Shanghuo Li

"Make the star that you want to see in the universe"

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I am a postdoctoral fellow at the Korea Astronomy and Space Science Institute (KASI). I received my PhD degree from University of Chinese Academy of Sciences (UCAS) and Shanghai Astronomical Observatory (SHAO), China, supervised by Dr. Junzhi Wang (SHAO) and Dr. Qizhou Zhang (CfA), in Feb 2020. I also worked as an SMA predoctoral fellow at the Harvard-Smithsonian Center for Astrophysics (CfA), USA, supervised by Dr. Qizhou Zhang (CfA), in 2017-2019.

RESEARCH INTERESTS

My research interests focus on high-mass stars and clusters formation in molecular clouds. Mostly, I used the infrared, radio, millimeter and sub-millimeter data, e.g., from Spitzer, Herschel, ALMA, SMA, NOEMA, JVLA, IRAM 30m, JCMT, SMT, KP 12m, CSO, PMO 13.7m, KVN 21m and Tianma 65m, to probe the molecular gas and dust emission from large scales > 10 pc down to small scales < 0.01 pc. Some selected research projects:

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

EDUCATION

2015–2020 **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: Dr. Qizhou Zhang (CfA) and Dr. Junzhi Wang (SHAO)

2012–2015 **Masters** of Astrophysics — Guangzhou University (GZU)
Line Survey Toward HII Regions
Advisors: Prof. JunHui Fan (GZU) and Dr. 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
- 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

2017–2019 **SMA Predoctoral Fellow** — Center for Astrophysics | Harvard & Smithsonian (CfA), USA
working with Dr. Qizhou Zhang
- Massive stars and clusters formation in infrared dark filamentary molecular cloud
- Studying the outflow motions and its associated filaments in 70 um 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 Dr. Junzhi Wang (SHAO)
- 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
- 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

PRESS RELEASES AND MEDIA COVERAGE

2021
Center for Astrophysics | Harvard & Smithsonian (CfA) science update (11.26.2021): "The Role of Turbulence in Making Massive Stars."

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
I was interviewed by The Academic Times Magazine for their article titled "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."

PROFESSIONAL SERVICE

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

2022–present **Referee for: The Astrophysical Journal (ApJ)**

RECENT TALKS

09/02/2022 Colloquium, ALMA-J seminar, National Astronomical Observatory of Japan (NAOJ), Japan

24/02/2022 Colloquium, Xiamen University, China

16/03/2022 Colloquium, Korea Astronomy and Space Science Institute (KASI), South Korea

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 the molecular line emission (see in GitHub)
  - 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"**	Shanghai, China
2014	**Teaching data reduction in "Summer School in Radio Astronomy"**	Guizhou province, China

ACCEPTED OBSERVATION PROPOSALS

PI proposal: 1062 hours

Interferometer:

- ALMA ———————— 4.8 (12m) + 26 (ACA) + 50 (TP) hours, Cycle-8
- ALMA ———————— 9.5 (12m) hours, Cycle-8
- JVLA ———————— 14 hours, Aug. 2020
- JVLA ———————— 9 hours, Aug. 2020
- ALMA ———————— 4.6 (12m) + 27 (ACA) + 50 (TP) hours, Cycle-7 (Co-PI)
- NOEMA ———————— 12 hours, Sep. 2018
- NOEMA ———————— 12 hours, Mar. 2018
- JVLA ———————— 14 hours, Aug. 2018
- JVLA ———————— 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

Selected some Co-I proposals: 900+ hours

Interferometer:

- ALMA ———————— 9.4 (12m) + 26.3 (ACA) hours, Cycle-8
- ALMA ———————— 8.8 (12m) + 10.3 (ACA) hours, Cycle-8
- ALMA ———————— 26 (12m) hours, Cycle-8
- 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

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

Dr. Junzhi Wang
Shanghai Astronomical Observatory
Email: jzwang@shao.ac.cn

Dr. Howard A. Smith
Center for Astrophysics | Harvard & Smithsonian
Email: hsmith@cfa.harvard.edu

Dr. Kee-Tae Kim
Korea Astronomy and Space Science Institute
Email: ktkim@kasi.re.kr

PUBLICATIONS

9 first and second authored publications, 40 co-authored publications

Publication list on ADS ORCID: 0000-0003-1275-5251

First and Second authored Publications

9. **Li, Shanghuo**; Sanhueza, Patricio; Lee, Chang-Won; Zhang, Qizhou; Beuther, Henrik; Palau, Aina; Liu, Hong-Li; Hauyu Baobab; Feng, Siyi; Liu, Tie; Kim, Kee-Tae; Wang, Junzhi; Li, Di; Smith, Howard A. ; Izaskun; Jiménez-Serra; Miquel. Girart, Josep; Qiu, Keping; Wang, Ke; Lu, Xing; Li, Fei; Li, Juan; Cao, Yue; Kim, Shinyoung; Strom, Shaye; "ALMA observations of NGC 6334S. II. Subsonic and Transonic Narrow Filaments in a High-mass Star Formation Cloud ", 2022, ApJ, 9126, 125L.
(1). Center for Astrophysics | Harvard & Smithsonian (CfA) science update (11.26.2021): The Role of Turbulence in Making Massive Stars.

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, Hauyu 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.
(1). 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. Guzma'n, Takeshi Sakai, Natsuko Izumi, Daniel Tafoya, Fei Li, Contreras, Yanett, Morii, Kaho and Kim, Kee-Tae; "The ALMA Survey of 70 μm 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, Hauyu 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.
(1). 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 μm 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

40. Jhan, Kai-Syun; Lee, Chin-Fei; ... **Li, Shanghuo**; et al., "ALMA Survey of Orion Planck Galactic Cold Clumps (ALMASOP): Deriving Inclination Angle and Velocity of the Protostellar Jets from their SiO Knots", 2022, ApJ, in press.

39. Dutta, Somnath; Lee, Chin-Fei; ... **Li, Shanghuo**; et al., "ALMA Survey of Orion Planck Galactic Cold Clumps (ALMASOP): Evidence for a Molecular Jet Launched at an Unprecedented Early Phase of Protostellar evolution", 2022, ApJ, in press.

38. Luo, Qiuyi; Liu, Tie; ... **Li, Shanghuo**; et al., "ALMA Survey of Orion Planck Galactic Cold Clumps (ALMASOP): How do dense core properties affect the multiplicity of protostars?", 2022, ApJ, in press.

37. Liu, Hong-Li; Tej, Anandmayee; ... **Li, Shanghuo**; et al., "ATOMS: ALMA Three-millimeter Observations of Massive Star-forming regions - IX. A pilot study towards IRDC G034.43+00.24 on multi-scale structures and gas kinematics", 2022, MNRAS, 511, 4480L.

36. Tatematsu, Ken'ichi; Yeh, You-Ting; ... **Li, Shanghuo**; et al., "Nobeyama Survey of Inward Motions toward Cores in Orion Identified by SCUBA-2", 2022, ApJ, in press.

35. Liu, Rong; Liu, Tie; "ATOMS: ALMA three-millimeter observations of massive star-forming regions - VII. A catalogue of SiO clumps from ACA observations", 2022, MNRAS, 511, 3618L.

34. Qin, Sheng-Li; Liu, Tie; "ATOMS: ALMA Three-millimeter Observations of Massive Star-forming regions - VIII. A search for hot cores by using C2H5CN, CH3OCHO, and CH3OH lines", 2022, MNRAS, 511, 3463Q.

33. Olguin, Fernando A.; Sanhueza, Patricio; ... **Li, Shanghuo**; et al., "Digging into the Interior of Hot Cores with ALMA (DIHCA). II. Exploring the Inner Binary (Multiple) System Embedded in G335 MM1 ALMA1", 2022, ApJ, 929, 68O.

32. Zheng, Si-QI; Li, Juan; ... **Li, Shanghuo**; et al., "Spatial Distribution of HOCN Around Sagittarius B2", RAA, 22c, 5007Z.

31. Hsu, Shih-Ying; Liu, Sheng-Yuan; ... **Li, Shanghuo**; et al., "ALMA Survey of Orion Planck Galactic Cold Clumps (ALMASOP): A Hot Corino Survey toward Protostellar Cores in the Orion Cloud", 2022, ApJ, 927, 218H.

30. Zhou, Jian-Wen; Liu, Tie; ... **Li, Shanghuo**; et al., "ATOMS: ALMA Three-millimeter Observations of Massive Star-forming regions-VI. On the formation of the 'L' type filament in G286.21+0.17", 2021, MNRAS, 508, 4629Z.

29. Sakai, Takeshi; Sanhueza, Patricio; ... **Li, Shanghuo**; et al., "The ALMA Survey of 70 μm Dark High-mass Clumps in Early Stages (ASHES). V. Deuterated Molecules in the 70 μm dark IRDC G14.492-00.139", 2021, ApJ, 925, 144S.

28. Liu, Hong-Li; Tej, Anandmayee; ... **Li, Shanghuo**; et al., "ATOMS: ALMA Three-millimeter Observations of Massive Star-forming regions – V. Hierarchical fragmentation and gas dynamics in IRDC G034.43+00.24", 2021, MNRAS, 510, 5009L.

27. Dutta, Somnath; Lee, Chin-Fei; ... **Li, Shanghuo**; et al., "Detection of a dense SiO jet in the evolved protostellar phase", 2021, ApJ, 925, 11D.

26. Morii, Kaho; Sanhueza, Patricio; ... **Li, Shanghuo**; et al., "The ALMA Survey of 70 μm Dark High-mass Clumps in Early Stages (ASHES). IV. Star formation signatures in G023.477", 2021, ApJ, in press.

25. Zhang, Chao; Evans, Neal J.; ... **Li, Shanghuo**; et al., "ATOMS: ALMA Three-millimeter Observations of Massive Star-forming regions – IV. Radio Recombination Lines and evolution of star formation efficiencies", 2021, MNRAS, 510, 4998Z.

24. Li, Juan; Wang, Junzhi; ... **Li, Shanghuo**; et al., "Propionamide (C2H5CONH2): The largest peptide-like molecule in space", 2021, ApJ, 919, 4L.

23. Baug, T. ; Wang, Ke ;... **Li, Shanghuo**; et al., "An ALMA study of outflow parameters of protoclusters: outflow feedback to maintain the turbulence", 2021, MNRAS, 1652B.

22. Liu, Hong-Li; Liu, Tie; Evans, Neal J.; Wang, Ke; Garay, Guido; Qin, Sheng-Li; **Li, Shanghuo**; et al., "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. Tafoya, Daniel; Sanhueza, Patricio; Qizhou Zhang; **Li, Shanghuo**; et al., "The ALMA Survey of 70 μm 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; ... **Li, Shanghuo**; et al., "Dense gas in local galaxies revealed by multiple tracers", 2021, MNRAS, 503, 4508L.

19. Feng, Huanxue; Wang, Junzhi; **Li, Shanghuo**; et al., "Multiple HC3N line observations towards 19 Galactic massive star-forming regions", 2021, PASJ, 73, 467F.

18. Olguin, Fernando A.; Sanhueza, Patricio; ... **Li, Shanghuo**; et al., “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; ... **Li, Shanghuo**; et al., “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; ... **Li, Shanghuo**; et al., “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; ... **Li, Shanghuo**; et al., “Cloud-cloud collision as drivers of the chemical complexity in Galactic Centre molecular clouds”, 2020, MNRAS, 497, 4896Z.

14. Liu, Tie; Evans, Neal J.; ... **Li, Shanghuo**; et al., “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.; ... **Li, Shanghuo**; et al., “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; ... **Li, Shanghuo**; et al., “HCN 3-2 survey towards a sample of local galaxies”, 2020, PASJ, 72, 41L.

11. Li, Fei; Wang, Junzhi; Fang, Min; **Li, Shanghuo**; et al., “Isotopologues of dense gas tracers in nearby infrared bright galaxies”, 2020, MNRAS, 494, 1095L.

10. Wang, Junzhi; Li, Di; ... **Li, Shanghuo**; et al., “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;sZhang, 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; ... **Li, Shanghuo**; et al., “The ALMA Survey of 70 μm dark High-mass clumps in Early Stages (ASHES). I. Pilot Survey: Clump Fragmentation”, 2019, ApJ, 886, 102S.

7. Li, Juan; Shen, Zhiqiang; ... **Li, Shanghuo**; et al., “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**; et al., “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**; et al., “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; ... **Li, Shanghuo**; et al., “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; ... **Li, Shanghuo**; et al., “Correlation between γ-Ray and Radio Bands for Gamma-Ray Loud Blazars”, 2014, JApA, 35, 485T.

PERSONAL INTERESTS

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