

SPHEREx Thinkshop@SHAO

0930-1530, Oct. 17, 2025. [S. Kulkarni & Jian Ge]

Participants:

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Prof. Jian Ge's Bio

Dr. Jian Ge is a chair professor at Shanghai Astronomical Observatory, Chinese Academy of Sciences. He was a professor at the University of Florida in 2004-2020, an assistant professor at Pennsylvania State University in 2000-2004, and a postdoc at Lawrence Livermore National Lab in 1998-2000. He received his PhD from the University of Arizona in 1998. He is the PI of the Earth 2.0 space mission in China. He was the PI of the MARVELS survey of the SDSS-III program. Dr. Ge's team have made numerous discoveries of planets, brown dwarfs, binaries, asteroids, and various kinds of quasar absorbers. He has long been engaged in research on exoplanets, observational cosmology, astronomical technology and instruments, and the application of artificial intelligence in astronomical big data. He has published 157 refereed journal papers, 121 technical papers, and was awarded with three US patents. He has advised or co-advised 55 graduate students and 17 postdocs.





Zhen-Ya Zheng
(郑振亚)

 zhengzy@shao.ac.cn

 Research Professor

Research Topics

- High-redshift Galaxies
- Cosmic Reionization
- Supermassive Black Holes and Binaries
- CSST/MCI (Multi-Channel Imager)
- Astronomical Optical Techniques

Education and Work Background

2016-current: SHAO,CAS Research Professor
2014-2016: PUC, Chile Postdoc, CAS-CONICYT Fellow
Collaborators: Polo Infante
2012-2014: ASU, US Postdoc, SESE Fellow
Collaborators: James Rhoads, Sangeeta Malhotra & Nat Butler
2006-2012: USTC, China PhD
Advisor: Junxian Wang

Awards, achievements, and positions

2020-now: CSST-MCI Project Scientist
2020-now: Deputy-Director of DSTOA-SHAO
2021-2023: NSFC Excellent Youth Fund
2019-now: SHAO “Early Universe and High-z Galaxies”
Group, Group Leader
2018-2020: CAS Hundred-Talent Program

Group Members



Fangting Yuan
Research Professor



Xiaer Zhang
Postdoc,
(2024-)



Xiaodan Fu
Postdoc,
(2023-)



Lin Long
PhD Student



Shuyang Lin
Grad. Student



Ruqiu Lin
PhD → Postdoc.
@ UMass



Shuairu Zhu
PhD Student



Xiangdong Liu
Grad. Student
(Joint Training)



Jiawei Huang
Grad. Student



Jiaqi Lin
PhD Student
(Joint Training)

Service to community:

- Referee of ApJ, MNRAS, RAA
- TMT ISDT member, Early Universe and Galaxy Formation
- TAC member of Telescope Access Program
- Member of Astronomical Technology Committee, Chinese Astronomical Society



Hengxiao Guo (郭恒潇)

Shanghai Astronomical Observatory (SHAO), Chinese Academy of Sciences

Personal website: hengxiaoguo.wixsite.com/hengxiaoguo

Biography

Hengxiao Guo received his Ph.D. from the Shanghai Astronomical Observatory (SHAO) in 2016. Before returning to SHAO as a faculty member in 2022, he held postdoctoral and visiting scholar positions at the University of Science and Technology of China, the University of California, Los Angeles, the University of California, Irvine, and the University of Illinois at Urbana-Champaign (2015–2022).

His research focuses on AGN time-domain studies, including variability, intermediate-mass black holes (IMBHs), reverberation mapping (RM), supermassive black hole binaries, changing-look AGNs, and tidal disruption events. He currently leads the Intermediate-Mass Black Hole Reverberation Mapping Project (IMBH-RM), which aims to build a census of black holes below one million solar masses and to shed light on the formation of black hole seeds and supermassive black holes.

Future Prospects with SPHEREx

We plan to use SPHEREx for black hole reverberation mapping. Its 102 spectral channels provide continuous wavelength coverage ideal for tracing variability in both the continuum and broad emission lines. Our particular interest lies in IMBHs: in the high-cadence NEP and SEP fields, sufficiently bright targets will offer a unique opportunity to extend RM studies into the low-mass regime.



ZANG CHI

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Current position

2nd-year postgraduate student,
SHAO

Research keywords

IR excess
Debris disk
Machine learning
SED fitting

SPHEREx-related interest

Using SPHEREx all-sky near-IR spectro-photometry ($\sim 0.75\text{--}5\text{ }\mu\text{m}$; low R), I will search known OB-star samples by:

- fitting stellar photospheres with synthetic/templated SEDs,
- flagging IR excesses and continuum-shape deviations (especially $>2\text{ }\mu\text{m}$),
- stitching SPHEREx with Gaia/WISE photometry to vet SEDs and reject contaminants (e.g., YSOs with envelopes, galaxies, variables).

Define color-color and color-slope diagnostics (e.g., $K_s - W1$, $W1 - W3$, near-IR spectral slopes), and publish per-source confidence scores and quality flags (photometric S/N, crowding, extinction robustness).



CHEN CHENG

2nd-year Graduate Student, SHAO

Email: chencheng@shao.ac.cn

KEYWORDS

Infrared excess / debris disk / machine learning

RESEARCH INTERESTS

- composition and variability of debris disk
- search for IR excess using ML methods
- evolution path of exo-planetary systems

RESEARCH AIMS

The composition and variability of debris disk reveal the evolution path of the circumstellar environment, but the existing surveys are either coverage-limited or photometry only. SPHEREx's all sky infrared survey will generate >400million star spectra with proper time cadence for the research of those variable debris disks. by combining Gaia measurements, I will find more interesting debris disk and circumstellar dust around stars.



Bio: Dr. Lei Hao is a research scientist at the Shanghai Astronomical Observatory of Chinese Academy of Sciences (CAS). She received her PhD in Astronomy from Princeton University in 2004 and then worked as a research associate at Cornell University from 2004 to 2008, and the University of Texas at Austin from 2008 to 2009. She has been working at the Shanghai Astronomical Observatory since 2009. Dr. Lei Hao's main research interests are the formation and evolution of normal and active galaxies engaging in the spectroscopic studies, to understand the structure of active galactic nuclei, metal cycling in galaxies and AGN, as well as galaxy structures shaped by gas inflow and outflow. She has published over 80 refereed papers in various international journals. She is currently the science lead of the Integral Field Spectrograph onboard the Chinese Space Station Telescope (CSST-IFS) and the PI of the "China Lijiang IFU" (CHILI) project.

Curriculum Vitae

Wenwen Zuo

Shanghai Astronomical Observatory, Chinese
Academy of Sciences
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Citizenship

People's Republic of China

Work

Associate Researcher Shanghai Astronomical Observatory, China	2017 -
Assistant Researcher Shanghai Astronomical Observatory, China	2014 - 2017

Education

Ph.D. in Astrophysics (expected), Peking University, Beijing, China Thesis: <i>Probing quasar physics with quasar variability and near-IR spectroscopy</i> Advisors: Professor Xuebing Wu, Professor Xiaohui Fan	2009 - 2014
Visiting Student / Junior Specialist Steward Observatory, University of Arizona, Tucson	2012 - 2013
B.S. of Physics, Huazhong Normal University, Wuhan, China Senior thesis: <i>Vertical structure of outflow for accretion disks</i> Advisor: Professor Xuebing Wu	2005 - 2009

Research Interests and Experience

Interests

AGN Variabilities
IMBH Reverberation Mapping
Co-evolution of BH growth and quasar host galaxies
Contribution of quasar feedback to galaxy evolution

Recent Approved Proposals

LCOGT Global 2-m Telescope Network (22 hr), 2024B, PI, "Continuum Reverberation Mapping of Intermediate-Mass Black Holes"
Palomar 200-inch Telescope (1 night), CTAP2024-Boo70, PI, "Identifying AGN-origin broad lines in intermediate-mass black holes via multi-epoch spectroscopic observations"

VLBA (9 hr), VLBA/24B-289, PI, “Pilot radio imaging project of IMBH-photoRM: Imaging the nuclear region of two intermediate-mass black-hole candidates”, 2024

Refereed Publications

The Intermediate-Mass Black Hole Reverberation Mapping Project: Initial Results for a Candidate IMBH in a Nearby Seyfert 1 Galaxy

Wenwen Zuo, Hengxiao Guo, Jingbo Sun, et al., 2024, ApJ, 947, 288

Spectral Energy Distribution Variability of the Blazar OJ 287 During 2009–2021

Wenwen Zuo, Alok C. Gupta, Minfeng Gu, et al., 2025, ApJ, 979, 210

Do All the Quasars and High-Excitation Radio Galaxies (HERGs) in the 3CRR Catalog Contain a Magnetically Arrested Disk (MAD)?

Shuangliang Li, **Wenwen Zuo**, Xinwu Cao, 2024, ApJ, 972, 34

First Detection of Radio Emission from the Intermediate-mass Black Hole in POX 52: Deep Multiband Observations with ATCA and VLA

Qi Yuan, Hengxiao Guo, Minfeng Gu, Jamie Stevens, G. Philip Edwards, Yongjun Chen, **Wenwen Zuo**, et al., 2025, ApJ, 1, 97

The Intermediate-mass Black Hole Reverberation Mapping Project: First Detection of Mid-infrared Lags in Prototypical Intermediate-mass Black Holes in NGC 4395 and POX 52

Jingbo Sun, Hengxiao Guo, **Wenwen Zuo**, et al., 2025, ApJ, 989, 26

C IV Emission-line Properties and Uncertainties in Black-Hole Mass Estimates of $z \sim 3.5$ Quasars

Wenwen Zuo, Xue-Bing Wu, Xiaohui Fan, Richard Green, Weimin Yi, Andreas Schulze, Ran Wang, Fuyan Bian, 2020, ApJ, 896, 40

Black Hole Mass Estimates and Rapid Growth of Supermassive Black Holes in Luminous $z \sim 3.5$ Quasars

Wenwen Zuo, Xue-Bing Wu, Xiaohui Fan, Richard Green, Ran Wang, Fuyan Bian, 2015, ApJ, 799, 189

An Ultra-luminous Quasar with a Ten-billion-solar-mass Black Hole at the End of Cosmic Reionization

Xue-Bing Wu, Feige Wang, Xiaohui Fan, Weimin Yi, **Wenwen Zuo**, et al., 2015, Nature, 518, 512

Discovery of Bright Quasars at Intermediate Redshifts Based on Optical/Near-infrared Colors

Xue-Bing Wu, **Wenwen Zuo**, Jian-Yong Yang, Qian Yang, Feng-Gang Wang, 2013, AJ, 146, 100

The Correlations between Optical Variability and Physical Parameters of Quasars in SDSS Stripe 82

Wenwen Zuo, Xue-Bing Wu, Yan-Qian Liu, Cheng-Liang Jiao, 2012, ApJ, 759, 104

Honors and Awards

Advanced Individual in the 13th Five-Year Science-Popularization Work, Chinese Academy of Sciences 2021

Shanghai Science-Education Contribution Award (Individual, 3rd Prize) 2024

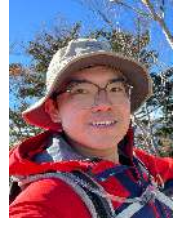
Rising Figure in the 16th Shanghai Science Communication Selection 2025

WENKE REN

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<https://www.wenkeren.com/>



EDUCATION	University of Science and Technology of China <i>Ph.D. in Astronomy</i> • Advisor: Prof. Junxian Wang	Hefei, China 2019.09 - 2025.06
	Kavli IPMU, The University of Tokyo <i>Visiting Student</i> • Advisor: Prof. John D. Silverman	Kashiwa, Japan 2023.09 - 2025.05
	University of Science and Technology of China <i>B.S. in Astronomy, School of the Gifted Young (honor)</i>	Hefei, China 2015.09 - 2019.06
WORK EXPERIENCE	Shanghai Astronomical Observatory <i>Postdoctoral Researcher</i> • Advisor: Dr. Hengxiao Guo • Research project: Intermediate Mass Black Holes, Little Red Dots	Shanghai, China 2025.07 - Present
RESEARCH INTERESTS	<ul style="list-style-type: none">• AGN & Host Galaxy Co-evolution• Quasar Variability• Intermediate Mass Black Hole	
SCIENCE WITH SPHEREx	<p>I'm interested in the potential of the SPHEREx for studying the NIR properties and variability of Active Galactic Nuclei (AGN). A preliminary look at some of the bright quasars in the SPHEREx NEP field is promising. It seems the mission will deliver high-quality NIR SEDs with reasonable resolution for detailed physical modeling.</p> <p>I'm particularly excited by the possibility of combining SPHEREx data with existing optical spectral surveys. A joint SED fitting approach over the broad 0.4-5.0 μm wavelength range would be a powerful tool. It offers the potential to robustly disentangle key emission components, which could provide insights of AGN obscuration and torus hot dust emissions.</p> <p>Another intriguing avenue could be applying data-driven methods like Principal Component Analysis (PCA). Constructing a set of empirical eigenspectra for NIR AGN spectra seems like an effective way to distill their complexity. Such a low-dimensional model would be incredibly useful for generating realistic NIR SEDs, helping to address the under-sampling issue in the datasets.</p> <p>The high-cadence aspect of the survey also opens a fascinating new window into NIR variability. It would be very interesting to systematically explore the variability of prominent NIR broad emission lines and what that can tell us about the connection between the optical and NIR properties of AGN.</p> <p>Looking further ahead, I think a grand-challenge goal in this area would be to develop a dynamic model, something like a function $f(\lambda, t)$, which can self-consistently describe the evolution of the AGN SED shape and their time lags.</p>	



Ning Jiang

Research associate
Univ. of Sci. & Tech. of China
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Education

PhD in Astrophysics	Univ. of Sci. & Tech. of China	Sep. 2009 - June. 2015
Research Assistant	Carnegie Observatories	Oct. 2012 - Sep. 2014
Bachelor in Astronomy	Univ. of Sci. & Tech. of China	Sep. 2005 - June. 2009

Research Interests

- Tidal Disruption Events (TDEs) and various nuclear transients
- Intermediate-mass black holes (IMBHs)
- Supermassive black hole binaries (SMBHBs)
- Time-domain and multi-messenger astronomy

Main Involvement

- TDE group leader of Wield Field Survey Telescope (WFST)
- Deputy Convenor of SVOM Observatory Science Working Group
- Science team member of Einstein Probe (EP)

Publications & Highlights

>80 refereed (12 as 1st author, 18 as 2nd author) papers (see [ADS](#)). Total citations >2000, h-index=25.

- 2025.02 AAS Nova, [Echoes of a Tidal Disruption Event](#) ([ApJL,980,L17](#))
- 2024.08 Nature, [This unlucky star got mangled by a black hole — twice](#) ([ApJL,971,L26](#))
- 2016.09 NASA/JPL, [Studies Find Echoes of Black Holes Eating Star](#) ([ApJL,828,L14](#))

Why interested in SPHEREx

I have been interested in IR time-domain astronomy since the launch of WISE, another extremely successful IR satellite by Caltech/JPL. My 2012 paper was among the first to explore the WISE's time-domain capability ([ApJL,759,L31](#)). In 2016, I discovered an IR echo of a TDE for the first time, again using the multi-epoch WISE data ([ApJL,828,L14](#)). Since then I have conducted a series of studies in this field (including at least 7 first-author and 7 second-author papers), such as those on IR echoes of known TDEs ([ApJ,911,31](#)), search for obscured TDEs ([ApJS,252,32](#)), revealing the missing energy of TDEs ([ApJL,980,L17](#)) and so on. I take SPHEREx as a new opportunity to further explore the IR time-domain astronomy, particularly for my interested topics after the retirement of WISE. Meanwhile, I am looking for new more exciting science that could be done with SPHEREx.



Congcong Zhang

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GENDER: Female

BORN: April 5, 1996

Nationality: China

Research Interests

- Observations based on infrared spectroscopy and imaging related to Interstellar and circumstellar medium and PAHs emissions, JWST, Infrared astronomy;
- The origin of water and biogenic molecules in the early phases of planetary system formation, the abundance and composition of interstellar and circumstellar ices;
- Galactic and extra-galactic star forming regions, PDRs.

Education background

Ph.D.

In Astrophysics, Department of Astronomy,
University of Science and Technology of China (USTC), Hefei, China, 2020.09 – 2025.06
Supervisor: Junfeng Zhen, Qingfeng Zhu

Exchange International Ph.D. student

In the Department of Physics and Astronomy,
University of Western Ontario (UWO), London, Canada, 2023.08 – 2024.01
Supervisor: Els Peeters, Jan Cami

Research Experience

My research focuses on large carbonaceous molecules and dust in the interstellar medium, based on observational, experimental and theoretical data to support an interpretation and to enhance our understanding of the formation processes and evolution of interstellar organic compounds and interstellar dust in interstellar space. In the interstellar environment, the chemical evolution of large molecules (e.g., large PAHs and fullerenes) are driven by different environmental factors as a function of time, such as the interstellar UV radiation, metallicity, the flux of H-atoms, hydrogen ions, PAHs and other co-exist molecules, and so on.

My research includes observational studies with JWST, as well as experimental studies, theoretical studies and simulations. JWST observations include imaging (NIRCam, MIRI) and spectroscopy (NIRSpec/IFU, MIRI/MRS) data. Comparison of profiles and relative intensities of the PAH emission bands reveals the spatial distribution characteristics of the PAH population and how the environments affect the resulting IR emission and PAH population^[1]. The experimental research was performed on the apparatus equipped with a quadrupole ion trap and reflection TOF mass spectrometer. In the theoretical calculation study, the theoretical calculations were performed based on density functional theory with the hybrid density functional B3LYP, as implemented in the Gaussian 16 program, the reaction pathways, the possible molecular structures, and the corresponding molecular spectra are obtained. A kinetic simulation model based on the Monte Carlo method is designed, trying to approach a more clear and detailed understanding about hydrogenation and dehydrogenation, hydrogenation/deuteration of interstellar PAHs^[2-4]. Our obtained results provide insights into the coevolution of the interstellar chemistry of PAH and fullerene species.

[1] Zhang et al., ApJS, 2025, 280, 4

[2] Zhang et al., A&A, 2023, 669, A41

[3] Zhang et al., ApJ, 2022, 940, 73

[4] Zhang et al., A&A, 2022, 662, A21



Ruocan Zhao, Associate Research Fellow and Ph.D. Supervisor at the University of Science and Technology of China (USTC), received his bachelor's degree in Applied Physics from the USTC Special Class for the Gifted Young. In 2012, he began his integrated master's and doctoral studies under the supervision of Prof. Xiankang Dou and was awarded a Ph.D. in Space Physics in 2018. During his doctoral studies, from 2016 to 2018, he was funded by the Chinese government to conduct visiting scholar at Stevens Institute of Technology in the United States, where he studied under radiative transfer expert Prof. Knut Stamnes and NASA lidar specialist Dr. Yongxiang Hu, focusing on key technologies and retrieval algorithms for spaceborne lidar systems.

Since returning to USTC in 2018, he has been engaged in cutting-edge research on precision remote sensing technologies based on optical frequency combs and single-photon lidar systems. He has served as principal investigator (PI) for both the National Natural Science Foundation of China (NSFC) Youth and General Programs, as well as for a major project under the NSFC's Strategic Priority Research Program on high-precision quantum control and detection.

He is the lead designer of the "Array-Type Large-Aperture Lidar" (Metastable Helium Lidar) under the national "Meridian Project Phase II" mega-science infrastructure initiative led by the National Development and Reform Commission. In 2023, he successfully developed the world's first all-season operable metastable helium lidar. He also serves as the deputy chief designer of the single-photon subsystem for the quantum precision measurement facility and is involved in the development of key technologies for the superconducting helium fluorescence resonance lidar.

Publications:

- [1] Han, J. J., Zhong, W., Zhao, R. C., Zeng, T., Li, M., Lu, J., ... & Pan, J. W. (2024). Dual-comb spectroscopy over a 100 km open-air path. *Nature Photonics*, 18(11), 1195-1202.
- [2] Zhong, W., Liu, Y., Yin, Q., Zhao, R., Wang, C., Ren, W., ... & Xue, X. (2025). Broadband photon-counting dual-comb spectroscopy with attowatt sensitivity over turbulent optical paths. *Light: Science & Applications*, 14(1), 293.
- [3] Zhao, R., Liu, Z., Xue, X., Zhou, H., Wang, Z., Liu, Y., ... & Dou, X. (2024). Metastable helium lidar for thermosphere and lower exosphere measurements: Instrument description and initial results. *Space Weather*, 22(8), e2024SW003977.
- [4] Yin, Q., Zhao, R., Wang, C., Chen, T., Liang, C., & Xue, X. (2025). Enhanced dual electro-optic comb spectroscopy for rapid metastable helium detection. *Optics Express*, 33(9), 18938-18950.
- [5] Yin, Q., Huang, C., Zhao, R., Liu, Z., Zhou, H., Liu, Y., ... & Liang, C. (2025). Laser-induced fluorescence of metastable helium for thermosphere studies. *Review of Scientific Instruments*, 96(5).

HAIBO YUAN



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Hai Dian District, Beijing, China
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Education

2011 Ph.D. in Astrophysics, Peking University, China
2006 B.Sc. Diploma in Astrophysics, Peking University, China

Work experience

2023-present Professor, Beijing Normal University
2015-2023 Associated professor, Beijing Normal University
2013-2015 KIAA Research Fellow at KIAA, Peking University (KIAA-PKU)
2011-2013 LAMOST Research Fellow at KIAA-PKU

Research interests

- Galactic archaeology; Near-field cosmology (e.g. M 31)
- Wide field photometric and spectroscopic surveys; Data reduction, calibration, and mining
- Dust and extinction; Diffuse interstellar bands
- Stars; Binaries
- Emission line nebulae

Interests related to SPHEREx

- Data reduction and calibration of SPHEREx data
- 3D dust distribution and properties with SPHEREx data
- Binary stars, SED outliers with SPHEREx data

Publications

My ADS Link: <https://ui.adsabs.harvard.edu/user/libraries/IQLJprNHSwGXCYk3p7A-jA>

Yang Huang



Yang Huang is currently an Associate Professor at the School of Astronomy and Space Science, University of Chinese Academy of Sciences. He received his Ph.D. from Peking University in 2016. From 2016 to 2018, he was a LAMOST Postdoctoral Fellow at Peking University.

His research focuses on understanding the formation and evolution of the Milky Way, mainly from an observational perspective, by combining data from large-scale Galactic surveys such as LAMOST, Gaia (including XP spectra), SEGUE, APOGEE. His work emphasizes mapping the structure, kinematics, and chemical evolution of the Galaxy to uncover its assembly history.

Beyond Galactic archaeology, he has broad interests across diverse areas of astronomy and astrophysics, including stellar evolution, black holes of various scales (stellar-mass, intermediate-mass, and supermassive), galaxy mergers, and supermassive binary black holes.

I am very interested in SPHEREx, as I have extensive experience in deriving stellar parameters from narrow- and medium-band photometric surveys such as SMSS, J-PAS, SAGES, J-PLUS, and S-PLUS. I am particularly eager to explore the potential of using SPHEREx data to derive reliable stellar parameters and advance stellar population studies. In addition, my research focuses on merging and post-merger stars, which often exhibit circumstellar disks and strong infrared emission. The spectral coverage of SPHEREx will thus provide valuable information for identifying and characterizing these systems.

Jianping Xiong

Postdoctoral Researcher
Yunnan Observatories, Chinese Academy of Sciences (CAS)
xiongjianping@ynao.ac.cn



Research Interests:

Parameters measurement and analysis of binaries
Distance measurement based on binaries

Research Experience

Conducting research on the characterization of binaries using data from large-scale time-domain photometric and spectroscopic surveys.

韩恒赓

HAN, HENGGENG

🏠 1993 年 10 月 16 日

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🏛️ National Astronomical Observa-
tories, Chinese Academy of Sci-
ences

🌐 China / Beijing

🎓 Ph.D

📍 20A Datun Road, Chaoyang District

🎓 Education

2023.01-now	National Astronomical Observatories, Chinese Academy of Sciences, Postdoc
2021.11-2022.10	DAAD-UCAS Scholarship, University of Potsdam
2016.09-2023.01	University of Chinese Academy of Sciences, School of Astronomy and Space Science, Ph.D
2012.09-2016.06	Sichuan University, College of Physics, Bachelor

📄 Publications

- Han, H., Wang, S., Li, X., et al. 2025, The Astrophysical Journal, 984, 2, 10.3847/1538-4357/adc600
- Han, H., Huang, Y., Wang, B., et al. 2025, Research in Astronomy and Astrophysics, 25, 4, 10.1088/1674-4527/adc791
- Han, H., Wang, S., Li, X., et al. 2024, The Astrophysical Journal, 977, 138. doi:10.3847/1538-4357/ad957a
- Han, H., Wang, S., Zheng, C., et al. 2024, The Astrophysical Journal Supplement Series, 273, 8. doi:10.3847/1538-4365/ad4b17
- Han, H., Wang, S., Bai, Y., et al. 2023, The Astrophysical Journal Supplement Series, 264, 12. doi:10.3847/1538-4365/ac9eac
- Han, H.-G., Cui, K.-M., Liu, J.-F., et al. 2021, Research in Astronomy and Astrophysics, 21, 142. doi:10.1088/1674-4527/21/6/142
- Li, X., Wang, S., Han, H., et al. 2024, The Astrophysical Journal, 966, 69. doi:10.3847/1538-4357/ad3038
- Li, X., Wang, S., Han, H., et al. 2025, The Astrophysical Journal Supplement Series, 276, 29. doi:10.3847/1538-4365/ad9011
- Wang, S., Li, X., Han, H., et al. 2024, The Astrophysical Journal, 976, 43. doi:10.3847/1538-4357/ad87d0
- Ding, Y., Zhang, S., Han, H., et al. 2024, The Astrophysical Journal, 976, 243. doi:10.3847/1538-4357/ad8eb9

🌿 Research Interests

Research on Stellar Magnetic Activity and Its Impact on Exoplanet Habitability: Utilizing observational data from various sky surveys, including the LAMOST, VLASS, TESS, ROSAT, and GALEX, to conduct comprehensive multi-band (including X-ray, ultraviolet, optical, and radio) studies of stellar magnetic activities. The main goal is to investigate the stellar dynamo mechanism, construct the evolution history of stellar magnetic fields and stellar rotation, explore the effects of stellar high-energy radiation (including ultraviolet and X-ray radiation) and stellar flares (phenomena analogous to solar flares occurring on other stars) on the habitability of exoplanets and the boundaries of the stellar habitable zone.



蔡肇伟博士 (Chao-Wei Tsai, Ph.D.)

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Chao-Wei Tsai is experienced in multi-wavelength investigations of normal, starburst galaxies, and active galactic nuclei, with an emphasis on radio morphology, optical/IR/radio spectroscopy, and spectral energy distribution analysis. His research focuses on observations to study galaxy-black hole co-evolution, the properties of the interstellar medium in and around galaxies, and the formation/evolution of dwarf galaxies. He was involved in the Infrared Imaging Spectrograph (IRIS) for the Thirty Meter Telescope (TMT). Currently, he is a member of the science working group for the China Space Station Telescope/Integral Field Spectrograph (CSST/IFS) instrument and a core member of the Ali Cosmic Polarization Telescope (AliCPT). He is participating in major observational programs, including FAST key science projects, CSST main survey science preparation, and SKA early science initiatives.

Before joining NAOC in late 2018, he worked at Caltech, JPL, and UCLA. He contributed to NASA's Wide-field Infrared Survey Explorer (WISE) mission and was part of the NASA WISE Team Achievement Award. He also represented his team in receiving the NASA Group Achievement Award for his discovery of the most luminous infrared systems in the Universe. He was a recipient of the 2023 Beijing Natural Science First Prize. In 2024, he was awarded the ACAMAR Senior Visiting Scholarship for his China-Australia collaborations. As of October 2025, he has published over 130 papers (total citations >19,000; h-index 44; i10-index 81).

■ Education:

- D.Phil. in Astronomy, University of California, Los Angeles
- M.Sc. in Astronomy, Nat'l Central University
- B.Sc. in Physics, Nat'l Taiwan University

■ Professional Positions:

- Adjunct Research Scientist, Institute for Frontiers in Astronomy and Astrophysics, Beijing Normal University, Beijing (2022-present)
- Staff Research Scientist, National Astronomical Observatories, Chinese Academy of Sciences, Beijing (2018-present)
- Assistant Researcher, University of California, Los Angeles (2016-2018)
- NASA Postdoctoral Program Fellow, Jet Propulsion Laboratory (2012-2016)
- Postdoctoral Scholar, California Institute of Technology (2009-2012)

■ Research Interests:

- Active galactic nucleus - black hole accretion and feedback
- Extreme star formation activities and star cluster formation
- AGN and star formation feedback and the circumgalactic medium
- Dwarf galaxy formation and evolution
- Applications of machine learning in Astronomy

■ Honors & Awards:

- ACAMAR Senior Visiting Scholarship (2024)
- Beijing Natural Science First Prize (2023)
- Pioneer Talents Program, Chinese Academy of Sciences (2018)
- NASA Group Achievement Awards, WISE Hot Dust Obscured Galaxy Team (2016)
- NASA Group Achievement Awards, WISE Science Data Center Team (2012)
- NASA Postdoctoral Program Fellowship (2012-2015)



Dr. Bin Ma

Associate Professor, Sun Yat-sen University

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RESEARCH INTERESTS

- **Infrared astronomy:** I have been leading an 80 cm infrared telescope at Lenghu Observatory, and a 15 cm Antarctic Infrared Binocular Telescope at Dome A.
- **Data processing:** I am involved in the development of pipeline for the China Space Station Survey Telescope (CSST).
- **Site-testing:** I have been leading the seeing measurement at Dome A by DIMM, and am investigating new facilities for measuring seeing, infrared background and PWV.

ACADEMIC EMPLOYMENT

- 2020.12 – Present Associate Professor, School of Physics and Astronomy, Sun Yat-sen University
- 2019.8 – 2020.7 Postdoctoral Fellow, Department of Physics and Astronomy, the University of British Columbia
- 2010.3 – 2020.11 Assistant Research Prof., National Astronomical Observatories, Chinese Academy of Sciences

EDUCATION

- Ph.D., Astrophysics, University of Chinese Academy of Sciences, Beijing, 2013 – 2019
- M.S., Astrophysics, Graduate University of Chinese Academy of Sciences, Nanjing, 2005 - 2009
- B.S., Astronomy, University of Science & Technology of China, Hefei, 2001 - 2005

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EDUCATION

Peking University

2024.09 - Present

Ph.D. Student, Department of Astronomy, School of Physics

• Major: Astrophysics

• Advisor: Professor Xue-Bing Wu

Shandong University

2020.09 - 2024.06

B.Sc. (Hons.), School of Space Science and Physics

• Major: Space Science and Technology

• Advisor: Professor Yun-Guo Jiang

• Thesis: Revealing the Variation Mechanism of ON 231

RESEARCH INTERESTS

I am interested in AGN variability and reverberation mapping (RM). My current research focuses on continuum reverberation mapping across the UV and optical bands to investigate the accretion disk structure and the “too-big disk” problem. In parallel, I am also interested in developing and testing photometric RM methods to measure $H\alpha$ lags for the broad-line region (BLR). These techniques are expected to be applied to estimate black hole masses for a large sample of AGNs in large multi-epoch photometric sky surveys, such as ZTF, WFST, and LSST.

While my current work focuses on UV and optical RM, I am further exploring infrared (IR) RM to study the dusty torus in AGNs. The broad spectral coverage ($0.75\text{--}5\ \mu\text{m}$) and multi-epoch capability of SPHEREx, particularly in its deep fields (SEP and NEP), provide an unprecedented opportunity to measure time lags between the optical and IR continuum. By combining SPHEREx observations with complementary ground-based optical monitoring and space-based facilities such as Swift, it will be possible to trace AGN variability from the X-ray through the UV/optical to the IR. This multi-wavelength monitoring will provide a more comprehensive picture of the AGN structure, linking the accretion disk, BLR, and dusty torus within a unified framework of variability. Moreover, SPHEREx will expand IR RM samples to higher redshifts and luminosities, enabling further tests and calibration for the radius–luminosity relation.

PUBLICATIONS

1. **Wang C.-Z.**, & Jiang Y.-G., Revealing the Variation Mechanism of ON 231 via the Two-component Shock-in-jet Model, 2024, ApJ, 966, 65.
2. **Wang C.-Z.**, & Wu, X.-B., Jiang, Y., Ma, Q., Gu, H., & Wen, Y., The UV/optical Continuum Reverberation Mapping of Eight Active Galactic Nuclei with Swift: Further Evidence for the Outer Component, 2025, Accepted for publication in ApJ.
3. **Wang C.-Z.**, & Feng, H.-C., Li, S.-S., Wu, X.-B., & Ma, Q., Validating the ICCF-CUT Method with Simultaneous Photometric and Spectroscopic Monitoring: $H\alpha$ Reverberation Mapping of NGC 4151 and UGC 3374, 2025, In preparation.

Maokai Hu, Ph.D.

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Employment History

2021.9 – 2023.12 Postdoc, Purple Mountain Observatory

2024.1 - Postdoc, Tsinghua University

Education

2010.9 – 2014.6 Bachelor in physics, Sichuan University

2014.9 – 2021.6 Ph.D. in astrophysics, University of Science and Technology of China

Research Publications

Hu Maokai, Wang Lifan & Wang Xiaofeng , 2025, The Astrophysical Journal, 984, 44
Hu Maokai, Ao Yiping, Yang Yi et al. 2025, The Astrophysical Journal Letters, 978, L27

Li Gaici, Hu Maokai, Li Wenxiong, Yang Yi, et al., 2024, Nature, 627, 754

Wang Lingzhi, Hu Maokai, Wang Lifan, et al., 2024, Nature Astronomy, 8, 504

Hu Maokai, Wang Lifan et al. , 2023, Monthly Notices of the Royal Astronomical Society, 525, 246

Hu Maokai, Hu Lei et al., 2023, Universe, 9, 7

Hu Maokai, Wang Lifan, et al. , 2022, The Astrophysical Journal, 931, 110

Research Interest

My main interest is the circumstellar environment surrounding supernovae and the multi-band signal relating to the CSM interaction. I developed a Monte Carlo procedure to simulate the radiative transfer process within circumstellar dust, and then applied it to fit the late-phase light curve of type Ia supernovae. I also focused on the ejecta-CSM interaction process and its influence on the radio, optical, and X-ray signals of supernovae soon after the explosion.



Xue-Bing Wu

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Degrees

B.Sc., 1986, Physics, Central China Normal Univ.

M.Sc., 1989, Astrophysics, Central China Normal Univ.

Ph.D., 1996, Astrophysics, Beijing Astronomical Observatory, Chinese Academy of Sciences

Working Experiences

1989-1993, Teaching Assistant, Lecturer, Dept. of Physics, Central China Normal Univ.

1996-1998, Postdoc, Institute of Theoretical Physics, Chinese Academy of Sciences (CAS)

1998-2000, Research Associate, Beijing Astronomical Observatory, CAS

2000-2001, Associate Professor, Department of Astronomy, Peking University

2001-present, Professor, Dept. of Astronomy, Peking Univ. (Chair in 2011-2014 and 2018-)

2014-present, Associate Director, Kavli Institute for Astronomy and Astrophysics, Peking U.

Visiting Experiences (more than 3 months)

10/1995-01/1996, Research Assistant, Dept. of Physics, University of Hong Kong, China

04-07/1997, Visiting Scientist, Max-Planck Institut fuer Extraterrestrische Physik, Germany

01-07/1999, Visiting Scientist, Dept. of Physics, Univ. of Alabama in Huntsville, USA

08/1999-12/2000, Visiting Scientist, Max-Planck Institut fuer Astrophysik, Germany

02-05/2011, Senior Visiting Fellow, Dept. of Astronomy/Steward Observatory, University of Arizona, USA

Research Interests

Accretion disks; Black hole physics; LAMOST extragalactic survey; Quasars and active galactic nuclei

Professional Services

2023-present, Scientific Editor, Science Bulletin

2023-present, President of Beijing Astronomical Society

2019-present, Scientific Editor, Research in Astronomy and Astrophysics

2018-present, Vice President of Chinese Astronomical Society

2013-2017, Chair of the User Committee of LAMOST

2010-present, Members of LAMOST Scientific Committee (Vice chair after 2017)

Represent Publications

1. Jin, Jun-Jie; **Wu, Xue-Bing**; Feng, Xiao-Tong, 2022, A Systematic Analysis of Stellar Populations in the Host Galaxies of Changing-look AGNs, *Astrophysical Journal*, 926, 184

2. Yao, Su; Wu, Xue-Bing; Ai, Y.L., et al., 2019, The Large Sky Area Multi-object Fiber Spectroscopic Telescope (LAMOST) Quasar Survey: The Fourth and Fifth Data Releases, *Astrophysical Journal Supplement Series*, 240, 6

3. Yang Qian; **Wu Xue-Bing**; Fan Xiaohui; et al., 2018, Discovery of 21 New Changing-look AGNs in the Northern Sky, *Astrophysical Journal*, 862, 109

4. Yao, Feige; **Wu, Xue-Bing**; Fan, Xiaohui; et al., 2016, A Survey of Luminous High-redshift Quasars with SDSS and WISE. I. Target Selection and Optical Spectroscopy, *Astrophysical Journal*, 819, 24

5. **Wu, Xue-Bing**, Wang F., Fan X., et al., 2015, An ultraluminous quasar with a twelve-billion-solar-mass black hole at redshift 6.30, *Nature* 518, 512

S. R. Kulkarni



I am the George Ellery Hale Professor of Astronomy & Planetary Sciences at the California Institute of Technology. I did my undergraduate studies at the Indian Institute of Technology, Delhi and got my PhD in radio astronomy at UC Berkeley in 1983 (Advisors: Carl Heiles & Donald Backer). I joined Caltech in 1985 and have been here ever since. I served as the Executive Officer for Astronomy (1997-2000) and the Director of Caltech Optical Observatories for the period 2006-2018. I was recognized by Cornell University with an AD White Professor-at-large appointment and received an honorary doctorate from the Radboud University of Nijmegen, The Netherlands. I chair the Physical Sciences panel. I thank the taxpayers of India & the state of California for funding my formal education.

My modus operandi (MO) has been to avoid popular fields and instead identify interesting topics and make inroads and ideally great progress and then leave that field once either it becomes popular or I have made tremendous progress. Highlights of my career: the discovery of the first millisecond pulsar, the first brown dwarfs, identifying soft-gamma ray repeaters as Galactic objects, the demonstration that gamma-ray bursts are of cosmological origin and showing that some (most) FRBs come from magnetars). I founded the Palomar Transient Factory (PTF) and the Zwicky Transient Facility. These projects seemed to have been instrumental in the development of optical time domain astronomy.

I have advised or co-advised 34 graduate students and mentored 54 postdoctoral fellows. For additional details please see my [homepage](#).

Kulkarni's awards include the Alan T. Waterman Prize of the US National Science Foundation (NSF), a fellowship from the David and Lucile Packard Foundation, a Presidential Young Investigator award from the NSF, the Helen B. Warner award of the American Astronomical Society, the Karl Jansky Prize of Associated Universities, Inc, the Dan David Prize and the Shaw Prize.

Kulkarni is a fellow or member of the following learned societies: the American Academy of Arts & Sciences, the Royal Society of London, the US National Academy of Sciences, Indian Academy of Sciences and the Royal Netherlands Academy of Arts and Sciences (KNAW). Fritz Zwicky, George Ellery Hale and Jan Oort are my heroes.