

Shanghuo Li

KASI Postdoctoral Fellow

PRESENT ADDRESS:

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Publication: ADS library

RESEARCH INTERESTS

- The initiation conditions of massive star and cluster formation
- Binary and multiple system formation
- Star formation in filamentary structures of molecular cloud
- Outflows/jets/accretions evolution with time in star formation regions
- Radio interferometry/single dish technique

EDUCATION

2015–2019	Doctor of Philosophiae in Astrophysics	Shanghai Astronomical Observatory (SHAO) & University of Chinese Academy of Sciences (UCAS)
	Investigating the Formation of Massive Stars and Clusters Advisors: Prof. Qizhou Zhang (CfA) and Prof. Junzhi Wang (SHAO)	
2012–2015	Masters of Astrophysics	Guangzhou University (GZU) & SHAO
	Line Survey Toward HII Regions Advisors: Prof. Junhui Fan (GZU) and Prof. Junzhi Wang (SHAO)	
2008–2012	Bachelor of Physics	Jiaying University

WORK EXPERIENCE

2020–Now	KASI Postdoctoral Fellow	KASI, Republic of Korea
	working with Dr. Kee-Tae Kim	
	<ul style="list-style-type: none">• Extreme early stages of massive stars and clusters formation• Binary and multiple in massive star protocluster-forming regions• Star formation and filaments• The influence of stellar feedback on new star formation	
2017–2020	SMA Predoctoral Fellow	Center for Astrophysics Harvard & Smithsonian (CfA), USA
	working with Prof. Qizhou Zhang	
	<ul style="list-style-type: none">• Massive stars and clusters formation in infrared dark filamentary molecular cloud (NGC 6334S)• Studying the outflow motions and its associated filaments in 70 μm dark clumps• Formation of massive star protostellar clusters — Observations of a sample of massive 70 μm dark clouds• Investigating the fragmentation at different evolutionary stages of massive star formation regions	
2013–2017	Graduate Student Research	Shanghai Astronomical Observatory (SHAO), China
	working with Prof. Junzhi Wang (SHAO)	
	<ul style="list-style-type: none">• SiO multi-transitions survey toward 199 massive star formation regions• Millimeter line survey toward four HII regions• Investigating the outflows properties of S255IR with the SMA observations	
2012–2013	Graduate Student Research	Guangzhou University, China
	working with Prof. Junhui Fan	
	<ul style="list-style-type: none">• Investigating the galaxy evolution and activity	

AWARDS

2017–2019	The Submillimeter Array (SMA) pre-doctoral fellow	Center for Astrophysics Harvard & Smithsonian
2017–2019	China Scholarship Council fellowship	China
2018	The Zhu-Li Yuehua outstanding doctoral award	Chinese Academy of Sciences
2017	National Scholarship	China
2016	Merit Student	Chinese Academy of Science

PROFESSIONAL SERVICE

2021–present **Referee for: Astronomy and Astrophysics (A&A)**

PROFESSIONAL SKILLS

languages

English (fluency), Chinese & Cantonese & Hakka (mother tongue)

programming

♥ Python, IDL & C++

- To involve in the design OTF observing System of TianMa 65m telescope
- Familiar with radio data (cm/mm/submm) reduction and analysis using CASA, GILDAS, MIR, Miriad, CARMA, Python, IDL and XCLASS
- Experience with Chandra data using CIAO
- Developed several Python codes for analyzing observational data:
 - Friend-of-Friend (FOF) algorithm Python code to identify filaments using molecular line emission
 - Automatic multiple velocity components fitting code for molecular line cube
 - Interactive tool to calculate the molecular outflow parameters (see in GitHub)
- Skilled in TOPCAT, DS9, Photoshop, Linux, Mac OS and Latex

TEACHING/MENTORING AND OUTREACH

2018	Teaching data reduction to Shaoshan Zeng (SMA pre-doctoral) for doing the project of “SMA observations toward CMZ”	Center for Astrophysics Harvard & Smithsonian
2016–2017	Teaching data reduction to Fei Li (PhD student at SHAO) for doing the project of “millimetre line observations towards four local galaxies”	Shanghai Astronomical Observatory
2015	Teaching data reduction in “Summer School in Radio Astronomy”	Guizhou province, China
2014	Teaching data reduction in “Summer School in Radio Astronomy”	Guizhou province, China

ACCEPTED OBSERVATION PROPOSALS

PI and Co-PI proposal: 972.2 hours

Interferometer:

- JVLA ————— 14 hours, Aug. 2020
- JVLA ————— 9 hours, Aug. 2020
- ALMA ————— 4.6 (12m) + 27 (ACA) + 50 (TP) hours, Cycle-7

- NOEMA ————— 12 hours, Sep. 2018
- NOEMA ————— 12 hours, Mar. 2018
- JVL A ————— 14 hours, Aug. 2018
- JVL A ————— 10 hours, Aug. 2018
- SMA ————— 2 tracks, Mar. 2018
- SMA ————— 2 tracks, Mar. 2018
- SMA ————— 2 tracks, Mar. 2018

Single dish:

- JCMT ————— 5.6 hours, Nov. 2020
- JCMT ————— 52 hours, Nov. 2020
- TRAO ————— 300+ hours, Oct. 2020
- SMT ————— 78 hours, Jan. 2017
- KVN ————— 104 hours, Nov. 2017
- SMT ————— 35 hours, Aug. 2016
- JCMT ————— 15 hours, Sep. 2016
- SMT ————— 140 hours, Sep. 2015
- KP 12m ————— 30 hours, Sep. 2015
- CSO ————— 20 hours, Feb. 2015
- PMO ————— 60 hours, May. 2014

Co-I proposal: 836.8 hours

Interferometer:

- NOEMA ————— 12 hours, Sep. 2020
- NOEMA ————— 8 hours, Sep. 2020
- NOEMA ————— 4 hours, Sep. 20q8
- ALMA ————— 5.4 (12m) + 37.9 (ACA) hours, Cycle-6
- ALMA ————— 7.9 (12m) + 14 (ACA) hours, Cycle-6
- ALMA ————— 19.6 (12m) hours, Cycle-5
- SMA ————— 4 tracks, Sep. 2017
- SMA ————— 2 tracks, Sep. 2017

Single dish:

- IRAM 30m ————— 50 hours, Sep. 2019
- IRAM 30m ————— 49 hours, Mar. 2019
- IRAM 30m ————— 50 hours, Mar. 2019
- IRAM 30m ————— 65 hours, Mar. 2019
- IRAM 30m ————— 46 hours, Mar. 2019
- IRAM 30m ————— 37 hours, Sep. 2018
- SMT ————— 250 hours, 2016-2017
- KVN ————— 151 hours, May. 2017

OBSERVING EXPERIENCE

- TRAO - - - - - remote+on-site, 2020-2021 (>300 hours)
- Tianma 65m Telescope (TianMa) - - - - - on-site, 2014 — 2019 (>200 hours)
- IRAM 30m - - - - - on-site, 2019 (5 days)

- Submillimeter Array (SMA) - - - - - on-site, 2017 (5 nights)
- Submillimeter Telescope (SMT) - - - - - remote, 2015 — 2017 (>300 hours)
- Kitt Peak 12m Radio Telescope (KP 12m) - - - - - remote, 2015 — 2016 (>50 hours)
- Caltech Submillimeter Telescope (CSO) - - - - - remote, 2015 (20 hours)
- Purple Mountain Observatory Telescope (PMO) - - - - - on-site, 2014 (60 hours)

REFERENCES

Prof. Qizhou Zhang

Center for Astrophysics | Harvard & Smithsonian
Email: qzhang@cfa.harvard.edu

Prof. Junzhi Wang

Shanghai Astronomical Observatory
Email: jzwang@shao.ac.cn

Dr. Kee-Tae Kim

Korea Astronomy and Space Science Institute
Email: ktkim@kasi.re.kr

PERSONAL INTERESTS

Badminton (very good), Hiking (frequently), Tennis (frequently), Fishing (sometimes), Skiing (newbie), Swimming (very good)

PRESS RELEASES AND MEDIA COVERAGE

2021

Center for Astrophysics | Harvard & Smithsonian (CfA) science update (04.16.2021): The Youngest Stellar Embryos in Massive Clouds.

2021

The Academic Times: Astronomers enable search for small soon-to-be stars.

2021

NATURE research highlights: Baby stars make it in a tough part of the Galaxy.

2019

Center for Astrophysics | Harvard & Smithsonian (CfA) science update (03.20.2020): Gas Motions in Interstellar Cores Forming Low-Massive Stars.

PUBLICATIONS

8 first and second authored publications, 23 co-authored publications

Publication list on ADS

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First and Second authored Publications

8. **Li, Shanghuo**; Lu, Xing; Zhang, Qizhou; Lee, Chang-Won; Sanhueza, Patricio; Beuther, Henrik; Izaskun; Jiménez-Serra; Qiu, Keping; Palau, Aina; Feng, Siyi; Pillai, Thushara; Kim, Kee-Tae; Liu, Hong-Li; Miquel. Girart, Josep; Liu, Tie; Wang, Junzhi; Wang, Ke; Liu, Haoyu Baobab; Smith, Howard A. ; Li, Di; Lee, Jeong-Eun; Li, Fei; Li, Juan; Kim, Shinyoung; Yue, Nannan; Strom, Shaye; “A Low-mass Cold and Quiescent Core Population in a Massive Star Protocluster”, 2021, ApJL, 912L, 7L.

(1). Center for Astrophysics | Harvard & Smithsonian (CfA) science update (04.16.2021): The Youngest Stellar Embryos in Massive Clouds.

(2). The Academic Times: Astronomers enable search for small soon-to-be stars.

7. Lu, Xing; **Li, Shanghuo**; Zhang, Qizhou; Feng, Siyi; Cheng, Yu; Ginsburg, Adam; Dan, Walker; Battersby, Cara; Kauffmann, Jens; Pillai, Thushara; Longmore, Steven; Diederik, Kruijssen; Natsuko, Izumi; Pan, Xing; Callahan, Daniel; “ALMA Observations of Massive Clouds in the Central Molecular Zone: Protostellar Outflows”, 2021, ApJ, 909, 177L.

NATURE research highlights: Baby stars make it in a tough part of the Galaxy.

6. **Li, Shanghuo**; Sanhueza, Patricio; Zhang, Qizhou; Fumitaka Nakamura, Lu, Xing; Wang, Junzhi; Liu, Tie; Ken'ichi Tatematsu, Jackson, James M; Andrea Silva, Andre's E. Guzman, Takeshi Sakai, Natsuko Izumi, Daniel Tafuya, Fei Li, Contreras, Yanett, Morii, Kaho and Kim, Kee-Tae; "The ALMA Survey of 70 μ m Dark High-mass Clumps in Early Stages (ASHES). II: Molecular Outflows in the Extreme Early Stages of Protocluster Formation", 2020, ApJ, 903, 119.

5. **Li, Shanghuo**; Zhang, Qizhou; Liu, Haoyu Baobab; Beuther, Henrik; Palau, Aina; Girart, Josep; Storm, Shaye; Qiu, Keping; Smith, Howard; Hora, Joseph; Wang, Junzhi; Li, Fei; Yue, Nannan; "ALMA observations of NGC 6334S – I. Forming massive stars and cluster in subsonic-to-transonic filamentary clouds", 2020, ApJ, 896, 110.

Center for Astrophysics | Harvard & Smithsonian (CfA) science update (03.20.2020): Gas Motions in Interstellar Cores Forming Low-Massive Stars.

4. **Li, Shanghuo**; Zhang, Qizhou; Pillai, Thushara; Wang, Junzhi; Stephens, Ian W; Li, Fei; "Formation of Massive Protostellar Clusters – Observations of Massive 70 μ m Dark Molecular Clouds", 2019, ApJ, 886, 130.

3. **Li, Shanghuo**; Wang, Junzhi; Fang, Min; Zhang, Qizhou; Li, Fei; Zhang, Zhi-Yu; Li, Juan; Zhu, Qingfeng; "A SiO J=5-4 Survey Toward Massive Star Formation Regions", 2019, ApJ, 878, 29.

2. **Li, Shanghuo**; Wang, Junzhi; Zhang, Zhi-Yu; Fang, Min; Li, Juan; Zhang, Jiangshui; Fan, Junhui; Zhu, Qingfeng; Li, Fei; "Millimetre spectral line mapping observations towards four massive star-forming H II regions", 2017, MNRAS, 466, 248.

1. **Li, Shanghuo**; Fan, Junhui, Wu, D. X; "Core Dominance Parameter for Gamma-Ray Loud Blazars", 2014, JApA, 35, 467.

Co-authored Publications

23. Li, Juan; Wang, Junzhi; ... **Li, Shanghuo**; et al., "Propionamide (C₂H₅CONH₂): The largest peptide-like molecule in space", 2021, ApJ, in press.

22. Liu, Hong-Li; Liu, Tie; Evans, Neal J.; Wang, Ke; Garay, Guido; Qin, Sheng-Li; **Li, Shanghuo**; Stutz, Amelia; Goldsmith, Paul F.; Liu, Sheng-Yuan; Tej, Anandmayee; Zhang, Qizhou; Juvela, Mika; Li, Di; Wang, Jun-Zhi; Bronfman, Leonardo; Ren, Zhiyuan; Wu, Yue-Fang; Kim, Kee-Tae; Lee, Chang-Won Tatematsu, Kenichi; Cunningham, Maria. R.; Liu, Xun-Chuan; Wu, Jing-Wen; Hirota, Tomoya; Lee, Jeong-Eun; Li, Pak-Shing; Kang, Sung-Ju; Mardones, Diego; Ristorcelli, Isabelle; Zhang, Yong; Luo, Qiu-Yi; Toth, L. Viktor; Yi, Hee-weon; Yun, Hyeon-Sik; Peng, Ya-Ping; Li, Juan; Zhu, Feng-Yao; Shen, Zhi-Qiang; Baug, Tapas; Dewangan, Lokesh; Chakali, Eswareiah; Liu, Rong; Xu, Feng-Wei; Wang, Yu; Zhang, Chao; Li, Jinzeng; Zhang, Chao; Zhou, Jianwen; Tang, Mengyao; Xue, Qiaowei; Issac, Namitha; Soam, Archana; Alvarez-Gutierrez, Rodrigo H. "ATOMS:ALMA Three-millimeter Observations of Massive Star-forming regions – III :Catalogues of candidate hot molecular cores and Hyper/Ultra compact HII regions", 2021, MNRAS, 1368L.

21. Tafuya, Daniel; Sanhueza, Patricio; Qizhou Zhang; **Li, Shanghuo**; Guzman, Andres E; Andrea Silva, Eduardo de la Fuente, Lu, Xing Lu, Morii, Kaho; Tatematsu, Ken'ichi; Contreras, Yanett; Izumi, Natsuko; Jackson, James M.; Nakamura, Fumitaka; Sakai, Takeshi; "The ALMA Survey of 70 μ m Dark High-mass Clumps in Early Stages (ASHES) III. A Young Molecular Outflow Driven by a Decelerating Jet", 2021, ApJ, 913.131T.

20. Li, Fei; Wang, Junzhi; Gao, Feng; Liu, Shu; Zhang, Zhi-Yu; **Li, Shanghuo**; Gong, Yan; Li, Juan; Shi, Yong; "Dense gas in local galaxies revealed by multiple tracers", 2021, MNRAS, 503, 4508L.

19. Feng, Huanxue; Wang, Junzhi; **Li, Shanghuo**; Shi, Yong; Zhu, Fengyao; Kong, Minzhi; Gao, Ripeng; Li, Fei; "Multiple HC₃N line observations towards 19 Galactic massive star-forming regions", 2021, PASJ, 73, 467F.

18. Olguin, Fernando A.; Sanhueza, Patricio; Guzmán, Andrés E.; Lu, Xing; Saigo, Kazuya; Zhang, Qizhou; Silva, Andrea; Chen, Huei-Ru Vivien; **Li, Shanghuo**; Ohashi, Satoshi; Nakamura, Fumitaka; Sakai, Takeshi; Wu, Benjamin; "Digging into the Interior of Hot Cores with ALMA (DIHCA). I. Dissecting the High-mass Star-Forming Core G335.579-0.292 MM1", 2021, ApJ, 909, 199O.

17. Sahu, Dipen; Liu, Sheng-Yuan; Liu, Tie; Evans, Neal J; II; Hirano, Naomi; Tatematsu, Ken'ichi; Lee, Chin-Fei; Kim, Kee-Tae; Dutta, Somnath; Alina, Dana; Bronfman, Leonardo; Cunningham, Maria; Eden, David J.; Garay, Guido; Goldsmith, Paul F.; He, Jinhua; Hsu, Shih-Ying; Jhan, Kai-Syun; Johnstone, Doug; Juvela, Mika Kim, Gwanjeong; Kuan, Yi-Jehng; Kwon, Woojin; Lee, Chang Won; Lee, Jeong-Eun; Li, Di; Li, Pak Shing; **Li, Shanghuo**; Luo, Qiu-Yi; Montillaud, Julien; Moraghan, Anthony; Pelkonen, Veli-Matti; Qin, Sheng-Li; Ristorcelli, Isabelle; Sanhueza, Patricio; Shang, Hsien; Shen, Zhi-Qiang; Soam, Archana; Wu, Yuefang; Zhang, Qizhou; Zhou, Jianjun; "ALMA Survey of Orion Planck Galactic Cold Clumps (ALMASOP): Detection of Extremely High-density Compact Structure of Prestellar Cores and Multiple Substructures Within", 2021, ApJ, 907L, 15S.

16. Dutta, Somnath; Lee, Chin-Fei; Liu, Tie; Hirano, Naomi; Liu, Sheng-Yuan; Tatematsu, Ken'ichi; Kim, Kee-Tae; Shang, Hsien; Sahu, Dipen; Kim, Gwanjeong; Moraghan, Anthony; Jhan, Kai-Syun; Hsu, Shih-Ying; Evans, Neal J; Johnstone, Doug; Derek Ward-Thompson, Kuan, Yi-Jehng; Lee, Chang Won; Lee, Jeong-Eun; Traficante, Alessio; Juvela, Mika; Vastel, Charlotte; Zhang, Qizhou, Sanhueza, Patricio; Soam, Archana; Kwon, Woojin;

- Bronfman, Leonardo; Eden, David; Goldsmith, Paul F.; He, Jinhua; Wu, Yuefang; Pelkonen, Veli-Matti; Qin, Sheng-Li; and **Li, Shanghuo**; “ALMA Survey of Orion Planck Galactic Cold Clumps (ALMASOP) II. Survey overview: a first look at 1.3 mm continuum maps and molecular outflows”, 2020, *ApJS*, 251, 20D.
15. Zeng, Shaoshan; Zhang, Q; Jiménez-Serra, I; Tercero, B; Lu, X; Martín-Pintado, J; de Vicente, P; Rivilla, V. M; **Li, Shanghuo**; “Cloud-cloud collision as drivers of the chemical complexity in Galactic Centre molecular clouds”, 2020, *MNRAS*, 497, 4896Z.
14. Liu, Tie; Evans, Neal J.; Kim, Kee-Tae; Goldsmith, Paul F.; Liu, Sheng-Yuan; Zhang, Qizhou; Tatematsu, Ken'ichi; Wang, Ke; Juvela, Mika; Bronfman, Leonardo; Cunningham, Maria R.; Garay, Guido; Hirota, Tomoya; Lee, Jeong-Eun; Kang, Sung-Ju; Li, Di; Li, Pak-Shing; Mardones, Diego; Qin, Sheng-Li; Ristorcelli, Isabelle Tej; Anandmayee; Toth, L. Viktor; Wu, Jing-Wen; Wu, Yue-Fang; Yi, Hee-weon; Yun, Hyeong-Sik; Liu, Hong-Li; Peng, Ya-Ping; Li, Juan; **Li, Shanghuo**; Lee, Chang Won; Shen, Zhi-Qiang; Baug, Tapas; Wang, Jun-Zhi; Zhang, Yong; Issac, Namitha; Zhu, Feng-Yao; Luo, Qiu-Yi; Soam, Archana; Liu, Xun-Chuan; Xu, Feng-Wei; Wang, Yu; Zhang, Chao; Ren, Zhiyuan; Zhang, Chao, “ATOMS: ALMA Three-millimeter Observations of Massive Star-forming regions - I. Survey description and a first look at G9.62+0.19”, 2020, *MNRAS*, 496, 2790L.
13. Liu, Tie; Evans, Neal J.; Kim, Kee-Tae; Goldsmith, Paul F.; Liu, Sheng-Yuan; Zhang, Qizhou; Tatematsu, Ken'ichi; Wang, Ke; Juvela, Mika; Bronfman, Leonardo; Cunningham, Maria R.; Garay, Guido; Hirota, Tomoya; Lee, Jeong-Eun; Kang, Sung-Ju; Li, Di; Li, Pak-Shing; Mardones, Diego; Qin, Sheng-Li; Ristorcelli, Isabelle Tej; Anandmayee; Toth, L. Viktor; Wu, Jing-Wen; Wu, Yue-Fang; Yi, Hee-weon; Yun, Hyeong-Sik; Liu, Hong-Li; Peng, Ya-Ping; Li, Juan; **Li, Shanghuo**; Lee, Chang Won; Shen, Zhi-Qiang; Baug, Tapas; Wang, Jun-Zhi; Zhang, Yong; Issac, Namitha; Zhu, Feng-Yao; Luo, Qiu-Yi; Liu, Xun-Chuan; Xu, Feng-Wei; Wang, Yu; Zhang, Chao; Ren, Zhiyuan; Zhang, Chao; “ATOMS: ALMA three-millimeter observations of massive star-forming regions - II. Compact objects in ACA observations and star formation scaling relations”, 2020, *MNRAS*, 496, 282L.
12. Li, Fei; Wang, Junzhi; Fang, Min; Tan, Qing-Hua; Zhang, Zhi-Yu; Gao, Yu; **Li, Shanghuo**; “HCN 3-2 survey towards a sample of local galaxies”, 2020, *PASJ*, 72, 41L.
11. Li, Fei; Wang, Junzhi; Fang, Min; **Li, Shanghuo**; Zhang, Zhi-Yu; Gao, Yu; Kong, Minzhi; “Isotopologues of dense gas tracers in nearby infrared bright galaxies”, 2020, *MNRAS*, 494, 1095L.
10. Wang, Junzhi; Li, Di; Goldsmith, Paul F.; Zhang, Zhi-Yu; Gao, Yu; Shi, Yong; **Li, Shanghuo**; Fang, Min; Li, Juan; Zhang, Jiangshui; “Molecular Oxygen in the nearest QSO Mrk 231”, 2020, *ApJ*, 889, 129.
9. Li, Juan; Wang, Junzhi; Qiao, Haihua; Quan, Donghui; Fang, Min; Dun, Fujun; Li, Fei; Shen, Zhiqiang; **Li, Shanghuo**; Li, Di; Zhang, Zhi-Yu; Zhang, Jiangshui; “Mapping observations of complex organic molecules around Sagittarius B2 with the ARO 12 m telescope”, 2020, *ApJ*, 492, 556L.
8. Sanhueza, Patricio; Contreras, Yanett; Wu, Benjamin; Jackson, James M; Guzman, Andres E; Zhang, Qizhou; **Li, Shanghuo**; Lu, Xing; Silva, Andrea; Izumi, Natsuko; Liu, Tie; Miura, Rie E; Tatematsu, Ken'ichi; Sakai, Takeshi; Beuther, Henrik; Garay, Guido; Ohashi, Satoshi; Saito, Masao; Nakamura, Fumitaka; Saigo, Kazuya; Veena, V. S; Nguyen-Luong, Quang; Tafoya, Daniel; “The ALMA Survey of 70 μ m dark High-mass clumps in Early Stages (ASHES). I. Pilot Survey: Clump Fragmentation”, 2019, *ApJ*, 886, 102S.
7. Li, Juan; Shen, Zhiqiang; Wang, Junzhi; Chen, Xi; Li, Di; Wu, Yajun; Dong, Jian; Zhao, Rongbing; Gou, Wei; Wang, Jinqing; **Li, Shanghuo**; Wang, Bingru; Zheng, Xingwu; “Widespread Presence of Glycolaldehyde and Ethylene Glycol around Sagittarius B2”, 2017, *APJ*, 849, 115L.
6. Li, Fei; Wang, Junzhi; Kong, Minzhi; **Li, Shanghuo**; “Millimetre line observations towards four local galaxies”, 2017, *MNRAS*, 482, 4763L.
5. Dong, Jian; Wu, Yajun; Yuan, Jin; **Li, Shanghuo**; Li, Juan; Wang, Junzhi; Chen, Xi; Liu, Qinghui; Shen, Zhiqiang; “Spectral Line On-The-Fly Observing System of the Tian Ma Telescope”, 2016, *Progress In Astronomy*, 34, 2D.
4. Fan, Junhui; Yang, Jianghe; Wu, Dexiang; **Li, Shanghuo**; Liu, Yi; Ji, Z.Y.; “The Correlation between the Gamma-Ray Luminosity and the Core-Dominance for a Fermi Blazar Sample”, 2014, *IAU*, 304, 157F.
3. Fan, Junhui; Bastieri, Denis; Yang, Jianghe.; Liu, Yi; Wu, Dexiang; **Li, Shanghuo**; “Relativistic Beaming Effect in Fermi Blazars”, 2014, *JApA*, 35, 231F.
2. Wu, Dexiang; Fan, Junhui; **Li, Shanghuo**; “Correlation Between Gamma-ray and Radio Bands for Gamma-ray Loud Blazars”, 2014, *JApA*, 35, 353W.
1. Tao, Jun, Fan, Junhui; Pan, H. J; Wu, Dexiang; **Li, Shanghuo**; “Correlation between γ -Ray and Radio Bands for Gamma-Ray Loud Blazars”, 2014, *JApA*, 35, 485T.