RUI LUO

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Postal Address: PO Box 76, Epping, NSW 1710, Australia

EDUCATION

Peking University *Sep 2013 – Jul 2019*
Department of Astronomy, School of Physics
Doctor of Philosophy, Astrophysics
Dissertation: *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*
School of Physics
Bachelor of Science, Applied Physics

EMPLOYMENT

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

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

Rank No.1, Top 10 Research Progresses, Chinese Astronomy (Team Award)	2020
Vela Prize for oral presentations, 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, 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

Co-I: *Monitoring the repeating FRB 180301*, 32.5 hours	2021APRS
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, 70+ 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 CSIRO-ATNF 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

FRB 2021 International Meeting, Zoom Webinar Jul-Aug 2021
Plenary talk: *Diverse polarization angle swings from a repeating fast radio burst source*
Video recordings: [Session 3A] and [Session 3B]
C3DIS 2021 Conference, Virtual, Australia Jul 2021
Contributed oral presentation: *simulateSearch – A package for simulating high time-resolution data in radio astronomy*
MQ AAAstroseminar, Macquarie University, Sydney, Australia May 2021
Invited in-person talk: *Diverse polarization angle swings from a repeating fast radio burst source*
ASKAP-CRAFT Group Meeting, ATNF-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*
CSIRO-ATNF Co-learnium, Marsfield, NSW, Australia Dec 2020
Contributed remote talk: *Life changes of the local residents around the FAST site*
Video recording: [co-learnium link]
CHIME/FRB Journal Club, Canada Dec 2020
Invited remote talk: *Diverse polarization angle swings from a repeating fast radio burst source*
Video recording: [YouTube link]
Seminar, AUS-NZ-PSR Group Meeting, Australasia Nov 2020
Contributed remote talk: *Diverse polarization angle swings from a repeating fast radio burst source*
FRB 2020 International Meeting, Zoom Webinar Jul 2020
Pleanry talk: *Measurement of the luminosity function of Fast Radio Bursts*
Video recording: [Session 5]
ATNF Bolton Symposium, Kensington, Perth, Australia Mar 2020
Contributed talk: *A new repeating FRB discovered by the FAST telescope*
CSIRO-ATNF Co-learnium, Marsfield, NSW, Australia Dec 2019
Contributed talk: *A beginner's guide to Bayesian inference*
Video recording: [co-learnium link]
CSIRO-ATNF 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*
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 Annual Meeting 2016, 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 Annual Meeting 2015, 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, HTML

LANGUAGES

Chinese	Native
English	Fluent
Japanese	Elementary

REFERENCES

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PUBLICATIONS

(Summary: 19 publications in total, including one first-author paper in Nature. H-index: 8, – Aug 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., Caballero, R. N., Chen, M. Z., Chen, X. L., Gan, H. Q., Guo, Y. J., Hao, L. F., Huang, Y. X., Jiang, P., Li, H., Li, J., Li, Z. X., Luo, J. T., Pan, J., Pei, X., Qian, L., Sun, J. H., Wang, M., Wang, N., Wen, Z. G., Xu, R. X., Xu, Y. H., Yan, J., Yan, W. M., Yu, D. J., Yuan, J. P., Zhang, S. B., & Zhu, Y., *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:

9. Bhandari, S., Heintz, K. E., Aggarwal, K., Marnoch, L., Day, C. K, Sydnor, J., Burke-Spolaor, S., Law, C. J., Prochaska, J. X, Tejos, N., Bannister, K. W., Butler, B. J., Deller, A. T., Ekers, R. D., Flynn, C., Fong, W.-F., James, C. W., Lazio, T. J. W., **Luo, R.**, Mahony, E. K., Ryder, S. D., Sadler, E. M., Shannon, R. M., Han, J. L., Lee, K. J., & Zhang, B., *Characterizing the FRB host galaxy population and its connection to transients in the local and extragalactic Universe*, 2021, ApJ, submitted

8. Niu, C.-H., Aggarwal, K., Li, D., Zhang, X., Chatterjee, S., Tsai, C.-W., Yu, W., Law, C. J., Burke-Spolaor, S., Cordes, J. M., Zhang, Y.-K., Ocker, S., Yao, J.-M., Wang, P., Feng, Y., Niino, Y., Bochenek, C., Cruces, M., Connor, L., Jiang, J.-A., Dai, S., **Luo, R.**, Li, G.-D., Miao, C.-C., Niu, J.-R., Anna-Thomas, R., Stern, D., Wang, W.-Y., Yuan, M., Yue, Y.-L., Zhou, D.-J.,

Yan, Z., Zhu, W.-W., & Zhang, B., *A highly active repeating fast radio burst in a complex local environment*, 2021, Nature, submitted

7. Yang, X., Zhang, S.-B., Wang, J.-S., Hobbs, G., Sun, T.-R., Manchester, R. N., Geng, J.-J., Russell, C. J., **Luo, R.**, Tang, Z.-F., Wang, C., Wei, J.-J., Staveley-Smith, L., Dai, S., Li, Y., Yang, Y.-Y., & Wu, X.-F., *81 New Candidate Fast Radio Bursts in Parkes Archive*, 2021, MNRAS, accepted

6. Goncharov, B., Shannon, R. M., Reardon, D. J., Hobbs, G., Zic, A., Bailes, M., Curylo, M., Dai, S., Kerr, M., Lower, M. E., Machester, R. N., Mandow, R., Middleton, H., Miles, M. T., Parthasarathy, A., Thrane, E., Thyagarajan, N., Xue, X., Zhu, X.-J., Cameron, A. D., Feng, Y., **Luo, R.**, Russell, C. J., Sarkissian, J., Spiewak, R., Wang, S., Wang, J. B., Zhang, L., & Zhang, S., *On the evidence for a common-spectrum process in the search for the nanohertz gravitational wave background with the Parkes Pulsar Timing Array*, 2021, ApJL, accepted

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, 503, 5223

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.**, Filipovic, M., & Jiang, J. C., *On the Non-detection of Circular Polarisation from Repeating Fast Radio Bursts*, 2020, ApJ, accepted

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