

# YAN-RONG LI (李彦荣)

## PERSONAL INFORMATION

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<b>Date of Birth</b>	Jan 10, 1985	<b>Place of Birth</b>	Gansu Province, China (中国甘肃)
<b>Nationality</b>	Chinese	<b>Gender</b>	Male
<b>Marital Status</b>	Married	<b>Tel</b>	+86 (010) 8823 6713
<b>Address</b>	Key Laboratory for Particle Astrophysics Institute of High Energy Physics 19B Yuquan Road, Beijing, China, 100049		
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## EDUCATION

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2006—2011	Ph.D in Astrophysics Institute of High Energy Physics, China Thesis: <i>Spins of Supermassive Black Holes in Galactic Centers</i>
2002—2006	Bachelor degree in Theoretical and Applied Mechanics Peking University, China

## POSITIONS

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Jan, 2020—present	Staff researcher Institute of High Energy Physics
Jan, 2014—Dec, 2019	Staff associate researcher Institute of High Energy Physics
Jul, 2011—Dec, 2013	Staff assistant researcher Institute of High Energy Physics

## MEMBERSHIP

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2019—2022	The Youth Innovation Promotion Association, Chinese Academy of Sciences
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## AWARDS

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2011	Outstanding Graduate Student Award of Chinese Academy of Sciences
2011	Chinese Academy of Sciences Dean Excellent Reward
2020	National Science Fund for Outstanding Young Scholars of China (No.11922304)

## CURRENT RESEARCH INTERESTS

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- Active galactic nuclei
- Mass and spin of supermassive black holes
- Broad-line regions
- Accretion processes
- Supermassive black hole binaries

## TECHNICAL SKILLS

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- Scientific programming using C/C++, FORTRAN, Python, IDL, MATLAB, and R language
- High-performance parallel scientific computation using MPICH and OpenMP

## Observing Experience

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- 2015, Lijiang 2.4m, Optical spectroscopy, 60 nights, Co-I  
Reverberation Mapping Monitoring of AGNs
- 2022A, IRTF 3m, Infrared spectroscopy, 16 nights, Co-I  
Infrared Spectroscopic Reverberation Mapping of two GRAVITY/VLTI-targeted AGNs
- 2022B, IRTF 3m, Infrared spectroscopy, 13 nights, Co-I  
Infrared Spectroscopic Reverberation Mapping of the GRAVITY/VLTI-targeted AGN Ark 120

## GRANTS & FUNDING

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- NSFC Youth Funding, PI, ¥280,000: “Spins of Supermassive Black Holes and Their Cosmological Evolution”, 2014-2016
- NSFC General Program, PI, ¥700,000: “Mass Measurement of Supermassive Black Holes”, 2016-2019
- The Youth Innovation Promotion Association Grant, PI, ¥800,000: “Supermassive Black Holes”, 2019-2022
- NSFC General Program, PI, ¥550,000: “Accretion and Variability of Close Binaries of Supermassive Black Holes”, 2023-2026

## SOFTWARE

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- **PyCALI**—a Bayesian method for the inter-calibration of spectra in reverberation mapping  
<https://github.com/LiyuAstroph/PyCALI>
- **BRAINS**—dynamical modeling for broad-line regions in active galactic nuclei  
<https://github.com/LiyuAstroph/BRAINS>
- **MICA**—a reverberation-mapping analysis package  
<https://github.com/LiyuAstroph/MICA2>
- **PIXON**—a pixon-based reverberation mapping analysis  
<https://github.com/LiyuAstroph/PIXON>
- **CDNest**—an MPI-based diffusive nested sampling package in C  
<https://github.com/LiyuAstroph/CDNest>
- **RECON**—measures power spectra and reconstructs time series in active galactic nuclei  
<https://github.com/LiyuAstroph/RECON>
- **CyPDM**—a fast package to apply the phase dispersion minimization (PDM) algorithm  
<https://github.com/LiyuAstroph/CyPDM>
- **Spartan**—a code to calculate the structure and emergent spectrum of ADAFs  
<https://github.com/LiyuAstroph/Spartan>

## INVITED TALKS AND COLLIQUIA

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- Colloquium, Huazhong University of Science and Technology, Mar. 9, 2022  
*Black Hole Mass Measurements in Active Galactic Nuclei*
- Colloquium, Xiamen University, Nov. 4, 2021  
*Black Hole Mass Measurements in Active Galactic Nuclei*
- Mapping Central Regions of Active Galactic Nuclei, Guilin, China, Oct. 19-24, 2019  
*BLR Dynamical Modeling in Active Galactic Nuclei*
- AGN Reverberation Mapping: the pc-Scale Garden of Massive Black Holes, Lijiang, China, Oct. 24-26, 2016  
*BLR Dynamical Modeling and Black-Hole Mass Measurements of AGNs*

## CONTRIBUTED TALKS

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- Time-domain Gravitational Lensing Workshop, Nanjing, China, Apr. 15-16, 2023  
Talk: *Reverberation Mapping of Broad-line Regions and Accretion Disks in Active Galactic Nuclei*
- Serbian-Chinese Astronomical Scientific Meeting: Physics and Nature of Active Galactic Nuclei, Belgrade, Serbia, Apr. 16-19, 2018  
Talk: *Testing Periodic Signals in Red-Noise Time Series of Active Galactic Nuclei*
- USTC Symposium on "Accretion on all scales", Hefei, China, Jan. 14-16, 2017  
Talk: *Black-Hole Mass Measurement and Supermassive Black Hole Binaries*
- East-Asia AGN Workshop 2016, Seoul, Korea, Sep. 22-24, 2016  
Talk: *Spectroscopic Indication of a Centi-parsec Supermassive Black Hole Binary in the Galactic Center of NGC 5548*
- USTC Symposium on "SMBH and Galaxies", Hefei, China, Jul. 26-27, 2015  
Talk: *Spins of Supermassive Black Holes and Lifetimes of AGNs*
- AGN Reverberation: Present & Future, Oct 23-25, 2013  
Talk: *A Bayesian Approach to Estimate the Size and Structure of the BLR In AGNs Using Reverberation Mapping Data*
- Workshop on Accretion Disks, KIAA, Peking University, Nov 23-30, 2008  
Talk: *Spins of Supermassive Black Holes: Constraints from TeV Observations*

## PEER REVIEW SERVICES

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- Referee for ApJ, ApJL, MNRAS, PASJ, Frontiers, RAA, and Chinese Physics C
- Grant reviewer for NSF of China

## PUBLICATIONS ([ADS Link](#))

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### Papers submitted.

1. Chen, Y.-J., Zhai, S., Liu, J.-R., Guo, W.-J., Peng, Y.-C., **Li, Y.-R.\***, Songsheng, Y.-Y., Du, P., Hu, C., Wang, J.-M.\*, **2022**, MNRAS submitted (arXiv: 2206.11497)  
*Quasar candidates with periodic variations from the Zwicky Transient Facility. I. Sample*

### Refereed papers, first-author/corresponding-author.

20. Chen, Y.-J., Zhai, S., Liu, J.-R., Yao, Z.-H., **Li, Y.-R.\***, Du, P., Hu, C., Guo, W.-J., Lu, K.-X., Xiao, M., Songsheng, Y.-Y., Wang, J.-M.\*, **2023**, MNRAS in press  
*Mid-infrared Dusty Torus Sizes in Active Galactic Nuclei with H $\beta$  Reverberation Mapping*
19. Chen, Y.-J., Bao, D.-W., Zhai, S., Fang, F.-N., Hu, C.\*, Du, P., Yang, S., Yao, Z.-H., **Li, Y.-R.\***, Brotherton, M. S., McLane, J. N., Zastrocky, T. E., ..., Wang, J.-M.\*, **2023**, MNRAS, 520, 1807  
*Broad-line Region in NGC 4151 Monitored by Two Decades of Reverberation Mapping Campaigns. I. Evolution of Structure and Kinematics*
18. **Li, Y.-R.** & Wang, J.-M., **2023**, ApJ, 943, 36  
*Spectroastrometric Reverberation Mapping of Broad-line Regions*
17. Guo, W.-J., **Li, Y.-R.\***, Zhang, Z.-X., Ho, L. C. & Wang, J.-M.\* **2022**, ApJ, 929, 19  
*Accretion Disk Size Measurements of Active Galactic Nuclei Monitored by the Zwicky Transient Facility*
16. **Li, Y.-R.**, et al., **2022**, ApJ, 927, 58  
*Spectroastrometry and Reverberation Mapping: the Mass and Geometric Distance of the Supermassive Black Hole in the Quasar 3C 273*
15. **Li, Y.-R.**, et al., **2021**, ApJ, 921, 151  
*A Pixion-Based Method for Reverberation-Mapping Analysis in Active Galactic Nuclei*
14. **Li, Y.-R.**, et al., **2020**, ApJ, 897, 18  
*Untangling Optical Emissions of the Jet and Accretion Disk in the Flat-Spectrum Radio Quasar 3C 273 with Reverberation Mapping Data*
13. **Li, Y.-R.**, et al., **2019**, ApJS, 241, 33  
*A Possible  $\sim 20$  yr Periodicity in Long-term Variations of the Nearby Radio-Quiet Active Galactic Nucleus Ark 120*
12. **Li, Y.-R.**, et al., **2018**, ApJ, 869, 137  
*Supermassive Black Holes with High Accretion Rates in Active Galactic Nuclei. VIII. Structure of the Broad-Line Region and Mass of the Central Black Hole in Mrk 142*
11. **Li, Y.-R.**, & Wang, J.-M., **2018**, MNRAS, 476, L55  
*A New Approach for Measuring Power Spectra and Reconstructing Time Series in Active Galactic Nuclei*
10. **Li, Y.-R.**, Wang, J.-M., & Bai, J.-M., **2016**, ApJ, 831, 206  
*A Non-parametric Approach to Constrain the Transfer Function in Reverberation Mapping*
9. **Li, Y.-R.**, Wang, J.-M., Ho, L. C. et al., **2016**, ApJ, 822, 4  
*Spectroscopic Indication of a Centi-parsec Supermassive Black Hole Binary in the Galactic Center of NGC 5548*
8. **Li, Y.-R.**, Wang, J.-M., Cheng, C. & Qiu, J., **2015**, ApJ, 804, 45  
*Alignments of Black Holes with Their Warped Accretion Disks and Episodic Lifetimes of Active Galactic Nuclei*
7. **Li, Y.-R.**, Wang, J.-M., Hu, C., Du, P. & Bai, J.-M., **2014**, ApJL, 786, L6  
*A Bayesian Method for the Intercalibration of Spectra In Reverberation Mapping*
6. **Li, Y.-R.**, Wang, J.-M., Ho, L. C., Du, P. & Bai, J.-M., **2013**, ApJ, 779, 110  
*A Bayesian Approach to Estimate the Size and Structure of the Broad Line Region In Active Galactic Nuclei Using Reverberation Mapping Data*
5. **Li, Y.-R.**, Wang, J.-M., Cheng, C. & Qiu, J., **2013**, ApJ, 764, 16  
*Evolution of Warped Accretion Disks in Active Galactic Nuclei. I. Roles of Feeding at the Outer Boundaries.*

4. **Li, Y.-R.**, Wang, J.-M. & Ho, L. C., **2012**, ApJ, 749, 187  
*Cosmological Evolution of Supermassive Black Holes. II. Evidence for Downsizing of Spin Evolution.*
3. **Li, Y.-R.**, Ho, L. C. & Wang, J.-M., **2011**, ApJ, 742, 33  
*Cosmological Evolution of Supermassive Black Holes. I. Mass Function at  $0 < z \lesssim 2$ .*
2. **Li, Y.-R.**, Wang, J.-M., Yuan, Y.-F., Hu, C. & Zhang, S., **2010**, ApJ, 710, 878  
*Episodic Activities of Supermassive Black Holes at Redshift  $z \lesssim 2$ : Driven by Mergers?*
1. **Li, Y.-R.**; Yuan, Y.-F., Wang, J.-M., Wang, J.-C. & Zhang, S., **2009**, ApJ, 699, 513  
*Spins of Supermassive Black Holes in M87. II. Fully General Relativistic Calculations.*

Selected refereed papers, co-authoring.

- Kara, E. et al. (including **Li, Y.-R.**), **2021**, ApJ, 922, 151  
*AGN STORM 2: I. First results: A Change in the Weather of Mrk 817*
- Cackett, E. M., Gelbord, J., **Li, Y.-R.**, et al., **2020**, ApJ, 896, 1  
*Supermassive black holes with high accretion rates in active galactic nuclei. XI. Accretion disk reverberation mapping of Mrk 142*
- Hu, C., **Li, Y.-R.**, et al. **2020**, ApJ, 890, 71  
*Broad-line Region of the Quasar PG 2130+099 from a Two-Year Reverberation Mapping Campaign with High Cadence*
- Czerny, B., **Li, Y.-R.**, et al. **2017**, ApJ, 846, 154  
*Failed Radiatively Accelerated Dusty Outflow Model of the Broad Line Region in Active Galactic Nuclei. I. Analytical Solution*
- Wang, J.-M., **Li, Y.-R.**, Wang, J.-C. & Zhang, S., **2008**, ApJL, 676, 109  
*Spins of the Supermassive Black Hole in M87: New Constraints from TeV Observations.*