P. Martín, D. Sauzin, T. M. Seara. Resurgence of inner solutions for perturbations of the McMillan map.
  Discrete and continuous dynamical systems (DCDS) 31(1): 165–207, 2011.
- M. Guardia, S.J. Hogan, T. M. Seara. An analytical approach to codimension-2 sliding bifurcations in the dry friction oscillator.
  SIAM J. App. Dyn. Sys. 9(3): 769–798, 2010. DOI:10.1137/090766826
- M. Guardia, C. Olive, T. M. Seara. Exponentially small splitting for the pendulum: a classical problem revisited.

Journal of Nonlinear Science 20(5): 595–685, 2010 DOI: 10.1007/s00332-010-9068-8

Actual grants

- Dinámica, Atractores y Nolinealidad: Caos y Estabilidad. Red excelencia n° RED2018-102324-T. PI: Joan Torregrosa, Patricia Yanguas. Number of researchers: 209. Amount: 21.000 Euros
- Dinámica Asociada a Conexiones entre Objetos Invariantes con Aplicaciones a la Neurociencia y la Mecánica (DACOBIANEM), PGC2018-098676-B-I00 (AEI/FEDER/UE) PI: Tere M-Seara, Gemma Huguet. Number of researchers: 13. Amount: 164.318,00 Euros.

Scientific and Organizing committees

7 cientific committees and 29 organizing committees in International conferences.

Since 2011:

- Co-Organizer of the summer course: Jornades d'Introducció als Sistemes Dinàmics i les EDP (JISD) since 2002, with 16 editions. $http://www.crm.cat/en/Activities/Curs_2017-2018/Pages/JISD-2018.aspx$
- Co-Organizer of the Internacional seminar: One World Dynamics Seminar, Online siince 2020: $https://sites.google.com/view/oneworlddynamics/home$
- Scientific Committee of the: Colloque International de Dynamique Hamiltonienne, París, France, 7-10 June 2021.
- Scientific Committee of the: CEDYA/CMA 2022, Zaragoza, Spain, 18-22 June 2022.
- Co-organizer of the international workshop: Connections for Women: Hamiltonian Systems, from topology to applications through analysis. MSRI; Berkeley, USA, 16-17 August 2018
- Co-organizer of the Scientific program: Hamiltonian Systems, from Topology ro Applications through Analysis. MSRI; Berkeley, USA, 13th August- 14 December 2018
- Co-organizer of the CIMPA school: Dynamical Systems and Applications: geometrical, topological and numerical aspects. Dangbo, Benin, 1-14 July 2018
- Member of the scientific Commitee of the international workshop: Advances in Nonsmooth Dynamics 2018. Bristol, UK, 13-15 June 2018.
- Co-organizer of the conference: A broad perspective on finite and infinite dimensional Dynamical Systems (FIDDS-17), Barcelona, 2017.
- Co-organizer of the conference: Global Dynamics in hamiltonian Systems (GDHAM), Nuria, Girona, 2015.
- Co-organizer of the Special session: Celestial mechanics, The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Madrid, 2014.
- Co-organizer of the conference: SIAM meeting for the Applications of Dynamical Systems, Snowbird, Utah, 2013.
- Member of the Scientific Commitee of the conference: XXIII CEDYA/XIII CMA, Castellon, 2013.
- Co-organizer of the Sesión de dinámica no lineal, Nolineal 2012, Zaragoza, 2012.
- Co-organizer of the Special session: Global Dynamics in Hamiltonian Systems, the 9th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, USA, July 2012.
- Member of the Scientific Commitee of the conference: Dynamical Systems: 100 years after Poincaré, Gijon, 2012.
- Member of the Scientific Commitee of the workshop: DDAYS, Benicássim, 2012.
- Co-organizer of the courses: Recent Trends in Nonlinear Science, Vilanova i la Geltru, 2011.

- Co-organizer of the Minisymposium: Exponentially small phenomena. EQUADIFF2011, Loughborough, U.K., 2011.
- Member of the Scientific Committee of the International Congress on Industrial and Applied Mathematics (ICIAM2011), Vancouver, 2011.
- Co-organizer of the 15th general meeting of European Women in Mathematics (EWM), Barcelona, 2011.