

# Shanghuo Li

*"Make the star that you like in the universe"*

## **PRESENT ADDRESS:**

Max Planck Institute for Astronomy,  
Königstuhl 17, 69117 Heidelberg,  
Germany  
+49 (0)160 504 6163

## **CONTACT INFORMATION:**

**E-mail:** [shanghuo.li@gmail.com](mailto:shanghuo.li@gmail.com), [li@mpia.de](mailto:li@mpia.de)  
**Homepage:** <https://shanghuoli.github.io>  
**ORCID:** 0000-0003-1275-5251  
**Publication:** [ADS library](#)

I am an independent postdoctoral fellow at Max Planck Institute for Astronomy (MPIA). 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 pre-doctoral fellow at Harvard-Smithsonian Center for Astrophysics (CfA), USA, supervised by Dr. Qizhou Zhang (CfA), in 2017-2019. I also a postdoctoral fellow at Korea Astronomy and Space Science Institute (KASI) in 2020-2022.

## **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  $< 0.001$  pc ( $\sim 100$  AU). 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

## **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 the 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."](#)

## EDUCATION

2015–2019	<b>Doctor of Philosophiae</b> in Astrophysics <i>Investigating the Formation of Massive Stars and Clusters</i> Advisors: <a href="#">Dr. Qizhou Zhang (CfA)</a> and <a href="#">Dr. Junzhi Wang (SHAO)</a>	Shanghai Astronomical Observatory (SHAO) & University of Chinese Academy of Sciences (UCAS)
2012–2015	<b>Masters</b> of Astrophysics <i>Line Survey Toward HII Regions</i> Advisors: <a href="#">Dr. Junzhi Wang (SHAO)</a> and <a href="#">Prof. JunHui Fan (GZU)</a>	Guangzhou University (GZU)
2008–2012	<b>Bachelor</b> of Physics	Jiaying University

## WORK EXPERIENCE

2022–Now	<b>MPIA PSF Postdoctoral Fellow</b> <i>working with Dr. Henrik Beuther</i> <ul style="list-style-type: none"><li>• Turbulence in star-formation clouds</li><li>• Extreme early stages of massive stars and clusters formation</li><li>• Binary and multiple in massive star protocluster-forming regions</li><li>• Filament formation and its embedded star formation</li><li>• Stellar feedback and star formation feedback</li></ul>	MPIA, Germany
2020–2022	<b>KASI Postdoctoral Fellow</b> <i>working with Dr. Kee-Tae Kim</i> <ul style="list-style-type: none"><li>• Extreme early stages of massive stars and clusters formation</li><li>• Binary and multiple in massive star protocluster-forming regions</li><li>• Star formation and filaments</li><li>• The influence of stellar feedback on new star formation</li></ul>	KASI, Republic of Korea
2017–2019	<b>CfA-SMA Predoctoral Fellow</b> <i>working with Dr. Qizhou Zhang</i> <ul style="list-style-type: none"><li>• Massive stars and clusters formation in infrared dark filamentary molecular cloud</li><li>• Studying the outflow motions and its associated filaments in 70 <math>\mu</math>m dark clumps</li><li>• Formation of massive star protostellar clusters — Observations of a sample of massive 70 <math>\mu</math>m dark clouds</li><li>• Investigating the fragmentation at different evolutionary stages of massive star formation regions</li></ul>	Center for Astrophysics   Harvard & Smithsonian (CfA), USA
2013–2017	<b>Graduate Student Research</b> <i>working with Dr. Junzhi Wang</i> <ul style="list-style-type: none"><li>• SiO multi-transitions survey toward 199 massive star formation regions</li><li>• Millimeter line survey toward four HII regions</li><li>• Investigating the outflows properties of S255IR with the SMA observations</li></ul>	Shanghai Astronomical Observatory (SHAO), China
2012–2013	<b>Graduate Student Research</b> <i>working with Prof. Junhui Fan</i> <ul style="list-style-type: none"><li>• Investigating the galaxy evolution and activity</li></ul>	Guangzhou University, China

## AWARDS

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

## PROFESSIONAL SERVICE

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

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

## INVITED TALKS

---

01/19/2023: Cosmic Origin seminar, Physical Research Laboratory (PRL), India.

Title: “Massive Protostellar Cluster Formation”

11/10/2022: KIAA-DoA seminar, Peking University (PKU) Kavli Institute for Astronomy and Astrophysics (KIAA), China.

Title: “Shining in the Darkness — The ALMA Survey of 70  $\mu\text{m}$  Dark High-mass Clumps in Early Stages (ASHES)”

24/02/2022: Colloquium, Department of Astronomy, Xiamen University, China.

Title: “Dancing in Molecular Clouds — Massive Star Formation”

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

Title: “The Sharp ALMA View of Early Stages of Massive Star Formation”

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

Title: “Early Stages of Massive Star Formation”

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

## ACCEPTED OBSERVATION PROPOSALS

---

### PI proposal: 1331 hours

Interferometer:

- ALMA ————— 12.0 (12m) hours, Cycle-10 (grade A)
- ALMA ————— 16.1 (12m) + 44.9 (ACA) + 84.2 (TP) hours, Cycle-9 (grade A)
- ALMA ————— 12.1 (12m) hours, Cycle-9
- 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:

- TRAO ————— 100+ hours, Oct. 2021
- 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: 1000+ hours**

Interferometer:

- ALMA ————— 39.7(12m) hours, Cycle-9
- ALMA ————— 26.8(12m) + 24.9(ACA) hours, Cycle-9
- ALMA ————— 12.5(12m) + 35.5(ACA) hours, Cycle-9
- 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

GuangXi University  
Email: junzhiwang@gxu.edu.cn

### Dr. Henrik Beuther

Max Planck Institute for Astronomy  
Email: beuther@mpia.de

### 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

---

12 first and second authored publications, 59 co-authored publications

[Publication list on ADS](#)

[ORCID: 0000-0003-1275-5251](#)

### First and Second authored Publications

13. **Li, Shanghuo**; Sanhueza, Patricio; Henrik Beuther, Huei-Ru Vivien Chen, Rolf Kuiper, Fernando A. Olguin, Ralph E. Pudritz, Ian W. Stephens, Qizhou Zhang, Fumitaka Nakamura, Xing Lu, Rajika L. Kuruwita<sup>1</sup>, Takeshi Sakai, Thomas Henning, Kotomi Taniguchi; Li, Fei; *“High-order multiplicity in high-mass star formation”*, 2023, submitted.

12. **Li, Shanghuo**; Sanhueza, Patricio; Zhang, Qizhou; Guido, Garay; Sabatini, Giovanni; Morii, Kaho; Lu, Xing; Tafoya, Daniel; Nakamura, Fumitaka; Izumi, Natsuko; Tatematsu, Ken'ichi; Li, Fei; “*The ALMA Survey of 70  $\mu$ m Dark High-mass Clumps in Early Stages (ASHES). VIII: Dynamics of Embedded Dense Cores*”, 2022, submitted to ApJ.

11. Zhou, Jian-Wen; **Li, Shanghuo**; Liu, Hong-Li; Peng, Yaping; Zhang, Siju; Xu, Feng-Wei; Zhang, Chao; Liu, Tie; Li, Jin-Zeng; “*Formation of hub-filament structure triggered by a cloud-cloud collision in the W33 complex*”, 2023, MNRAS, 519, 2391.

10. **Li, Shanghuo**; Sanhueza, Patricio; Lu, Xing; Lee, Chang Won; Zhang, Qizhou; Bovino, Stefano; Sabatini, Giovanni; Liu, Tie; Kim, Kee-Tae; Morii, Kaho; Tafoya, Daniel; Tatematsu, Ken'ichi; Sakai, Takeshi; Wang, Junzhi; Li, Fei; Silva, Andrea; Izumi, Natsuko; Allingham, David; “*The ALMA Survey of 70  $\mu$ m Dark High-mass Clumps in Early Stages (ASHES). VII: Chemistry of Embedded Dense Cores*”, 2022, ApJ, 939, 102.

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. Guzman, Takeshi Sakai, Natsuko Izumi, Daniel Tafoya, Fei Li, Contreras, Yanett, Morii, Kaho and Kim, Kee-Tae; “*The ALMA Survey of 70  $\mu$ 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, 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  $\mu$ 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

59. Sahu, Dipen; Liu, Sheng-Yuan; ... **Li, Shanghuo**; et al., “*ALMA Survey of Orion Planck Galactic Cold Clumps (ALMASOP): Density Structure of Centrally Concentrated Prestellar Cores from Multiscale Observations*”, 2023, ApJ, 945, 156.

58. Hsu, Shih-Ying; Liu, Sheng-Yuan; ... **Li, Shanghuo**; et al., “ALMA Survey of Orion Planck Galactic Cold Clumps (ALMASOP): The Warm-Envelope Origin of Hot Corinos”, 2023, ApJ, in press.
57. Yang, Dongting; Liu, Hong-Li; ... **Li, Shanghuo**; et al., “Direct Observational Evidence of the Multi-scale, Dynamical Mass Accretion Toward a High-mass Star-forming Hub-filament System”, 2023, ApJ, 953, 40.
56. Luo, Qiu-yi; Liu, Tie; ... **Li, Shanghuo**; et al., “ALMA Survey of Orion Planck Galactic Cold Clumps (ALMASOP): A Forming Quadruple System with Continuum “Ribbons” and Intricate Outflows”, 2023, ApJ, 952, 2.
55. Dutta, Somnath; Lee, Chin-Fei; ... **Li, Shanghuo**; et al., “Episodic Accretion in Protostars – An ALMA Survey of Molecular Jets in the Orion Molecular Cloud”, 2023, ApJ, in press.
54. Morii, Kaho; Sanhueza, Patricio; ... **Li, Shanghuo**; et al., “The ALMA Survey of 70  $\mu$ m Dark High-mass Clumps in Early Stages (ASHES). IX. Physical Properties and Spatial Distribution of Cores in IRDCs”, 2023, ApJ, 950, 148.
53. Taniguchi, Kotomi; Sanhueza, Patricio; ... **Li, Shanghuo**; et al., “Digging into the Interior of Hot Cores with the ALMA (DIHCA). III. The Chemical Link between  $\text{NH}_2\text{CHO}$ ,  $\text{HNCO}$ , and  $\text{H}_2\text{CO}$ ”, 2023, ApJ, 950, 57.
52. Liu, Junhao; Zhang, Qizhou; ... **Li, Shanghuo**; et al., “Multi-scale physical properties of NGC 6334 as revealed by local relative orientations between magnetic fields, density gradients, velocity gradients, and gravity”, 2023, ApJ, 949, 109.
51. Liu, Hong-Li; Tej, Anandmayee; ... **Li, Shanghuo**; et al., “Evidence of high-mass star formation through multi-scale mass accretion in hub-filament-system clouds”, 2023, MNRAS, 522, 3719.
50. Xu, Feng-Wei; Wang, Ke; ... **Li, Shanghuo**; et al., “ATOMS: ALMA Three-millimeter Observations of Massive Star-forming regions – XV. Steady Accretion from Global Collapse to Core Feeding in Massive Hub-filament System SDC335”, 2023, MNRAS, in press.
49. Zhang, C; Zhu, Feng-Yao; ... **Li, Shanghuo**; et al., “ATOMS: ALMA Three-millimeter Observations of Massive Star-forming regions -XIV. Properties of resolved UC HII regions”, 2023, MNRAS, in press.
48. Zhang, Siju; Wang, Ke; ... **Li, Shanghuo**; et al., “ATOMS: ALMA three-millimeter observations of massive star-forming regions -XIII. Ongoing triggered star formation within clump-fed scenario found in the massive (1500  $M_\odot$ ) clump”, 2023, MNRAS, in press.
47. Kim, Shinyoung; Lee, Chang Won; ... **Li, Shanghuo**., “Role of Filamentary Structures in the Formation of Two Dense Cores, L1544 and L694-2”, 2022, ApJ, 940, 112.
46. Wang, Junzhi; Qi, Chunhua; **Li, Shanghuo**; Wu, Jingwen., “CN 2-1 and CS 5-4 Observations toward Arp 299 with the SMA”, 2022, ApJ, 937, 120W.
45. Saha, Anindya; Tej, Anandmayee; .. **Li, Shanghuo**; et al., “ATOMS: ALMA three-millimeter observations of massive star-forming regions - XII: Fragmentation and multiscale gas kinematics in protoclusters G12.42+0.50 and G19.88-0.53”, 2022, MNRAS, 516, 1983S.
44. Sabatini, Giovanni; Bovino, Stefano; .. **Li, Shanghuo**; et al., “The ALMA Survey of 70  $\mu$ m Dark High-mass Clumps in Early Stages (ASHES). VI. The Core-scale CO Depletion”, 2022, ApJ, 936, 80S.
43. Redaelli, E; Bovino, S; .. **Li, Shanghuo**; et al., “The core population and kinematics of a massive clump at early stages: an ALMA view”, 2022, ApJ, in press.
42. Zhou, Jian-Wen; Liu, Tie; .. **Li, Shanghuo**; et al., “ATOMS: ALMA Three-millimeter Observations of Massive Star-forming regions - XI. From inflow to infall in hub-filament systems”, 2022, MNRAS, 514, 6038Z,
41. Li, Fei; Zhang, Zhi-Yu; .. **Li, Shanghuo**; et al., “Properties of Dense Molecular Gas along the Major Axis of M82”, 2022, ApJ, 933, 139L.
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, 931L, 5J.
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, 931, 130D.
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, 931, 158L.
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, 931, 33T.

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 C<sub>2</sub>H<sub>5</sub>CN, CH<sub>3</sub>OCHO, and CH<sub>3</sub>OH 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  $\mu$ m Dark High-mass Clumps in Early Stages (ASHES). V. Deuterated Molecules in the 70  $\mu$ m 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  $\mu$ m 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 (C<sub>2</sub>H<sub>5</sub>CONH<sub>2</sub>): 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  $\mu$ 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; ... **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 HC<sub>3</sub>N 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; 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; ... **Li, Shanghuo**; et al., “The ALMA Survey of 70  $\mu$ m 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  $\gamma$ -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)