Yong Gao

Contact Information

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Education

Ph.D. candidate, Physics, Peking University, Beijing, China **August 2018-Present**

Dissertation Advisor: Prof. Lijing Shao

Dissertation Title: *Probing Structures of Neutron Stars with Gravitational Waves*

B.S., Physics, Dalian University of Technology, Dalian, Liaoning Province, China **July 2018**

Degree conferred with honor.

Senior Thesis Advisors: Prof. Renxin Xu and Prof. Chong Li

Thesis Title: *The Electron Distributions of Strangelets in the Thomas-Fermi Model*

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, such as tidal 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 **2022-2023**

Tung Scholarship, Peking University **2021–2022**

Merit Student, Peking University **2021–2022**

The Second Prize for Oral Presentation, Physics Five Universities **April 2021**

Vela Prize for Oral Presentation, FAST/Future Pulsar Symposium 9 (FPS9) **August 2020**

National Scholarship, Peking University **2019–2020**

Merit Student, Peking University **2019–2020**

Excellent Teaching Assistant Award, Peking University **2019–2020**

Principal Scholarship, Peking University **2018–2019**

Learning Excellence Award (First Prize), Dalian University of Technology **2015–2016**

National Encouragement Scholarship, Dalian University of Technology **2015–2016**

National Encouragement Scholarship, Dalian University of Technology **2014–2015**

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**

Professional Activities, Outreach, and Service

KAGRA Collaboration

Member of Compact Binaries Coalescence (CBC) Group	**2018–Present**
Member of KAGRA Future Strategy Committee (FSC)	**2021–Present**

Chair of conference session/group meeting

KAGRA Future Working Group 1st Open Meeting, Remote	**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**

Participated Grants

Gravitational Waves

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].
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].
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].
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. The Waltz of A Binary Neutron Star System (2019), **Y. Gao**, L. Shao, R.-X. Xu, (an article about GW170817, *in Chinese*).
2. The Structures of Neutron Stars (2022), **Y. Gao** (an article about dense matter in neutron stars, *in Chinese*).
1. Does Einstein's Theory of Gravity Hold Up to The Latest LIGO/VIRGO/KAGRA Observations? (2022), **Y. Gao**, L. Shao (**Translated** from the English version).

Invited Talks

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

Contributed Talks

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 (*online*)	June 2022
5.	Ninth Meeting on CPT and Lorentz Symmetry (*online*)	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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