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教育背景

1997.09-1998.04 四川大学 化学系 物理化学专业 本科学习

1998.05-2001.06 四川大学 物理系 理论物理专业 本科学习 获学士学位

2004.09-2005.08 中国科学技术大学 近代物理系 理论物理专业 硕士研究生 基础课程学习

2005.08-2006.07 中国科学院 合肥物质科学研究院 理论物理专业 硕士研究生 获提前攻博资格并入选首届 Max Planck Society / 中国科学院联合培养博士生项目

2006.09-2009.06 德国 Max Planck Society / 中国科学院 等离子体物理 联合培养博士 获博士学位 (德国 2 年/中国 8 个月)

研究领域

同步动力学; 复杂; 有序、混沌与随机; 生命的涌现性; 人工生命; 人工社会; 宏观量子态(超导、超流、激光、Bose-Einstein 凝聚); 聚变等离子体物理理论与模拟; 高性能计算在多领域应用等

代表性成果

已发表并检索的论文和著作(标*为通讯作者, 标¹为共同第一作者):

1. Yin, W; **Gao, H***; Liu, R; Shen, C; Liu, Y and Wang, C*; Mediation analysis for integrating motor symptoms of Parkinson's disease, cognitive function and gait characteristics, *Frontiers in Neurology*, 2025, (16) 1659581 (JCR 2 区)
2. Yin, W; **Gao, H¹**; Liang, B; Liu, R; Liu, Y; Shen, C; Niu, X and Wang, C*; Quantitative analysis of gait parameters in Parkinson's disease and the clinical significance, *Frontiers in Neurology*, 2025, (16) 1527020 (JCR 2 区)
3. Yin, W; **Gao, H***; Emergence of unquenchable rumors with extended SIR epidemic model, *Advances in Continuous and Discrete Models*, 2025, (2025)102 (JCR 1 区 1/128 in *Algebra and Number Theory*)
4. Yin, W; Zhu, W; **Gao, H**; Niu, X; Shen, C; Fan, X; Wang C*; Gait analysis in the early stage of Parkinson's disease with a machine learning approach, *Frontiers in Neurology*, 2024, (15) 1472956 (JCR 2 区)
5. **Gao, H***, Shao, Z ; Tan, M; Study of Electron Anomalous Heat Diffusion Affected by Mode Number of Perturbed Magnetic Island in Tokamak Plasmas; *Fusion Science and Technology*; 2022, 414-419 (JCR 3 区)
6. Wu, Y; Chen, M; Zhang, Q; **Gao, H***; Experimental study on natural drop of

- materials with transverse stress; 2022 International Conference on Applied Mathematics, Mechanical Engineering and Robotics (AMMER 2022) Xi'an, China; **2022**; AMMER-218 (EI会议论文)
7. Li, W; Ding, G*; **Gao, H**; Zhuang, Y; Gu, X, Peijnenburg, W; Prediction of octanol-air partition coefficients for PCBs at different ambient temperatures based on the solvation free energy and the dimer ratio, *Chemosphere*, **2020** (242) 125246 ([JCR 1 区](#))
 8. **高宏***; 胡琪琳; 张朋波; 李思衡; 赵琪; 奚柳; 刘伟; 同步——非线性科学中的通用概念, 科学出版社, **2018**, 北京 ([国家一级出版社](#))
 9. **Gao, H***; Liu, W and Nie, JL, Who, What and Where (WWW) Problems in Scientific Communities, *Science and Engineering Ethics*, **2018**,(24)332-330 ([JCR 1 区](#))
 10. Guo, M*; Yao, Y; Zhao, F; Wang, S; Wang, D; Yin, S*; Zhang, H; **Gao, H**; Xiao, J, An $\text{In}_{2.77}\text{S}_4$ @conductive carbon composite with superior electrocatalytic activity for dye-sensitized solar cells, *Journal of Photochemistry and Photobiology A: Chemistry*, **2017**,(332)87-91 ([JCR 2 区](#))
 11. Zhang, Y and **Gao, H***, Human Flesh Search Engine and Online Privacy, *Science and engineering ethics*, **2016**, 22(2),601-604. ([JCR 1 区](#))
 12. **Gao, H.***; Yin, S; Wang, D, et. al, Theoretical and Numerical Study of Electron Transport Through Magnetic Island, *Journal Of Fusion Energy*, **2015**, 34 (4), 941-944. ([JCR 1 区](#))
 13. Duan, P*; Qin, HJ; Zhou, XW; Cao, AN; Chen, L; **Gao, H**, Characteristics of wall sheath and secondary electron emission under different electron temperatures in a Hall thruster, *CHINESE PHYSICS B*, **2014**, 23(7),075203 ([JCR 2 区](#))
 14. Wu, D; Wang, Y; Guo, MX; Yin, SH; **Gao, H**; Li, L; Che, L, Coriolis coupling effects in exact quantum scattering study of the isotopic reaction dynamics of $\text{Ne} + \text{D-2}(+)/\text{T-2}(+) \rightarrow \text{NeD}^+/\text{NeT}^+ + \text{D/T}$, *COMPUTATIONAL AND THEORETICAL CHEMISTRY*, **2014**,1032(56-64) ([JCR 3 区](#))
 15. Nie, J.L.*; Ao, L.; Zu, X.T. and **Gao, H.**, First-principles study of O_2 adsorption on the $\alpha\text{-U}(001)$ surface, *Journal of Physics and Chemistry of Solids*, **2014**,1(130) ([JCR 2 区](#))
 16. Zou, J; Yin, S*; Wu D; Guo, M; Xu, X; **Gao, H**; Che, L and Li L, Quasi-classical trajectory study of the reaction $\text{H}^+ + \text{HS}$ on a new ab initio potential energy surface H_2S (3A''), *Journal of Chemical Sciences*, **2013**,5(1237) ([JCR 3 区](#))
 17. Zou, J; Yin, S*;Guo, M; Xu, X; Che. L; Li. L and **Gao, H**, Isotopic Effect on Stereodynamics of the Reactions $\text{H} + \text{NeH}^+/\text{H} + \text{NeD}^+/\text{H} + \text{NeT}^+$, *BULLETIN OF THE CHEMICAL SOCIETY OF JAPAN*, **2013**,4(472) ([JCR 2 区](#))
 18. Yin, S.; Zou, J.; Guo, M.; Li, L.; Xu, X.; **Gao, H.**; Che, L., Effect of ro-vibrational excitation of NeH^+ on the stereodynamics for the reactions $\text{H} + \text{NeH}^+$ ($\nu=1-3, j=1,3,5$) $\rightarrow \text{H-2}(+) + \text{Ne}$. *Chinese Physics B*, **2013**, 22(2). ([JCR 2 区](#))
 19. Peng, E.; Wang, G. Q. *; Yao, L.; **Gao, H.**; Wang, Y. C.; Zhong, H. Y.; Liu, W.; Yang, K.; Sun, M.; Xu, D. G., The Influence of Strong Laser Fields on the Interaction between Fast $\text{B-3}(+)$ Clusters and Plasmas. *Chinese Physics Letters*,

- 2013, 30 (3). ([JCR1](#) )
20. **Gao, H.***, Study on Electron Heat Diffusion Across Stochastic Magnetic Field Affected by Magnitude of Perturbed Magnetic Field in Tokomak. Journal of Fusion Energy **2013**, 32 (2), 203-207.3. ([JCR1](#) )
 21. Yin, S.; Zou, J.; Guo, M*.; Xu, X.; **Gao, H.**; Li, L.; Che, L., Theoretical study on stereodynamics of $H^+ + NeH^+ (v=0, j=0) \rightarrow H_2^+ + Ne$ reaction. Chinese Science Bulletin **2012**, 57 (36), 4712-4717. (JCR 2 )
 22. Yin, S.; Guo, M. *; Zou, J.; Xu, X.; Che, L.; Li, L.; **Gao, H.**, PRODUCT ROTATIONAL ANGULARMOMENTUM POLARIZATION IN REACTIONS $D + FCl(v=0, j=0) \rightarrow DCl + F, DF + Cl$. Journal Of Theoretical & Computational Chemistry **2012**, 11 (4), 791-810. (JCR 3 )
 23. Wang, G*.; Peng, E.; Ma, T.; Wang, Y.; Yao, L.; Wang, Y.; Liu, D; **Gao, H.**; Hu, Z. H.; Duan, F. S.; Zhong, H. Y.; Cheng, L. H.; Yang, K.; Liu, W.; Sun, M.; Xu, D. G., Influence of a strong laser field on the Coulomb explosion and the stopping power of fast C-60 clusters in plasmas. Physical Review A **2012**, 86 (4). (JCR 2 )
 24. Wang, G*.; E, P.; Wang, Y; Hu, Z; **Gao, H.**; Wang, Y; Yao, L.; Zhong, H; Cheng, L; Yang, K.; Liu, W.; Xu, D, Influence of a strong laser field on Coulomb explosion and stopping power of energetic H-3(+)clusters in plasmas. Physics Of Plasmas **2012**, 19 (9). (JCR 3 )
 25. **Gao, H. ***; Yu, J.; Nie, J. L.; Yang, J. H.; Wang, G. Q.; Yin, S. H.; Liu, W.; Wang, D. F.; Duan, P., Hamiltonian canonical guiding center equations constructed under a nested magnetic flux coordinates system. Physica Scripta, **2012**, 86 (6). (JCR 2 )
 26. **Gao, H***; Enhanced heat conductivity in stochastic magnetic field of tokomak affected by the ratio of the parallel to the perpendicular heat diffusivity. European Physical Journal D **2012**, 66 (11). (JCR 3 )
 27. Yin, S. H.; Guo, M. X. *; **Gao, H.**; Xu, X. S.; Li, L., Quasi-classical trajectory study of the dynamics of the reaction $F + DCI (v=0, j=0) \rightarrow DF + Cl$. Computational And Theoretical Chemistry **2011**, 967 (1), 19-25. (JCR 3 )
 28. Xia, W. W.; Lu, N.; Yao, L.*; Gao, S. S.; Yang, K.; **Gao, H.**, QUASI-CLASSICAL TRAJECTORY CALCULATION OF THE CHEMICAL REACTION $Sr + CF_3Br$. Journal Of Theoretical & Computational Chemistry **2011**, 10 (6), 819-828. (JCR 3 )
 29. Gu, L. Z.; Yao*, L.; Shao, Y.; Liu, W.; **Gao, H.**, Anharmonic effect of the dissociation rate constant of the unimolecular reactions of CH_2XCHFO ($X = H, F$). Molecular Physics **2011**, 109 (16), 1983-1994. (JCR 3 )
 30. **Gao, H.***; Yao, L.; Zhong, H. Y.; Liu, W.; Yang, K.; Shao, Y.; Xia, W. W.; Li, Q. A., Heat Diffusion in a Non-Local Tokomak Stochastic Magnetic Field. Journal Of Fusion Energy **2011**, 30 (2), 195-198. ([JCR1](#) )
 31. **Gao, H.***; Zha, X, A Comparative Study of Electron Heat Transport in a Stochastic and a Non-Stochastic Magnetic Field. Contributions To Plasma Physics **2010**, 50 (2), 135-140. (JCR 3 )
 32. **Gao, H.***; Yu, Q, Heat Diffusion across a Strong Stochastic Magnetic Field in

代表性项目

Tokamak Plasmas. Chinese Physics Letters **2009**, 26 (6). (JCR 1 区)

33. **Gao, H.***, Study of Heat Transport Across a Quasi-Stochastic Magnetic Field in Magnetic Confined Plasma Physics. Plasma Science & Technology **2009**, 11 (6), 657-660. (JCR 3 区)

会议论文:

34. **Gao, H.***; Pikovsky, A; et al., Robust of Chimera states, Conference on Coupled oscillators, Berlin(2014)
35. **Gao, H.***; Pikovsky, A; Liu, W; Chimera in small systems, Dynamics day European – Bayeuth (2015)
36. **Gao, H.***; Pikovsky, A; Rosenblum, M; et al., Synchronization of multi-layer network of chaotic oscillators, The fourth conference on nonlinear dynamics on synchronization, Potsdam(2015)
37. **Gao, H.***, Electron Heat Transport Across Stochastic and Quasi-stochastic Magnetic Field, ICTP Smr. 2361, Trieste(2012.08)
38. **Gao, H.*** and Zhang Y, Reliability analysis of emergency response to disaster struck with a complex network model view, The International Emergency Management Society(TIEMS) 17th Annual Conference(2010.04)

工作论文:

39. **Gao, H.***; The parallel TM8 code for calculating the heat diffusion across magnetic islands and stochastic field, Max-Planck Institut für Plasmaphysik working paper(2007.10)
40. **Gao, H.***; Hamiltonian canonical guiding center equations with a new defined flux coordinates, Max-Planck Institut für Plasmaphysik working paper (2006.09)
41. **Gao, H.***; Gyro-kinetic equations with the 2nd orders gauge invariant, Institute of Plasma Physics of Chinese Academy of Sciences working paper(2006.03)

学位论文:

42. **Gao, H.***; Study of Heat Diffusion across a Stochastic Magnetic Field In Magnetic Confined Plasma Physics, Doctoral Dissertation (Apr.2009, in Chinese)
43. **Gao, H.***; A new expression of statistical mechanics with single particle as the example, Bachelor of Science Dissertation(Jul. 2001, in Chinese)

主持项目 (项目负责人):

1. 电磁模反常输运研究, 国家自然科学基金(面上基金), 11375035
2. 柱及环几何位形下托克马克中磁岛和随机磁场的电子径向热输运理论及模拟研究, 国家自然科学基金 (青年基金), 11105022
3. 大规模机器学习问题及机器学习与统计物理学的共性问题, 国家自然科学基金 (国际&地区合作基金), 11211140222
4. 生命及人造系统中的磨擦及能量损耗, 国家自然科学基金 (国际&地区合作基金), 11391240482
5. 复杂聚变等离子体物理系统中的输运问题, 辽宁省自然科学基金 (博士启动), 20131008

	6.同步：非线性动力学中的通用概念，大连市出版学术专著资助出版基金（面上基金） 7.波与等离子体混相物理的非线性动力学,中央高校基本科研业务费（青年骨干教师基金），3132017059 8.社会进化涌现性的构造定律模型研究，中央高校基本科研业务费（青年骨干教师基金），3132015155 9.生命及社会进化的动理学对比研究，中央高校基本科研业务费（基础培育基金），3132014232 10. 理论研究金融物理学中几个临界现象，中央高校基本科研业务费（基础培育基金），2011JC038 11. 磁化等离子体中反常热输运的研究，中央高校基本科研业务费（青年骨干教师基金），2011QN062 12. 大连海事大学引进人才科研启动基金
	参与项目（第一参与人）： 13. 在 LHT 和 TC2模型下研究 B 介子稀有衰变过程，国家自然科学基金，11147122 14. B 介子稀有衰变过程的唯象研究，辽宁省教育厅项目 15. 几种碳氢化合物燃烧的动力学模拟，辽宁省教育厅项目
	奖励： 1. 2006.10 月，获得德国马普学会（Max-Planck Society）科研经费资助奖励，在慕尼黑马普学会等离子体物理研究所进行托克马克等离子体物理的理论和模拟工作。 2. 2007.9 月，因为前期工作评估优秀，第二次获得上述经费资助奖励。 3. 2010.10 月，入围《2011 年度 ENI 新能源及可再生能源奖》终选名单。 4. 2013.7 月，大连市自然科学优秀学术论文，三等奖。 5. 2013.8 月，辽宁省自然科学学术成果（学术论文类）二等奖。
荣誉奖励	2011.05-2014.08 大连海事大学青年学术沙龙（交叉学科研究院（筹））总负责人 2012.03-至今 国家自然科学基金、国家留学基金、教育部学位中心、大连市/北京市科技项目、吉林省/浙江省人才评审等等科研及人才项目 评审专家
社会兼职	2010.01-至今 《Physica Scripta》，《Nuclear Science and Technology》，《Journal of atmospheric and Solar-Terrestrial Physics》，《Frontiers in Energy》，《复杂系统与复杂性科学》，《Science and

Engineering Ethics》等十几个国内外学术期刊编委
&评阅人