

Yong Gao

CONTACT INFORMATION	k102, Kavli Institute for Astronomy and Astrophysics Peking University, Yiheyuan Rd. 5, Haidian District Beijing 100871, China	email: gaoyong.physics@pku.edu.cn academic records: ORCID
EDUCATION	Ph.D. candidate, Physics , Peking University, Beijing, China Dissertation Advisor: Prof. Lijing Shao Dissertation Title: <i>Probing Structures of Neutron Stars with Gravitational Waves</i> August 2018–Present	
	B.S., Physics , Dalian University of Technology, Dalian, Liaoning Province, China Degree conferred with honor. Senior Thesis Advisors: Prof. Renxin Xu and Prof. Chong Li Thesis Title: <i>The Electron Distributions of Strangelets in the Thomas-Fermi Model</i> July 2018	
RESEARCH INTERESTS	Understanding the composition and state of matter under the extreme conditions inside neutron stars (NSs). One major theme is modelling gravitational waves (GWs) from systems involving NSs: tidal/spin effects in the inspiral phase of binary NS systems, GW asteroseismology of oscillating NSs. A second major theme is studying the dynamics and observational consequences of freely precessing NSs. Testing gravity in the strong-field regime of NSs. Focusing on the properties of rotating, tidally-deformed, and oscillating NSs in alternative theories of gravity.	
HONORS AND AWARDS	Principal Scholarship , Peking University Tung Scholarship , Peking University Merit Student , Peking University The Second Prize for Oral Presentation , Physics Five Universities Vela Prize for Oral Presentation , FAST/Future Pulsar Symposium 9 (FPS9) National Scholarship , Peking University Merit Student , Peking University Excellent Teaching Assistant Award , Peking University Principal Scholarship , Peking University Learning Excellence Award (First Prize) , Dalian University of Technology National Encouragement Scholarship , Dalian University of Technology	2022–2023 2021–2022 2021–2022 April 2021 August 2020 2019–2020 2019–2020 2019–2020 2018–2019 2015–2016 2015–2016
TEACHING EXPERIENCE	Teaching Assistant , Peking University Electrodynamics (B)	Fall 2022

General Physics I, *incl. Mechanics & Electromagnetism

Fall 2021

Theoretical Mechanics (A), Excellent Teaching Assistant Award

Fall 2019

CO-ADVISED STUDENTS

Graduate Student, Peking University

Hongbo Li, co-advise with Prof. Lijing Shao and Prof. Renxin Xu

2021–present

Oscillations of neutron stars and gravitational wave asteroseismology

Undergraduate Students, Peking University

Haoyang Qi, co-advise with Prof. Lijing Shao

2021–Present

Constraints on ultralight dark matter with pulsar timing

Huimei Wang, co-advise with Prof. Lijing Shao

2020–2021

Undergraduate thesis: The structure of neutron stars with anisotropic pressure

Jingyuan Deng, co-advise with Prof. Lijing Shao

2020–2021

Undergraduate thesis: Forced precession of neutron stars

Zexin Hu, co-advise with Prof. Lijing Shao

2020–2021

Scalarized neutron stars in massive scalar-tensor gravity

PROFESSIONAL ACTIVITIES, OUTREACH, AND SERVICE

KAGRA Collaboration

Member of KAGRA Future Strategy Committee (FSC)

2021–Present

Chair of conference session/group meeting

KAGRA Future Working Group 1st Open Meeting (*online*)

November 2021

Chair of the group meeting, **KIAAGRAVITY**

2020–2021

Journal referee

Classical and Quantum Gravity (CQG)

2021–Present

Research in Astronomy and Astrophysics (RAA)

2021–Present

Science China Physics, Mechanics & Astronomy (SCPMA)

2021–Present

COMPUTER SKILLS

Proficient in MATHEMATICA, Python, and Matlab. Experience in C, Bash, and HPC.
Markup languages: \LaTeX , Markdown.

Code development— Most contributions can be found at <https://github.com/GravYong>.

SUBMITTED PUBLICATIONS

12. H.-B. Li, **Y. Gao (Corresponding author)**, L. Shao, R.-X. Xu, R. Xu, (2022) *Oscillation modes and gravitational waves from strangeon stars* [[arXiv:2206.09407](https://arxiv.org/abs/2206.09407)].
11. **Y. Gao**, R. Xu, L. Shao, *Precession of spheroids under Lorentz violation and observational consequences for neutron stars*, submitted to Proceedings of the Ninth Meeting on CPT and Lorentz Symmetry.

REFEREED PUBLICATIONS

10. **Y. Gao**, X.-Y. Lai, L. Shao, R.-X. Xu, (2022) *Rotation and deformation of strangeon stars in the Lennard-Jones model*, **Mon. Not. R. Astron. Soc.** **509**, 2758 [[arXiv:2109.13234](https://arxiv.org/abs/2109.13234)].
9. **Y. Gao**, L. Shao, R. Xu, L. Sun, C. Liu, R.-X. Xu, (2020) *Triaxially-deformed freely-precessing neutron stars: continuous electromagnetic and gravitational radiation*, **Mon. Not. R. Astron. Soc.** **498**, 1826 [[arXiv:2007.02528](https://arxiv.org/abs/2007.02528)].

8. Z. Hu, **Y. Gao (Corresponding author)**, R. Xu, L. Shao, (2021) *Scalarized neutron stars in massive scalar-tensor gravity: X-ray pulsars and tidal deformability*, *Phys. Rev. D* **104**, 104014 [[arXiv:2109.13453](#)].
7. R. Xu, **Y. Gao**, L. Shao, (2022) *Neutron stars in massive scalar-Gauss-Bonnet gravity: Spherical structure and time-independent perturbations*, *Phys. Rev. D* **105**, 024003 [[arXiv:2111.06561](#)].
6. R. Xu, **Y. Gao**, L. Shao, (2021) *Precession of spheroids under Lorentz violation and observational consequences for neutron stars*, *Phys. Rev. D* **103**, 084028 [[arXiv:2012.01320](#)].
5. R. Xu, **Y. Gao**, L. Shao, (2020) *Strong-field effects in massive scalar-tensor gravity for slowly spinning neutron stars and application to X-ray pulsar pulse profiles*, *Phys. Rev. D* **102**, 064057 [[arXiv:2007.10080](#)].
4. J. Zhao, L. Shao, **Y. Gao**, C. Liu, Z. Cao, B.-Q. Ma, (2021) *Probing dipole radiation from binary neutron stars with ground-based laser-interferometer and atom-interferometer gravitational-wave observatories*, *Phys. Rev. D* **104**, 084008 [[arXiv:2106.04883](#)].
3. C. Liu, L. Shao, J. Zhao, **Y. Gao**, (2020) *Multiband observation of LIGO/Virgo binary black hole mergers in the gravitational-wave transient catalog GWTC-1*, *Mon. Not. R. Astron. Soc.* **496**, 182 [[arXiv:2004.12096](#)].
2. **Y. Gao**, L. Shao, (2021) *Precession of triaxially deformed neutron stars*, *Astron. Nachr.* **342**, 364 [[arXiv:2011.04472](#)].
1. R. Xu, **Y. Gao**, L. Shao, (2021) *Signature of Lorentz violation in continuous gravitational-wave spectra of ellipsoidal neutron stars*, *Galaxies* **9**, 12 [[arXiv:2101.09431](#)].

POPULAR SCIENCE
ARTICLES

3. **Y. Gao**, L. Shao, R.-X. Xu, (2019) *The waltz of a binary neutron star system* (an article about GW170817, *in Chinese*).
2. **Y. Gao**, (2022) *The structures of neutron stars* (an article about dense matter in neutron stars, *in Chinese*).
1. **Y. Gao**, L. Shao, (2022) *Does Einstein's theory of gravity hold up to the latest LIGO/VIRGO/KAGRA observations?* (**translated** from *the English version*).

INVITED TALKS

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|----|--|----------------|
| 3. | School of Physics in Peking University, CuiYing Graduate Student Salon | February 2021 |
| 2. | Max Planck Institut f. Gravitationsphysik Colloquium (<i>online</i>) | September 2020 |
| 1. | University of Tartu, Theoretical Physics Laboratory Colloquium (<i>online</i>) | October 2020 |

CONTRIBUTED
TALKS

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| 9. | SKA Pulsar Science Symposium 2022 | August 2022 |
| 8. | FAST/Future Pulsar Symposium 11 | August 2022 |
| 7. | Summer Science Day, KIAA, Peking University | July 2022 |
| 6. | The 60th Anniversary of X-Ray Astronomy (<i>online</i>) | June 2022 |
| 5. | Ninth Meeting on CPT and Lorentz Symmetry (<i>online</i>) | May 2022 |
| 4. | FAST/Future Pulsar Symposium 10 | July 2021 |
| 3. | Gravitation and Relativistic Astrophysics, Chinese Physical Society | April 2021 |
| 2. | Gravitation and Cosmology Symposium | December 2020 |
| 1. | FAST/Future Pulsar Symposium 9 | August 2020 |

REFERENCES

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Renxin Xu, Professor of Physics, Peking University
2912, Science Teaching Building No. 2, Department of Astronomy
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Beijing 100871, P. R. China
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