Qunfeng Jiang

Personal Information

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Education

Fudan University Shanghai, China
Bachelor of Science in Physics Sept. 2019 – Present

Publications

- Yu, Z., **Jiang, Q.**, Abdikamalov, A.B., Ayzenberg, D., Bambi, C., Liu, H., Nampalliwar, S. and Tripathi, A., 2021. Constraining the Konoplya-Rezzolla-Zhidenko deformation parameters. II. Limits from stellar-mass black hole x-ray data. *Physical Review D*, 104(8), p.084035.
- Wang, X., Kong, D., Guo, M., Wang, L., Gu, C., Dai, C., Wang, Y., **Jiang, Q.**, Ai, Z., Zhang, C. and Qu, D., 2021. Rapid SARS-CoV-2 nucleic acid testing and pooled assay by tetrahedral DNA nanostructure transistor. *Nano letters*, 21(22), pp.9450-9457.
- Gou, Q., Li, Z., Giuseppe, D., Hou, C., Liu, J., Chang, X., Lv, H., Yang, L., Lin, S., Addazi, A., Liu, X., Kang, M., Marciano, A., Gou, J., Yin, S., Wang, Y., Yang, Z., Tian, X., Zhang, Q., Miozzi, S., Shao, C., Dou, J., Ou, X., Xue, Y., Fu, L., Zuo, Q., Wang, Z., Wang, Y., Gong, C., Yu, Z., Li, J., Liu, L. and **Jiang, Q.**, 2022, March. Observation of Horizontal Air Showers with LHAASO-KM2A. In *37th International Cosmic Ray Conference*. 12-23 July 2021. Berlin (p. 364).
- Jess Wade, Melissa Castrillón, **Qunfeng Jiang**(Chinese translator), 2022. *Nano: The Spectacular Science of the Very (Very) Small*. Zhejiang Science and Technology Press.

Research Experience

California Institute of Technology Pasadena, US
Supervisor: *Javier Garcia, Ph.D, Research Assistant Professor* July. 2022 – Present

Studying the Inner Accretion Flows of Black Hole X-ray Binary H 1743-322 with RXTE and NuSTAR Data

- Written six Python scripts with PyXspec to perform automatic spectra fitting with more than 557 *RXTE* observations of the black hole binary H 1743-322 in the outbursts from 2003 to 2011.
- Performed global reflection modeling with `relxill` model to measure key physical properties like spin and inclination angle with *RXTE* and *NuSTAR* data.

National Astronomical Observatories, Chinese Academy of Sciences Beijing, China
Supervisor: *Roberto Soria, Ph.D, Professor* July. 2021 – Sept. 2021

Testing the existence of two coronae of the black hole candidate MAXI J1348-630 in the 2019 outburst observed by INSIGHT-HXMT

- Reduced the *INSIGHT-HXMT* observation of the black hole candidate MAXI J1348-630 in the 2019 outburst.
- Applied `relxill` model to test the existence of two coronae to confirm results from QPOs models.

Fudan University Shanghai, China
Supervisor: *Cosimo Bambi, Ph.D, Professor* Sept. 2020 – June. 2021

Constraining the KRZ deformation parameters with stellar mass black hole X-ray data

- Reduced the *NuSTAR* observation of stellar mass black hole EXO 1846+031.
- Applied `relxill_nk` model which assumed KRZ metric, a non-Kerr metric.

- A paper published in Physical Review D.

Supervisor: *Antonino Marciano, Ph.D, Associate Professor* Sept. 2020 – July 2021

Simulations of cosmic ray air shower with different hadronic models

- Simulated extensive air showers with `CORSIKA` software and generated muon lateral distribution histograms with `C++` codes.
- Applied hadronic model `Sibyll 2.3c`. Different models are about to be tested.
- Plan to apply machine learning techniques to explore parameter space.

Supervisor: *Dacheng Wei, Ph.D, Professor* June 2020 – Oct. 2020

Electrical devices based on DNA molecules and their nanostructures

- Fabricated a field-effect transistor (FET) with an actuatable liquid-gating sensing interface with DNA electro-actuators (DNA-EAs) manipulated electrostatically at the liquid-gate surface and realized direct detection of SARS-CoV-2 nucleic acids.
- Used secondary current distribution module in `COMSOL Multiphysics`® to simulate the electrical field distribution when an electro-actuation voltage was applied at the gate.

Selected Awards and Honors

National College Student Curricular Academic Science and Technology Works Competition
First Prize in Fudan University May. 2021

- A national academic competition for undergraduates' research works in science and technology.
- The project, Constraining the KRZ deformation parameters with stellar mass black hole X-ray data, was awarded the first prize in Fudan section and the third prize in Shanghai section.
- Collaborated with teammates to revise project and gave presentations in the defense.

Xiyuan Scholar May. 2021
Awarded for finishing research work in Fudan Undergraduate Research Opportunities Program(FDUROP)

Junzheng Scholar May. 2022
Awarded for finishing research work in Fudan Undergraduate Research Opportunities Program(FDUROP)

Invited Talk

The Origin and Goals of X-ray Astronomy Apr. 2022

I was invited by the Fudan Liberal Arts Society to give a talk about the history and task of X-ray astronomy in an activity called *the Light of Subjects*, which aimed to share experience in different fields by undergraduates and graduates.

Computer Skills

Languages: Python, C++, LaTeX

Softwares: Wolfram Mathematica, Matlab, Xspec, PyXpec, CORSIKA, Arduino, COMSOL Multiphysics, Origin, Git, Office

Outreach Experience

Intern June 2021 – Sept. 2021
Scientific American(Chinese Version)

- I searched and collected the newest scientific news and articles, translated them into Chinese, and published them on the social media of the Chinese version of Scientific American.

Director Aug. 2020
Tianwen Project, Fudan Astronomy Society

- I organized a charity summer camp on astronomy for 10 days in Jiangxi Province and we taught about 40 students basic knowledge on astronomy and the spreading COVID-19 epidemic.

Invited Author Aug. 2021
Guanxiang Magazine(Observation in English), Fudan Astronomy Society

Leadership Experience

Director Sept. 2020 – Sept. 2021
Outreach Department, Fudan Astronomy Society

- I organized several volunteer activities in museums in Shanghai, and outreach lectures on astronomy at Fudan University and invited distinguished professors and scholars to give a lecture every semester.

Director Apr. 2022 – Present
Western Political Thoughts Reading Seninars, Fudan University