Yan-Rong LI (李彦荣)

PERSONAL INFORMATION

Date of Birth	Jan 10, 1985	**Place of Birth**	Gansu Province, China (中国甘肃)
Nationality	Chinese	**Gender**	Male
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Address Key Laboratory for Particle Astrophysics
Institute of High Energy Physics
19B Yuquan Road, Beijing, China, 100049

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EDUCATION

2006—2011 Ph.D in Astrophysics
Institute of High Energy Physics, China
Thesis: *Spins of Supermassive Black Holes in Galactic Centers*
Adviser: Jian-Min Wang

2002—2006 Bachelor degree in Theoretical and Applied Mechanics
Peking University, China

POSITIONS

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

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

AWARDS

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

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

TECHNICAL SKILLS

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

Observing Experience

- 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

- 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

- **`PyCALI`**—a Bayesian method for the inter-calibration of spectra in reverberation mapping
  `https://github.com/LiyrAstroph/PyCALI`
- **`BRAINS`**—dynamical modeling for broad-line regions in active galactic nuclei
  `https://github.com/LiyrAstroph/BRAINS`
- **`MICA`**—reverberation-mapping analysis package
  `https://github.com/LiyrAstroph/MICA2`
- **`PIXON`**—a pixon-based reverberation mapping analysis
  `https://github.com/LiyrAstroph/PIXON`

- `CDNest`—a MPI-based diffusive nested sampling package in C
  `https://github.com/LiyrAstroph/CDNest`
- `RECON`—measures power spectra and reconstructs time series in active galactic nuclei
  `https://github.com/LiyrAstroph/RECON`
- `CyPDM`—a fast package to apply the phase disperion minimization (PDM) algorithm
  `https://github.com/LiyrAstroph/CyPDM`

INVITED TALKS AND COLLIQUIA

- Colliquium, Huazhong University of Science and Technology, Mar. 9, 2022
  Black Hole Mass Measurements in Active Galactic Nuclei
- Colliquium, 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

- 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 Wrorkshop 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

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

PUBLICATIONS (ADS Link)

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

Referred papers, first-author/corresponding-author.

18. 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

17. **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

16. **Li, Y.-R.**, et al., **2021**, ApJ, 921, 151
A Pixon-Based Method for Reverberation-Mapping Analysis in Active Galactic Nuclei

15. **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

14. **Li, Y.-R.**, et al., **2019**, ApJS, 241, 33
A Possible ∼20 yr Periodicity in Long-term Variations of the Nearby Radio-Quiet Active Galactic Nucleus Ark 120

13. **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

12. **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

11. **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

10. **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

9. **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

8. **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

7. **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

6. **Li, Y.-R.**, Wang, J.-M. & Ho, L. C., **2013**, Proceedings of IAUS 290 "Feeding Compact Objects: Accretion on All Scales", C. M. Zhang, T. Belloni, M. Mendez & S. N. Zhang (eds.), 290, 259
Cosmological Evolution of SMBHs: Mass Functions & Spins

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 referred papers, co-author.

- 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.