RUI LUO

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EDUCATION

Peking University *Sep 2013 – Jul 2019*
Doctor of Philosophy, Astrophysics
Department of Astronomy, School of Physics
Thesis: **Measurement of the luminosity function of Fast Radio Bursts**
Advisor: Prof. K.J. Lee (KIAA-PKU)

Huazhong University of Science and Technology *Sep 2009 – Jun 2013*
Bachelor of Science, Applied Physics
School of Physics

EMPLOYMENT

CSIRO Astronomy and Space Science *Aug 2019 – present*
Research Plus Postdoctoral Fellow
Supervisor: Dr. George Hobbs (CASS-ATNF)
Australia Telescope National Facility

RESEARCH INTERESTS

Radio Astronomy: Fast Radio Bursts (FRBs), Pulsars, Radio Frequency Interferences (RFIs), the unknown unknowns
Statistics: Bayesian inference, Markov Chain Monte Carlo (MCMC)
Machine Learning: Convolutional Neural Network (CNN), Bayesian Optimization

AWARDS AND PRIZES

Vela Prize in FAST/Future Pulsar Symposium 8 2019
Second Academic Scholarship, Peking University 2013 – 2018
Kwang-Hua Scholarship, Peking University 2016
Second Prize of Chen Hu-Xiong Scholarship, Peking University 2015
Annual Scholarship of National Astronomical Observatories, Chinese Academy of Sciences 2013

OBSERVING EXPERIENCE

Five-hundred-meter Aperture Spherical radio Telescope
PI: *Monitoring the repeating FRB candidates*, 12 hours Jul – Oct 2019
Engineering: *Helped configure ROACH2 and monitor the real-time bandpass* Apr 2016

Parkes 64-m radio telescope
PI: *Observing the repeating FRB 180301 with the Parkes UWL*, 32.5 hours 2020OCTS
PI: *Monitoring the repeating FRB candidates in the Southern Sky*, 16 hours 2020ARPS

Australia Telescope Compact Array
PI: *Observing CU Virginis at 16cm wavelength using the Green Time*, 9 hours 2019OCTS

Kunming 40-m radio telescope
Engineering: *Installed FRB backend and configured the FRB real-time searching software* Aug 2017

Engineering: *Assisted calibration for two polarization channels of the digital backend* Oct 2014

Miyun 50-m radio telescope
Engineering: *Tested ROACH2 to observe bright pulsars* Aug 2015

STUDENTS ADVISED

Lunhua Shang: Joint-PhD student at NJUST and CSIRO 2020 – present
Research projects: Studies on the pulsed variable stars with radio observations

Weiyang Wang: PhD at UCAS-NAOC, graduated in the end of 2020 2017 – 2020
Research projects: Theoretical studies on Fast Radio Bursts

TEACHING AND OUTREACH

PULSE@Parkes: Remote sessions of pulsar observing for the high-school students in Australia 2020
TA: General Physics, School of Earth and Space Sciences, Peking University 2017
TA: Atomic Physics, School of Physics, Peking University 2015

SUPPORTS AND SERVICES

The CASS Co-learnia: One of main organisers
Duties: Seeking the speakers, scheduling the slots, sending email reminders, hosting the talks and maintaining the resources on the Co-learnium website

Duty Astronomer (DA): Serving as DA for the ATCA in each semester 2019 – present

TALKS IN CONFERENCES OR SEMINARS

Seminar in the pulsar group at MPIfR, Bonn, Germany Feb 2021
Invited remote talk: *Diverse polarization angle swings from a repeating fast radio burst source*

Colloquium at the Curtin Institute of Radio Astronomy (CIRA), Perth, WA, Australia Jan 2021
Invited remote talk: *Diverse polarization angle swings from a repeating fast radio burst source*

Colloquium at Department of Astrophysics, University of Radboud, Netherlands Dec 2020
Invited remote talk: *Diverse polarization angle swings from a repeating fast radio burst source*

Lunch Talk at Kavli IPMU, University of Tokyo, Japan Dec 2020
Invited remote talk: *Diverse polarization angle swings from a repeating fast radio burst source*

CASS Co-learnium, Marsfield, NSW, Australia Dec 2020
Contributed remote talk: *Life changes of the local residents around the FAST site*

CHIME/FRB Journal Club, Canada Dec 2020
Invited remote talk: *Diverse polarization angle swings from a repeating fast radio burst source*

AUS-NZ-PSR Group Meeting, Australasia Nov 2020
Contributed remote talk: *Diverse polarization angle swings from a repeating fast radio burst source*

FRB2020 International Meeting, Zoom Webinar Jul 2020
Contributed remote talk: *Measurement of the luminosity function of Fast Radio Bursts*

ATNF Bolton Symposium, ARRC Building Lecture Theatre, Kensington, Perth, Australia Mar 2020

Contributed talk: *A new repeating FRB discovered by the FAST telescope*

CASS Co-learnium, Marsfield, NSW, Australia — Dec 2019
Contributed talk: *A beginner's guide to Bayesian inference*

CASS Colloquium, Marsfield, NSW, Australia — Sep 2019
Invited talk: *Measurement of the luminosity function of Fast Radio Bursts*

FAST/Future Pulsar Symposium 8, Xi'an, China — Jun 2019
Contributed talk: *Measurement of the luminosity function of Fast Radio Bursts*

Cosmology Group Meeting at NAOC, Beijing, China — Mar 2019
Invited talk: *Measurements on the FRB luminosity function*

KIAA Graduate Dinner Talk, Beijing, China — Dec 2018
Invited talk: *An Overview on Fast Radio Bursts and FRB luminosity function*

NAOC Graduate Student Seminar, Beijing, China — Apr 2018
Invited talk: *A Review of Fast Radio Bursts and FRB luminosity function*

Radio Astronomy Forum 2017, Pingtang, China — Sep 2017
Poster talk: *Simulating DM of host galaxies to derive FRB luminosity function*

Chinese Astronomical Society 2016 Annual Meeting, Wuhan, China — Nov 2016
Contributed talk: *Simulating the dispersion measure of host galaxies*

Jing-Guang-Xia Astrophysics Meeting, Xiamen, China — Jul 2016
Contributed talk: *Simulating the dispersion measure of host galaxies*

QTT Colloquium Series 2016, Zunyi, China — Jul 2016
Contributed talk: *Simulating the dispersion measure of FRB host galaxies*

PKU-XAO Bilateral Meeting, Urumqi, China — Jun 2016
Contributed talk: *Simulating the dispersion measure of FRB host galaxies*

Chinese Astronomical Society 2015 Annual Meeting, Beijing, China — Oct 2015
Contributed talk: *Consideration of Research on FRBs*

QTT Colloquium Series 2015, Ming'antu, China — Jul 2015
Contributed talk: *Consideration of Research on FRBs*

KIAA-SHAO Bilateral Workshop, Beijing, China — May 2015
Contributed talk: *Consideration of FRB searching*

TECHNICAL SKILLS

Programming	Python (Proficient), C, C++, Unix
Softwares	Matlab, Mathematica, presto, tempo2, MultiNest
Tools	Git, LaTeX, Wiki

LANGUAGES

Chinese	Native
English	Fluent
Japanese	Elementary

REFERENCES

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Kavli Institute for Astronomy and Astrophysics, Peking University
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PUBLICATIONS

(summary: 15 in total, including one in Nature as the first author. H-index: 6, – Mar 2021)

First-author papers:

3. **Luo, R.**, Wang, B. J., Men, Y. P., Zhang, C. F., Jiang, J. C., Xu, H., Wang, W. Y., Lee, K. J., Han, J. L., Zhang, B., et al., *Diverse polarization angle swings from a repeating fast radio burst source*, 2020, Nature, 586, 693

2. **Luo, R.**, Men, Y. P., Lee, K. J., Wang, W. Y., Lorimer, D. R., & Zhang, B., *On the FRB luminosity function - II. Event rate density*, 2020, MNRAS, 494, 665

1. **Luo, R.**, Lee, K. J., Lorimer, D. R., & Zhang, B., *On the normalized FRB luminosity function*, 2018, MNRAS, 481, 2320

Second/Third-author papers:

7. Niu, C.-H., Li, D., **Luo, R.**, Wang, W.-Y., Yao, J., Zhang, B., Zhu, W.-W., et al. *CRAFTS for Fast Radio Bursts – II. Extending the dispersion-fluence relation with new FRBs detected by FAST*, 2021, ApJ, 909, L8

6. Zhu, W., Li, D., **Luo, R.**, Miao, C., Zhang, B., Spitler, L., Lorimer, D.; Kramer, M., Champion, D., Yue, Y., Cameron, A., Cruces, M., Duan, R., Feng, Y., Han, J., Hobbs, G., Niu, C., et al., *A Fast Radio Burst discovered in FAST drift scan survey*, 2020, ApJ, 895, L6

5. Jiang, J. C., Wang, W. Y., **Luo, R.**, Du, S., Chen, X. L., Lee, K. J., & Xu, R. X., *FRB 171019: An event of binary neutron star merger?*, 2020, RAA, 20, 4, 56

4. Men, Y. P., **Luo, R.**, Chen, M. Z., Hao, L. F., Lee K. J., Li, J., Li Z. X., Liu, Z. Y., Pei, X., Wen, Z. G., Wu, J. J., Xu, Y. H., Xu, R. X., Yuan, J. P., & Zhang, C. F., *Piggyback searching for fast radio bursts using Nanshan 26m and Kunming 40m radio telescopes – I. Observing and data analysis systems, discovery of a mysterious peryton*, 2019, MNRAS, 488, 3957

3. Yi, S.-X., Cheng, K. S., & **Luo, R.**, *Clumpy jets from black hole-massive star binaries as engines of Fast Radio Bursts*, 2019, MNRAS, 483, 4197

2. Wang, W. Y., **Luo R.**, Yue, H., Chen, X. L., Lee, K. J., & Xu, R. X., *FRB 121102: A Starquake-induced Repeater?*, 2018, ApJ, 852, 140

1. Yang, Y.-P., **Luo, R.**, Li, Z., & Zhang, B., *Large Host-galaxy Dispersion Measure of Fast Radio Bursts*, 2017, ApJ, 839, L25

Other co-author papers:

5. Zhang, C. F., Xu, J. W., Men, Y. P., Deng, X. H., Xu, H., Jiang, J. C., Wang, B. J., Lee, K. J., Li, J., Yuan, J. P., Liu, Z. Y., Huang, Y. X., Xu, Y. H., Li, Z. X., Hao, L. F., Luo, J. T., Dai, S., **Luo, R.**, Zakie, H., & Ma, Z. Y., *Fast radio burst detection in the presence of coloured noise*, 2021, MNRAS, accepted

4. Dai, S., Lu, J. G., Wang, C., Wang, W. Y., Xu, R. X., Yang, Y.-P., Zhang, S.-B., Hobbs, G., Li, D., & **Luo, R.**, *On the Non-detection of Circular Polarisation from Repeating Fast Radio Bursts*, 2020, ApJ, submitted

3. Zhang, S.-B., Hobbs, G., Russell, C. J., Toomey, L., Dai, S., Dempsey, J., Manchester, R. N., Johnston, S., Staveley-Smith, L., Wu, X.-F., Li, D., Yang, Y.-Y., Wang, S.-Q., Qiu, H., **Luo, R.**, Wang, C., Zhang, C., Zhang, L., & Mandow, R., *Parkes transient events: I. Database of single pulses, initial results and missing FRBs*, 2020, ApJS, 249, 14

2. Men, Y. P., Aggarwal, K, Li, Y., Palaniswamy, D., Burke-Spolaor, S., Lee, K. J., **Luo, R.**, Demorest, P., Tendulkar, S., Agarwal, D., Young, O., & Zhang, B., *Non-detection of fast radio bursts from six gamma-ray burst remnants with a possible magnetar engine*, 2019, MNRAS, 489, 3643

1. Wang, W. Y., Lu, J. G., Zhang, S. B., Chen, X. L., **Luo, R.**, & Xu, R. X., *Pulsar giant pulse: coherent instability near light cylinder*, 2019, SCPMA, 62(7), 979511