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## 专任教师 Faculty

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教授

**高发宝**

副教授

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高发宝, 博士, 副教授, 扬州大学数学科学学院

个人主页 (实时更新) : <http://www.gaofabao.com/research>

一、主要研究方向/ Research Interests

- 非线性动力学/ Nonlinear dynamics

➤ Horava-Lifshitz宇宙模型的全局动力学/ Global dynamics of Horava-Lifshitz cosmological model

➤ 三体问题/ three-body problem

● 木星和土星卫星的分布规律/ Distribution of Jupiter and Saturn's moons

● 微分方程及其应用/ Differential equations and their applications

## 二、教育背景/ Educations

● 2012年6月, 获工学博士学位, 北京工业大学机械工程与应用电子技术学院工程力学专业。导师: 张伟教授

June 2012, Ph.D. in Engineering Mechanics, Beijing University of Technology, China. Advisor: Prof. Wei Zhang

● 2008年7月, 获理学硕士学位, 安徽师范大学数学计算机科学学院应用数学专业。导师: 鲁世平教授

July 2008, M.S. in Applied Mathematics, Anhui Normal University, China. Advisor: Prof. Shiping Lu

● 2005年7月, 获理学学士学位, 安徽师范大学数学与应用数学专业。

July 2005, B.S. in Mathematics & Applied Mathematics, Anhui Normal University, China

## 三、工作经历/ Work Experiences

● 2016年09月~至今, 扬州大学, 数学科学学院, 副教授

From 09/2016 to now, Associate Professor, School of Mathematical Science, Yangzhou University, China

● 2019年02月~2020年08月, 客座研究员, 西班牙巴塞罗那自治大学, 数学研究中心。合作学者: Prof. J. Llibre

From 02/2019 to 08/2020, Investigador Invitado Vinculado, Departament de Matemàtiques, Universitat Autònoma de Barcelona, Spain. Host: Prof. J. Llibre

● 2018年01月~2018年02月, 研究助理, 香港理工大学, 土木及环境工程学系。合作学者: Dr. S.K. Lai

From 01/2018 to 02/2018, Research Associate, Department of Civil and Environmental Engineering, The Hong Kong Polytechnic University, Hong Kong. Host: Dr. S.K.

Lai

● 2017年01月~2017年02月, 研究助理, 香港理工大学, 土木及环境工程学系。合作学者: Dr. S.K. Lai

From 01/2017 to 02/2017, Research Associate, Department of Civil and Environmental Engineering, The Hong Kong Polytechnic University, Hong Kong. Host: Dr. S.K.

Lai

● 2014年8月~2015年3月, 访问学者, 美国弗吉尼亚理工大学, 工程科学和力学系。合作学者: Shane Ross

From 08/2014 to 03/2015, Visiting Scholar, Department of Engineering Science and Mechanics, Virginia Tech, USA. Host: Prof. Shane Ross

● 2012年11月~2016年8月, 扬州大学, 数学科学学院, 讲师。

From 11/2012 to 08/2016, Lecturer, School of Mathematical Science, Yangzhou University, China

#### 四、目前主讲课程/ Courses Teaching

- 常微分方程/ Ordinary Differential Equations
- 概率论与数理统计/ Probability Theory and Mathematical Statistics
- 非线性动力学/ Nonlinear Dynamics

#### 五、发表论文/ Publications

##### 1. 期刊论文/ Journal Papers

- Periodic orbits of the two fixed centers problem with a variational gravitational field, *Celestial Mechanics and Dynamical Astronomy*, Accepted, (2020), F.B. Gao\* and J. Llibre.
- Revisiting the distributions of Jupiter's irregular moons: II. orbital characteristics, *Bulgarian Astronomical Journal*, Accepted, (2020), F.B. Gao\* and X. Liu.
- Revisiting the distributions of Jupiter's irregular moons: I. physical characteristics, *Bulgarian Astronomical Journal*, Accepted, (2020), F.B. Gao\* and X. Liu.
- Bifurcation analysis and periodic solutions of the HD 191408 system with triaxial and radiative perturbations, *Universe*, 6(2020): 35, F.B. Gao\* and R.F. Wang.
- Global dynamics of Horava-Lifshitz cosmology with non-zero curvature and a wide range of potentials, *European Physical Journal C*, 80(2020): 137, F.B. Gao\* and J. Llibre. (**Nature Index Journal**)
- Bifurcation and chaotic analysis for cable vibration of a cable-stayed bridge, *International Journal of Structural Stability and Dynamics*, 20(2)(2020): 2071004, F.B. Gao\*, R.F. Wang and S.K. Lai.
- Global dynamics of the Horava-Lifshitz cosmological system, *General Relativity and Gravitation*, 51(2019):152. F.B. Gao and J. Llibre\*.
- Analytical analysis of large-amplitude oscillation in triple-well non-natural systems, *Journal of Computational and Nonlinear Dynamics*, 14(9)(2019): 091002, S.K. Lai\*, X. Yang and F.B. Gao.
- Distribution inference for physical and orbital properties of the Jupiter's moons, *Advances in Astronomy*, 2018(2018):1894850. F.B. Gao\*, X.H. Zhu, X. Liu and R.F. Wang.

- Numerical study of the zero velocity surface and transfer trajectory of a circular restricted five-body problem, [Mathematical Problems in Engineering](#), 2018 (2018):7489120. R.F. Wang, F.B. Gao\*.
- Numerical study on the species of transfer orbit in the circular restricted three-body problem, [Astronomy and Astrophysics](#), 6(1)2018: 1-7. Y. Huang, F. Lin, Y.Q. Shen, R.F. Wang, F.B. Gao\*. (in Chinese)
- Study on the distribution law of exam scores of public course “Probability and mathematical statistics” in colleges and universities, [Statistics and Application](#), 6(3) (2017):333-350. J.Y. Li, F.B. Gao\*. (in Chinese)
- Periodic solutions for Liénard type equation with time-variable coefficient, [Advances in Difference Equations](#), 2015(2015):125. F.B. Gao\*, S.P. Lu, M.H. Yao
- A study on periodic solutions for the circular restricted three-body problem, [Astronomical Journal](#), 148(2014):116. F.B. Gao\* and W. Zhang
- A refined asymptotic perturbation method for nonlinear dynamical systems, [Archive of Applied Mechanics](#), 84(2014):591-606. W. Zhang\*, H.L. Hu, Y.H. Qian and F.B. Gao
- Nontrivial periodic solutions of an  $n$ -dimensional differential system and its application, [Abstract and Applied Analysis](#), 2013(2013):140173. F.B. Gao\*
- Periodic solutions and stability of a tethered satellite system, [Mechanics Research Communications](#), 44(2012):24-29. W. Zhang\*, F.B. Gao and M.H. Yao
- Periodic solutions for a  $p$ -Laplacian-like NFDE system, [Journal of the Franklin Institute](#), 348(2011):1020-1034. F.B. Gao and W. Zhang\*
- Periodic solutions for a Rayleigh type  $p$ -Laplacian equation with sign-variable coefficient of nonlinear term, [Applied Mathematics and Computation](#), 216 (2010):2010-2015. F.B. Gao, S.P. Lu and W. Zhang\*
- Periodic solutions for  $n$ -dimensional generalized Liénard type  $p$ -Laplacian functional differential system, [Nonlinear Analysis-Theory Methods & Applications](#), 71(2009):5906-5914. F.B. Gao, W. Zhang\*, S.K. Lai and S.P. Chen
- Existence and uniqueness of periodic solutions for a  $p$ -Laplacian Duffing equation with a deviating argument, [Nonlinear Analysis-Theory Methods & Applications](#), 70(2009):3567-3574. F.B. Gao\*, S.P. Lu and W. Zhang
- Periodic solutions for  $p$ -Laplacian neutral Liénard equation with a sign-variable coefficient, [Journal of the Franklin Institute](#), 346(2009):57-64. F.B. Gao\*, S.P. Lu and W. Zhang
- Periodic solutions for a Rayleigh type equation with a variable coefficient ahead of the nonlinear term, [Nonlinear Analysis-Real World Applications](#), 10 (2009):254-258. F.B. Gao\* and S.P. Lu
- New results on the existence and uniqueness of periodic solutions for Liénard type  $p$ -Laplacian equation, [Journal of the Franklin Institute](#), 345(2008) 374-381. F.B. Gao\* and S.P. Lu
- Existence of periodic solutions for a Liénard type  $p$ -Laplacian differential equation with a deviating argument, [Nonlinear Analysis-Theory Methods & Applications](#), 69(2008):4754-4763. F.B. Gao\* and S.P. Lu

## 2. 会议论文/ Conference Papers

- 高发宝, 刘霞, 木星卫星平均轨道距离及平均半长轴的分布规律, 数学力学物理学高新技术交叉研究进展—[中国交叉科学学会第十七届学术年会](#), 78-81, 内蒙古呼伦贝尔, 2018年8月.
- F.B. Gao, W. Zhang and J.E. Chen, Existence of periodic orbits for the CR3BP under a new frame, [The 23rd International Congress of Theoretical and Applied Mechanics](#), 2012.08.19-24, Beijing, 2012.
- F. B. Gao and W. Zhang, New Results on the existence of periodic orbits in the CR3BP, [MACE'12 Proceedings of the 2012 Third International Conference on Mechanic Automation and Control Engineering](#), pp3590-3593, 2012.
- W. Zhang, F. B. Gao and J. H. Zhang, On the existence of periodic orbits in the CR3BP, [The 2nd International Conference on Mechanic Automation and Control Engineering](#) 9, pp7504-7507, 2011.
- F. B. Gao, W. Zhang and M. H. Yao, Periodicity and stability of tethered satellite systems-part I: circular orbit case, [AIP Conference Proceedings](#) 1233, pp197-202, 2010.

## 六、承担科研项目/ National Natural Science Foundation of China (NSFC) Projects

- 主持国家自然科学基金面上项目(批准号No.11672259): 受摄限制性三体问题轨道的非线性动力学理论研究, 2017.01-2020.12。  
NSFC granted No.11672259, Research on nonlinear dynamics theory of the orbits in perturbed restricted three-body problem, 1/1/2017-12/31/2020, ¥ 700000, Project leader.
- 主持国家自然科学基金青年项目(批准号No.11302187): 深空探测中限制性三体问题的轨道动力学研究, 2014.01-2016.12。  
NSFC granted No.11302187, Study on orbital dynamics of the restricted three-body problem in deep-space exploration, 1/1/2014-12/31/2016, ¥ 280000, Project leader.
- 参与国家自然科学基金青年项目(批准号No.11501494): 传染病病区区域的扩张特征研究, 2016.01-2018.12。  
NSFC granted No.11501494, The study on spreading feature of epidemic area of disease, 1/1/2016-12/31/2018, ¥ 180,000, Co-Principal Investigator.
- 参与国家自然科学基金面上项目(批准号No.11571301): 种群入侵的扩张准则及边沿特征, 2016.01-2019.12。  
NSFC granted No.61473340, The criteria for spreading and characteristic of spreading front in species invasions, 1/1/2016-12/31/2019, ¥ 550,000, Co-Principal Investigator.
- 参与国家自然科学基金面上项目(批准号No.61473340): 高维非线性系统的分支问题与仿真研究, 2015.01-2018.12。

NSFC granted No.61473340, Investigations for bifurcation problems and simulations of nonlinear systems with higher dimension, 1/1/2015-12/31/2018, ¥ 580000, Co-Principal Investigator.

- 参与国家自然科学基金面上项目(批准号No.11371311): 传染病扩散的边沿及移动速度研究, 2014.01-2017.12。

NSFC granted No.11371311, Study on the edge and moving speed of the spread of infectious diseases, 1/1/2014-12/31/2017, ¥ 620000, Co-Principal Investigator.

- 参与国家自然科学基金面上项目(批准号No.11072008): 伸缩式可变量结构的非线性动力学建模、理论分析与实验研究, 2011.01-2013.12。

NSFC granted No.11072008, Nonlinear dynamic modeling, theoretical analysis and experimental research on variable structures, 1/1/2011-12/31/2013, ¥ 580000, Co-Principal Investigator

## 七、联系方式/ Contact Information

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