QUALITATIVE THEORY AND NON-DEGENERATE AND DEGENERATE BIFURCATIONS IN n-DIMENSIONAL DYNAMICAL SYSTEMS

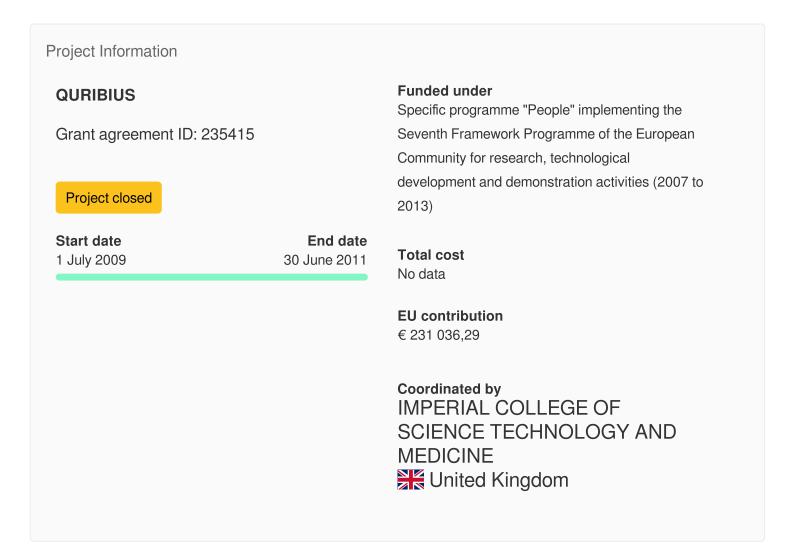


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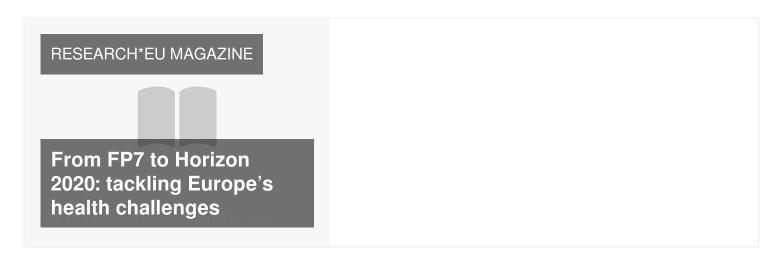


# QUALITATIVE THEORY AND NON-DEGENERATE AND DEGENERATE BIFURCATIONS IN n-DIMENSIONAL DYNAMICAL SYSTEMS

### **Fact Sheet**



# This project is featured in...



# **Objective**

Dynamical systems theory contains important tools in investigating various theoretical and practical models generated by systems of differential equations. Such models may be found in a lot of areas, ranging from Mathematics, Engineering to Medicine and Psychiatry. In this project we address some unexplored themes in this field. We will study degenerate codimension-2 bifurcations in n-dimensional dynamical systems. Of these bifurcations we will focus on the fold-Hopf degenerate bifurcation, firstly in three dimensional nonlinear continuous dynamical systems and then we will generalize it for n-dimensional dynamical systems. In discrete dynamical systems, an analogous of the continuous fold-Hopf bifurcation will also be addressed. The existence and number of limit cycles in two-dimensional (polynomial, Hamiltonian, perturbed Hamiltonian) continuous and discontinuous differential systems is another objective of this project. Using Melnikov functions of any order we will give new insights on the existence and number of limit cycles in these systems. Finally, we are interested in investigating some practical models.

### Fields of science (EuroSciVoc) (1)

<u>natural sciences</u> > <u>mathematics</u> > <u>pure mathematics</u> > <u>mathematical analysis</u> > <u>differential equations</u>

<u>natural sciences</u> > <u>mathematics</u> > <u>applied mathematics</u> > <u>dynamical systems</u>



## Keywords

<u>Attractors</u> <u>Bifurcations</u> <u>Chaos theory</u> <u>Differential equations</u>

Dynamical systems theory

Limit cycles

### Programme(s)

<u>FP7-PEOPLE - Specific programme "People" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)</u>

# Topic(s)

FP7-PEOPLE-IEF-2008 - Marie Curie Action: "Intra-European Fellowships for Career Development"

### Call for proposal

FP7-PEOPLE-IEF-2008
See other projects for this call

# **Funding Scheme**

MC-IEF - Intra-European Fellowships (IEF)

#### Coordinator



#### IMPERIAL COLLEGE OF SCIENCE TECHNOLOGY AND MEDICINE

EU contribution

€ 231 036,29

Total cost

No data

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Region

London > Inner London — West > Westminster

Activity type

**Higher or Secondary Education Establishments** 

Links

Contact the organisation Website Participation in EU R&I programmes

#### HORIZON collaboration network

Last update: 15 July 2019

**Permalink:** https://cordis.europa.eu/project/id/235415

European Union, 2025