

Rodrigo G. Schaefer

APPLIED MATHEMATICIAN

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Research interests

Dynamical Systems and Geometry

- I am interested on analytical and numerical study of Hamiltonian Dynamics. I have experience on Arnold Diffusion phenomenon and Celestial Mechanics problems, as N -body problem on manifolds.

Education

Ph.D in Applied Mathematics

UNIVERSITAT POLITÈCNICA DE CATALUNYA

Barcelona, Spain

Sep. 2014 - Jul. 2018

- Title: Global Instability in Hamiltonian Systems
- Supervisor: Amadeu Delshams
- Qualification: Excellent *cum laude* (The highest qualification possible in Spain)

M.S. in Mathematics

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO

Rio de Janeiro, Brazil

Mar. 2012 - May 2014

- Master's thesis: A dinâmica de N corpos sobre superfícies : um exemplo para 2 corpos
- Supervisor: Stefanella Boatto

B.S. in Mathematics

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO

Rio de Janeiro, Brazil

Mar. 2008 - Jan 2012

Work experience

Assistant Professor

ESCOLA DE NOVES TECNOLOGIES INTERACTIVES (ENTI-UB)

Barcelona, Spain

Sep. 2024- current

- Head teacher in "Introducció a la programació" (50h), "Fonaments d'animació de personatges" (40h), "Mecànica" (40h), "Informàtica gràfica" (40h) and lecture of practical sessions in "Matemàtica Discreta" (15h), "Àlgebra Lineal i Geometria" (15h) and "Tecnologia de la programació" (15h)

Assistant Professor (Adjunkt) in Computational Mathematics

UNIwersytet Jagielloński

Krakow, Poland

Nov. 2021- Aug. 2024

- Head teacher in "Theoretical and Numerical Aspects of Celestial Mechanics" (60h) and Lecturer of practical sessions in "Computational Dynamics" (30h), "Geometric theory of Dynamical Systems with computer" (30h)
- Research in Central Configurations and Galactic Dynamics.
- Project Manager.

Master's thesis supervisor

UNIVERSIDAD INTERNACIONAL DE LA RIOJA

La Rioja, Spain

March 2022- Sep.2022

Master Program in Engineering mathematics and computational science

Didactic material author

UNIVERSIDAD INTERNACIONAL DE LA RIOJA

La Rioja, Spain

March 2022- Sep.2022

Preparation of didactic material (textbook and audiovisual content) for Dynamical Systems course.

Postdoctoral Researcher in Mathematics

UPPSALA UNIVERSITET

Uppsala, Sweden

Aug. 2019- Aug. 2021

- Head teacher in "Several Variable Calculus for master's students" (30h) and "Ordinary Differential Equations II" (22.5h) and Lecturer of Practical sessions in "Calculus of Several Variables" (20h).
- Research in Hamiltonian Systems in Arnold Diffusion and Central Configurations.
- Organization of seminars.

Solutions Assistant (Junior Consultant)

EVERIS - AN NTT DATA COMPANY

Consulting in ETL - Extraction, Transformation and Load of data in a database.

Barcelona, Spain

Mar. 2019- Jul. 2019

Temporary lecturer in Applied Mathematics

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO

Teaching in "Differential and Integral Calculus"(90h) and "Linear Algebra"(60h).

Rio de Janeiro, Brazil

Mar. 2014 - Aug. 2014

Teaching assistant

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO

Teaching: Practical sessions in "Linear Algebra"(120h/year).

Rio de Janeiro, Brazil

2009 - 2011

Research stay

Universitat de Girona

DEPARTAMENT D'INFORMÀTICA, MATEMÀTICA APLICADA I ESTADÍSTICA

Girona, Spain

Apr. 2024- Jul. 2024

Centre de Recerca Matemàtica

RESEARCH PROGRAM GEOMETRY AND DYNAMICS IN INTEGRABLE SYSTEMS

Bellaterra, Spain

Jun. 2017- Jul. 2017

Research Group and Networks

Dynamical Systems and Geometry with applications in gravitational dynamics and incompressible fluids

MEMBER

Brazil

2021-current

CAPA (Computer-Aided Proof in Analysis) group

MEMBER

Uppsala

2019 - 2021

Laboratory of Geometry and Dynamical Systems

MEMBER

Barcelona

2017 - 2019

- Group of researchers in Dynamical Systems and Symplectic geometry of Universitat Politècnica de Catalunya

UPC Dynamical Systems Group

MEMBER

Barcelona

2014 - 2018

- Group of researchers in Dynamical Systems of Universitat Politècnica de Catalunya

DANCE-Net

MEMBER

Spain

2016-2018

- Network of Spanish researchers in Dynamical Systems

Grants

Esseen, L and C-G, for mathematical studies fellowship

UPPSALA UNIVERSITET

Uppsala

2019

PhD scholarship

CNPQ - BRAZIL

Barcelona

2014 - 2018

Master's degree FAPERJ - student grade A scholarship

FAPERJ - RIO DE JANEIRO/BRAZIL

Rio de Janeiro

2013 - 2014

- Scholarship which is given to the two best students in the Master program - Dept. of Mathematics.

Master's degree scholarship

CNPQ - BRAZIL

Rio de Janeiro

2012 - 2013

Participation in funded projects

A mathematical study in galaxy's structure

LEADER

- Funded by SciMat (Excellence Initiative - Research University)

Kraków

2021 - 2024

Sistemes dinàmics de la UPC - 2017SGR1049

MEMBER

- Funded by Catalan Science Department / Leading researcher: Tere Martinez-Seara

Barcelona

2017 - 2019

Dinámica Asociada a Conexiones entre Objetos Invariantes con Aplicaciones a Neurociencia y Astrodinámica

MEMBER

- Funded by Ministerio de Economía y Competitividad (Spain) / Leading researcher: Tere Martinez-Seara

Barcelona

2016 - 2018

Sistemes dinàmics de la UPC - 2014SGR504

MEMBER

- Funded by Catalan Science Department / Leading researcher: Tere Martinez-Seara

Barcelona

2015-2016

Dinámica Asociada a Conexiones entre Objetos Invariantes, Aplicaciones a Astrodinámica, Neurociencia y Otros Campos

MEMBER

- Funded by Ministerio de Economía y Competitividad (Spain) / Leading researcher: Amadeu Delshams

Barcelona

2014 - 2015

Student Supervision

Juan Francisco Alférez Muñoz

MASTER IN ENGINEERING MATHEMATIC AND COMPUTATIONAL SCIENCE AT UNIR

Master thesis: The Three-body problem on the plane's intrinsic geometry (in Spanish)

Spain

2022

Montserrat Cabrera Sánchez

MASTER IN ENGINEERING MATHEMATIC AND COMPUTATIONAL SCIENCE AT UNIR

Master thesis: Study of models of an electrical impulse in a neuron (in Spanish)

Spain

2022

Academic services

Regular and Chaotic Dynamics

REFEREE

International School on Dynamical Systems and Applications

CO-ORGANIZER

International Journal of Bifurcation and Chaos

REFEREE

Thematic session in Celestial Mechanics - IV CBJME

CO-ORGANIZER

SIAM Journal on Applied Dynamical Systems

REFEREE

Mathematical Reviews/MathSciNet

REVIEWER

online/Brazil

2021-current

online/Brazil

2020/2021

Other Courses

Advanced Learning Algorithms

DEEPLARNING.AI VIA COURSERA.ORG

online

2024

Supervised Machine Learning: Regression and Classification

DEEPLARNING.AI VIA COURSERA.ORG

online

2024

SQL y PL/SQL

EVERIS

Barcelona

2019

Introduction to Data Science in Python

UNIVERSITY OF MICHIGAN VIA COURSERA.ORG

online

2019

R Programming

JOHNS HOPKINS UNIVERSITY VIA COURSERA.ORG

online

2016

Getting and Cleaning Data

JOHNS HOPKINS UNIVERSITY VIA COURSERA.ORG

online

2016

Introduction to Python

CENTRE DE RECERCA MATEMÀTICA

Barcelona

2015

Skills

Languages: Portuguese (Native fluent) , English (Advanced) , Spanish (Advanced) , Catalan (Advanced)

Programming: Python, LaTeX, R, SQL, C++, C#, GIT, Linux, Unity, OpenGL

Certificate

Favourable Tenure-elegible lecturer report

Issued by AQU Catalunya

Program “Improving didactical competences for academic teachers”

Issued by Jagiellonian University

References

Amadeu Delshams

PROFESSOR AT UNIVERSITAT POLITÈCNICA DE CATALUNYA

amadeu.delshams@upc.edu

Stefanella Boatto

ASSOCIATE PROFESSOR AT UNIVERSIDADE FEDERAL DO RIO DE JANEIRO

stefanella.boatto@matematica.ufrj.br

Publications

Arnold Diffusion for a Hamiltonian system with $3+1/2$ degrees of freedom

2024

DELSHAMS, A., GRANADOS, A. AND SCHAEFER, R.G.

- Chaos

Arnold diffusion for a complete family of perturbations with two independent harmonics

2018

DELSHAMS, A. AND SCHAEFER, R.G.

- Discrete and Continuous Dynamical Systems - A

Arnold diffusion for a complete family of perturbations

2017

DELSHAMS, A. AND SCHAEFER, R.G.

- Regular and Chaotic Dynamics

N-body dynamics on closed surfaces: the axioms of mechanics

2016

BOATTO, S., DRITSCHEL, D.G. AND SCHAEFER, R.G.

- Proceedings of the Royal Society of London A: Mathematical, Physical and Engineering Science

Preprint

No infinite spin for partial collisions converging to isolated CC on the plane

Submitted

GIERZKIEWICZ, A., SCHAEFER, R.G. AND ZGLICZYŃSKI, P.

INVITED TALKS

KTH Dynamical Systems seminar

ARNOLD DIFFUSION FOR A HAMILTONIAN WITH $3 + 1/2$ DEGREES OF FREEDOM

Stockholm, Sweden

2021

Congreso Bienal de la Real Sociedad Matemática Española

ARNOLD DIFFUSION FOR A HAMILTONIAN WITH $3 + 1/2$ DEGREES OF FREEDOM

Santander, Spain

2019

Geometry, Dynamics, Integrable Systems

SCATTERING MAPS AND GLOBAL INSTABILITY IN HAMILTONIAN SYSTEMS

Moscow, Russia

2018

IV Congreso de Jóvenes Investigadores-Real Sociedad Matemática Española

GLOBAL INSTABILITY IN HAMILTONIAN SYSTEMS

Valencia, Spain

2017

JuniorGesta

GLOBAL INSTABILITY IN HAMILTONIAN SYSTEMS

Barcelona, Spain

2016

INVITED COURSES

Arnold Diffusion and applications

ORGANIZED BY UNIVERSIDAD DEL BÍO-BÍO - 4H

online / Chile

2020

OTHER PRESENTATIONS

XXII Jornadas de Trabajo en Mecánica Celeste

NO INFINITE SPIN FOR PARTIAL COLLISIONS CONVERGING TO ISOLATED CC ON THE PLANE

Girona, Catalonia

2024

Seminário de Sistemas Dinâmicos/UFF

ARNOLD DIFFUSION VIA SCATTERING MAPS: A GEOMETRICAL MECHANISM TO DETECT GLOBAL INSTABILITY

Niterói, Brazil

2023

XII Workshop in Dynamical Systems

ARNOLD DIFFUSION VIA SCATTERING MAPS: A GEOMETRICAL MECHANISM TO DETECT GLOBAL INSTABILITY (POSTER)

São José do Rio Preto, Brazil

2023

Spanish+Polish Mathematical Meeting

ARNOLD DIFFUSION VIA SCATTERING MAPS: A GEOMETRICAL MECHANISM TO DETECT GLOBAL INSTABILITY

Lodz, Poland

2023

Dynamics, Topology and Computations

ARNOLD DIFFUSION FOR A HAMILTONIAN WITH $3 + 1/2$ DEGREES OF FREEDOM

Bedlewo, Poland

2022

Celestial Mechanics and Beyond

SCATTERING MAPS AND GLOBAL INSTABILITY IN HAMILTONIAN SYSTEMS

Puebla, Mexico

2020

I-CELMECH training school

ARNOLD DIFFUSION FOR A HAMILTONIAN WITH $3 + 1/2$ DEGREES OF FREEDOM

Milan, Italy

2020

DDAYS 2018

GLOBAL INSTABILITY IN HAMILTONIAN SYSTEMS

Murcia, Spain

2018

Hamsys2018

GLOBAL INSTABILITY FOR 'COMPLETE' FAMILIES OF PERTURBATIONS WITH TWO OR THREE INDEPENDENT HARMONICS

Bellaterra, Spain

2018

Satellite Dynamics and Space Missions: Theory and Applications of Celestial Mechanics

ARNOLD DIFFUSION FOR SEVERAL EXAMPLES USING SCATTERING MAPS (POSTER)

San Martino al Cimino, Italy

2017

Llavefest: A Broad Perspective on Finite and Infinite Dimensional Dynamical Systems

ARNOLD DIFFUSION FOR SEVERAL EXAMPLES USING SCATTERING MAPS (POSTER)

Barcelona, Spain

2017

14th Winter School of the Spanish Dance Network

ARNOLD DIFFUSION FOR SEVERAL EXAMPLES USING SCATTERING MAP (POSTER)

Vigo, Spain

2017

Barcelona UB-UPC DSG Seminar

GLOBAL INSTABILITY IN HAMILTONIAN SYSTEMS AND SEVERAL SCATTERING MAPS

Barcelona, Spain

2016

13th Winter School of the Spanish Dance Network

ARNOLD DIFFUSION USING SEVERAL COMBINATIONS OF SCATTERING MAPS (POSTER)

Seville, Spain

2016

14th Workshop on interactions between Dynamical Systems and PDE's

ARNOLD DIFFUSION USING SEVERAL COMBINATIONS OF SCATTERING MAPS (POSTER)

Barcelona, Spain

2016

II BGSMath Junior Meeting

GLOBAL INSTABILITY IN HAMILTONIAN SYSTEMS

Barcelona, Spain

2016

CNMAC - Congresso Nacional de Matemática Aplicada e Computacional

PROPAGAÇÃO DE UM IMPULSO ELÉTRICO EM UM AXÔNIO NERVOSO (POSTER)

Águas de Lindóia, Brazil

2012