

Yong Gao

| | | |
|---------------------|--|--|
| CONTACT INFORMATION | K102, Kavli Institute for Astronomy and Astrophysics Peking University, Yiheyuan Rd. 5, Haidian District Beijing 100871, P. R. China | email: gaoyong.physics@pku.edu.cn academic records: ORCID |
| EDUCATION | Ph.D. candidate, Physics , Peking University, Beijing, China August 2018-Present Dissertation Advisor: Prof. Lijing Shao Dissertation Title: <i>Probing Structures of Neutron Stars with Gravitational Waves</i> 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: <i>The Electron Distributions of Strangelets in the Thomas-Fermi Model</i> | |
| 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, continuous GWs from NS "mountains". 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 global 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 | |
| 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**Ph.D. 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

- | | | |
|----|--|----------------|
| 3. | Peking University, School of Physics, 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

- | | | |
|----|---|---------------|
| 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

Lijing Shao, Assistant Professor of Kavli Institute for Astronomy and Astrophysics, Peking University
K217, Kavli Institute for Astronomy and Astrophysics
Yiheyuan Rd. 5, Haidian District
Beijing 100871, P. R. China
email: lshao@pku.edu.cn
office phone: 86-10-6275-8461

Renxin Xu, Professor of Physics, Peking University
2912, Science Teaching Building No. 2, Department of Astronomy
Yiheyuan Rd. 5, Haidian District
Beijing 100871, P. R. China
email: r.x.xu@pku.edu.cn
office phone: 86-10-6275-8631

David Ian Jones, Professor of Mathematical Physics, University of Southampton
B54, West Highfield Campus
University Road, SO17 1BJ
Southampton, United Kingdom
email: d.i.jones@soton.ac.uk
office phone: 44-23-8059-4829

Gregory Desvignes, Postdoctoral researcher of Radio Astronomy, Max Planck Institute for Radio Astronomy
Auf dem Hügel 69
D-53121 Bonn, Germany
email: gdesvignes.astro@gmail.com