Dr. Yali Shao

Max Planck Institut für Radioastronomie
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I mainly study the interstellar medium (e.g., dust, [C II], and CO) properties, the gas kinematics, system dynamics, and the coevolution of black hole and its host of far-infrared luminous quasars in the early Universe, and the radio continuum emission of radio quiet-to-loud quasars and radio galaxies at high redshifts.

Education

Peking University
Beijing, China
Ph.D., Astrophysics, Sep 2013 – Jul 2019

National Radio Astronomy Observatory
Socorro, New Mexico, America
Exchange-student, Oct 2016 – Oct 2017

Shandong University
Shandong, China
B.S., Space science and technology, Sep 2009 – Jun 2013

Employment

Postdoc in Max Planck Institut für Radioastronomie — Dec 2019 – Now

Honors, Scholarship, Awards

Student Awards — Peking University

- One-year support from China Scholarship Council to study at NRAO — 2016–2017
- China Aerospace Science and Technology Corporation (CASC) scholarship — 2014–2015
- Merit Student Award — 2014–2015
- Merit Student Award — 2013–2014

Student Awards — Shandong University

- Merit Student Award — 2012–2013
- Merit Student Award — 2011–2012
- National Inspirational Scholarship — 2011–2012
- Outstanding Young Volunteer Award — 2010–2011
- National Inspirational Scholarship — 2010–2011
- The Third Prize of Competitionol Body-building Exercises — 2009–2010
- Wenping Inspirational Scholarship — 2009–2010
- Merit Student Award — 2009–2010

Approved Proposals as PI

- ALMA (2018.1.00597.S): Sub-kpc imaging of the star-forming gas in two [C II] luminous quasar host galaxies at $z \sim 6$; 3.04 hrs
- VLA (19A–107): Searching for high-frequency peak of seven radio-detected quasars at $z > 5$; 4.92 hrs
- VLBA (20A–011): On the origin of the radio spectral turnover of 11 radio-loud quasars at $z > 4$; 5 hrs

- JCMT (M20AP001): The star formation and the environments of 11 radio-loud quasars at $z > 5$; 21.809 hrs
- uGMRT (38_069): Low-frequency radio properties of 11 radio-loud quasars at $z > 5$; 21.17 hrs
- Effelsberg-100m (64–20): Searching for H_2O megamaser in a distant gravitationally lensed quasar in the early Universe; 8.25 hrs
- Effelsberg-100m (99–20): Searching for H_2O megamasers in PG quasars; 32 hrs
- VLBA (21A–084): On the origin of the radio spectral turnover of 6 radio-loud quasars at $z > 5$; 28 hrs
- EVN (E21A016): High-resolution radio observations of 7 radio galaxies at $z > 4$; 14 hrs
- IRAM (083–21): The star formation and the environments of radio galaxies at $z > 4$; 15 hrs
- VLA (22A-138): On the origin of the two radio spectral peaks of a radio-loud quasar at $z = 5$; 1 hr
- VLA (22A-307): The radio continuum emission from FIR luminous quasars in the early Universe; 18 hrs
- ALMA (2022.1.01178.S): The ISM distribution, gas kinematics and system dynamics of five rotation-dominated quasar-starburst systems at $z > 6$; 24 hrs
- VLBA (VLBA-23A-184; pending): Investigating the nature of the weakness of the line in J0535+1150 at $z = 6.34$; 20 hrs
- VLA (VLA-23A-183; pending): The radio continuum emission from FIR luminous quasars in the early Universe; 24 hrs
- EVN (E22C016; pending): The highest redshift gravitationally lensed quasar?; 20 hrs
- ALMA (2022.A.00002.S; pending): The highest redshift gravitationally lensed quasar?; 20 hrs

Relevant Experience

Observing Experience

- IRAM for 2 days — Remote in Bonn (Germany), Oct 2021
- Effelsberg-100m for 3 nights — Bonn (Germany), Jan 2020
- Bok 2.3 m telescope for 10 nights — Arizona (USA), Jul 2018
- JCMT for 5 nights — Hawaii (USA), Mar 2018
- JCMT for 5 nights (JINGLE) — Hawaii (USA), Jun 2016
- JCMT for 5 nights — Hawaii (USA), Apr 2016
- Bok 2.3 m telescope for 12 nights — Arizona (USA), Apr 2016
- JCMT for 6 nights — Hawaii (USA), Sep 2015
- 2.16m telescope for 10 nights — Xinglong (China), Feb 2014

Talks & Posters

- Lunch colloquium — MPIfR (German), Feb 2020 [REPORT]
- Lunch talk — UA (America), Oct 2017 [REPORT]
- Black Hole workshop — KIAA (China), Sep 2016 [REPORT]
- Chinese Astronomical Society Annual Meeting — KIAA (China), Oct 2015 [REPORT]

Teaching Experience

- Teaching assistant on Astronomical Spectroscopy — Mar 2016 – Jun 2016

Publications

A complete ADS list

- **Shao, Yali**; Wang, Ran; Jiang, Linhua; Fan, Xiaohui; Strauss, Michael; Wagg, Jeff; Riechers, Do- minik A.; Walter, Fabian; Bertoldi, Frank; Omont, Alain; Cox, Pierre; Weiss, Axel; Menten, Karl M., 2022, Deep Hubble Space Telescope near-infrared imaging of a luminous quasar - ULAS J1319+0950 at $z = 6.13$. To be submitted.
- **Shao, Yali**; Wang, Ran; Weiss, Axel; Wagg, Jeff; Carilli, Chris L.; Strauss, Michael; Walter, Fabian; Cox, Pierre; Fan, Xiaohui; Menten, Karl M.; Narayanan, Desika; Riechers, Dominik A.;

Bertoldi, Frank; Omont, Alain; Jiang, Linhua, 2022, Sub-kpc Imaging of the Star-forming Gas Disk in the Host Galaxy of Quasar SDSS J2310+1855 at $z = 6.00$. Astronomy & Astrophysics. Accepted

- **Shao, Yali**; Wagg, Jeff; Wang, Ran; Momjian, Emmanuel; Carilli, Chris L.; Walter, Fabian; Riechers, Dominik A.; Intema, Huib T.; Weiss, Axel; Brunthaler, Andreas; Menten, Karl M.. 2022, The radio spectral turnover of radio-loud quasars at $z > 5$. Astronomy & Astrophysics, 659A, 159S.
- **Shao, Yali**; Wagg, Jeff; Wang, Ran; Carilli, Chris L.; Riechers, Dominik A. Intema, Huib T.; Weiss, Axel; Menten, Karl M.. 2020 Observations by GMRT at 323 MHz of radio-loud quasars at $z > 5$. Astronomy & Astrophysics, 641A, 85S.
- **Shao, Yali**; Wang, Ran; Carilli, Chris L.; Wagg, Jeff; Walter, Fabian; Li, Jianan; Fan, Xiaohui; Jiang, Linhua; Riechers, Dominik A.; Bertoldi, Frank; Strauss, Michael A.; Cox, Pierre; Omont, Alain; Menten, Karl M.. 2019 Star formation and ISM properties in host galaxies of three far-infrared luminous quasars at $z \sim 6$. The Astrophysical Journal, 876, 99S.
- **Shao, Yali**; Wang, Ran; Jones, Gareth C.; Carilli, Chris L.; Walter, Fabian; Fan, Xiaohui; Riechers, Dominik A.; Bertoldi, Frank; Wagg, Jeff; Strauss, Michael A.; Omont, Alain; Cox, Pierre; Jiang, Linhua; Narayanan, Desika; Menten, Karl M., 2017, Gas Dynamics of a Luminous $z = 6.13$ Quasar ULAS J1319+0950 Revealed by ALMA High-resolution Observations. The Astrophysical Journal, 845, 138.

<**Highlighted by AAS Nova**> |AAS Nova news link|

- Wang, Ran; **Shao, Yali**; Carilli, Chris L.; Jones, Gareth C.; Walter, Fabian; Fan, Xiaohui; Riechers, Dominik A.; Decarli Roberto;Bertoldi, Frank; Wagg, Jeff; Strauss, Michael A.; Omont, Alain; Cox, Pierre; Jiang, Linhua; Narayanan, Desika; Menten, Karl M.; Venemans, Bram P. 2019, Resolving the interstellar medium in the nuclear region of two $z = 5.78$ quasar host galaxies with ALMA. The Astrophysical Journal 887, 40W.
- Carilli, Chris L.; **Shao, Yali** 2018, Imaging Molecular Gas at High Redshift. ASPC, 517, 535C.
- Jones, Gareth C.; Carilli, Chris L.; **Shao, Yali**; Wang, Ran; Capak, Peter L.; Pavesi, Riccardo; Riechers, Dominik A.; Karim, Alexander; Neeleman, Marcel; Walter, Fabian. 2017, Dynamical Charaterization of Galaxies at $z \sim 4{-}6$ via Tilted Ring Fitting to ALMA [C II] observations. The Astrophysical Journal, 850, 180.

- Liu, Yuanqi; Wang, Ran; Momjian, Emmanuel; Wagg, Jeff ; Yang, Xiaolong; An, Tao; **Shao, Yali**; Carilli, Chris L.; Wu, Xue-Bing; Fan, Xiaohui; Walter, Fabian; Jiang, Linhua; Li, Qiong; Li, Jianan; Fei, Qinyue ; Xu, Fuxiang. 2022, Exploring the Radio Spectral Energy Distribution of the Ultraluminous Radio-quiet Quasar SDSS J0100+2802 at Redshift 6.3. Astrophysical Journal, 929, 69L.
- Carilli, Chris L.; Walter, Fabian; Decarli, Roberto; Aravena, M.; Riechers, Dominik A.; Gonzalez-Lopez, J.; **Shao, Yali**; Boogaard, L.; Bouwens, R.; Neeleman, M. 2021, Dense Gas History of the Universe: From ASPECS to the ngVLA. URSI Radio Science Letters, vol. 3.
- Molina, Juan; Wang, Ran; Shangguan, Jinyi; Ho, Luis C.; Bauer, Franz E.; Treister, Ezequiel; **Shao, Yali**. 2021, Compact Molecular Gas Distribution in Quasar Host Galaxies. The Astrophysical Journal, 908, 231M.
- Liu, Yuanqi; Wang, Ran; Momjian, Emmanuel; Bañados, Eduardo; Zeimann, Greg; Willott, Chris J.; Matsuoka, Yoshiki; Omont, Alain; **Shao, Yali**; Li, Qiong; Li, Jianan. 2021, Constraining the Quasar Radio-loud Fraction at $z \sim 6$ with Deep Radio Observations. The Astrophysical Journal, 908, 124L.
- Li, Qiong; Wang, Ran; Fan, Xiaohui; Wu, Xue-Bing; Jiang, Linhua; Bañados, Eduardo; Venemans, Bram; **Shao, Yali**; Li, Jianan; Zhang, Yunhao; Zhang, Chengpeng; Wagg, Jeff; Decarli, Roberto; Mazzucchelli, Chiara; Omont, Alain; Bertoldi, Frank. 2020, SCUBA2 High Redshift Bright Quasar Survey: Far-infrared Properties and Weak-line Features. The Astrophysical

Journal, 900, 12L.

- Li, Jianan; Wang, Ran; Cox, Pierre; Gao, Yu; Walter, Fabian; Wagg, Jeff; Menten, Karl M.; Bertoldi, Frank; **Shao, Yali**; Venemans, Bram P.; Decarli, Roberto; Riechers, Dominik; Neri, Roberto; Fan, Xiaohui; Omont, Alain; Narayanan, Desika. 2020, Ionized and atomic interstellar medium in the $z = 6.003$quasar SDSS J2310+1855. The Astrophysical Journal, 900, 131L.
- Li, Jianan; Wang, Ran; Riechers, Dominik; Walter, Fabian; Decarli, Roberto; Venamans, Bram P.; Neri, Roberto; **Shao, Yali**; Fan, Xiaohui; Gao, Yu; Carilli, Chris L.; Omont, Alain; Cox, Pierre; Menten, Karl M.; Wagg, Jeff; Bertoldi, Frank; Narayanan, Desika. 2020, Probing the Full CO Spectral Line Energy Distribution (SLED) in the Nuclear Region of a Quasar-starburst System at $z = 6.003$. The Astrophysical Journal, 889, 162L.
- Saintonge, Amelie; Wilson, Christine D.; Xiao, Ting; Lin, Lihwai; Hwang, Ho Seong; Tosaki, Tomoka; Bureau, Martin; Cigan, Phillip J.; Clark, Christopher J. R.; Clements, David L.; De Looze, Ilse; Dharmawardena, Thavisha; Gao, Yang; Gear, Walter K.; Greenslade, Joshua; Lamperti, Isabella; Lee, Jong Chul; Li, Cheng; Michaowski, Micha J.; Mok, Angus Pan, Hsi-An; Sansom, Anne E.; Sargent, Mark; Smith, Matthew W. L.; Williams, Thomas; Yang, Chentao; Zhu, Ming; Accurso, Gioacchino; Barmby, Pauline; Brinks, Elias; Bourne, Nathan; Brown, Toby; Chung, Aeree; Chung, Eun Jung; Cibinel, Anna; Coppin, Kristen; Davies, Jonathan; Davis, Timothy A.; Eales, Steve; Fanciullo, Lapo; Fang, Taotao; Gao, Yu; Glass, David H. W.; Gomez, Haley L.; Greve, Thomas; He, Jinhua; Ho, Luis C.; Huang, Feng; Jeong, Hyunjin; Jiang, Xuejian; Jiao, Qian; Kemper, Francisca; Kim, Ji Hoon; Kim, Minjin; Kim, Taehyun; Ko, Jongwan; Kong, Xu; Lacaille, Kevin; Lacey, Cedric G.; Lee, Bumhyun; Lee, Joon Hyeop; Lee, Wing-Kit; Masters, Karen; Oh, Se-Heon; Papadopoulos, Padelis; Park, Changbom; Park, Sung-Joon; Parsons, Harriet; Rowlands, Kate; Scicluna, Peter; Scudder, Jillian M.; Sethuram, Ramya; Serjeant, Stephen; **Shao, Yali**; Sheen, Yun-Kyeong; Shi, Yong; Shim, Hyunjin; Smith, Connor M. A.; Spekkens, Kristine; Tsai, An-Li; Verma, Aprajita; Urquhart, Sheona; Violino, Giulio; Viti, Serena; Wake, David; Wang, Junfeng; Wouterloot, Jan; Yang, Yujin; Yim, Kijeong; Yuan, Fangting; Zheng, Zheng 2018, JINGLE, a JCMT legacy survey of dust and gas for galaxy evolution studies - I. Survey overview and first results. Monthly Notices of the Royal Astronomical Society, 481, 3497.
- Wang, Chun; Liu, Xiaowei; Huang, Yang; Xiang, Maosheng; Ren, Juanjuan; Yuan, Haibo; Chen, Bingqiu; Tian, Zhijia; Bai, Jinming; Sun, Ningchen; Zuo, Fang; Zhang, Huawei; Zhang, Yangwei; Fan, Zhou; Luo, Ali; Shi, Jianrong; Li, Ji; **Shao, Yali** 2018, LEMONY–a Library of Empirical Medium-resolution spectra by Observations with the NAOC Xinglong 2.16 m and YNAO Gaomeigu 2.4 m telescopes. MNRAS, 480.4766W.
- Zou, Hu; Zhang, Tianmeng; Zhou, Zhimin; Nie, Jundan; Peng, Xiyan; Zhou, Xu; Jiang, Linhua; Cai, Zheng; Dey, Arjun; Fan, Xiaohui; Fan, Dongwei; Guo, Yucheng; He, Boliang; Jiang, Zhaoji; Lang, Dustin; Lesser, Michael; Li, Zefeng; Ma, Jun; Mao, Shude; McGreer, Ian; Schlegel, David; **Shao, Yali**; Wang, Jiali; Wang, Shu; Wu, Jin; Wu, Xiaohan; Yang, Qian; Yue, Minghao 2017, The First Data Release of the Beijing-Arizona Sky Survey. The Astronomical Journal, 153, 276.