

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 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

Contributions: Parkes Pulsar Timing Array, 30+ 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: <i>Installed FRB backend and configured the FRB real-time searching software</i>	Aug 2017
Engineering: <i>Assisted calibration for two polarization channels of the digital backend</i>	Oct 2014
Miyun 50-m radio telescope	
Engineering: <i>Tested ROACH2 to observe bright pulsars</i>	Aug 2015

STUDENTS CO-ADVISED

Lunhua Shang: Joint-PhD student at NJUST and CSIRO <i>Research projects: Studies on the pulsed variable stars with radio observations</i>	2020 – present
Weiyang Wang: PhD at UCAS-NAOC, graduated in the end of 2020 <i>Research projects: Theoretical studies on Fast Radio Bursts</i>	2017 – 2020

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 voluntary speakers, scheduling the weekly talks, sending email reminders, hosting the speakers and maintaining the resources on the website	2019 – present
ATCA Duty Astronomer Duties: Assisting the observers to calibrate and configure the observations, reporting and solving possible observing issues.	2019 – present
Updates on the ATNF-PSRCAT Duties: Collecting the new parameters for known and new pulsars in the literature, making and compiling the update files.	2020 – present

TALKS IN CONFERENCES OR SEMINARS

ASKAP-CRAFT Group Meeting , CASS-Swinburne-Curtin, Australia Invited remote talk: <i>Current FRB Science Outcomes with FAST</i>	Mar 2021
Pulsar Group Meeting , MPIfR, Bonn, Germany Invited remote talk: <i>Diverse polarization angle swings from a repeating fast radio burst source</i>	Feb 2021
Colloquium, Curtin Institute of Radio Astronomy , Perth, Australia Invited remote talk: <i>Diverse polarization angle swings from a repeating fast radio burst source</i>	Jan 2021
Colloquium, Department of Astrophysics, University of Radboud , Netherlands Invited remote talk: <i>Diverse polarization angle swings from a repeating fast radio burst source</i>	Dec 2020
Lunch Talk, Kavli IPMU, University of Tokyo , Japan Invited remote talk: <i>Diverse polarization angle swings from a repeating fast radio burst source</i>	Dec 2020
CASS Co-learnium , Marsfield, NSW, Australia Contributed remote talk: <i>Life changes of the local residents around the FAST site</i>	Dec 2020
CHIME/FRB Journal Club , Canada Invited remote talk: <i>Diverse polarization angle swings from a repeating fast radio burst source</i>	Dec 2020
Seminar, AUS-NZ-PSR Group Meeting , Australasia Contributed remote talk: <i>Diverse polarization angle swings from a repeating fast radio burst source</i>	Nov 2020
FRB2020 International Meeting , Zoom Webinar Contributed remote talk: <i>Measurement of the luminosity function of Fast Radio Bursts</i>	Jul 2020

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: 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](#)