

RUI LUO

PO Box 76, Epping, NSW 1710, Australia
+61 2-93724434 ◇ rui.luo@csiro.au

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 Interference (RFI), the unknown unknowns

Statistics: Bayesian inference, Markov Chain Monte Carlo (MCMC)

Machine Learning: Convolutional Neural Network (CNN), Bayesian Optimization

AWARDS AND PRIZES

No.1 in the Top 10 Progresses for China Astronomy (awarded to the FAST Collaborations)	2020
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

2020APRS

Contributions: Parkes Pulsar Timing Array, 40+ hours

Nov 2020 – present

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 CO-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 2019 – present
Duties: Seeking the voluntary speakers, scheduling the weekly talks, sending email reminders, hosting the speakers and maintaining the resources on the website

The ATCA Duty Astronomer 2019 – present
Duties: Assisting the observers to calibrate and configure the observations, reporting and solving possible observing issues.

Updates on the **ATNF-PSRCAT** 2020 – present
Duties: Collecting the new parameters for known and new pulsars in the literature, making and compiling the update files.

TALKS IN CONFERENCES OR SEMINARS

ASKAP-CRAFT Group Meeting, CASS-Swinburne-Curtin, Australia Mar 2021
Invited remote talk: *Current FRB Science Outcomes with FAST*
Pulsar Group Meeting, MPIfR, Bonn, Germany Feb 2021
Invited remote talk: *Diverse polarization angle swings from a repeating fast radio burst source*
Colloquium, Curtin Institute of Radio Astronomy, Perth, Australia Jan 2021
Invited remote talk: *Diverse polarization angle swings from a repeating fast radio burst source*
Colloquium, 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, 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*
Seminar, 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: <i>Measurement of the luminosity function of Fast Radio Bursts</i> ATNF Bolton Symposium , Kensington, Perth, Australia	Mar 2020
Contributed talk: <i>A new repeating FRB discovered by the FAST telescope</i> CASS Co-learnium , Marsfield, NSW, Australia	Dec 2019
Contributed talk: <i>A beginner's guide to Bayesian inference</i> CASS Colloquium , Marsfield, NSW, Australia	Sep 2019
Invited talk: <i>Measurement of the luminosity function of Fast Radio Bursts</i> FAST/Future Pulsar Symposium 8 , Xi'an, China	Jun 2019
Contributed talk: <i>Measurement of the luminosity function of Fast Radio Bursts</i> Cosmology Group Meeting, NAOC , Beijing, China	Mar 2019
Invited talk: <i>Measurements on the FRB luminosity function</i> KIAA Graduate Dinner Talk , Beijing, China	Dec 2018
Invited talk: <i>An Overview on Fast Radio Bursts and FRB luminosity function</i> NAOC Graduate Student Seminar , Beijing, China	Apr 2018
Invited talk: <i>A Review of Fast Radio Bursts and FRB luminosity function</i> Radio Astronomy Forum 2017 , Pingtang, China	Sep 2017
Poster talk: <i>Simulating DM of host galaxies to derive FRB luminosity function</i> Chinese Astronomical Society Annual Meeting 2016 , Wuhan, China	Nov 2016
Contributed talk: <i>Simulating the dispersion measure of host galaxies</i> Jing-Guang-Xia Astrophysics Meeting , Xiamen, China	Jul 2016
Contributed talk: <i>Simulating the dispersion measure of host galaxies</i> QTT Colloquium Series 2016 , Zunyi, China	Jul 2016
Contributed talk: <i>Simulating the dispersion measure of FRB host galaxies</i> PKU-XAO Bilateral Meeting , Urumqi, China	Jun 2016
Contributed talk: <i>Simulating the dispersion measure of FRB host galaxies</i> Chinese Astronomical Society Annual Meeting 2015 , Beijing, China	Oct 2015
Contributed talk: <i>Consideration of Research on FRBs</i> QTT Colloquium Series 2015 , Ming'antu, China	Jul 2015
Contributed talk: <i>Consideration of Research on FRBs</i> KIAA-SHAO Bilateral Workshop , Beijing, China	May 2015
Contributed talk: <i>Consideration of FRB searching</i>	

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

Kejia Lee
Associate Professor
 Kavli Institute for Astronomy and Astrophysics, Peking University
 No.5 YiHeYuan Rd, Haidian District, Beijing 100871, China
 Tel: +86 10-62766380
 Email: kjlee@pku.edu.cn

George Hobbs

Research Scientist and Team Leader

CSIRO Astronomy and Space Science, Australia National Telescope Facility

Box 76, Epping, NSW 1710, Australia

Tel: +61 2-9372-4652

Email: george.hobbs@csiro.au

Duncan Lorimer

Professor and Associate Dean for Research

Department of Physics and Astronomy, West Virginia University

White Hall, PO Box 6315, Morgantown, WV 26506, USA

Tel: +1 304-293-4867

Email: duncan.lorimer@mail.wvu.edu.cn

R. N. Manchester

Fellow of the Australian Academy of Science

CSIRO Astronomy and Space Science, Australia National Telescope Facility

Box 76, Epping, NSW 1710, Australia

Tel: +61 2-9372-4313

Email: dick.manchester@csiro.au

Bing Zhang

Distinguished Professor and Associate Dean for Research

Department of Physics and Astronomy, University of Nevada, Las Vegas

MPE-A 129, UNLV, Las Vegas, NV 89154, USA

Tel: +1 702-895-3170

Email: zhang@physics.unlv.edu

PUBLICATIONS

(summary: 15 in total, including one in Nature as the first author. H-index: 7, – 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](#)