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**Codice concorso 4390**

## **PAEZ, Rocio Isabel CURRICULUM VITAE**

**INFORMAZIONI PERSONALI (NON INSERIRE INDIRIZZO PRIVATO E TELEFONO FISSO O CELLULARE)**

<b>COGNOME</b>	<b>PAEZ</b>
<b>NOME</b>	<b>ROCIO ISABEL</b>
<b>DATA DI NASCITA</b>	26/11/1985

**INSERIRE IL PROPRIO CURRICULUM  
(non eccedente le 30 pagine)**

Data

10/07/2020

Luogo

Padova

# Rocío Isabel Paez

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## Personal data

**Nationality:** Argentinian  
**Date of birth:** November 26<sup>th</sup>, 1985  
**Birthplace:** Lanús, Buenos Aires, Argentina  
**T.E.:** +39 324 566 5797  
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## Academic data

**Ph.D. in Mathematics** (11/2012 - 02/2016)  
Department of Mathematics, Università di Roma “Tor Vergata”, Roma, Italia. **Ph.D. thesis:** *New normal forms approaches adapted to the Trojan Problem*. Supervisor: Dr. Ugo Locatelli. **Defense date :** 26/02/2016.

**Licenciatura in Astronomy** (03/2005 - 08/2012)  
**(combined bachelor and MSc degree)**  
Facultad de Ciencias Astronómicas y Geofísicas (FCAG), Universidad Nacional de La Plata, La Plata, Argentina. **Master thesis:** *Diffusion studies in symplectic multidimensional mappings*. Supervisor: Prof. Pablo M. Cincotta.

**Specialized high school studies** (2004)  
Science and Technology, Colegio Nacional de Buenos Aires, Buenos Aires, Argentina.

**High school studies** (03/1999-12/2003)  
Colegio Nacional de Buenos Aires, Buenos Aires, Argentina.

## Working experience

### *Research*

**Postdoctoral fellow** (01/07/2019 - 30/06/2021)  
Postdoctoral grant under the project MIUR-PRIN 20178CJA2B “New frontiers of Celestial Mechanics: theory and applications”, at the Department of Mathematics, Università degli Studi di Padova, Padova, Italy. **Subject:** Sviluppo di teorie perturbative e problemi di stabilità in Meccanica Celeste con applicazioni all’astrodinamica, con technique basate sulla costruzione esplicita di forme normali hamiltoniane, teorie di KAM-Nekhoroshev, regolarizzazioni e modelli non-hamiltoniani.

**Postdoctoral fellow** (01/07/2018 - 30/06/2019)  
Postdoctoral grant under the project 677793 - Stable and Chaotic Motions in the Planetary Problem, of the European Research Council (ERC), at the Department of Mathematics, Università degli Studi di Padova, Padova, Italy. **Subject:** Numerical and analytical study of non-trivial orbits in the planetary problem.

**Postdoctoral fellow** (01/08/2016 - 30/06/2018)  
Postdoctoral grant of the Research Committee of the Academy of Athens, at Research Center for Astronomy and Applied Mathematics, Athens, Greece. **Subject:** Nonlinear phenomena in galactic discs - Quantum dynamic systems: chaos and coupling measures.

**Post-Laurea fellow** (01/04/2016 - 30/09/2016)  
Post-Laurea grant at Department of Mathematics, Università di Roma “Tor Vergata”, Roma, Italy. **Subject:** Dynamics of the celestial bodies in the neighborhood of the Lagrangian points.

**Early Stage Researcher (ESR)** (01/11/2012 - 31/10/2015)

Astronet-II Marie Curie Training Network “The AstroDynamics Network” (PITN-GA-2011-289240) at the Department of Mathematics, Università di Roma “Tor Vergata”, Roma, Italy. **Subject:** Modeling of the orbital and rotational dynamics of natural and artificial satellites of the Solar System.

**BENTR11 fellow** (01/10/2011 - 30/09/2012)

BENTR11 grant for advanced university students, Comisión de Investigaciones Científicas (CIC) de la Provincia de Buenos Aires, La Plata, Argentina. **Subject:** Diffusion studies in symplectic multidimensional mappings.

*Teaching*

**Undergraduated teacher assistant**

Department of Physics, Facultad de Ciencias Exactas, Universidad Nacional de La Plata, La Plata, Argentina

*Experimental Physics II course* (2012)

**Undergraduated teacher assistant**

Facultad de Ciencias Astronómicas y Geofísicas, Universidad Nacional de La Plata, La Plata, Argentina.

*Elementary Mathematics course* (2012, 2011, 2009)

**Supervision**

**Dot. Mara Volpi** - Laurea Magistrale in Matematica Pura e Applicata (Master Thesis in Mathematica ) “*Effects of stellar jets on protoplanetary disks: dynamical behavior of a simple model with gravitationally interacting rings*”. Dipartimento di Matematica, Università degli Studi di Roma “Tor Vergata” (Co-supervision with Dr. U. Locatelli, approved May 2015).

**Prizes**

Distinguished Graduate Student of Year 2012 of the ‘Licenciatura en Astronomía’ of Facultad de Ciencias Astronómicas y Geofísicas, Universidad de La Plata, La Plata, Argentina.

‘Joaquín V. Gonzalez’ prize to the Best Averaged Mark for the ‘Licenciatura en Astronomía’ of Facultad de Ciencias Astronómicas y Geofísicas, Universidad de La Plata, La Plata, Argentina (2012).

**Publications**

**Refereed papers in scientific journals**

9 - Páez, R.I., Guzzo, M., (2020) ‘Low-energy close encounters in the Elliptic Restricted Three-body Problem’ (in preparation)

8 - Páez, R.I., Contopoulos, G., (2019) ‘Analytical description of chaos and the asymptotic behavior of chaotic orbits in symplectic mappings’ (submitted to *Communications in Nonlinear Science and Numerical Simulations*).

7 - Páez, R.I., Guzzo, M., (2020) ‘A study of temporary captures and collisions in the Circular Restricted Three-Body Problem with normalizations of the Levi-Civita Hamiltonian’, *International Journal of Non-Linear Mechanics*, **120**, p. 103417.

6 - Guzzo, M., Efthymiopoulos, C., Páez, R.I., (2020) ‘Semi-analytic computations of the speed of Arnold diffusion along single resonances in a priori stable Hamiltonian systems’, *Journal of Nonlinear Science*, **30**, p. 851.

- 5 - Efthymiopoulos, C., Kyziropoulos, P., Páez, R.I., Zouloumi, K., Gravvanis, G., (2019) 'Manifold spirals, disc-halo interactions and the secular evolution in N-body models of barred galaxies', *Monthly Notices of the Royal Astronomical Society*, **484**(2), p. 1487
- 4 - Páez, R.I., Efthymiopoulos, C. (2018) 'Secondary resonances and the boundary of effective stability of Trojan motions', *Celestial Mechanics and Dynamical Astronomy*, **130**, p. 20
- 3 - Páez, R.I., Locatelli, U., Efthymiopoulos, C. (2016), 'New Hamiltonian expansion adapted to the Trojan problem', *Celestial Mechanics and Dynamical Astronomy*, **126**, p. 519
- 2 - Páez, R.I., Locatelli, U. (2015), 'Trojan dynamics well approximated by a new Hamiltonian normal form', *Monthly Notices of the Royal Astronomical Society*, **453**(2), p. 2177
- 1 - Páez, R.I., Efthymiopoulos, C. (2015), 'Trojan resonant dynamics, stability, and chaotic diffusion for parameters relevant to exoplanetary systems', *Celestial Mechanics and Dynamical Astronomy*, **121**, p. 139

#### Refereed papers in conference proceedings

- 7 - Páez, R. I., Locatelli, U., Efthymiopoulos, C. (2016), 'The Trojan problem from a perturbative perspective', *Astrodynamics Network AstroNet-II, Astrophysics and Space Science Proceedings 44*, G. Gómez at J.J. Masdemont, eds., p. 193
- 6 - Bacciotti, F., Locatelli, U., Páez, R.I., Volpi, M. (2015), 'Effects of asymmetric jets on the dynamics of protoplanetary disks: study of a simple model', "*Jets, Disks and the Dawn of the Planets*", *Proceedings of the Second JEDI meeting (Jets and Disks at INAF)*, S. Antonucci, J. Alcalá, C. Codella et B. Nisini, eds., p. 27
- 5 - Páez, R. I., Locatelli, U. (2014), 'Design of maneuvers based on new normal form approximations: the case study of the CPRTBP', *ICNPAA 2014 Proceedings - AIP Conf. Proc.*, **1637**, p. 776
- 4 - Páez, R.I., Efthymiopoulos, C. (2014), 'Modeling Trojan dynamics: diffusion mechanisms through resonances', *Complex Planetary Systems, Proceedings IAU Symp. 310*, Z. Knezevic et A. Lemaître, eds., p. 96
- 3 - Efthymiopoulos, C., Páez, R.I. (2014), 'Modeling resonant trojan motions in planetary systems', *Complex Planetary Systems, Proceedings IAU Symp. 310*, Z. Knezevic et A. Lemaître, eds., p. 70
- 2 - von Essen, C., Miculan, R., Páez, R. I. (2013), 'Orbital parameter refinement and transit timing variation analysis of the hot-Neptune Gliese 436b', *BAAA*, **56**, p. 423
- 1 - von Essen, C., Páez, R. I., Schmitt, J.H.M.M. (2012), 'Búsqueda de exoplanetas: Cuán confiables son las observaciones obtenidas mediante telescopios terrestres?', *BAAA*, **55**, p. 441

#### Research Visits

*Astronomical Institute of the Czech Academy of Sciences*, Prague, Czech Republic (19/11/2018-25/11/2018). Invitation by Dr. Georgios Lukes-Gerakopoulos.

*SAC Stellar Astrophysics Center*, Aarhus University, Aarhus, Denmark (07/12/2016 - 14/12/2016). Invitation by Dr. Carolina von Essen.

*Facultad de Ciencias Astronómicas y Geofísicas, Universidad Nacional de La Plata, La Plata, Argentina (03/10/2016 - 25/11/2016). Invitation by Dr. Octavio Guilera.*

*IEEC Institut d'Estudis Espacials de Catalunya, Barcelona, Spain (26/04/2014 - 08/06/2014). Invitation by Prof. G. Gómez and Prof. J.J. Masdemont.*

## Seminars (12)

*The Levi-Civita Hamiltonian normalization, the analytical construction of large Lyapunov orbits and their manifolds*, I-CELMECH online seminar, May 11<sup>th</sup> 2020. Available at [HTTP://WWW.MAT.UNIMI.IT/I-CELMECH/INDEX.PHP/SEMINARS/](http://www.mat.unimi.it/I-CELMECH/index.php/seminars/)

*Describing Trojan dynamics: resonant structure, stability and long-term diffusion*, Astronomical Institute of the Czech Academy of Sciences, November 23<sup>th</sup> 2018.

*Space mission designs for stable Lagrangian points*, Research Center for Astronomy and Applied Mathematics, Academy of Athens, February 20<sup>th</sup> 2018.

*A fully predictive model for the adiabatic evolution of the actions in Arnold diffusion*, Institute of Nanoscience and Nanotechnology, NCSR Demokritos, Athens, October 4<sup>th</sup> 2017.

*A fully predictive model for the adiabatic evolution of the actions in Arnold diffusion*, Research Center for Astronomy and Applied Mathematics, Academy of Athens, October 3<sup>rd</sup> 2017.

*Resonant dynamics in the Trojan problem*, Research Center for Astronomy and Applied Mathematics, Academy of Athens, January 31<sup>st</sup> 2017.

*Dynamics of resonances in the Trojan problem: applications to extrasolar planetary systems*, Stellar Astrophysics Center, Dept. of Physics and Astronomy, Aarhus University, December 8<sup>th</sup> 2016 (invited).

*New normal forms approaches adapted to the Trojan problem* (Ph.D. Defense), Dip. di Matematica, Univ. di Roma "Tor Vergata", February 26<sup>th</sup> 2016.

*Perturbation Theory for Trojan motions*, Dip. di Matematica, Univ. di Roma "Tor Vergata", 21<sup>th</sup> May 2015.

*Resonant dynamics of Trojan exoplanets*, SIMBa (Seminari Informal de Matemàtiques de Barcelona), Faculty of Mathematics, Univ. of Barcelona, May 26<sup>th</sup> 2014.

*Resonant dynamics of Trojan exoplanets*, Dip. di Matematica, Univ. di Roma "Tor Vergata", March 17<sup>th</sup> 2014.

*Diffusion along resonances in a symplectic mapping*, Dip. di Matematica, Univ. di Roma "Tor Vergata", February 21<sup>st</sup> 2013.

## Participation in Conferences (26)

'I-CELMECH Training School', University of Milano, Milano, Italy. Feb 3-7 2020. **Talk:** *Study of large Lyapunov orbits and temporary captures via the Levi-Civita Hamiltonian normalization.*

'SIAM Conference on Applications of Dynamical Systems (DS19)', Snowbird, Utah, U.S.A. May 19-23 2019. **Talk:** *The speed of Arnold diffusion along single resonances: a predictive semi-analytical approach.*

'Dynamical Systems: from Geometry to Mechanics', University Tor Vergata, Rome, Italy. February 5-8 2019.

'Perspectives in Hamiltonian Systems', Venice, Italy. June 18-22 2018. **Talk:** *Modeling chaotic diffusion along resonances: fastest drift orbits.*

'Stable and chaotic motions in the planetary problem', Osservatorio di Asiago, Asiago, Italy. June 10-15 2018.

CELMEC VII 'The Seventh International Meeting on Celestial Mechanics', San Martino al Cimino, Viterbo, Italy. September 4-8 2017. **Talk:** *Unveiling Nekhoroshev instabilities and chaotic diffusion along resonances.*

9th Alexander von Humboldt Colloquium on Celestial Mechanics, Bad Hofgastein, Salzburg, Austria. March 20-24 2017.

'Computational perturbative methods for Hamiltonian systems - Applications in physics and astronomy', Research Center for Astronomy and Applied Mathematics of the Academy of Athens, Athens, Greece. July 11-13 2016.

'The Dynamics of Complex Systems', Mathematics Research Center, Uni. of Warwick, Coventry, UK. May 18-20 2016. **Poster:** *Precise resonance location in the Trojan problem, by a new asymmetric expansion.*

'Astronet-II International Final Conference', Tossa de Mar, Spain. June 15-19 2015. **Talk:** *Astrodynamics of Trojan asteroids from a perturbative approach.*

'Fourth Astronet-II Training School and Annual Meeting', Politecnico di Milano, Milano, Italy. February 2-6 2015. **Talk:** *Internship experience at IEEC in Barcelona.*

'INDAM-GNFM XXXIX Scuola estiva di Fisica Matematica', Ravello, Italy. September, 15-20 2014.

'Second Stardust Training School', Università degli Studi di Roma "Tor Vergata", Roma, Italy. September 8-12 2014.

'ICNPAA 2014 World Congress: 10th International Conference on Mathematical Problems in Engineering, Aerospace and Sciences', Narvik University College, Narvik, Norway. July 15-18 2014. **Talk:** *Exploring the marginal stability region in the planar circular restricted three-body problem.*

'Complex Planetary Systems IAU Symposium 310', Faculté des Sciences, Université de Namur, Namur, Belgium. July 7-11 2014. **Poster:** *Modeling Trojan dynamics: resonant motions, chaotic diffusion and long term stability.*

'Third Astronet-II Training School and Workshop', Faculty of Physics and Astronomy, University of Zielona Góra, Zielona Góra, Poland. June 23-27 2014. **Talk:** *Moving in the marginal stability region of the tadpole orbits: an approach based on normal forms.*

CELMEC VI 'The Sixth International Meeting on Celestial Mechanics', San Martino al Cimino, Viterbo, Italy. September 2-6 2013. **E-poster:** *Exploring the border of the stability region in the PCR3BP.*

'Planetary Motions, Satellite Dynamics and Spaceship Orbits', Centre de Recherches Mathématiques, Université di Montréal, Montreal, Canada. July 22-26 2013.

Second Astronet-II School 'Advanced Aspects of Spacecraft Control and Mission Design', University of Strathclyde, Glasgow, Scotland, United Kingdom. June 3-7 2013. **Talk:** *Perturbation Theory at Work on Astrodynamics: Dealing with the Planar Restricted 3-Body Problem.*

'Mathematical Models and Methods for Planet Earth', Instituto Nazionale di Alta Matematica (INDAM), Università di Roma "La Sapienza", Roma, Italia. May 27-29 2013.

First Astronet-II School 'Astrodynamics of Natural and Artificial Satellites: from Regular to Chaotic Motions', Università di Roma "Tor Vergata", Roma, Italia. January 14-17 2013. **Talk:** *Introduction to the Network*.

55<sup>a</sup> Reunión Anual de la Asociación Argentina de Astronomía, Mar del Plata, Buenos Aires, Argentina. September 15-19 2012.

'3rd. La Plata International School on Astronomy and Geophysics' (LAPIS2011). "Chaos, diffusion and non-integrability in Hamiltonian Systems - Applications to Astronomy", FCAG, UNLP, Argentina, 11-15 July, 2011.

V Workshop on Planetary Sciences, FCAG, UNLP, Pcia. de Buenos Aires. February 23-26 2010.

52<sup>a</sup> Reunión Anual de la Asociación Argentina de Astronomía, FCAG, UNLP, Argentina. September 21-25 2009

50<sup>a</sup> Reunión Anual de la Asociación Argentina de Astronomía, Malargüe, Mendoza, Argentina. September 15-19 2007.

#### Organization of Conferences

LOC member of the First Astronet-II School "Astrodynamics of Natural and Artificial Satellites: from Regular to Chaotic Motions", Università di Roma "Tor Vergata", Roma, Italia. January 14-17 2013.

LOC member of the 3rd. *La Plata International School on Astronomy and Geophysics* (LAPIS2011). "Chaos, diffusion and non-integrability in Hamiltonian Systems - Applications to Astronomy", La Plata, Argentina. July 11-15 2011.

#### Participation in administration and management committees

**Elected Ordinary Council member** (01/04/2012-31/03/2013)  
Superior Council of the Universidad Nacional de La Plata, La Plata, Argentina.

**Elected Ordinary Council member** (01/04/2010-31/03/2012) - 2 Periods -  
Interpretations, Regulations and Finances Commission, Facultad de Ciencias Astronómicas y Geofísicas, Universidad Nacional de La Plata, La Plata, Argentina.  
Directive Council of the Facultad de Ciencias Astronómicas y Geofísicas Universidad Nacional de La Plata, La Plata, Argentina.

**Elected Substitute Council member** (01/04/2009-31/03/2010)  
Interpretations, Regulations and Finances Commission, Facultad de Ciencias Astronómicas y Geofísicas, Universidad Nacional de La Plata, La Plata, Argentina.  
Honorable Academic Council, Facultad de Ciencias Astronómicas y Geofísicas, Universidad Nacional de La Plata, La Plata, Argentina.

#### Outreach activities

Open public talk "Dynamical Chaos at service of space missions design", presented at Colegio San Pio X, La Plata, Argentina. September 24<sup>th</sup> 2013.

Open public talk "Dynamical Chaos at service of space missions design", presented at FCAG, UNLP, Argentina. September 13<sup>th</sup> 2013.

Participation in the 1er. *Encuentro de Estudiantes de Astronomía*. Facultad de Ciencias Astronómicas y Geofísicas. September 21-23 2011.

Participation in the Scholar Olympic Games on Mathematics *Ñandú*, years 1996, 1997 and 1998.

## **Skills**

### **Languages**

Spanish: native; English: fluent; Italian: advanced; Greek: intermediate.

### **Software and Programming skills**

FORTRAN (advanced); C (intermediate); **Mathematica** symbolic manipulator (advanced); GNUPLOT (advanced);  $\text{\LaTeX}$ (advance); HTML+CSS (intermediate)

Date: 10/07/2020