Aiyuan Yang | Curriculum Vitae

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Education & Background

Max Planck Institute for Radio Astronomy (MPIfR) — **Aug. 2018 – Now**
Postdoctoral researcher — *Bonn, Germany*

National Astronomical Observatories (NAOC), CAS — **Sep. 2014 – Aug. 2018**
Ph.D. student of Astrophysics — *Beijing, China*

University of Hertfordshire — **Feb. 2016 – Oct. 2017**
SKA Joint Ph.D. student of Astrophysics — *Hatfield, UK*

Xinjiang Astronomical Observatories (XAOC), CAS & NAOC — **Sep. 2011 – Jul. 2014**
Joint Master student of Astrophysics — *Xinjiang & Beijing, China*

Xinjiang University (XJU) — **Sep. 2007 – Jul. 2011**
Student of Physics — *Xinjiang, China*

Research Interests

- The birth of HII regions, HCHII regions
- Line study to investigate the outflow properties of high-mass star formation
- Multi-band continuum study (from radio to near infrared) of ISM related to star formation
- Observations of radio interferometer and single-dish telescopes
- Radio recombination lines
- Young PNe associated with masers
- Multi-band Galactic plan surveys

Research Experience & Projects

Pulsar nulling phenomena | *Master, work with Prof. Dr. Jinlin Han* **2011-2014**

- Proposed a new method to analysis nulling phenomenon and used Tian-Ma telescope once to observe nulling pulsars.

Kinematic distance of Galactic Planetary Nebulae (PNe) | *Ph.D., work with Prof. Dr. Wenwu Tian,* **2014-2015**

- Extract and Analyse data of HI and CO spectra from the Galactic plane survey;
- Use the velocity of emission/absorption features of HI spectra to estimate the kinematic distances of PNe, based on the axisymmetric rotation curve model for the Galaxy.

Search for Hyper-compact HII regions | *Ph.D., work with Prof. Dr. Mark Thompson* **2016-2017**

- Analyse and reduce continuum data from Galactic plane surveys of Radio (THOR, CORNISH, MAGPIS), FIR (Hi-GAL), MIR (GLIMPSE), NIR (UKIDSS), submm (ATLASGAL).
- Analyse the continuum data and measure the spectral index to obtain a sample of steep positive radio spectrum radio objects, e.g., HCHII regions, young PNe, ect.
- As a PI, arrange and prepare the scheduling blocks and technique settings of VLA observations for the sample.

Outflows clumps in CHIMPS | *Ph.D., work with Prof. Dr. Mark Thompson, Dr. James Urquhart* **2016-2018**

- Created an python pipeline to extract CO spectra and identify outflow wings.
- Systematically discuss when outflow activity switch on, how its evolve in the massive clumps.

Enrolled in the Galactic plane CO surveys of CHIMPS2 and SEDIGISM | *UH &MPIfR* **2017/2019-Now**

- As a PI, work on the project of massive outflows in the CHIMPS2 and SEDIGISM survey.

Enrolled in the VLA survey: GLOSTAR | *Postdoc MPIfR, PI: Prof. Dr. K. M. Menten* **2018-Now**

- The GLOSTAR survey ($2^\circ < \ell < 60^\circ, -1^\circ < b < 1^\circ$) observes lines (formaldehyde, methanol maser, and radio recombination lines) and continuum, using VLA B- and D-configuration and the Effelsberg at C-band.
- Calibrate the B-configuration continuum data ($2 < \ell < 28, 36 < \ell < 40$) of the GLOSTAR survey, using Obit pipeline.
- Work on the source catalog paper of the B-configuration continuum data of the GLOSTAR survey, e.g., sources extraction, completeness estimation, classification, etc.

Follow-up PI projects | *MPIfR* **In progress**

- conduct a multi-band surveys of radio recombination lines for a sample of young HII regions, and proposals approved by the APEX, IRAM 30m, and Effelsberg 100m telescopes.

- identify and map molecular outflows associated with ATLASGAL clumps in the Galaxy, and data provided by the surveys of CHIMPS and SEDIGISM.
- identify all the HCHII regions in the Galactic plane and understand the birth of HII regions, and data approved by GLOSTAR survey and VLA.
- identify and investigate the planetary nebulae associated with masers, and proposals approved by VLA and the Effelsberg telescope.

Publications

ADS link

21. Jun Yang; Yongjun Chen, Leonid I. Gurvits; Zsolt Paragi, **A. Y. Yang**, Xiaolong Yang and Zhiqiang Shen; *Structural and spectral properties of Galactic plane variable radio sources*, 2021, MNRAS, Submitted;

20. Shan Su-Su; Fan Yang; You-Jun Lu; Xing Wei; Wen-Wu Tian; Hai-Yan Zhang; Rui Guo; Xiao-Hong Cui; **A. Y. Yang**; Bo Zhang; and Ji-Feng Liu *Significant TESS Timing Offsets of 31 Hot Jupiters*, 2021, ApJS, Submitted;

19. Urquhart, J. S.; ...; Menten, K. M.; ..., **A. Y. Yang**; *ATLASGAL – Evolutionary trends in high-mass star formation*, 2021, MNRAS, Submitted;

18. D. Colombo; Menten, K. M.; ..., **A. Y. Yang**; & The SEDIGISM Team, *The SEDIGISM survey: the influence of spiral arms on the molecular gas distribution of the inner Milky Way*, 2021, A&A, Accepted;

17. **A. Y. Yang**; Menten, K. M. ; Wyrowski, F.; Urquhart, J. S.; & **The GLOSTAR Team**, 2021 *GLOSTAR: Radio Source Catalog III. VLA B-configuration*, A&A, In Prep.;

16. **A. Y. Yang**, Urquhart, J. S. ; Thompson, M. A. ; Menten, K. M. ; Wyrowski, F.; & **The SEDIGISM Team**, 2021 *The SEDIGISM survey: a search for molecular outflows*, 2021, A&A, Under Review;

15. **A. Y. Yang**; Urquhart, J. S. ; Thompson, M. A. ; Menten, K. M. ; Wyrowski, F. ; Brunthaler, A. ; Tian, W. W. ; Rugel, M. ; Yang, X. L. ; Yao, S. ; Mutale, M., *A population of hypercompact H II regions identified from young H II regions*, 2021, A&A, 645A, 110Y, 2021; Paper link

14. Brunthaler, A.; Menten, K. M.; ..., **A. Y. Yang**; & The GLOSTAR Team, 2021, A&A, 651, A85, *A global view on star formation: The GLOSTAR Galactic Plane Survey. I. Overview and first results for the Galactic longitude range* $28 < \ell^\circ < 36$ **MPIFR/NRAO press release** Paper link

13. Ortiz-León Gisela N.; Menten, K. M. ;..., **A. Y. Yang**; & The GLOSTAR Team; A&A, 651, A87, *A Global View on Star Formation: The GLOSTAR Galactic Plane Survey III. 6.7 GHz Methanol maser survey in Cygnus X*, **MPIFR/NRAO press release** Paper link

12. Nguyen, H., Menten, K. M.,..., **A. Y. Yang**; & The GLOSTAR Team; 2021; A&A, 651, A88, *A global view on star formation: The GLOSTAR Galactic plane survey IV. Radio continuum detections of young stellar objects in the Galactic Centre region*,**MPIFR/NRAO press release** Paper link

11. Dokara, Rohit., Menten, K. M. ,..., **A. Y. Yang**; & The GLOSTAR Team; 2021; , A&A, 651, A86, *A global view on star formation: The GLOSTAR Galactic plane survey. II. Supernova Remnants in the first quadrant of the Milky Way*, **MPIFR/NRAO press release** Paper link

10. Eden, D. J., ..., **A. Y. Yang**; & The CHIMPS Team; 2020, MNRAS, 498, 5936E; *CHIMPS2: survey description and 12CO emission in the Galactic Centre*; Paper link

9. Shan, Su-Su; Zhu, Hui ; Tian, Wen-Wu ; Zhang, Hai-Yan ; **A. Y. Yang**; Zhang, Meng-Fei; *The distance measurements of supernova remnants in the fourth Galactic quadrant*, 2019, RAA, 19, 92S; Paper link

8. Bai, X.; ...; **A. Y. Yang** et al., *The Large High Altitude Air Shower Observatory (LHAASO) Science White Paper*, 2019; Paper link

7. **A. Y. Yang**; Thompson M. A.; W. W. Tian, S. Bihr; H. Beuther; L. Hindson, *A search for hyper-compact HII regions in the Galactic Plane*, MNRAS, 482.2681Y, 2019; Paper link

6. Shan, S. S.; Zhu, H.; Tian, W. W.; Zhang, M. F.; Zhang, H. Y.; Wu, D.; **A. Y. Yang**; Zhang, Meng-Fei; *Distances of Galactic Supernova Remnants Using Red Clump Stars*, 2019, ApJS, 236, 35S; Paper link

5. **A. Y. Yang**; Thompson M. A.; Urquhart J.S.; W. W. Tian; *Massive Outflows Associated with ATLASGAL Clumps*, 2018, ApJS, 235, 3; Paper link

4. **A. Y. Yang**; W. W. Tian; H. Zhu; D. Wu; *Kinematic Distances of Galactic Planetary Nebulae*; 2016, ApJS, 223, 6; Paper link

3. Thompson M. A.; ...; **A. Y. Yang**; *MeerGAL: the MeerKAT Galactic Plane Survey*, 2016; Paper link

2. **A. Y. Yang**; H. Zhu; W. W. Tian; D. Wu; 2015, *The Current Research of Planetary Nebulae Distance*, Progress in Astronomy (Chinese), 33, 284; PDF link

1. **A. Y. Yang**; J. L. Han; N. Wang; 2014, *A New Method to Analysis Pulsar Nulling Phenomena*, SCIENCE CHINA Physics, Mechanics & Astronomy, 57(8), 1600-1606; Paper link

Proposals — Total: 1144.4 h

20. **In summary, Approved: 1011.7h | New Submitted: 132.7h | PI: 396.1h | Co-I: 748.3h**

19. PI: **Aiyuan Yang, approved**, CoI: Friderich Wyrowski, Karl Menten et al., VLA ID: VLA/21B-131, 2021, B-configuration., 2 h;

18. PI: **Aiyuan Yang, approved**, Effelsberg project ID: 19-21, 2021, 20.6 h;

17. PI: **Aiyuan Yang, submitted**, CoI: Friderich Wyrowski, Karl Menten et al., IRAM ID: P408990, 2021, 35.6 h;

16. PI: **Aiyuan Yang, submitted**, Effelsberg ID: 101-21, 2021, 62 h;

15. PI: **Aiyuan Yang, submitted**, CoI: Friderich Wyrowski, Karl Menten et al., VLA project ID: VLA/22A-294, Feb. 2021, D-configuration., 4.4 h;

14. PI: **Aiyuan Yang, submitted**, CoI: James Urquhart, VLA ID: VLA/22A-297, Aug. 2021, D-configuration. 12 h;

13. CoI: **Aiyuan Yang, approved**, PI: Wenjin Yang, Karl Menten et al., Effelsberg ID: 17-21,2021, , 37.6 h;

12. CoI: **Aiyuan Yang**, PI: Karl Menten, Effelsberg ID: 102-20, 2021, approved 600 h;

11. CoI: **Aiyuan Yang, approved**, PI: M. Rugel Karl Menten et al., Effelsberg ID: 13-20, 2021, 30 h;

10. CoI: **Aiyuan Yang, submitted**, PI: Rohit Dokara, Karl Menten et al., VLA ID: VLA/22A-172, Aug. 2021, D-configuration, Aug. 2021, 8.7 h;

9. CoI: **Aiyuan Yang, submitted**, PI: Andreas Brunthaler, Karl Menten et al., VLBA ID: VLBA/22A-390, Aug. 2021, 72 h;

8. PI: **Aiyuan Yang, observed**, CoI: Friderich Wyrowski, Karl Menten, et al., Effelsberg ID: 77-19, , 2019, 88 h;

7. PI: **Aiyuan Yang, observed**, CoI: Friderich Wyrowski, Karl Menten et al., IRAM ID: 043-19, 2019, 33 h;

6. PI: **Aiyuan Yang**, CoI: Thompson M. A., W. W. Tian, VLA project ID: VLA18B-065, Feb. 2018, A-config, observed 9 h;

5. PI: **Aiyuan Yang, observed**, CoI: Thompson M. A., W. W. Tian, VLA ID: VLA/19B-040, Feb. 2018, A-config, 13 h;

4. PI: **Aiyuan Yang**, CoI: Thompson M. A., W. W. Tian, VLA ID: VLA/19B-041, Feb. 2018, C-config, observed 4.5 h;

3. PI: **Aiyuan Yang, observed**, CoI: Friderich Wyrowski, Karl Menten et al., APEX project ID: 9516A-2019, 2019, 100 h;

2. PI: **Aiyuan Yang, observed**, CoI: Thompson M. A., W. W. Tian,VLA ID: VLA18A-066, Aug. 2017, C-configuration., 13.5 h;

1. PI: **Aiyuan Yang, observed**, CoI: Thompson M. A., W. W. Tian, VLA ID: VLA17A-070, C-config, Aug. 2016, 3 h;

Language and Skills

- **Computer Language**: python, C, R, and MySQL
- **Language**: English (fluent), Deutsch (beginner); Chinese (first language)
- **software**: CASA, Obit, KVIS, TOPCAT, DS9, and GILDAS

Honors and Awards

- CAS Presidential Scholarship (2018).
- China Scholarship Council Scholarship, SKA project, China-UK (2016-2017)
- National Scholarship of China (2015-2016)
- National Scholarship of China (2015-2016)
- Advanced Micro Devices (AMD) Scholarship at NAOC (2015-2016)
- Outstanding student at NAOC (2014-2016)
- Outstanding student leader of College of Physics Science and Technology at XJU (2009)
- Government grants for outstanding students (2007-2011)

Presentations

- Workshop talk, The SEDIGISM workshop, Bonn, Germany, Sep. 2021, *Molecular outflows in the SEDIGISM survey*
- Talk at the MPIfR, Bonn, Germany, March. 2020, *Hypercompact HII regions identified from young HII regions*
- Talk at the MPIfR, Bonn, Germany, Nov. 2018, *Multi-band study of ISM related to massive star formation*
- Seminar talk, Chinese radio astronomy annual conference, Hefei, Anhui, China, Nov. 2017, *Searching for hyper-compact HII regions using JVLA survey data*
- Seminar talk, the 2th Chinese annual conference of SKA, Shanghai, China, Dec., 2017, *A search for steep positive radio spectrum object: make prediction for SKA and its precursors*

Professional References

- **Prof. Dr. Karl M. Menten**
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- **Prof. Dr. Mark Thompson:**
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