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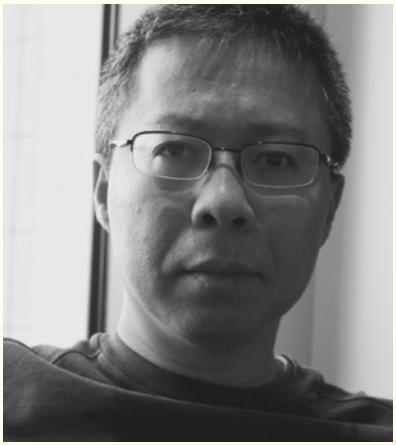
Director's Corner

Metric of Success



KIAA officially celebrated its 10th anniversary in May this year. In the days leading up to the big, hectic celebratory event, my mind wrestled with a set of questions: How well have we done? How can we tell? What are the metrics of success? KIAA is unique and challenging in many ways. We are still very young—only a decade old—with many of the significant developments really taking off only in the last few years. Our faculty, on average, is also very young. We have no Academicians, no big titles, no famous prizes, hardly any institutional history. We do terribly in any domestic, national ranking, which typically puts a premier on ostensible, outward displays of success and achievement, ornaments that we neither have nor ever can hope to attain. Moreover, as an international institute, KIAA suffers, in fact, from a distinctive handicap: our foreign faculty don't even quality for some of the perks that typically come with success or seniority, and, even if they do technically qualify to apply, we all know they don't actually stand a chance of getting a fair chance. Such is the reality of a culture deeply rooted in tradition still striving toward true modernity. We are working hard to establish a truly international institute of high caliber, all the while recognizing that we must do so in a local environment that sometimes cannot easily accommodate such a radical change.

Earlier this year, all universities were frantically responding to a major directive from the Ministry of Education to implement a new national plan—'double first rate' (双一流), as it is awkwardly translated. The intent is clear, and laudable: to reform the higher education system to produce both first-rate universities and first-rate disciplines, with the long-term goal of narrowing the gap between China and the rest of the developed world. The reason for all the angst is that the outcome of this national evaluation and ranking will directly impact the future funding stream of the universities, as well as the internal allocation of resources within each university. Much is at stake. But, once again, this raises the same set of questions that had troubled me. What does 'first rate' mean? What are the benchmarks for reference? What are the criteria by which we will be judged? Who will ultimately decide?

It's actually not that complicated. Our best and brightest students certainly know. After all, why do they try so hard to go abroad, especially to the US? Because there they can find what China still cannot provide. And when they make it out, which schools do they choose? In astronomy, at least, the top-10 invariably includes places such as

CalTech, Berkeley, Harvard, Princeton, and the like. Young people flock to these places for obvious reasons: they have highly accomplished faculty, access to world-leading facilities, and stimulating environments where hard-working, ambitious people can thrive and succeed. Without a doubt, first rate. The astronomy program at PKU has come a long way, especially since the establishment of KIAA a decade ago, and it has begun to come to maturity. Collectively, PKU astronomy has grown considerably, both in size and in quality. I do not kid myself to think that we are anywhere close to the ranks of the top-tier universities. That remains a distant goal. Nevertheless, among the top 200 university astronomy programs worldwide included in the 2017 ranking of the US News & World Report, I am pleased to see that PKU is already considered above average (we rank number 74). We are third in Asia, behind the University of Tokyo, and virtually tied with the University of Kyoto.

Yet, the just-released results of the 'double first-rate' competition tell a starkly different story. PKU astronomy failed to even make the mark. We are not good enough. To add insult to injury, in the latest national ranking of university astronomy programs, the Ministry of Education gave us a grade of B–. This is, to say the least, a deeply disappointing outcome, even if it is perhaps not altogether surprising. KIAA is a 'new-style' institute operating in a predominantly still old-style environment. The two can come to sharp tension, and this is a perfect example of that. Within this landscape, it is all the more important that we continue to engage the leadership of PKU and the Kavli Foundation, to press upon them the uniqueness and importance of the KIAA enterprise, and our need for their sustained support. We should remain steadfast in our conviction, clear in our vision, relentless in our efforts, and proud of where we stand. By all objective measures, we have made undeniable progress on multiple fronts: faculty recruitment, a vibrant postdoc program, student training, grant funding, and, most important of all, scientific productivity and impact. For the last four years, our annual number of refereed publications has ranged between 165 and 244, with an average of 212. We maintain a steady stream of high-impact results that consistently get recognized by our international peers and the media. We engage the international community on a variety of fronts and are deeply immersed in a range of domestic initiatives, firmly committed to the belief that KIAA's mission should extend beyond mere paper counts and national rankings. And all the while, we unremittingly strive to ensure that KIAA provides a positive, nurturing environment for people to work and learn, to inspire and be inspired.

Luis C. Ho

Director, KIAA

Developments

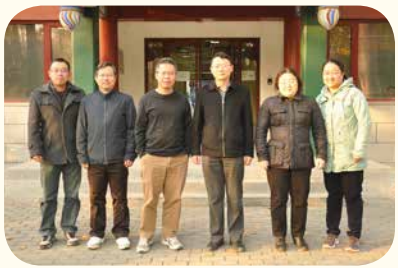
PKU Astronomy Highlights 2017

1. KIAA 10th Anniversary: KIAA celebrated its 10th anniversary by hosting a symposium on 4 May 2017. The symposium was attended by PKU president Jianhua Lin, former PKU president and current vice-president of the Chinese Academy of Sciences Enge Wang, former PKU president Zhihong Xu, PKU vice-president Jie Wang, Kavli Foundation executive vice-president Miyoung Chun, several directors of other Kavli institutes, and many prominent guests and scholars from international and domestic universities and institutes.

2. Science Advisory Committee and Governing Board: The Science Advisory Committee and Governing Board met at KIAA immediately before the 10th anniversary symposium. Both bodies evaluated the recent performance of KIAA and were impressed by its continued progress.

3. PKU Administration: The top leaders of the PKU administration, including Party Secretary Ping Hao, evaluated the performance of KIAA, expressed their strong support, and recommended that we conduct a long-range strategic plan.

4. NSFC Group Innovation Award: The project Galaxies and Quasars, led by Luis C. Ho, was awarded a prestigious Group Innovation Award by the National Science Foundation of China. This project is a collaboration of six members of KIAA and DoA (Luis Ho, Xuebing Wu, Qingjuan Yu, Linhua Jiang, Ran Wang, and Fukun Liu) to conduct long-term, forefront research on supermassive black holes, quasars, and galaxy evolution.



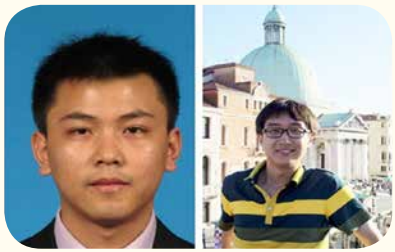
5. BHOLE Project: Funded by a National Key Program for Science and Technology Research and Development Grant by the Ministry of Science and Technology of China, this major initiative, led by Luis Ho, has successfully completed its first year of operations. In total this project has already produced over 100 peer-reviewed publications.

6. Top-ranked Postdoctoral Program at PKU: In 2017, Zhao Dongyao, Ravi Joshi, and Shi Jingjing won second- to the fourth-round Boya Fellowships. KIAA postdocs have continuously successfully obtained Boya Fellowships from the time it was established (Kohei Hayashi and Yao Su won first-round Boya Fellowships). Du Min won one of three awards issued to

postdocs in astronomy this year (among 300 awardees nation-wide) from the National Innovative Postdoc Support Program. Yang Yuanpei won a 2017 PKU Outstanding Postdoc Award, one of 24 from among more than 1400 postdocs at PKU. Six postdocs (Kohei Hayashi, Alessia Longobardi, Guo Kexin, Jongsuk Hong, Zhao Dongyao, and Guo Jincheng) from the PKU astronomy family won grant funding from either the General or Special Funds of the China Postdoctoral Science Foundation in 2017. Two international postdocs (John Graham and Chandrachur Chakraborty) won Research Funds for International Young Scientists, sponsored by the National Natural Science Foundation of China.

7. Two New Joint Postdoc Fellowships: KIAA has launched two new international joint postdoctoral fellowships: the KIAA–International Centre of Radio Astronomy Research (ICRAR) Postdoctoral Fellowship and the KIAA–Kavli Institute for the Physics and Mathematics of the Universe at Tokyo University (KIPMU) Postdoctoral Fellowship (the 'Kavli Astrophysics Postdoctoral Fellowship'). The KIAA–ICRAR program has concluded the interview process and issued three offers to Guo Kexi (from KIAA/PKU), Shi Jingjing (from SISSA) and Zuo Pei (from NAOC). Guo Kexin started her term at ICRAR in late October 2017. The KIAA–IPMU program is partially funded by the Kavli Foundation and will launch in 2018. The recruitment shortlist will be announced in spring 2018. The successful fellow will spend two years at the Kavli IPMU and two years at KIAA.

8. Postdoc Recruitment: We recruited two KIAA Postdoctoral Fellows in 2017 (John Graham and Anupam Bhardua). Several additional postdocs were hired through other funding channels: five PI-sponsored postdocs (Shao Li, Yang Xiaolong, Toky Herimandimby Randriamampandry, Tapas Baug, and Chandrachur Chakraborty), one KIAA–CAS postdoc (LI Ye), three PKU Boya Fellows (Zhao Dongyao, Ravi Joshi, and Shi Jingjing), three KIAA–ICRAR fellows (Guo Kexin, Shi jingjing, and Zuo Pei), one postdoc supported by National Postdoc Innovative program (Du Min), and one postdoc supported by the PKU Top 100 university recruitment program (Ming-yi Lin); in total fifteen new postdocs throughout the year.



9. Honors and Awards: Xuebing Wu's discovery of the most luminous quasar with the most massive black hole in the early Universe was awarded the First-class Prize in the Natural Sciences of the Excellent Achievement Award for Scientific Research in Chinese Universities in 2017 by the Ministry of Education of China; Subo Dong was awarded the 6th Su-Shu Huang Prize of the Chinese Astronomical Society. The discovery of the most luminous supernova, led by Subo Dong was ranked second in the category of Fundamental Research of the Top 10 Achievements in Astronomical Science and Technology in 2016; he also co-led the research ranked first in the same category. Two of PKU's recent students (Wang Long and Huang Yang) received the best PhD prize for the year of 2016 from the International Astronomical Union (IAU); PhD student Xu Siyao received a Hubble Fellowship funded by the National Aeronautics and Space Administration (NASA) and the Space Telescope Science Institute.

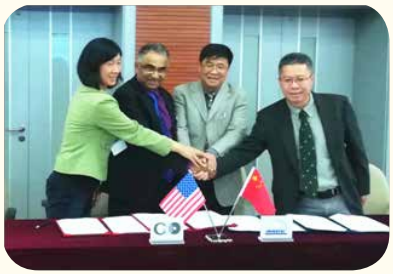
10. Faculty Recruitment: Jing

Wang, an expert on observational studies of the interstellar medium in galaxies, joined KIAA's faculty as an Assistant Professor. She received a Youth One Thousand Talent Award. Xian Chen, an expert on dynamics and radiation processes in the vicinity of black holes and gravitational-wave astrophysics, joined the Department of Astronomy as an Assistant Professor. Pau Amaro-Seoane, an expert on stellar dynamics and gravitational waves, joined KIAA as a visiting faculty member.

11. Tenure and Promotion: Gregory Herczeg was promoted to the rank of Associate Professor with tenure.

12. Publications: A total of 244 publications were published or accepted for publication in international peer-reviewed journals.

13. Next-Generation Palomar Spectrograph: A formal MoU was signed among KIAA, CalTech, and the National Astronomical Observatories, Chinese Academy of Sciences, for the construction of a new, state-of-the-art



optical spectrograph for the 5m Hale Telescope at Palomar Observatory. Luis Ho is the co-chair of the science board, and Xuebing Wu is the optical system manager.

14. Visiting Scholars: We hosted a total of 58 visiting scholars from 44 institutions worldwide, including the Director of the NASA Exoplanet Science Institute, Shri Kulkarni, the Director of the Harvard–Smithsonian Center for Astrophysics, Charles Alcock, Professor at the University of Oxford James Binney, etc.

15. Conferences: KIAA faculty organized a total of 13 meetings, including

- The 2017 KIAA/PKU Astrophysics Forum
- BHOLE Annual Meeting
- Transients from Compact Objects Workshop
- Stellar Populations and the Distance Scale (a conference in honour of Jeremy Mould)
- 2017 SHAO–PKU bilateral Symposium
- Workshop on Astroparticle Physics II
- Workshop of Pulsar Timing Array in China
- BHOLE Group 3 Workshop
- KIAA Governing Board Meeting
- KIAA Science Advisory Committee Meeting
- The KIAA 10th Anniversary Symposium
- Bilateral workshop between KIAA/PKU and the Instituto de Astrofisica, PUC (Chile).

Featured science

ALMA finds hints of early black-hole growth

Yali Shao

In recent years, more than 200 quasars with redshifts greater than 5.7 have been discovered in large optical and near-infrared surveys. These quasar–starburst systems provide unique laboratories to study the formation of the first supermassive black holes (SMBHs) and their host galaxies close to the end of the era of cosmic reionization.

Bright [CII] 158 μm fine-structure line emission has been widely detected in high-redshift quasar–starburst systems. The [CII] line is one of the primary coolants of the star-forming interstellar medium (ISM). Thus, it directly traces the distribution of the star-formation activity and the kinematic properties of the atomic/ionized gas in quasar host galaxies. Fourteen $5.7 < z < 7.1$ quasars have been observed with the Atacama Large Millimeter/Submillimeter Array (ALMA) at subarcsecond resolution, and the inferred source sizes are 1.5−3.3 kpc. Six show clear velocity gradients, providing constraints on the dynamical mass. In these objects, the black hole-to-bulge mass ratio appears to be above the correlation defined by local objects. However, these studies were limited by the moderate angular resolution of the early ALMA observations (typically 0.7 arcseconds). The bulge mass was estimated approximately from the [CII] line width, which resulted in a strong degeneracy between the inclination angle and the intrinsic rotational velocity. However, this can be improved with recent high-resolution ALMA observations.

Ran Wang's group studies the

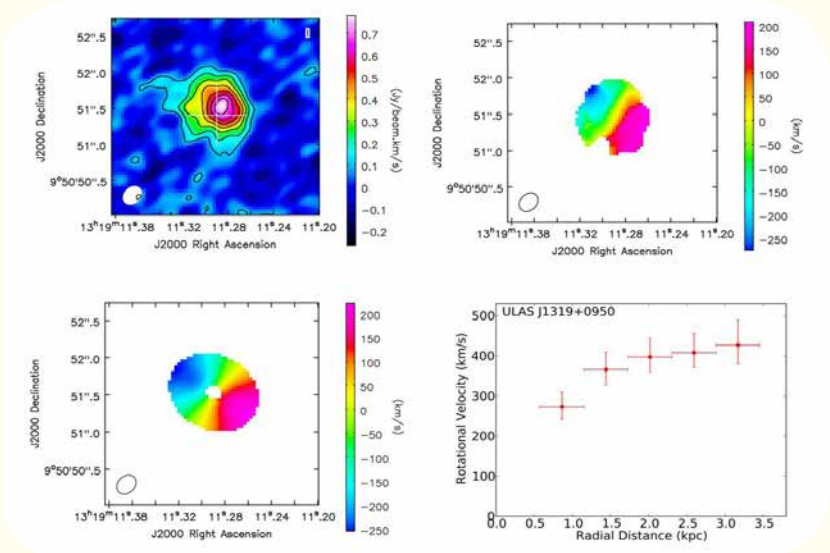


Figure 1. (Top left) Integrated [C II] velocity map, presenting a source size with a FWHM of 3.57 × 2.94 kpc. (Top right) Observed velocity field. A velocity gradient is obvious. (Bottom left) Tilted-ring model. (Bottom right) Rotation curve, rising to 2 kpc, and then flattening on larger scales.

ISM properties of far-infrared (FIR)-luminous quasars with redshifts greater than 5.7. We selected FIR-luminous quasars using the IRAM 30 m telescope and the James Clerk Maxwell Telescope (JCMT), and we found significant star-formation activity, with star-formation rates (SFRs) from a few hundred to athousand solar masses per year in the quasar host galaxies. We also detected CO (2–1) line emission from a few redshift-6 quasars using the Karl G. Jansky Very Large Array (JVLA), which indicate abundant molecular gas with masses of order o 1010 solar masses. Our recent paper (Shao, Wang, et al. 2017), studying the gas dynamics of the luminous z = 6.13 quasar ULAS J1319+0950, revealed with high-resolution ALMA observations, was highlighted by the American Astronomical Society (aasnova.org) on 6 September 2017. We combined new ALMA Cycle 1 data with Cycle 0 data. The combined data [CII] line emission has an angular resolution of 0.3 arcseconds and resolve both the dust continuum and the [CII] line emission on scales of a few kiloparsecs. The combined data confirm the [CII] velocity gradient that was previously detected in a lower-resolution ALMA image based on Cycle 0 data alone. We applied a tilted-ring model to the [CII] velocity map to obtain a rotation curve and constrained the circular velocity at 427 ± 55 km *s–1* at a radius of 3.2 kpc with an inclination angle of 34 degrees. We then measured a dynamical mass within the 3.2 kpc region of ~ 13.4 ×1010 solar masses. This yields a black hole to host galaxy mass ratio of ~0.020, which is roughly four times higher than the present-day MBH/Mbulge ratio. This suggests that the supermassive black hole grew the bulk of its mass before most of the stellar mass in this quasar host galaxy had formed in the early Universe.

Featured science

Studies of the Dispersion Measures of Fast Radio Bursts

Yuanpei Yang

Fast radio bursts (FRBs) are a new, mysterious class of radio transients of millisecond duration, large dispersion measures (DMs), and an all-sky distribution. So far, 25 FRBs have been discovered, among which FRB 121102 clearly shows a repeating behavior. Thanks to the precise localization and multi-wavelength follow-up observations of the repeating source FRB 121102, the distance scale of FRBs has finally been established as a cosmological scale. The large DM excess of other FRBs with respect to Galactic values and their high Galactic latitudes also suggest that FRBs should have extragalactic and likely cosmological origins.

DMs are among the most important observed quantities of pulsars and FRBs, which reflect the column density of free electrons along the line of sight. For an electromagnetic pulse with a given frequency, the larger the DM value is, the longer the arrival time takes. Thus, one can use the relation between the delay time and the frequency to measure DMs. Once a typical value for the electron density in the propagation path is known, an estimate of the source's distance can be obtained. For an FRB, the observed DM is composed of three contributions: from the Milky Way, from the intergalactic medium (IGM), and from the host galaxy (including its interstellar medium, ISM, and near-source plasma): see Figure 1. According to Galactic pulsar data, the DM contribution in the Milky Way can be estimated for a localized FRB. However, the other two contributions are poorly known.

A recent study with Prof. Bing Zhang (University of Nevada Las Vegas, UNLV) developed a method of using measured DMs and redshifts of FRBs to address cosmological research questions. Methods of using measured DMs and redshifts to study cosmology had been proposed in some earlier papers, but one needs to assume

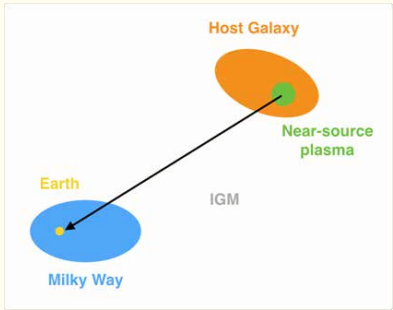


Figure 1: For an FRB, the observed DM has three contributions, i.e., from the Milky Way, from the intergalactic medium (IGM), and from the host galaxy (including its interstellar medium and near-source plasma).

a certain amount of DM contribution from the host galaxy to apply those methods. Since the DM from the host galaxy is poorly known, especially the contribution from the near-source plasma which involves a FRB's physical origin, previously proposed methods would have overestimated the distances to FRB sources if the near-source plasma has a large contribution. We found that using the derivative of the inferred dispersion with redshift can help remove the impact of the host galaxy and further constrain the cosmological parameters. We also performed Bayesian inference to verify our claim and found that host galaxy

DMs and cosmological parameters can indeed be extracted from a sample of FRBs: Figure 2. Such a study is relevant to use FRBs as cosmic probes. At the beginning of this year, a further study with Rui Luo (KIAA/PKU), Prof. Zhuo Li (KIAA/PKU) and Prof. Bing Zhang developed a method to extract the mean host galaxy DM and the characterized luminosity of FRBs using the observed DM–flux data, based on the assumption of a narrow luminosity distribution. Applying Bayesian inference to the data of current FRBs, we derived a relatively large mean host DM with a large dispersion. We note that this result is also supported by the millisecond scattering times of some FRBs and the relatively low redshift, z = 0.19273, of FRB 121102. The large DM of the host galaxy may be contributed by the ISM or near-source plasma. If it is contributed by the ISM, the type of FRB host galaxies would not be Milky Way-like, consistent with the detected host of FRB 121102.

In addition to the absolute DM values of FRBs, DM variations can also reveal important clues as to the properties of the medium along the propagation path. This is particularly relevant for a repeating FRB such as FRB 121102. So far, the DMs derived for each burst of FRB 121102 have not shown significant evolution, even though an apparent increase was recently seen in newly detected VLA bursts. Very recently, Prof. Bing Zhang and I investigated a list of possible astrophysical processes that might cause DM variation of a particular repeating FRB source, including: (1) cosmological scale effects, e.g., Hubble expansion and large-scale structure fluctuations; (2) FRB local effects, e.g., gas density fluctuations, expansion of a supernova remnant (SNR), a pulsar wind nebula, and an HII region; and (3) propagation effects owing to plasma lensing. We found that any observable DM variation is likely caused by the local plasma around the FRB source and DM variations contributed by the large-scale structure are extremely small. In addition to the classical mechanisms which decrease DMs over time, we also suggested that an FRB source in an expanding SNR (during Sedov–Taylor and snow-plow phases) around a nearly neutral ambient medium or in a growing HII region can increase a DM. Some effects, e.g., an FRB source moving in through HII region or plasma lensing, can produce either positive or negative DM variations. It is expected that more repeating FRB sources may be detected in the future, and the observations of DM variations of FRB 121102 and other repeating FRB sources can provide important clues regarding the physical origin of these sources.

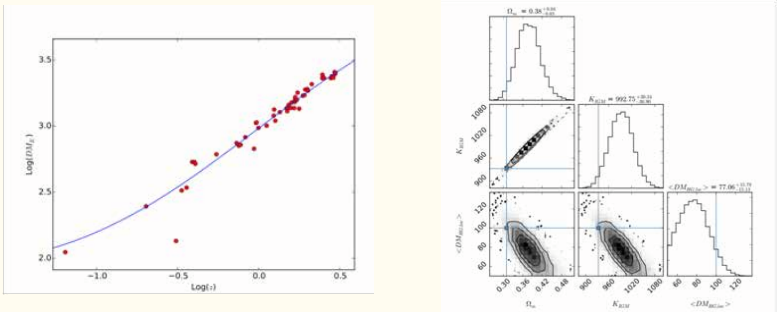


Figure 1: Comparisons of the spectra of the new quasar, J0100+2802, taken with the 2.4m Lijiang telescope at Yunnan Observatory, the MMT, and the LBT, with the spectrum of the most luminous high-redshift quasar previously known, J1148+5251 (the spectra of the 2.4m and the MMT have been shifted up by 2 units and 1 unit,respectively).

Featured science

An ultramassive protocluster of galaxies in the early Universe

Linhua Jiang

An international team of astronomers led by Youth Qianren Research Professor Linhua Jiang at the Kavli Institute for Astronomy and Astrophysics at Peking University discovered an ultra-massive protocluster of galaxies in the distant Universe. This protocluster occupies a huge cosmic volume of ~53×36×46 cubic co-moving megaparsecs (cMpc; one parsec is equal to about 3.26 light years), at a redshift $z \approx 5.70$, when the Universe was only one billion years old (about 7% of its current age). Such a large structure is rarely seen in current cosmological simulations. This protocluster will eventually collapse into a galaxy cluster with a total mass of ~5.3 × 1015 solar masses, roughly twice the mass of the most massive clusters or protoclusters at any redshift known to date.

Galaxy clusters trace the largest structures of the Universe and provide ideal laboratories for studying galaxy evolution and cosmology. Protoclusters of galaxies are the progenitors of galaxy clusters, and they are powerful tools for understanding cosmic structure formation in the early Universe. In recent years, there has been growing interest in hunting for protoclusters at high redshift. It is, however, very challenging to find the largest protoclusters at early times when they start to assemble. According to cosmological simulations, the largest protoclusters extend over tens of co-moving megaparsecs at the epoch of their early formation, and thus deep, wide-area spectroscopic surveys are needed to reliably identify these giant structures at high redshift.

Jiang and colleagues are carrying out a deep spectroscopic survey of galaxies covering four square degrees on the sky, aiming to build a homogeneous sample of Lyα-emitting galaxies (Lyα Emitters, or LAEs) at $z \approx 5.7$ and 6.5, and Lyman-break galaxies at $5.5 < z < 6.8$. They are observing five well-studied fields, including the Subaru XMM–Newton Deep Survey (SXDS) field. These fields have deep optical imaging data in a series of broad and narrow bands which allow an efficient selection of high-redshift galaxy candidates. From these LAE candidates, they identified a large overdense region at $z \approx 5.70$ in SXDS. With spectroscopic observations, they confirmed that this overdense region consists of a giant protocluster (SXDS_gPC for short) that will grow into an ultra-massive galaxy cluster by $z = 0$.

At least 41 luminous LAEs (brighter than NB816 = 25.5 AB mag) in SXDS_gPC were confirmed within a volume of ~53×36×46 cubic cMpc at $z \approx 5.7$ (Figures 1 and 2). The galaxy overdensity of SXDS_gPC is 4.4 ± 0.9, i.e., its spatial density is 5.4 times the average density at $z \approx 5.70$. By comparing with galaxies in blank fields, this overdensity is highly significant (at 7.0σ significance). Giant protoclusters like SXDS_gPC at high redshift have not been reported before. Jiang's team estimated how rare they are using a cosmological simulation with a size of 713 cMpc on a side, and they found no giant protoclusters like SXDS_gPC in

the entire simulation box. This implies that such systems are very rare in the distant Universe.

The high overdensity of SXDS_gPC significantly exceeds the collapse threshold in the classical theory of spherical collapse. Cosmological simulations also suggest that an overdense region like SXDS_gPC will inevitably fall into a giant galaxy cluster by $z = 0$. Two methods have been used to estimate its present-day mass M_z=0, which is the total mass of baryonic and dark matter in SXDS_gPC. The first method uses a classic formula that assumes everything within the protocluster volume will collapse into a cluster. It gives an upper limit of M_z=0 = (6.2 ± 1.1) × 10^{15} solar masses. The second method uses the correlation between galaxy overdensity and present-day mass drawn from simulation results. This method is more practical and is not sensitive to the collapse volume assumed. The best estimate from this approach gives Mz=0 ≈ (5.3 ± 1.3) × 10^{15} solar masses. This mass is twice the mass of the most massive clusters or protoclusters currently known at any redshift.

The cold dark matter model predicts that small structures merge hierarchically to form large structures, so the largest structures are expected to form at the latest cosmic times. It is thus remarkable that giant protoclusters like SXDS_gPC already exist at $z \approx 5.7$. Although SXDS_gPC is still far from virialized, its high overdensity suggests that this large overdense region must have been in place at an even earlier time. Such protoclusters may be ideal probes for understanding early structure formation.

(This work is supported by the National Key R&D Program of China and the National Science Foundation of China.)

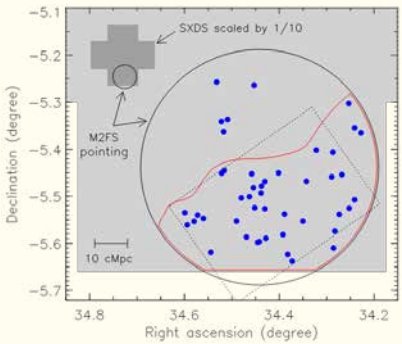


Figure 1. Schematic representation of the SXDS_gPC region. The blue solid points represent LAEs. SXDS_gPC is enclosed by a red, half-round shape. The upper curved boundary is a density contour, and the other parts of the boundary are confined by the coverage of the imaging and spectroscopic data available. Our estimate shows that the LAE overdensity of SXDS_gPC is 4.4 ± 0.9 at 7.0σ significance.

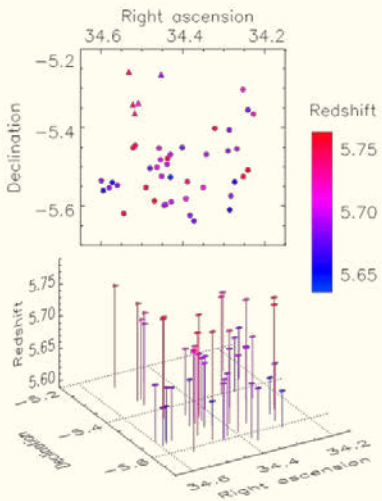
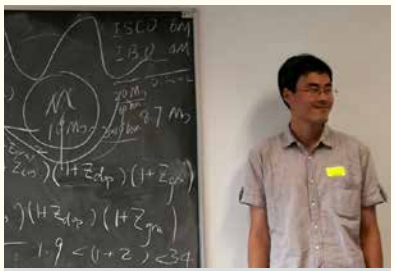


Figure 2. Spatial distribution of the LAEs in the SXDS_gPC region. The color-coded symbols represent LAEs. Their colors indicate their redshifts as given in the color bar. The top panel shows the projected distribution. The bottom panel shows the 3D distribution, with the third dimension being redshift.

Featured science

The frontiers of gravitational-wave astrophysics



Xian Chen

Xian Chen's recent research projects focus on gravitational-wave astronomy, a forefront subdiscipline in astronomy and astrophysics which has seen a tremendous amount of progress in the past two years.

Gravitational waves were predicted by Albert Einstein more than 100 years ago, based on his Theory of General Relativity. They are ripples in space and time which are generated by the acceleration of matter and propagate at the speed of light. There are numerous sources in the Universe that can generate gravitational waves, but the most common cause, as many scientists have foreseen, is the coalescence of compact objects, such as black holes or neutron stars.

It was not until 14 September 2015 that gravitational waves were finally detected. This great discovery, made by the Laser Interferometer Gravitational-wave Observatory (LIGO), was awarded the Nobel Prize for Physics in 2017. The detected signal matched seamlessly with the model of coalescing black holes. It took such a long time to prove Einstein's prediction because these waves are extremely weak—the effect is as small as 0.001 times the diameter of the nucleus of an atom. Detecting such a small distortion required decades of innovative and hard work to refine the instruments. Today, about six binary black hole mergers and one neutron star binary have been detected through gravitational-wave radiation.

These detections were all made by laser interferometers on the ground. They are very sensitive to gravitational waves in the 100–1000 Hertz range, and hence these facilities are suitable for the detection of coalescing binaries that are 1–100 times more massive than the Sun. However, the majority of binaries in this mass range are not in the final stage of their coalescence and do not emit kilo-Hertz gravitational waves. Instead, they emit gravitational waves at much lower frequencies, less than 1 Hz, because during most of their lifetimes the compact objects they are composed of are far apart. In this sense, so far we have only been seeing the proverbial tip of the iceberg.

It is obvious that a new type of interferometer is needed, which should be sensitive to low-frequency gravitational waves. The most promising proposal is to construct one in space, such as the planned European mission, the Laser Interferometer Space Antenna (LISA). Xian and his collaborators are investigating the optimal gravitational-wave band for such a space interferometer, to maximize the scientific payback. Addressing this issue requires a good understanding of the formation and evolution history of the binary compact objects—you are in the best position to find one if you know what they look like, starting from when they were born.

Xian and his collaborator, Pau Amaro-Seoane, who is also a visiting KIAA faculty member, reviewed the best-established

theories for the formation of binary compact objects. They arrived at one inevitable prediction: Ground-based instrumentation would first detect a small population of massive binary black holes, whose components have similar masses, low spins, and which are on circular orbits. This is driven by a combination of LIGO's instrumental noise and the fact that gravitational-wave radiation tends to circularize eccentric orbits. This prediction was, in fact, confirmed by the first LIGO event, GW150914, and it was acknowledged by the LIGO Science Collaboration as the astrophysical implication of the first gravitational-wave detection.

Encouraged by their success and knowing that the first binaries detected by LIGO are not the most typical samples, Xian and Pau adventured further to predict the properties of the binary black holes that are detectable in space. They found that, in particular, those binaries forming in dense star clusters initially can have high eccentricities, even though by the time they enter the LIGO band the eccentricities would have been mostly damped.

This result has an important implication for observations of binary black holes using space detectors. As is illustrated in the figure, the gravitational-wave radiation emitted by binary black holes on eccentric orbits (thick colored lines) is below the noise curve of a LISA-type detector. LISA is blind to these interesting objects, as if they never existed!

This result also means that a better band to detect gravitational waves in space is located between 0.1 and 1 Hz, because both eccentric and circular binaries enter this band with relatively strong gravitational-wave strain. For the gravitational-wave community in China, an opportunity is now open: Building an instrument sensitive to deci-hertz gravitational waves would recover the missing link in the gravitational-wave spectrum and greatly enhance the scientific return in astronomy and astrophysics.

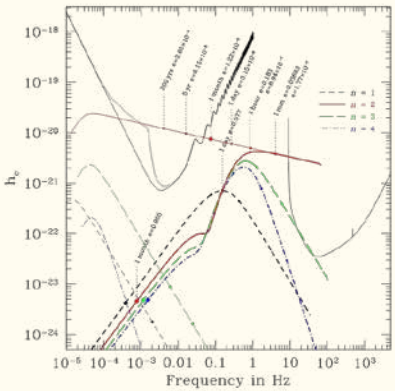


Figure 2. Spatial distribution of the LAEs in the SXDS_gPC region. The color-coded symbols represent LAEs. Their colors indicate their redshifts as given in the color bar. The top panel shows the projected distribution. The bottom panel shows the 3D distribution, with the third dimension being redshift.

News items 2017

17 January 2017:

KIAA–UWA Joint Postdoctoral Fellowship Program on Radio Astronomy Approved by CSC

A proposal for the KIAA–University of Western Australia (UWA) Joint Postdoctoral Fellowship Program in radio astronomy was formally approved by the Chinese Scholarship Council (CSC) on 4 January 2017.

KIAA and the International Center of Radio Astronomy Research (ICRAR), an unincorporated joint venture between Curtin University and UWA, signed a memorandum of understanding in October 2016, intending to collaborate and form a jointly funded postdoctoral fellowship program to begin in 2017, by awarding two fellowship positions annually. The objectives of the program are to support excellent basic and applied research by early-career researchers; to advance promising early-career researchers and promote enhanced opportunities for diverse career pathways; and to enable research and research training in high-quality and supportive environments.

The program was supported by CSC as one of the Initiative Talents International Collaboration Training Programs in 2017.

Official Announcement from CSC:
http://kiaa.pku.edu.cn/sites/default/files/article/CSCprogram2017.pdf

14 February 2017:

Siyao Xu Awarded a 2017 Hubble Fellowship

PhD student Siyao Xu of the Peking University Department of Astronomy (DoA), School of Physics, has been awarded a 2017 Hubble Fellowship, which is funded by the National Aeronautics and Space Administration (NASA) and the Space Telescope Science Institute. As one of the most prestigious and competitive postdoctoral fellowship in astronomy, the Hubble Fellowship Program provides a great opportunity for outstanding recent postdoctoral scientists to carry out independent research, aiming to explore the cosmic origins.

Under the supervision of her advisor, Prof. Bing Zhang, Chang Jiang Visiting Chair Professor, Joint DoA–KIAA faculty, the PhD thesis of Siyao Xu focuses on the fundamental physics of magnetohydrodynamic turbulence and its applications to

a broad range of astrophysical problems related to the first stars and galaxies, cosmic rays, pulsars, and fast radio bursts. "I truly thank my advisor Prof. Zhang for his guidance on my research, and I very much appreciate our professors and other people working in the Department of Astronomy, KIAA, and the School of Physics for their help and support during my PhD study," said Siyao Xu. As incoming Hubble fellow, Siyao Xu will continue her theoretical research on interstellar turbulence and try to contribute to our better understanding of the Universe.

PKU News: http://pkunews.pku.edu.cn/xwzh/2017-02/15/content_296713.htm

1 March 2017:
The Influence of Environment on the Chemical Evolution of Low-mass Galaxies

Galaxies are the basic units of cosmic structures. Studying galactic star formation histories is important for understanding the evolution of baryonic matter in the Universe. Most early-type galaxies (ETGs) stopped forming stars long ago, and they record the star formation processes and quenching scenarios at early epochs. A powerful tracer of these early processes is the alpha-to-iron abundance ratio ([α/Fe]), which is an indicator of the star formation timescale (t_{SF}) under the assumption of a universal stellar initial mass function and constant supernova properties. Galaxies with shorter tSF would have higher [α/Fe] ratios, and [α/Fe] is sensitive to t_{SF} if t_{SF} is relatively short.

Empirically, among massive ETGs, there is a tight positive correlation between [α/Fe] and central velocity dispersion (σ; e.g. Thomas et al., 2005). It indicates that more massive ETGs have shorter t_{SF} and stopped their star formation earlier, which suggests mass-dependent quenching mechanisms. Because instead of mass, low-mass ETGs are presumably quenched by environmental processes (Peng et al. 2010) or by feedback from supernova explosions and stellar winds (e.g. Hopkins et al. 2011), the behavior of their [α/Fe]–σ relation is intriguing.

To investigate the [α/Fe] ratio at low masses, astronomers from the Kavli Institute for Astronomy and Astrophysics (KIAA) at Peking University assemble [α/Fe] and σ measurements from the literature for 708 ETGs across a wide range in mass and environment. They found that the [α/Fe]–σ relation at low masses generally follows the tight correlation in the high-mass range, but has significantly larger intrinsic scatter. However, the large scatter is essentially caused by ETGs in the highest- and

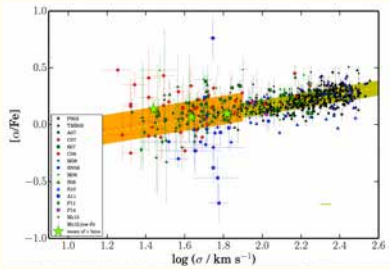
lowest-density environments.

The majority of the low-mass sample are quenched galaxies located in moderate-density environments (green symbols in the figure). They have both a similar relation and similar intrinsic scatter to that of massive ETGs. On the other hand, the [α/Fe] ratios of low-mass galaxies in the most massive relaxed galaxy clusters (red symbols) and galaxy groups (blue symbols), which are the environments of the highest and lowest densities in the sample, are on average elevated and suppressed, respectively. This suggests that low-mass ETGs quenched their star formation earlier in very dense environments, and that they have more extended star formation histories in low-density environments. Moreover, the subsamples from extreme environments have large intrinsic scatter in their [α/Fe] distributions, implying stochasticity in their chemical evolution.

Based on the unprecedentedly large data set, this work for the first time shows a mass-dependent t_{SF} of most ETGs across a wide mass range, on average. However, the low-mass ETGs depart from this standard relationship with large intrinsic scatter in extreme environments. The higher and lower mean [α/Fe] ratios suggest earlier quenching in very dense environments and more extended star formation histories in low-density environments, and the large scatter implies stochasticity in their chemical evolution.

Published paper:

Yiqing Liu, Luis C. Ho, & Eric Peng, 2016, The Astrophysical Journal Letters, 829, L26: The Influence of Environment on the Chemical Evolution in Low-mass Galaxies



Relationship between [α/Fe] derived from single stellar population models and sigma of ETGs. Different colors and symbols represent different subsamples, and the references are listed in the legend. The galaxies in the sample are divided into two groups by log(σ) = 1.9. The green stars in the low-mass range show the weighted mean of three bins of sigma, which are log(σ) = 1.2–1.5, 1.5–1.7, and 1.7–1.9. The yellow dashed line and band display the relation and the intrinsic scatter fitted by the high-σ group, and those fitted by the low-σ group are displayed in orange.

10 March 2017:

Will a New Discovery Fast-track Our Understanding of the Origins of Galaxies and Gargantuan Black Holes?

The discovery of more than 60 quasars—stupendously bright regions in the cores of galaxies, powered by gargantuan black holes—is a windfall for astrophysicists probing the early Universe. At more than 13 billion light-years away, these quasars rank among the farthest objects ever glimpsed by humans.

The Kavli Foundation recently spoke with three astrophysicists about how this haul of ultra-distant quasars

will transform what we know about the early Universe. That's important because they take us way back in time, to the first billion years after the Big Bang, and may help explain how the first galaxies and supermassive black holes arose. Guided by their light, astrophysicists hope to understand how the Universe transitioned from a dark, featureless expanse into a rich, starry realm loaded with luminous galaxies.

The participants were:

Roberto Maiolino – is a professor of experimental astrophysics at the Cavendish Laboratory of the

University of Cambridge and director of the Kavli Institute for Cosmology, Cambridge(KICC). He studies distant quasars to learn about how galaxies and black holes have evolved together throughout cosmic history.

Linhua Jiang – is a Youth Qianren Research Professor at the Kavli Institute for Astronomy and Astrophysics (KIAA) at Peking University. An author of two recent studies that discovered dozens of new and extremely distant quasars, Jiang is interested in how the first galaxies changed the Universe hundreds of millions of years after the Big Bang.

Marta Volonteri – is research director at the Institut d'Astrophysique de Paris. A theorist, she is the principal investigator of the BLACK project, which investigates how supermassive black holes formed and influenced their host galaxies, especially as quasars, in the early Universe.

25 April 2017:

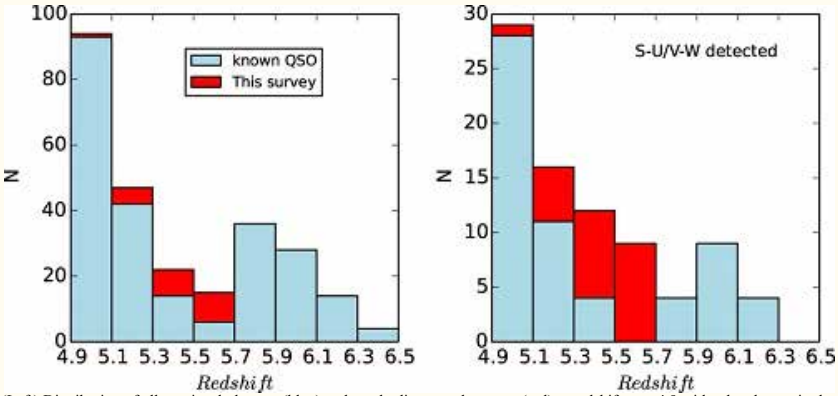
New Discoveries Fill the Gap of Quasar Color Selection

Quasars comprise the most luminous class of non-transient objects in the Universe, powered by their central supermassive black holes. At higher redshift, given their extremely high luminosities, quasars are among the most important tools to probe the early Universe. Characterizing their population and evolution is the critical tool to directly constrain the formation and evolution of supermassive black holes across cosmic time. More than 380,000 quasars have been discovered since the first discovery of a quasar in 1963. While high-redshift quasars are very rare, the fraction of high-redshift ($z > 4.5$) quasars is only 0.2% of all known quasars.

In the redshift distribution of known quasars, there is an obvious redshift gap at $5.3 < z < 5.7$. Only ~30 known quasars have been found in this redshift gap over a wide magnitude range. Most of them are too faint to be used for follow-up studies. Quasars at $5.3 < z < 5.7$, the post-reionization epoch, are crucial tools to explore the evolution of the intergalactic medium, quasar evolution, and early supermassive black hole growth. However, it has been very challenging to select quasars at $z \sim 5.5$ using conventional color selection due to their similar optical colors to late-type stars, especially M dwarfs. In previous high-redshift quasar surveys, quasars at $z \sim 5.5$ were mostly rejected together with M dwarfs.

Prof. Xue-Bing Wu and Prof.

Hubble Space Telescope image of the quasar PG 0052+251. (Credit: John Bahcall, Institute for Advanced Study, Princeton; Mike Disney, University of Wales; and NASA/ESA)



(Left) Distribution of all previously known (blue) and newly discovered quasars (red) at redshifts z > 4.9 with z-band magnitudes brighter than 20.5.
(Right) Distribution of newly discovered quasars compared with all known SDSS–ULAS/VHS–WISE quasars.

Xiaohui Fan's team is focusing on the study of high-redshift quasars. They developed a new selection technique for $z \sim 5.5$ quasars based on optical, near-infrared (IR) and mid-IR photometric data from the Sloan Digital Sky Survey (SDSS), the UKIRT Infrared Deep Sky Survey – Large Area Survey (ULAS), the VISTA Hemisphere Survey (VHS), the UKIRT Hemisphere Survey (UHS), and the Wide field Infrared Survey Explorer (WISE). To date, they have discovered 18 new quasars at $5.3 < z < 5.7$ and seven new lower-redshift quasars ($z \sim 5$), with SDSS z-band magnitudes brighter than 20.5, which forms the first uniformly selected quasar sample at $z \sim 5.5$. Their discovery not only nearly doubles the number of known quasar in this magnitude and redshift range, but also provides a new luminous quasar sample for studies of the intergalactic medium and supermassive black hole growth in the post-reionization epoch.

A related paper was published in The Astronomical Journal on 30 March 2017, with graduate student Jinyi Yang as the lead author. It was selected as a research highlight on 12 April 2017 by the journals of the American Astronomical Society (aasnova.org).

Published paper: https://doi.org/10.3847/1538-3881/aa6577

AAS Nova: http://aasnova.org/2017/04/12/new-discoveries-fill-the-quasar-gap/

PKU News: http://pkunews.pku.edu.cn/xxfz/2017-04/23/content_297546.htm

1 May 2017:

5 Postdocs at PKU Won a Chinese Science Postdoctoral General Grant in Astronomy

The Chinese Science Postdoctoral Foundation has announced the awardees of the postdoc general grants this year. PKU (KIAA and DoA) takes five of the 11 postdoc general grants in the field of astronomy.

The awardees in astronomy at PKU are:

First-class (2 postdocs including 1 KIAA postdoc): Kohei Hayashi;

Second-class (9 postdocs including 4 KIAA/DoA postdocs): Jincheng Guo, Kexin Guo, Jongsuk Hong, Alessia Longobardi.

27 April 2017:

PKU Party Secretary Ping Hao visits KIAA

On 27 April 2017, a group led by Ping Hao, Party Secretary of Peking University (PKU), comnposed of Song Gao, Vice President of PKU and leaders of various functional departments of the university visited the KIAA, to hold a meeting with Luis C. Ho, Director of KIAA, Xue-Bing Wu, Associate Director of KIAA, Fukun Liu, Chairman of the Department of Astronomy, and various faculty members and postdoctoral researchers.

Luis C. Ho gave a report on the current status of KIAA, including the current developments in astronomy research and training in China and Asia, the history, mission, organization, facilities, personnel recruitment, research team, exchange programs, teaching, and recent scientific achievements of the institute. He concluded with a discussion of the difficulties and challenges faced by KIAA. Xuebing Wu introduced the financial situation of KIAA, and raised issues concerning the management system and housing policy for foreign faculty.

Pingwen Zhang, Director of the Disciplinary Development Department, Dawei Mao, Director of the Finance Department, Suiyan Fu, Director of the Academic Department, Xuesong Yin, Director of the Housing Department, Changliang Dai, Deputy Director of the Human Resource Department, Ya Deng, Secretary General of the Education Foundation, and Hui Cai, Deputy Director of Scientific Research

Department, offered feedback on the issues raised and expressed their full

support for KIAA.

Song Gao noted the rapid development, vibrant academic atmosphere and growing international influence of KIAA in recent years. He suggested that KIAA should foster better communication with the Department of Astronomy and formulate a long-term development plan, including a unified, comprehensive strategy for the development of astronomy at PKU.

Ping Hao concluded the meeting by expressing his appreciation for the contribution that KIAA has made to build a world-class institute with limited resources over a short period of time. He said that PKU will do its best to support KIAA to resolve its current challenges in terms of operating budget, salary and housing benefits, and administrative staffing. Finally, he expressed his hopes that KIAA will concentrate greater efforts in external fund raising, public lectures, and public outreach, by nurturing a truly harmonious domestic and international faculty, to jointly develop KIAA into a first-class institute in China and in the world.

The original PKU news item can be found here: http://pkunews.pku.edu.cn/xwzh/2017-04/28/content_297604.htm

3 May 2017:

VISTA Peeks Through the Small Magellanic Cloud's Dusty Veil

VISTA's infrared capabilities have now allowed astronomers to see the myriad of stars in the Small Magellanic Cloud (SMC) galaxy much more clearly than ever before. The result is this record-breaking image—the largest infrared image ever taken of the Small Magellanic Cloud—with the whole frame filled with millions of stars.

The SMC is a dwarf galaxy, the more petite twin of the Large Magellanic Cloud (LMC). They are two of our closest galaxy neighbours in space—the SMC lies about 200 000 light-years away, just a twelfth of the distance to the more famous Andromeda galaxy. Both are also rather peculiarly shaped, as a result of interactions with one another and with the Milky Way itself.

Their relative proximity to Earth makes the Magellanic Clouds ideal candidates for studying how stars form and evolve. However, while the distribution and history of star formation

in these dwarf galaxies were known to be complex, one of the biggest obstacles to obtaining clear observations of star formation in galaxies is interstellar dust. Enormous clouds of these tiny grains scatter and absorb some of the radiation emitted from the stars—especially visible light—limiting what can be seen by telescopes here on Earth. This is known as dust extinction.

The SMC is full of dust, and the visible light emitted by its stars suffers significant extinction. Fortunately, not all electromagnetic radiation is equally affected by dust. Infrared radiation passes through interstellar dust much more easily than visible light, so by looking at the infrared light from a galaxy we can learn about the new stars forming within the clouds of dust and gas.

VISTA, the Visible and Infrared Survey Telescope, was designed to image infrared radiation. The VISTA Survey of the Magellanic Clouds (VMC) is focused on mapping the star formation history of the SMC and LMC, as well as mapping their three-dimensional structures. Millions of SMC stars have been imaged in the infrared thanks to the VMC, providing an unparalleled view almost unaffected by dust extinction.

The whole frame of this massive image is filled with stars belonging to the SMC. It also includes thousands of background galaxies and several bright star clusters, including 47 Tucanae at the right of the picture, which lies much closer to the Earth than the SMC.

The VMC has revealed that most of the stars within the SMC formed far more recently than those in larger neighbouring galaxies. This early result from the survey is just a taster of the new discoveries still to come, as the survey continues to fill in blind spots in our maps of the Magellanic Clouds.

This research was presented in the paper The VMC survey. XIV. First results on the look-back time star formation rate tomography of the Small Magellanic Cloud, published in the Monthly Notices of the Royal Astronomical Society.

The wealth of new information in this 1.6 gigapixel image (43,223×38,236 pixels) has been analysed by an international team led by Stefano Rubele of the University of Padova. They have used cutting-edge stellar models to yield some surprising results. The European Southern Observatory issued a press release about this work that Richard de Grijs and Smitha Subramanian Hari Sharma from the KIAA have been and continue to be involved in. Ningchen Sun, a student at the KIAA is also part of the team.

Press release: http://www.eso.org/public/news/eso1714/?lang

1–2 May 2017:

KIAA Held the Science Advisory Committee Meeting

On 1–2 May 2017, the KIAA Science Advisory Committee (SAC) held a two-day face-to-face meeting at KIAA. In attendance were SAC chair Simon D. M. White (Max Planck Institute for Astrophysics), Tom Abel (Kavli Institue for Particle Astrophysics and Cosmology, Stanford University), Richard S. Ellis (California Institute of Technology), Martha P. Haynes (Cornell University), Robert C. Kennicutt (University of Cambridge), Shude Mao (National Astronomical Observatories, CAS, and Tsinghua University), Ramesh Narayan (Harvard University), new SAC member Paul T. P. Ho (East Asia Observatory), Luis C. Ho (KIAA, PKU), Xuebing Wu (KIAA, PKU), and Fukun Liu (DoA, PKU).

Luis C. Ho, Director of KIAA, gave a status report on KIAA, introducing recent developments in administration, personnel recruitment, scientific achievements and progress on various projects, difficulties and challenges faced by KIAA, as well as future development plans. Fukun Liu, Chairman of Department of Astronomy, discussed the status of DoA and the collaboration between the DoA and KIAA. Xuebing Wu, Associate Director of KIAA, gave a financial report for KIAA. Science highlight talks were presented by faculty members Kejia Lee, Ran Wang, Linhua Jiang, and Yingjie Peng.

SAC members had separate lunch meetings with postdocs and students, and closed-door meetings with faculty and administrative staff to assess the performance of the institute and the management of the current leadership. The SAC prepared a final report for the KIAA Governing Board.

3 May 2017:

KIAA Held its Governing Board Meeting

On 3 May 2017, the Governing Board (GB) meeting was held at KIAA. In attendance were Jie Wang (Peking University), Robert E. Williams (Space Telescope Science Institute), Jiansheng Chen (Founding Chairman of DoA), Anthony N. Lasenby (Kavli Institute for Cosmology, University of Cambridge), Simon D. M. White (Max Plank Institute for Astrophysics), Xincheng Xie (Peking University), Miyoung Chun (Kavli Foundation), Christopher Martin (Kavli Foundation), Luis C. Ho (KIAA, Peking University), and

Xuebing Wu (KIAA, Peking University).

Jie Wang, Vice President of PKU and chair of the GB, gave opening remarks to explain the goals and the procedure of the GB meeting. Robert E. Williams, co-chair of the GB, gave a quick review of last year's GB report. Miyoung Chun, Executive Vice President of Science Programs of Kavli Foundation, expressed the strong support from the Kavli Foundation, and her appreciation for the achievements KIAA has made during the last year.

Luis C. Ho, Director of KIAA, gave comprehensive

reports on the recent progress of KIAA, including the current status of administration staff, faculty, postdoc programs, students, academic activities, scientific projects, and also on future plans and new initiatives. Simon White, chair of the KIAA Science Advisory Committee, gave a summary of the activities of the SAC, introducing his impression on the progress KIAA has made in various aspects, as well as suggestions to resolve outstanding challenges. Xuebing Wu, Associate Director of KIAA, gave a financial report of the institute, which mainly focused on the financial restrictions recently imposed by the PKU Education Foundation (PKUEF). Yong Zhang, Vice General Secretary of the PKUEF, was invited to attend part of the meeting; he explained the financial regulations of PKUEF and discussed possible solutions to the restrictions.

The GB members had an extensive discussion on the reports. They spoke highly of the progress KIAA has made, and discussed practical measures to tackle the challenges, especially those concerning financial issues.

4 May 2017:

KIAA 10th Anniversary Symposium Held at PKU

On 4 May 2017, the KIAA 10th Anniversary Symposium was held at the Kavli Institute for Astronomy and Astrophysics, Peking University (KIAA, PKU). In attendance were Jianhua Lin, President of PKU, Jie Wang, Vice President of PKU, Song Gao, Vice President of PKU, Zhihong Xu, Former President of PKU, Enge Wang, Vice President of Chinese Academy of Sciences and Former President of PKU, Xincheng Xie, Dean of Physics School of PKU, Jiansheng Chen, Founding Director of the Department of Astronomy of PKU, Douglas Lin, Founding Director of the KIAA, Luis C. Ho, Director of the KIAA, Fukun Liu, Director of the Department of Astronomy (DoA) of PKU, Miyoung Chun, Executive Vice President of Science Programs of the Kavli Foundation, Simon White, Director of the Max Plank Institute for Astrophysics, Chair of the KIAA Science Advisory Committee (SAC), and other KIAA SAC members, Robert Williams, Former President of the International Astronomical Union, Co-chair of the KIAA's Governing Board (GB), and other KIAA GB members, Anthony Lasenby, Former Deputy Director of the Kavli Institute for Cosmology at University of Cambridge (KICC), Tom Abel, Director of the Kavli Institute for Particle Astrophysics and Cosmology at Stanford

University (KIPAC), Hitoshi Murayama, Director of the Kavli Institute for the Physics and Mathematics of the Universe at Tokyo University (KIPMU), Fuchun Zhang, Director of the Kavli Institute for Theoretical Science of CAS (KITS), and Academicians including Youyuan Zhou, Jingxiu Wang, and Xiangqun Cui, as well as leaders and colleagues from domestic and other international observatories and universities devoted to astronomy.

The symposium was hosted by Xuebing Wu, Associate Director of KIAA, and Fukun Liu, and started with an opening video displaying the development history of KIAA and its major research breakthroughs over the last ten years.

Jianhua Lin, President of PKU, gave welcome remarks noting the major progress in scientific research, education, and talent training at KIAA, and the growing international influence of astronomy at PKU. He expressed his special gratitude to all the colleagues who have made great contribution to the founding and development of KIAA. He expects KIAA to make greater progress in the next decade and to build a world-class institute.

Luis C. Ho, Director of KIAA, gave a report on the KIAA's development over the last ten years. He listed five key factors to build a world-class institute: talented researchers, open and elegant research environment, strong academic program, solid support from the Kavli Foundation and PKU, and efficient management. He addressed initiatives to establish KIAA as a platform connecting all the astronomers in China and in the world, and that the young KIAA will devote every effort to promote the development of astronomy in China to a whole new level.

Miyoung Chun from the Kavli Foundation introduced the 20 Kavli institutes around the world, and shared experiences in efficiently supporting these top institutes and promoting their mutual collaboration. She also expressed her gratitude to the founding members, Jiansheng Chen, Douglas Lin, and the presidents of Peking University.

Zhihong Xu, Former President of PKU, remarked that he was honored to make the decision to build this leading institute in astronomy. The symposium reminded him of the days of building the institute at the beginning. Many obstacles needed to be overcome. "We need to make up our mind to do it. I'll take full responsibility if there's any problem," he used to say. After two years of preparation and many negotiations, PKU finally facilitated the founding of KIAA. He is very pleased to see the achievements that KIAA has made over ten years.

Jiansheng Chen, Former Director of the DoA, who made great contributions to build the institute, shared many pleasant stories about the founding of KIAA with the guests. He emphasized hat rather than previous experiences in China and in the world, a world-class institute like KIAA needs to find and adapt its own way of development that accords with the conditions in China.

Douglas Lin, Founding Director of the KIAA, described the founding of theKIAA as "the right place, right time, and right people." He believes that KIAA has made all astronomers' dreams come true: it's a place without boundaries among countries, just like the Universe. He wished KIAA to gain a new level of development, many new astronomy discoveries, and a new generation of astronomers in the next ten years.

Xincheng Xie, Dean of School of Physics of PKU, described the scientific research achievements of KIAA as "stunning". He believes that the open research environment, the innovative research team, and the various scientific activities of KIAA have set a good example for other departments and schools at PKU.

Fukun Liu, Chair of theDoA, stressed the importance of collaboration in the discipline construction of astronomy. He expects KIAA and DoA to carry forward their advantages to promote mutual development, and to lead the development of astronomy in China.

A Kavli Astrophysics Postdoctoral Fellowship memorandum of

understanding (MoU) was signed by Luis C. Ho, Director of KIAA, Hitoshi Murayama, Director of KIPMU, and Miyoung Chun, Executive Vice President of Science Programs of Kavli Foundation. The KIAA–KIPMU joint postdoctoral fellowship program will be launched in 2018, with the goal to promote collaboration and joint development of astronomy between the two institutes.

Speeches were also delivered by Robert Williams, Simon White, Enge Wang, Hitoshi Murayama, Fu-Chun Zhang, Anthony Lasenby, Tom Abel, and representatives from domestic observatories and universities, including Gang Zhao, Associate Director of the National Astronomical Observatories of CAS, Zhiqiang Shen, Associate Director of Shanghai Astronomical Observatory of CAS , Jinming Bai, Director of Yunnan Astronomical Observatory of CAS, Na Wang, Director of Xinjiang Astronomical Observatory of CAS, Yongtian Zhu, Director of Nanjing Institute of Astronomical Optics & Technology of CAS, and other specially invited guests and colleagues. They offered their sincere congratulations and best wishes for KIAA to lead the astronomy in China in the next decade.

Science highlights were presented by faculty, postdocs, and PhD students from KIAA in the afternoon.

16 May 2017:

Merging Galaxies Have Enshrouded Black Holes

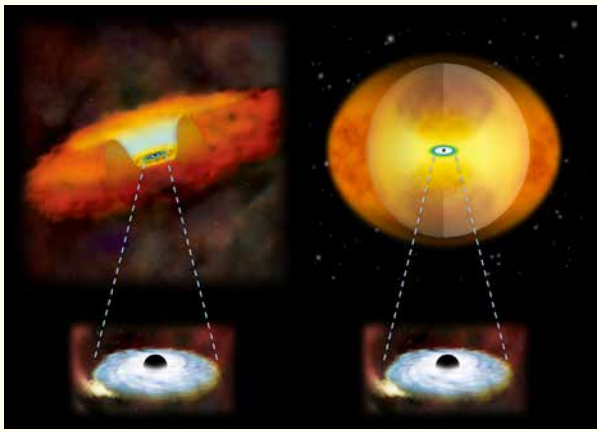
Black holes get a bad rap in popular culture for swallowing everything in their environments. In reality, stars, gas and dust can orbit black holes for long periods of time, until a major disruption pushes the material in.

A merger of two galaxies is one such disruption. As the galaxies combine and their central black holes approach each other, gas and dust in the vicinity are pushed onto their respective black holes. An enormous amount of high-energy radiation is released as material spirals rapidly toward the hungry black hole, which becomes what astronomers call an active galactic nucleus (AGN).

A study using NASA's NuSTAR telescope shows that in the late stages of galaxy mergers, so much gas and dust falls toward a black hole that the extremely bright AGN is enshrouded. The combined effect of the gravity of the two galaxies slows the rotational speeds of gas and dust that would otherwise be orbiting freely. This loss of energy makes the material fall onto the black hole.

"The further along the merger is, the more enshrouded the AGN will be," said Claudio Ricci, lead author of the study published in the Monthly Notices Royal Astronomical Society. "Galaxies that are far along in the merging process are completely covered in a cocoon of gas and dust."

Ricci and colleagues observed the penetrating high-energy X-ray emission from 52 galaxies. About half of them were in the later stages of merging. Because NuSTAR is very sensitive to detecting the highest-energy X-rays, it was critical in establishing how much light escapes the sphere of gas



This illustration compares growing supermassive black holes in two different kinds of galaxies. A growing supermassive black hole in a normal galaxy would have a donut-shaped structure of gas and dust around it (left). In a merging galaxy, a sphere of material obscures the black hole (right). (Credits NASA/CXC/M.Weiss/National Astronomical Observatory of Japan)

and dust covering an AGN. Researchers compared NuSTAR observations of the galaxies with data from NASA's Swift and Chandra and ESA's XMM–Newton observatories, which look at lower-energy components of the X-ray spectrum. If high-energy X-rays are detected from a galaxy, but low-energy X-rays are not, that is a sign that an AGN is heavily obscured.

The study helps confirm the longstanding idea that an AGN's black hole does most of its eating while enshrouded during the late stages of a merger.

"A supermassive black hole grows rapidly during these mergers," Ricci said. "The results further our understanding of the mysterious origins of the relationship between a black hole and its host galaxy."

26 May 2017:

Jing Wang Joins the KIAA Faculty

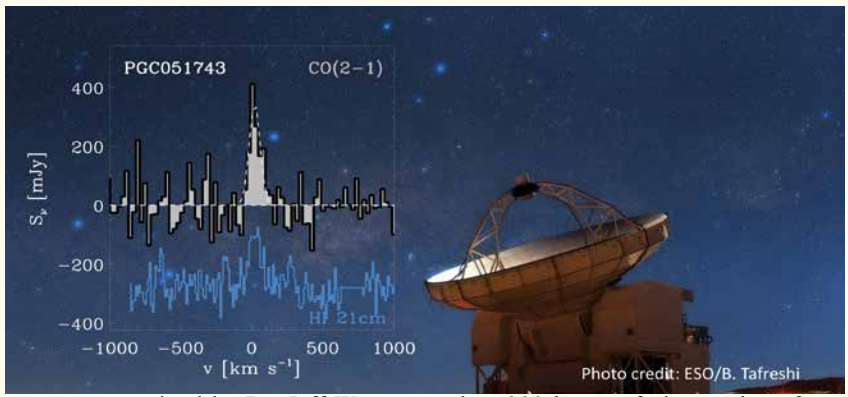
KIAA has recruited a new faculty member, Jing Wang.

Jing Wang spent three-and-a-half years at MPA in Germany as a visiting student before receiving her PhD from USTC in China in 2011. She then worked as a postdoc at MPA for over two years and at CSIRO/ATNF in Australia for three years. She received the Youth Qianren honor in 2017.

Jing Wang's research interests focus on gas accretion onto galaxies; the cold gas and stellar structure of galaxies; the morphological transformation of galaxies; the relation between star formation and cold gas; the effect of cluster and group environments on galaxies. Her research relies on multi-wavelength observational analysis, especially the 21 cm emission line data that probes atomic hydrogen gas (HI). She has been actively involved in several large HI surveys, including GASS (and also its follow-up survey for molecular hydrogen, COLD GASS), Bluedisk, LVHIS, WALLABY, IMAGING, Apertif-shallow, and MALS.

1 June 2017:

International Team Completes Large Survey of Gas in Nearby Galaxies



An international team of investigators led by Dr. Claudia Cicone (INAF–Astronomical Observatory of Brera), Dr. Matt Bothwell (University of Cambridge) and with the SKA Organisation Project Scientist Dr. Jeff Wagg as principal investigator has obtained spectra of the carbon monoxide emission line in a sample of small but nearby galaxies and found that the most massive galaxies form stars and are rich in metals.

The team, comprising investigators from Italy, the UK, Germany, Chile, and China has completed a large survey of molecular gas in nearby galaxies using the 12m APEX telescope in Chile. The APEX Low-redshift Legacy Survey of MOlecular Gas (ALLSMOG, PI: Dr. Jeff Wagg) has observed the Carbon Monoxide (CO) molecule in a sample of 97 galaxies in the local Universe. The ALLSMOG data provide important information on the cold molecular gas content of these galaxies which have been well characterized in terms of their star-formation rates, gas-phase metallicities and atomic HI gas masses.

ALLSMOG is an ESO observing program conceived by Dr. Jeff Wagg to study the molecular gas through the carbon monoxide emission line with the telescope Atacama Pathfinder Experiment (APEX), a collaboration between the Max Planck Institute for Radio Astronomy (MPIfR), the Onsala Space Observatory (Oso) and ESO, which is located on the plain of Chajnantor at 5000 meters above sea level, in the Chilean Andes.

The article, *The final release date of ALLSMOG: a survey of CO in typical local low-M, star-forming galaxies,* published today in the journal Astronomy & Astrophysics includes observations of 97 galaxies, 88 of which were studied with APEX (for more than 300 hours of observations from summer 2013 to winter 2015/2016) and nine with the telescope of the Institute of millimetric radio astronomy (IRAM) at Pico Veleta, Spain (between 2014 and 2015). The survey is the first major campaign made with the APEX telescope.

"The ALLSMOG survey is the first large systematic extragalactic survey of CO ever conducted with the APEX telescope," says Claudia Cicone, a Marie Skłodowska-Curie fellow at INAF–Osservatorio Astronomico di Brera. "Our research has an enormous legacy value because the entire scientific community can exploit our data. We really hope our efforts will stimulate

new ideas and results."

"For all the galaxies in our sample we have additional information on their physical properties from optical observations and on their atomic gas content (HI) from radio observations of the HI 21cm line published in previous studies and by other teams. We have created a real identikit of these galaxies which allows us to study the relations between the molecular gas and their other physical properties."

"In the near future, multi-wavelength galaxy studies like this will be greatly enhanced by data from the SKA telescope and its precursors such as ASKAP and MeerKAT," says Dr. Jeff Wagg. "While the SKA precursors are expected to detect more than half a million galaxies in HI line emission, these sample sizes have the potential to increase by nearly an order of magnitude when the SKA1-mid telescope comes online."

SKA1-mid is the dish array telescope to be built in South Africa that will be operating in the 350 MHz–14 GHz frequency range, complementary to the low-frequency telescope (so-called SKA1-low) to be built in Australia. Although SKA1-mid and the SKA precursors do not have the frequency coverage needed to measure the molecular gas in nearby galaxies, they will be able to detect the atomic gas through the 21cm atomic HI line transition.

"Quantifying the total gas content (atomic and molecular) of significant samples of galaxies out to large distances remains one of the crucial elements needed for a full understanding of galaxy formation," concludes Dr. Jeff Wagg.

Paper:

The final data release of ALLSMOG: a survey of CO in typical local low-M star-forming galaxies (Astronomy & Astrophysics); C. Cicone, M. Bothwell, J. Wagg, P. Møller, C. De Breuck, Z. Zhang, S. Martín, R. Maiolino, P. Severgnini, M. Aravena, F. Belfiore, D. Espada, A. Flütsch, V. Impellizzeri, Y. Peng, M. A. Raj, N. Ramírez-Olivencia, D. Riechers & K. Schawinski.

s://www.aanda.org/component/article?access=doi&doi=10.1051/0004-6361/201730605

http://skatelescope.org/news/international-team-completes-large-survey-of-gas-in-galaxies/

3 June 2017:

Kavli Science Highlight: Did a Starry 'Mosh Pit' Spawn LIGO's Gravitational Waves?

On 2 June 2017, the Kavli Foundation presented Rainer Spurzem's and his team's work on LIGO binary black hole detection as one of their science highlights. Former KIAA PhD student, Long Wang, who was supervised by Rainer Spurzem and M. B. N. (Thijs) Kouwenhoven, also made great contributions to the work.

In 2015, after a century of speculation, the world finally detected the elusive ripples in the Universe's fabric known as gravitational waves. This happened when a wave-hunting experiment called LIGO, which acts like a colossal tuning fork, sensed these waves hurled out from the cataclysmic collision of two massive black holes.

But where are these collisions occurring? A new paper about LIGO's third gravitational-wave detection, announced 1 June, suggests that the black hole smashup might well have been inside of a beautiful object called

a globular cluster—a glittering celestial 'snow globe' filled with hundreds of thousands of closely packed stars. At their centers, globular clusters are believed to harbor dozens to hundreds of black holes—by far the greatest concentration of these exotic objects found anywhere in the Universe.

Globular clusters could very well be a major source of the gravitational waves scientists are sensing with LIGO. Studying these waves could teach us more about their dense, star cluster origins, and in the process also shed light on the construction of galaxies, the Universe's biggest groupings of stars.

The Kavli Foundation spoke with three astrophysicists about the many scientific opportunities globular clusters present for understanding the collisions of black holes as well as the workings of the broader cosmos.

The participants were:

Rainer Spurzem – is a professor at the Kavli Institute for Astronomy & Astrophysics at Peking University and the Chinese Academy of Sciences. He specializes in computer simulations of complex astrophysical systems such as galaxies and globular clusters.

Carl Rodriguez – is a Pappalardo Postdoctoral Fellow and a postdoctoral scholar at the Massachusetts Institute of Technology (MIT) as well as a member of MIT's Kavli Institute for Astrophysics and Space Research. His research focuses on dense star clusters, including globular clusters, as well as how black holes form and behave in these crowded systems.

Jay Strader – is an assistant professor in the department of physics and astronomy at Michigan State University. He conducts searches for black holes in globular clusters.

6 June 2017:

Astronomer at KIAA Interviewed by Major Media in China

KIAA faculty member Yingjie Peng has recently been interviewed by several major media in China, including the People's Daily, Economic Daily, and China National Radio, for his outstanding research achievements in astronomy, and his great passion for astronomy and science.

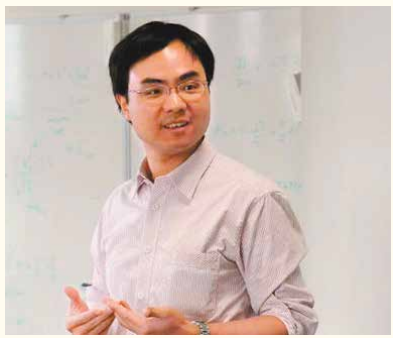
Please read the interview articles at:

People's Daily: http://paper.people.com.cn/rmrb/html/2017-06/05/nbs.D110000renmrb_04.htm

Economic Daily: http://paper.ce.cn/jjrb/html/2017-06/04/content_335111.htm

China National Radio: http://china.cnr.cn/yaowen/20170513/t20170513_523752890.shtml

PKU News: http://pkunews.pku.edu.cn/sdpl/2017-06/05/content_298122.htm

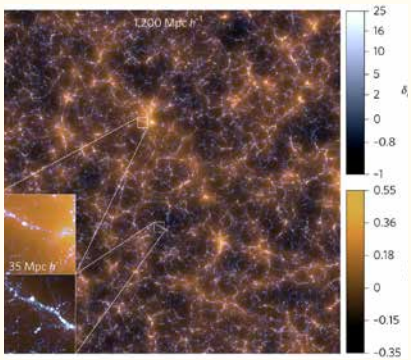


14 June 2017:

World's Largest N-body Simulation 'TianNu' Discovers the Differential Neutrino Condensation Effect

KIAA Postdoctoral Fellow Hao-Ran Yu, together with his research team, has completed the World's largest *N*-body simulation 'TianNu' on the Chinese Tianhe-2 supercomputer. This three-trillion-particle *N*-body simulation coevolve the cold dark matter and neutrino fluids throughout the cosmic evolution, and discovered the differential neutrino condensation effect. This research, with Hao-Ran Yu being the first author, is published in the 5 June 2017 issue of the journal Nature Astronomy.

Astrophysical techniques have pioneered the discovery of neutrino mass properties. Currently, the known neutrino effects on the large-scale structure of the Universe are all global, and neutrino masses are constrained by attempting to disentangle the small neutrino contribution from the sum of all matter using precise theoretical models. Yu and colleagues investigated an alternative approach: to detect the difference between the neutrinos and



Two-dimensional visualization of cold dark matter (CDM) and neutrino structures in TianNu. CDM is represented in blue-white and neutrinos in orange. The two subpanels focus on regions with similar CDM structure but different neutrino-to-CDM density ratios. The top panel shows a neutrino-rich region whereas the bottom panel shows a neutrino-poor region. The difference in neutrino condensation seen in these two panels leads to systematically different halo properties between both regions.

that of dark matter and baryons. Here, by using one of the largest *N*-body simulations yet, they discovered the differential neutrino condensation effect: in regions of the Universe with different relative neutrino abundances (the local ratio of neutrino to cold dark matter density), halo properties are different and neutrino mass can be inferred. In 'neutrino-rich' regions, more neutrinos can be captured by massive halos compared with 'neutrino-poor' regions. This effect differentially skews the halo mass function and opens the path to independent measurements of neutrino mass in current or future galaxy surveys.

Original Nature Astronomy article:
https://www.nature.com/articles/s41550-017-0143

Press coverage:
Science and Technology Daily:
http://digitalpaper.stdaily.com/http_www.kjrb.com/kjrb/html/2017-06/14/content_371299.htm?div=-1
http://www.stdaily.com/index/yaowen/2017-06/14/content_552658.shtml
PKU News:
http://pkunews.pku.edu.cn/xwzh/2017-06/14/content_298252.htm
http://pkunews.pku.edu.cn/sdpl/2017-06/14/content_298244.htm

15 June 2017:

Discovery of Dong's team Listed as one of the Top 10 Achievements in Astronomical Science and Technology in 2016 in China

On 14 June 2017, the Chinese Astronomical Society and the National Astronomical Observatory of China announced the Top 10 Achievements in Astronomical Science and Technology in 2016. The discovery of the most luminous supernova, led by KIAA faculty member Subo Dong, was ranked second in the category of Fundamental Research. He also co-led the research ranked first in the same category.

The awards were selected by experts from all astronomy units in China via an online vote. The goal of this award is to promote the progress of astronomy in China, to honor outstanding researchers and engineers working in astronomy, and to increase the broad impact of astronomy on society.

Official announcement: http://159.226.88.6/top10/ 关于公布2016年度十大天文科技进展评选结果的通知 .pdf

PKU news: http://pkunews.pku.edu.cn/xwzh/2017-06/15/content_298258.htm

An artist's impression of the record-breakingly powerful, superluminous supernova ASASSN-15lh as it would appear from an exoplanet located about 10,000 light years away in the host galaxy of the supernova. (Credit: Beijing Planetarium / Jin Ma)

16 June 2017:

Two Former PhD Students at PKU Awarded IAU PhD Prize

At the 99th Meeting of the International Astronomical Union (IAU) Executive Committee on 12 June 2017, the first winners of the IAU PhD Prize for the year of 2016 were announced. Two former PKU PhD students, Long Wang and Yang Huang were selected in Division H.

The IAU PhD Prize is open to candidates from any country, regardless of whether the country has an IAU National Membership. Candidates for the IAU PhD Prize were required to submit, among other items, an abstract of their thesis suitable for public consumption, a 1500-word thesis summary, three letters of recommendation (including one from the PhD advisor) and a CV. The winner of each Division was decided by the Division's own standards and methods, guided by the Division Steering Committee.

Read more: https://www.iau.org/news/announcements/detail/ann17024/

PKU News: http://pkunews.pku.edu.cn/xwzh/2017-06/18/content_298294.htm

11 August 2017:

Chinese Astronomical Society awards the Su-Shu Huang Prize to KIAA faculty member Subo Dong

During the opening ceremony of the 2017 Annual Meeting of the Chinese Astronomical Society held in Urumqi on 8 August 2017, Subo Dong, a faculty member at the Kavli Institute for Astronomy & Astrophysics of Peking University, was awarded the 6th Su-Shu Huang Prize of the Chinese Astronomical Society. The award is meant to recognize his research achievements in the discovery and study of supernovae with wide-field surveys, in particular his outstanding research on extreme supernovae.

The Chinese Astronomical Society established this prize in order to recognize young Chinese astronomers who have made significant contributions to astronomy. The Su-Shu Huang Prize is awarded every two years and each time to no more than two awardees who are Chinese astronomers under 40 years old who have done their prize-winning work primarily in China.

Professor Subo Dong was awarded the Youth Qianren Award by the Chinese government in 2014. His main research interests are observational and theoretical studies in the field of time-domain astronomy that cover the subjects including supernovae, extrasolar planets, and gravitational microlensing. He has published approximately 90 research papers in prestigious journals such as Science, PNAS, and ApJ. Two of his recent discoveries have been recognized as 'China's Top 10 Achievements in

Astronomical Science and Technology in 2016.'

CAS News: http://astronomy.pmo.cas.cn/xwdt/xhdt/201708/t20170809_379419.html

PKU News: http://pkunews.pku.edu.cn/xwzh/2017-08/11/content_298845.htm

29 September 2017:

Black Holes with Ravenous Appetites Define Type I Active Galaxies

New research suggests that the growing central black holes in active Type I and Type II active galaxies consume matter at different rates, upending popular theory.

For decades, astronomers have tried to pin down why two of the most common types of growing supermassive black holes, known as Type I and Type II active galaxies nuclei (AGN), appear different when observed from Earth. Although both galaxy types host voracious supermassive black holes at their center that actively swallow matter and emit massive amounts of radiation, Type I galaxies appear brighter to astronomers' telescopes.

New research from an international team of astronomers, with contributions from the University of Maryland, make a major modification to a popular theory

called the unified model. According to this model the growing black holes in Type I and Type II AGN have the same fundamental structure and energetic profile, but appear different solely because the galaxies point toward Earth at different angles. Specifically, Type II galaxies are tilted such that they are obscured by their own rings of dust, making Type I galaxies appear brighter by comparison.

The new results, published 28 September 2017, in the journal Nature, suggest that Type I and Type II galaxies do not just appear different—they are, in fact, very different from each other, both structurally and energetically. The key factor that distinguishes Type I and Type II galaxies is the rate at which their central black holes consume matter and spit out energy, according to the researchers.

"The unified model has been the prevailing wisdom for years. However, this idea does not fully explain the differences we observe in galaxies' spectral fingerprints, and many have searched for an additional parameter that fills in the gaps," said Richard Mushotzky, a professor of astronomy at UMD and a co-author of the study. "Our new analysis of X-ray data from NASA's Swift Burst Alert Telescope suggests that Type I galaxies are much more efficient at emitting energy."

To conduct the study, Mushotzky and his colleagues re-examined data from 836 active galaxies detected by NASA's Swift Burst Alert Telescope that strongly emit high-energy, or 'hard,' X-rays—the same X-rays that medical technicians use to visualize the human skeleton. In order to measure the mass of the supermassive black holes and how fast they were growing they used data from 12 different ground based telescopes spread across the globe to carefully estimate the stellar velocity dispersion and broad emission lines in the spectra which are strongly related to the black hole mass. This is a project that began in 2009 during Dr. Koss's thesis at the University of Maryland with Professor Mushotzky and Professor Veilleux and has radically grown with the help of over 40 researchers across the globe.

"When I started the project, I had a month of lonely nights observing by myself at the 2.1m telescope at Kitt Peak national observatory to study a few dozen galaxies. I could never have dreamed we would eventually such a large sample, where we can answer many amazing scientific questions for the first time," said Dr. Koss.

By comparing differences in the X-ray spectra between Type I and Type II galaxies, the researchers concluded that, regardless of which way the galaxy faces Earth, the central black holes in Type I galaxies consume matter and

emit energy much faster compared with the black holes at the center of Type II galaxies.

"Our results suggest this has a lot to do with the amount of dust that sits close to the central black hole," Claudio Ricci, the lead author of this work, said. "Type II galaxies have a lot more dust close to the black hole, and this dust pushes against the gas as it enters the black hole."

For decades, astronomers preferentially studied Type II galaxies, largely because the central black holes of Type I galaxies are too bright to see the stars and gas clouds that constitute the rest of the galaxy. Because the unified model suggested that all active galaxies were fundamentally the same, astronomers focused their efforts on Type II galaxies because they are easier to observe.

"Because our results suggest that the two types of galaxies are indeed fundamentally different, it is likely that a lot of researchers will re-evaluate their data and take another look at Type I galaxies now," Mushotzky said. "By putting us on a path to better understand

the differences between Type I and Type II galaxies, this work will help us better understand how supermassive black holes influence the evolution of their host galaxies."

The research was led by Dr. Claudio Ricci (PUC Chile/CASSACA/KIAA Beijing), and was based on data collected by a team led by Dr. Mike Koss (Eureka Scientific) a former University of Maryland graduate student.

The research paper, The close environments of accreting massive black holes are shaped by radiative feedback, Claudio Ricci et al., was published in the journal Nature on 28 September 2017. More information on the survey and team involved in this research can be found at www.bass-survey.com

(press release provided by the University of Maryland)

13 October 2017:

ALMA Finds Hints of Early Black-Hole Growth

In recent years, more than 200 quasars above redshift 5.7 have been discovered in large optical and near-infrared surveys. These quasar–starburst systems provide unique laboratories to study the formation of the first supermassive black holes and their host galaxies close to the end of cosmic reionization.

Bright [C II] 158 μm fine structure line emission has been widely detected in high-redshift quasar–starburst systems. The [C II] line is one of the primary coolants of the star-forming interstellar medium (ISM). Thus, it directly traces the distribution of star formation activity and kinematic properties of the atomic/ionized gas in quasar host galaxies. Fourteen $5.7 < z < 7.1$ quasars have been observed with ALMA at sub-arcsec resolution, and the inferred source sizes are 1.5−3.3 kpc. Six of them show clear velocity gradients, providing constraints on the dynamical mass. In these objects, the black hole-to-bulge mass ratio appears to be above the correlation defined by local objects. However, these studies were limited by the moderate angular resolution of the early ALMA observations (typically 0.7 arcsec), resulting in a strong degeneracy between inclination angle and intrinsic rotational velocity.

Ran Wang's group works on the ISM property of far-infrared (FIR) luminous quasars above redshift 5.7. They selected FIR luminous quasars using the IRAM-30 m telescope and the James Clerk Maxwell Telescope (JCMT), and found significant star formation activity with star formation rates (SFRs) from a few hundred to a thousand solar masses per year in the quasar host galaxies. They also detected CO (2–1) line emission from a few redshift-6 quasars, adopting the Karl G. Jansky Very Large Array (VLA), which indicates abundant molecular gas with mass of order 1010 solar masses. Their recent paper studying the gas dynamics of a luminous $z = 6.13$ quasar, ULAS J1319+0950, revealed by ALMA high-resolution observations (with graduate student Yali Shao as the lead author) was highlighted by the American Astronomical Society (aasnova.org) on 6 September 2017. They combined new ALMA Cycle 1 data with Cycle 0 data. The combined [C II] line emission data have an angular resolution of 0.3 arcsec and resolve both the dust continuum and the [C II] line emission on few kpc scales. The combined data confirm the [C II] velocity gradient that was previously detected in a lower-resolution ALMA image from Cycle 0 data alone. They applied a tilted ring model to the [C II] velocity map to obtain a rotation curve and constrain the circular

velocity to 427 ± 55 km s^{-1} at a radius of 3.2 kpc, with an inclination angle of 34 degrees. They measured a dynamical mass within the 3.2 kpc region of ~13.4×1010 solar masses. This yields a black hole and host galaxy mass ratio of ~0.020, which is roughly four times higher than the present-day MBH/Mbulge ratio. This suggests that the supermassive black hole grew the bulk of its mass before the formation of most of the stellar mass in this quasar host galaxy in the early Universe.

Published paper: http://iopscience.iop.org/article/10.3847/1538-4357/aa826c

AAS Nova: http://aasnova.org/2017/09/06/alma-finds-hints-of-early-black-hole-growth/

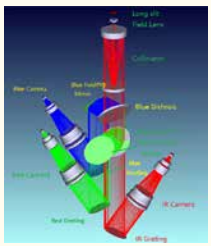
PKU News: http://pkunews.pku.edu.cn/xwzh/2017-10/16/content_299473.htm

26 October 2017:

Agreement Signed by KIAA, NAOC, and Caltech to Build a World-leading Spectrograph at Palomar Observatory

On 24 October 2017, Luis Ho, director of the Kavli Institute for Astronomy and Astrophysics at Peking University (KIAA/PKU), Suijian Xue, Deputy Director-General of National Astronomical Observatories of the Chinese Academy of Sciences (NAOC), and Shrinivas Kulkarni, director of the Caltech Optical Observatories (COO) signed a cooperative agreement in Beijing for the development and use of the 'Next Generation Palomar Spectrograph (NGPS)' at the 5-meter Hale telescope at Palomar Observatory, California, US.

In the last a few years, Chinese astronomers have frequently used the Hale telescope at Palomar Observatory through the Telescope Access Program organized by NAOC, and a close, productive partnership among KIAA, NAOC, and COO has been established. NGPS will replace the currently widely used famous Double Spectrograph (DBSP) at Hale telescope, and become one of the world's leading instruments for general purpose, high-throughput spectroscopy in optical astronomy. PKU has contributed the initial funding for the development of NGPS. The NGPS will be constructed at the Nanjing Institute of Astronomical Optics and Technology (NIAOT) and COO. The construction is expected to be completed by July 2021.



The project has important leadership from KIAA. According to the agreement, KIAA, NAOC and COO have formed a Science Board for NGPS; Luis Ho is the co-chair of the Board. Xue-Bing Wu, the associate director of KIAA, is the Optical System Manager for NGPS.

2 November 2017:

18-month twinkle in a forming star suggests the existence of a very young planet

Discovery made possible by a leap in submillimetre radio astronomy technology, comparable to viewing videos instead of photos

An international team of researchers have found an infrequent variation in the brightness of a forming star. This 18-month recurring twinkle is not only an unexpected phenomenon for scientists, but its repeated behavior suggests the presence of a hidden planet.

This discovery is an early win for the James Clerk Maxwell Telescope (JCMT) Transient Survey, just one-and-a-half years into its three-year mandate to monitor eight galactic stellar nurseries for variations in the brightness of forming stars. This novel study is critical to understanding how stars and planets are assembled. The survey is led by Doug Johnstone, Research Officer at the National Research Council of Canada and Greg Herczeg, Professor at Peking University (China), and is supported by an international team of astronomers from Canada, China, Korea, Japan, Taiwan, and the United Kingdom.

"This variation in the brightness or twinkle of the star EC53 suggests that something large is disrupting the gravitational pull of the forming star. The fact that it recurs every 18 months suggests that this influence is orbiting around the star – it's quite likely a hidden, forming planet," says Doug Johnstone. It is thought that a companion planet is orbiting the star, and its passing gravitational pull disrupts the rate of the gas falling onto the forming star, providing a variation in the observed brightness, or light curve, of the star.

Young stars are born in regions of the galaxy where molecular gas is abundant. When the star is young, gas and dust form a thick cloud that surrounds the star. Some of this material quickly flattens into a disk, in which planets will form. The cloud blocks the star itself from optical view, so astronomers study the star indirectly by using the cloud to learn details about the star growing inside. The star builds up its mass as gravity attracts gas to move from the disk onto the star, a process that also releases significant energy that heats up the surrounding gas cloud. Astronomers use telescopes sensitive to sub-millimetre wavelengths, like the JCMT, to measure the cloud brightness and reveal details about the growth of the star.

EC53's light curve anomaly was discovered by Hyunju Yoo, graduate student at Chungnam National University and advisor Jeong-Eun Lee, Professor at Kyung Hee University (South Korea), through careful analysis of monthly observations of Serpens Main, a stellar nursery known to contain many forming stars. Although the brightness of EC53 has been observed to vary periodically at near-infrared wavelengths for some time, these sub-millimetre observations were essential in validating that the brightness variation was due to heating from gas accreting onto the forming star, rather than variations in the cloudiness of the environment.

"What caught my eye was a new round of data that showed a sudden brightness that hadn't existed in previous observations," says Lee. "I knew that something unique and interesting must be happening around

this forming star. It turned out that it is indeed a very special object, providing a new window into how stars and planets form."

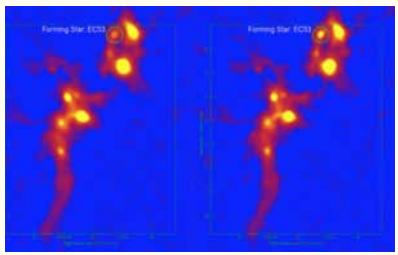
A deeper understanding of the formation of stars and planets

For the remainder of the three-year sub-millimetre survey, the team will continue to monitor EC53 and will also be searching for additional young stars showing variations in growth to learn more about how stars and planets assemble. There are already a half-dozen additional candidate variables within the survey. By studying these stars, and using additional telescope facilities such as the powerful Atacama Large Millimeter/submillimeter Array (ALMA) in Chile, the study will provide new and unique insight into the timescale for the formation of stars and planets, including whether planets form during or after the assembly of the star.

"This discovery marks a turning point; in a sense, it's like sub-millimetre astronomy is moving from taking pictures of our galaxy to taking videos," says Greg Herczeg. "The last 25 years have been devoted to perfecting observing techniques and instruments to allow us to see early star formation. But with recent advances in technology, we can now observe regions changing over time, for a deeper understanding of how stars form. This discovery is just one example of how much more we can now learn."

Monitoring the brightness of forming stars over time using sub-millimetre wavelengths is an unconventional approach to observing that has been made possible by recent advances in imaging technology, like SCUBA-2, and data reduction processing which enables precise calibration and measurement.

The JCMT resides at the summit of Maunakea in Hawaii and is the largest single-dish sub-millimetre telescope in the world. The JCMT is operated by the East Asian Observatory, a partnership between China, Taiwan, South Korea, and Japan, with support from the astronomy communities in Canada and



the United Kingdom. The university-led contributions from Canada are supplemented by the NRC's support for the JCMT archive at the Canadian Astronomy Data Centre.

This discovery has been accepted for publication in The Astrophysical Journal and is available online.

This story is distributed on behalf of: The National Research Council of Canada, Peking University, and Kyung Hee University.

News From:https://www.nrc-cnrc.gc.ca/eng/stories/2017/star_formation.html

PKU News: http://news.pku.edu.cn/xxfz/2017-11/02/content_299879.htm

23 November 2017:

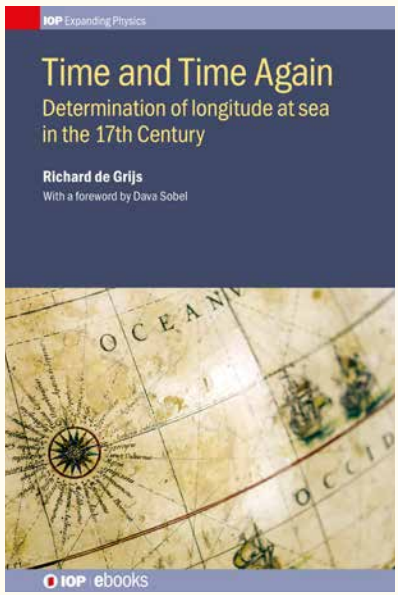
KIAA Faculty Member Publishes Major New Monograph

Professor Richard de Grijs (KIAA/PKU) recently completed his latest monograph, *Time and Time Again: Determination of Longitude at Sea in the 17th Century.* Published as part of the Institute of Physics' Expanding Physics series of high-quality texts from leading voices on key areas in physics, the book is primarily based on collections of 18th Century letters that have not been combined into a single volume before.

Determination of one's longitude at sea has perplexed sailors for many centuries. The significant uptake of world trade in the 17th and 18th Centuries rendered the increasingly urgent need to solve the 'Longitude Problem' an issue of strategic national importance. Historical accounts of these efforts often focus almost exclusively on John Harrison's role in 18th Century Britain. De Grijs's book starts, instead, from Galileo Galilei's late-16th Century development of an accurate pendulum clock, which was first achieved in practice in the mid-17th Century by Christiaan Huygens in the Dutch Republic. The open, tolerant and transparent conditions in the 17th Century Dutch Republic allowed the nation to play a pivotal role in the international network of humanists and scholars before and during the 'scientific revolution.'

A foreword written by New York Times best-selling author Dava Sobel *(Longitude: The True Story of a Lone Genius Who Solved the Greatest Scientific Problem of His Time, 1995)* and extensive introductory chapters on the history of mapmaking, the establishment of the world's reference meridian at Greenwich Observatory, the rise of the scientific enterprise, and the onset of journal publishing provide the appropriate context for non-expert readers to fully engage with the book's main subject matter.

Online book: http://iopscience.iop.org/book/978-0-7503-1194-6



1 December 2017:

Postdocs at KIAA Win Competitive Awards and Funds

The Postdoc Office at Peking University has announced the awardees of the 4th round of the PKU Boya Fellowships and the 2017 PKU Outstanding Postdoc Awards. Jingjing Shi, who will be a KIAA–ICRAR Fellow from December, has been awarded a PKU Boya Fellowship, and Yuanpei Yang, who is currently a KIAA–CAS Fellow and has won an award from the Innovative Postdoc Support Program sponsored by the national China Postdoc Committee before, was awarded the 2017 PKU Outstanding Postdoc award.

The China Postdoctoral Science Fund awardees have also been announced. Dongyao Zhao won the 62nd General Fund, as one of six postdocs of PKU astronomy who won grant funding from either the General or Special Fund of the China Postdoctoral Science Foundation in 2017.

Two international postdocs at KIAA, John Graham and Chandrachur Chakraborty, won Research Funds for International Young Scientists sponsored by the National Natural Science Foundation of China.

Postdocs at PKU astronomy have received more awards and funds from PKU and the national government, and have maintained a high rate of postdocs with successful proposals of any department at PKU, which makes the KIAA postdoc program one of the flagships of PKU astronomy.

Announcements:

4th Round PKU Boya Fellowships: http://postdocs.pku.edu.cn/tzgg/54737.htm

2017 PKU Outstanding Postdocs: http://postdocs.pku.edu.cn/tzgg/54729.htm

China Postdoctoral Science General Fund:

http://postdocs.pku.edu.cn/kxyj/jjyxmsq/54739.htm

2017 Research Fund for International Young Scientists:

http://www.nsfc.gov.cn/publish/portal2/tab186/info71774.htm

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de Grijs, Richard:

Interviews given/published:

●February 2017: China's next-generation space missions, Physics World

●3 April 2017: PBS, for a new documentary featuring the Ancient Observatory in Beijing

●19 April 2017: Experts' view on China's cyber security and informatization progress, china.org.cn: http://www.china.org.cn/opinion/2017-04/19/content_40642369.htm

●25 May 2017: University of Canterbury (New Zealand), Erskine blog: https://blogs.canterbury.ac.nz/intercom/2017/05/25/erskine-visiting-fellow-profile-richard-de-grijs/

●4 August 2017: Where do the stars come from?; Jingkids/Beijing kids magazine http://jingkids.com/2017/08/23/where-do-the-stars-come-from/; http://www.beijing-kids.com/blog/2017/10/17/fantastic-subjects-where-do-stars-come-from/

●30 August 2017: China boekt succes in kwantumcryptografie (China

successful in quantum cryptography), Technisch Weekblad (in Dutch)

●21 September 2017: Young science in an old city, Nature, vol. 549, pp. S5-S9

●13 October 2017: The daily life of a Dutch astronomer in China, European Union science promotion video: https://mp.weixin.qq.com/s/hbS5gtb7SeCCerLrgrc-iQ

●25 October 2017: China and World Focus: China leading the world in technology, china.org.cn (studio interview): http://www.china.org.cn/opinion/2017-10/25/content_41792934.htm

Peng, Eric:

●Spengler et al. 2017 (including Peng, E. W.) was highlighted by means of a featured image and an AAS Nova highlight.

http://aasnova.org/2017/11/13/featured-image-nuclear-star-clusters-in-virgo/

Ricci, Claudio:

●17 January 2017: Article in Las Ultimas Noticias (Chile): "Los choques de galaxias obscurecen los agujeros negros"

●28 September 2017: Front page of Las Ultimas Noticias (Chile): "Astronomo descubren como se alimentan los agujeros negros"

●28 Septmber 2017: Article in El Mercurio (Chile): "Astronomo descubren como se alimentan los agujeros negros"

Scientific advances

Colloquia and lunch talks

Throughout the year, Peking University astrophysicists have numerous local opportunities to exchanges ideas, report on their research progress, and learn both from each other and from visiting scientists.

Peking University astronomy colloquia 2016

- 5 January 2017, **Yi Mao** (Tsinghua University, China), 21 cm cosmology and cosmic reionization simulations
- 20 February 2017, **Roland de Putter** (California Institute of Technology, USA), Probing Inflation and more with cosmic large-scale structure
- 21 February 2017, **Xuening Bai** (Harvard–Smithsonian Center for Astrophysics, USA), Protoplanetary Disks and Planet Formation: A Microphysical Perspective
- 22 February 2017, **Lixin Dai** (University of Maryland, USA), Probing super-Eddington accretion via tidal disruption events
- 23 February 2017, **Sun Kwok** (The University of Hong Kong), Organic Matter in the Universe: from solar system to distant galaxies
- 2 March 2017, **Yefei Yuan** (USTC, China), Double SMBHs and Double TDEs
- 9 March 2017, **Volker Ossenkopf-Okada** (Cologne University, Germany), Characterizing interstellar cloud turbulence
- 30 March 2017, **Stuart Wyithe** (University of Melbourne, Australia), Modelling galaxy formation and reionization with DRAGONS
- 6 April 2017, **Taka Kajino** (National Astronomical Observatory of Japan), Solving the mystery of r-process, supernovae or neutron-star mergers?
- 13 April 2017, **Renbin Yan** (University of Kentucky, USA), The Puzzle of Low Ionization Emission in Galaxies
- 20 April 2017, **Qingguo Huang** (Institute of Theoretical Physics, CAS, China), Did LIGO hear the coalescence of primordial black holes?
- 27 April 2017, **Shude Mao** (Tsinghua University, China), Is the initial mass function universal in galaxies? A MaNGA view

- 5 May 2017, **Anthony Lasenby** (Kavli Institute for Cosmology, Cambridge, UK), Black Holes and Gravitational Waves
- 11 May 2017, **Martin Bureau** (University of Oxford, UK), 3D Observations of Molecular Gas in Galaxies: From Global Dynamics to Supermassive Black Holes
- 25 May 2017, **Ian Czekala** (Stanford University, USA), Protoplanetary Disks around Pre-main Sequence Binary Stars
- 1 June 2017, **Zach Etienne** (West Virginia University, USA), Electromagnetic Counterparts to Gravitational Wave Detections: Bridging the Gap between Theory and Observation
- 8 June 2017, **Xu Kong** (USTC, China), Star formation quenching and mass assembly of galaxies
- 15 June 2017, **Zheng Zheng** (University of Utah, USA), Anisotropic Galaxy Clustering in the Isotropic Universe
- 22 June 2017, **Xilong Fan** (Tsinghua University, China), Gravitational Wave Astronomy with High-Frequency Gravitational Waves
- 29 June 2017, **Banibrata Mukhopadhyay** (Indian Institute of Science, India), Super- and sub-Chandrasekhar limiting mass white dwarfs: Progenitors of peculiar Type Ia supernovae and multiple astrophysical implications
- 6 July 2017, **Doug Johnstone** (National Research Council Canada), Observing Variability of Embedded Protostars: The JCMT Transient Survey
- 27 July 2017, **Albrecht Karle** (University of Wisconsin-Madison, USA), IceCube and the Discovery of Energetic Cosmic Neutrinos
- 19 September 2017, **Stijn Wuyts** (University of Bath, UK), The growth of disks and bulges
- 28 September 2017, **Barbara Catinella** (University of Western Australia, Australia), Cold gas in galaxies: single-dish surveys in the SKA era
- 12 October 2017, **Laura Sales** (UC Riverside, USA), Dwarf galaxies and their satellites as extreme probes of LCDM
- 19 October 2017, **Jorge Piekarewicz** (Florida State University, USA), The Nuclear Physics of Neutron Stars
- 26 October 2017, **Eli Waxman** (Weizmann Institute of Science, Israel), High energy neutrino astronomy: What have we learned?
- 6 November 2017, **Geoffrey Bower** (Chief Scientist for Hawaii Operations), Sagittarius A* and the Galactic Pulsar
- 16 November 2017, **Masami Ouchi** (The University of Tokyo, Japan), Early Results of the Subaru Hyper Suprime-Cam Survey for High Redshift Galaxies

- 23 November 2017, **Martin C. Smith** (Shanghai Astronomical Observatory, China), A Golden Age for Astrometry – Uncovering the Secrets of the Milky Way
- 30 November 2017, **Nanyao Lu** (NAOC, China; China–Chile Center for Astronomy, Chile), Mid-J CO Line Emission in LIRGs
- 8 December 2017, **Xiaofeng Wang** (Tsinghua University, China), Multiple Supernova Explosions from A Zombie Star
- 14 December 2017, **Sherry Suyu** (Max Planck Institute for Astrophysics, Germany), Shedding Light on the Dark Cosmos through Gravitational Lensing
- 21 December 2017, **Jian-Min Wang** (Institute of High Energy Physics, CAS, China), Origin of broad-line regions: from torus to accretion disks
- 28 December 2017, **Cong Xu** (California Institute of Technology, USA), Close Major-Merger Pairs Since z=1: Evolution of Merger Rate & SFR Enhancement

Lunch talks 2017

- 6 January 2017, **Tao Wang** (CEA/Saclay, France), Discovery of the most distant X-ray galaxy cluster in the Universe, and its implications on galaxy formation and cosmology
- 23 February 2017, **Alexey Mints** (Max Planck institute for Solar System research, Germany), UniDAM – A Unified tool to estimate stellar distances, ages and masses from spectrophotometric data
- 27 February 2017, **Amelia Stutz** (Max-Planck-Institut für Astronomie, Germany), Beyond turbulence: a fundamentally different mode of cluster formation in Orion
- 1 March 2017, **Alessia Longobardi** (KIAA/PKU), The Virgo intra-cluster population and the mass assembly of M87
- 3 March 2017, **Alexander Kolodzig** (KIAA/PKU), Science with the unresolved cosmic background – An example from X-rays
- 8 March 2017, **Andreas Schulze** (NAOJ, Japan), New constraints on the black hole spin in radio-loud quasars
- 13 March 2017, **Robin Dong** (University of Arizona, USA), How to infer the mass of the planets that are forming in protoplanetary disks based on resolved disk observations?
- 15 March 2017, **Kohei Hayashi** (KIAA/PKU), Universal dark halo scaling relation for dwarf spheroidal satellites
- 29 March 2017, **Paul van der Werf** (Leiden University, Netherlands), Water emission and molecular gas outflows in (ultra)luminous infrared galaxies at low and high redshift
- 12 April 2017, **Guangxing Li** (USM Munich, Germany), Impact of molecular clouds on galactic disk clumpiness
- 14 April 2017, **Xun Shi** (Max Planck Institute for Astrophysics, Germany), At the edge of galaxy clusters: splashback and accretion shock
- 17 April 2017, **Birgitta Nordström and Johannes Andersen** (University of Copenhagen, Denmark), Studying the Milky Way
- 24 April 2017, **Dandan Xu** (Heidelberg Institute for Theoretical Studies, Germany), Inner structure of early-type galaxies since z=1.0: a simulation perspective
- 28 April 2017, **Haoran Yu** (KIAA/PKU), Cosmological simulations of large scale structure and neutrinos
- 5 May 2017, **You-Hua Chu** (ASIAA, Taiwan), CSI in Type Ia Supernova Remnants
- 19 May 2017, **Bruno Merin** (ESAC, Spain), ESASky, ESA's new science-driven portal for ESA space astronomy missions

- 5 June 2017, **Daniel Harsono** (Leiden Observatory, Netherlands), Multiscale view of disk formation around low-mass stars
- 9 June 2017, **Nan Li** (University of Chicago, USA), Machine Learning and Automated Analysis of Strong Gravitational Lensing Systems
- 14 June 2017, **Zhi-Yu Zhang** (University of Edinburgh, UK/ESO, Germany), ALMA as a sensitive probe of the stellar IMF across the cosmic time
- 23 June 2017, **Weichen Wang** (Johns Hopkins University, USA), Color gradients and dust attenuation in CANDELS galaxies
- 30 June 2017, **Huanian Zhang** (University of Arizona, USA), Hydrogen Emission and Absorption in the Halos of the Milky Way and Nearby Galaxies
- 4 July 2017, **Jessy Jose** (KIAA/PKU), Stellar feedback and star formation in Galactic high mass star forming regions
- 7 July 2017, **Zhaohuan Zhu** (University of Nevada at Las Vegas, USA), Applications of Spiral Density Waves: from Circumstellar disks to Circumplanetary Disks
- 10 July 2017, **Lloyd Knox** (UC Davis, USA), The Cosmic Microwave Background, the Hubble Constant, and Cosmological Models
- 14 July 2017, **Wei Zhu** (Ohio State University, USA), Microlensing Parallax Observations with Spitzer and Kepler
- July 2017, **Yuexing Cindy Li** (Penn State University, USA), The Electromagnetic Radiation and Gravitational Waves from the First Black Holes
- 25 July 2017, **Emma Yu** (University of Texas, USA), Probing giant-planet forming zones around Solar-like stars with CO
- 1 August 2017, **Alexander Kolodzig** (KIAA/PKU), Angular correlation studies of the cosmic X-ray background: A new frontier of ICM structure studies
- 2 August 2017, **Smitha Subramanian** (KIAA/PKU), Evolution of galaxies as traced by stellar populations
- 5 September 2017, **Petchara Pattarakijwanich** (KIAA/PKU), Roles of Environment and Core Stellar Density in Star-formation Quenching
- 18 September 2017, **Marios Karouzos** (Nature Astronomy), What is Nature Astronomy and how do I get published in it?
- 25 September 2017, **Kohei Hayashi** (KIAA/PKU), Dark matter in Galactic dwarf spheroidal galaxies
- 27 September 2017, **Min Fang** (University of Arizona, USA), Orion: a test bed for studying evolution of protoplanetary disks
- 11 October 2017, **Bill Coles** (UC San Diego, USA), Microstructure of the Ionized ISM from Pulsar Observations

- 23 October 2017, **Munan Gong** (Princeton University, USA), Simulating chemistry in star forming environments
- 23 October 2017, **Kedron Silsbee** (Princeton University, USA), Producing distant solar system bodies by mutual scattering of planetary embryos
- 24 October 2017, **Jian Fu (**Shanghai Astronomical Observatory, China), Modelling atomic and molecular gas and the radial profiles in SAMs.
- 25 October 2017, **Holger Baumgardt** (Queensland University, Australia), The formation of the smallest galaxies
- 30 October 2017, **Yun-Kyeon** Sheen (KASI, Republic of Korea), Discovery of ram-pressure stripped gas around an elliptical galaxy in Abell 2670
- 31 October 2017, **Yao Liu** (Max Planck Institute for Astronomy, Gwermany), The properties of the inner disk around HL Tau: Multi-wavelength modeling of the dust emission
- 9 November 2017, **Scott Chapman** (University of Cambridge, UK), High redshift starburst galaxies revealed by South Pole Telescope, ALMA, and gravitational lensing
- 6 December 2017, **Gongjie Li** (Harvard University, USA), On the Spin-axis Dynamics of Planets
- 11 December 2017, **Alain Omont** (Institut d'Astrophysque de Paris, France), Molecular tracers of major starbursts in high-redshift lensed submillimeter galaxies
- 13 December 2017, **Tsai Chao-Wei** (UCLA, USA), The Gobbling Monsters within the Hot DOGs
- 18 December 2017, **Song-Hu Wang** (Yale Unniversity, USA) Probing the Copernican Principle: Are We Special?
- 20 December 2017, **Meng Gu** (Harvard University, USA), Stellar Populations of Three Ultra Diffuse Galaxies in the Coma Cluster from the MaNGA Survey

Postdoc Pizza Lunch Talks, 2017

(Pizza lunch speakers are usually local scientists.)

- 10 January 2017, **Alexander Kolodzig,** Science with the cosmic background – an example from X-rays
- 28 February 2017, **Yanxia Xie,** The physics learned from measuring PAHs: the stochastic heating of ultra-small grains
- 21 March 2017, **Smitha Subramanian Hari Sharma,** The X-shaped bulge of the Milky Way
- 28 March 2017, **Jincheng Guo,** A disintegrating minor planet transiting WD 1145+017
- 11 April 2017, **Subhash Bose,** Optical observations of a peculiar supernova: ASASSN–15nx
- 18 April 2017, **Xiangkun Liu,** Strong lensing searches and cosmology
- 9 May 2017, **Su Yao,** Disk–jet connection in a special subclass of AGN – Narrow-line Seyfert 1 galaxies
- 16 May 2017, **Yuanpei Yang,** What will happen to pulsars if photons have mass?
- 6 June 2017, **Petchara Pattara-kijwanich,** Environmental Quenching of Star-formation Activity
- 13 June 2017, **Shu Wang,** The Optical–Mid-infrared Extinction Law of the $l = 165^{o}$ Sightline in the Galactic Plane
- 20 June 2017, **Kohei Hayashi,** Was Small Scale Crisis in Lambda CDM solved?
- 27 June 2017, **Kexin Guo,** Morphology transformation or progenitor bias?
- 17 October 2017, **Min Du,** The secular evolution driven by bars

Graduate student dinner talks, 2017

- 28 March 2017, **Guochao Sun** (California Institute of Technology, USA), Understanding the Dawn of Galaxies: Perspectives from the Galaxy Luminosity Function, the Global 21 cm Signal and Beyond
- 18 April 2017, **Paula Andrea Sánchez** (Universidad de Chile, Chile), The QUEST–La Silla AGN variability survey
- 7 July 2017, **Jiayi Sun** (The Ohio State University, USA), Self Gravity and the Physical State of Molecular Gas in Nearby Galaxies
- 17 September 2017, **Yi-Fei Jin** (Nanjing University, China; ANU, Australia), Studying kinematically decoupled galaxies with MaNGA

Peer-reviewed publications

Articles in peer-reviewed journals published or accepted for publication in 2017 by members of the Peking University astronomy community

1. Ai Y., Dou L., Fan X., **Wang F., Wu X.-B.,** Bian F. 2017, Erratum: Exploratory Chandra Observation of the Ultraluminous Quasar SDSS J010013.02+280225.8 at Redshift 6.30 (2016, ApJL, 823, L37), ApJL, 841, L32
2. Ai Y., Fabian A.C., Fan X., Walker S.A., Ghisellini G., Sbarrato T., Dou L., **Wang F., Wu X.-B.,** Feng L. 2017, XMM-Newton observation of the ultraluminous quasar SDSS J010013.02+280225.8 at redshift 6.326, MNRAS, 470, 1587
3. Annuar A., Alexander D.M., Gandhi P., Lansbury G.B., Asmus D., Ballantyne D.R., Bauer F.E., Boggs S.E., Boorman P.G., Brandt W.N., Brightman M., Christensen F.E., Craig W.W., Farrah D., Goulding A.D., Hailey C.J., Harrison F.A., Koss M.J., LaMassa S.M., Murray S.S., **Ricci C.,** Rosario D.J., Stanley F., Stern D., Zhang W. 2017, A New Compton-thick AGN in our Cosmic Backyard: Unveiling the Buried Nucleus in NGC 1448 with NuSTAR, ApJ, 836, 165
4. Babak S., Gair J., Sesana A., Barausse E., Sopuerta C.F., Berry C.P.L., Berti E.**, Amaro-Seoane P.,** Petiteau A., Klein A. 2017, Science with the space-based interferometer LISA. V. Extreme mass-ratio inspirals, Phys. Rev. D., 95, 103012
5. Banzatti A., Pontoppidan K.M., Salyk C., **Herczeg G.J.,** van Dishoeck E.F., Blake G.A. 2017, The Depletion of Water During Dispersal of Planet-forming Disk Regions, ApJ, 834, 152
6. Baronchelli L., Koss M., Schawinski K., Cardamone C., Civano F., Comastri A., Elvis M., Lanzuisi G., Marchesi S., **Ricci C.,** Salvato M., Trakhtenbrot B., Treister E. 2017, Inferring Compton-thick AGN candidates at z > 2 with Chandra using the >8 keV rest-frame spectral curvature, MNRAS, 471, 364
7. Baumgardt H., **Amaro-Seoane P.,** Schödel R. 2017, The distribution of stars around the Milky Way's black hole III: Comparison with simulations, A&A, in press (arXiv:1701.03818)
8. Bian F., Fan X., McGreer I., Cai Z., **Jiang L.** 2017, High Lyman Continuum Escape Fraction in a Lensed Young Compact Dwarf Galaxy at $z = 2.5$, ApJL, 837, L12
9. Bisogni S., di Serego Alighieri S., Goldoni P., **Ho L.C.,** Marconi A., Ponti G., Risaliti G. 2017, Simultaneous detection and analysis of optical and ultraviolet broad emission lines in quasars at $z \sim 2.2$, A&A, 603, A1
10. Boizelle B.D., Barth A.J., Darling J., Baker A.J., Buote D.A., **Ho L.C.,** Walsh J.L. 2017, ALMA Observations of

Circumnuclear Disks in Early-type Galaxies: 12CO(2–1) and Continuum Properties, ApJ, 845, 170

11. **Bose S., Dong S.,** Pastorello A., Filippenko A.V., Kochanek C.S., Mauerhan J., Romero-Canizales C., Brink T., **Chen P.,** Prieto J.L., Post R., Ashall C., Grupe D., Tomasella L., Benetti S., Shappee B.J., Stanek K.Z., Cai Z., Falco E., Lundqvist P., Mattila S., Mutel R., Ochner P., Pooley D., Stritzinger M.D., Villanueva S. Jr., Zheng W.-K., Beswick R.J., Brown P.J., Cappellaro E., Davis S., Fraser M., de Jaeger T., Elias-Rosa N., Gall C., Gaudi B.S., **Herczeg G.J.,** Hestenes J., Holoien T.W.-S., Hosseinzadeh G., Hsiao E.Y., Hu S.-M., Jaejin S., Jeffers B., Koff R.A., Kumar S., Kurtenkov A., Lau M.W., Prentice S., Reynolds T., Rudy R.J., Shahbandeh M., Somero A., Stassun K.G., Thompson T.A., Valenti S., Woo J.- H., Yunus S. 2018, Gaia17biu/SN 2017egm in NGC 3191: The closest hydrogen-poor superluminous supernova to date is in a 'normal' massive, metal-rich spiral galaxy, ApJ, in press (arXiv:1708.00864)
12. Brightman M., Baloković M., Ballantyne D.R., Bauer F.E., Boorman P., Buchner J., Brandt W.N., Comastri A., Del Moro A., Farrah D., Gandhi P., Harrison F.A., Koss M., Lanz L., Masini A., **Ricci C.,** Stern D., Vasudevan R., Walton D.J. 2017, X-Ray Bolometric Corrections for Compton-thick Active Galactic Nuclei, ApJ, 844, 10
13. **Cai M.X., Kouwenhoven M.B.N.,** Portegies Zwart S.F., **Spurzem R.** 2017, Stability of multiplanetary systems in star clusters, MNRAS, 470, 4337
14. Cai Z., Fan X., Bian F., Zabludoff A., Yang Y., Prochaska J.X., McGreer I., Zheng Z.-Y., Kashikawa N., **Wang R.,** Frye B., Green R., **Jiang L.** 2017, Mapping the Most Massive Overdensities through Hydrogen (MAMMOTH). II. Discovery of the Extremely Massive Overdensity BOSS1441 at $z = 2.32$, ApJ, 839, 131
15. Cai Z., Fan X., Yang Y., Bian F., Prochaska J.X., Zabludoff A., McGreer I., Zheng Z.-Y., Green R., Cantalupo S., Frye B., Hamden E., **Jiang L.,** Kashikawa N., **Wang R.** 2017, Discovery of an Enormous Lyα Nebula in a Massive Galaxy Overdensity at $z = 2.3$, ApJ, 837, 71
16. Castelló-Mor, N., Kaspi, S., Netzer, H., Du P., Hu C., **Ho L.C.,** Bai J.-M., Bian W.-H., Yuan Y.-F., Wang J.-M. 2017, Unveiling slim accretion disc in AGN through X-ray and infrared observations, MNRAS, 467, 1209
17. **Chen B.-Q., Liu X.-W., Ren J.-J.,** Yuan H.-B., **Huang Y.,** Yu B., Xiang M.-S., Wang C., Tian Z.-J., Zhang H.-W. 2017, Mapping the three-dimensional dust extinction towards the supernova remnant S147 – the S147 dust cloud, MNRAS, 472, 3924
18. **Chen B.-Q., Liu X.-W.,** Yuan H.-B., Robin A.C., **Huang Y.,** Xiang M.-S., **Wang C., Ren J.-J., Tian Z.-J., Zhang H.-W.** 2017, Constraining the Galactic structure parameters with the XSTPS-GAC and SDSS photometric surveys, MNRAS, 464, 2545
19. Chen C.-T.J., Brandt W.N., Reines A.E., Lansbury G., Stern D., Alexander D.M., Bauer F., Del Moro A., Gandhi P., Harrison F.A., Hickox R.C., Koss M.J., Lanz L., Luo B., Mullaney J.R., **Ricci C.,** Trump J.R. 2017, Hard X-Ray-selected AGNs in Low-mass Galaxies from the NuSTAR Serendipitous Survey, ApJ, 837, 48
20. **Chen X., Amaro-Seoane P.** 2017, Revealing the Formation of Stellar-mass Black Hole Binaries: The Need for Deci-Hertz Gravitational-wave Observatories, ApJL, 842, L2
21. **Chen X., de Grijs R.,** Deng L. 2017, New open cluster

Cepheids in the VVV survey tightly constrain near-infrared period-luminosity relations, MNRAS, 464, 1119

22 Cicone C., Bothwell M., Wagg J., Møller P., De Breuck C., Zhang Z., Martín S., Maiolino R., Severgnini P., Aravena M., Belfiore F., Espada D., Flütsch A., Impellizzeri V., **Peng Y.,** Raj M.A., Ramírez-Olivencia N., Riechers D., Schawinski K. 2017, The final data release of ALLSMOG: a survey of CO in typical local low-M_* star-forming galaxies, A&A, 604, A53

23. Dai S., Smith M.C., Wang S., Okamoto S., **Xu R.X.,** Yue Y.L., Liu J.F. 2017, The Identification of the White Dwarf Companion to the Millisecond Pulsar J2317+1439, ApJ, 842, 105

24. Davari R.H., **Ho L.C.,** Mobasher B., Canalizo G. 2017, Detection of Prominent Stellar Disks in the Progenitors of Present-day Massive Elliptical Galaxies, ApJ, 836, 75

25. Davies R.I., Hicks E.K.S., Erwin P., Burtscher L., Contursi A., Genzel R., Janssen A., Koss M., Lin M.-Y., Lutz D., Maciejewski W., Müller-Sánchez F., Orban de Xivry G., **Ricci C.,** Riffel R., Riffel R.A., Rosario D., Schartmann M., Schnorr-Muller A., Shimizu T., Sternberg A., Sturm E., Storchi-Bergmann T., Tacconi L., Veilleux S. 2017, The Role of Host Galaxy for the Environmental Dependence of Active Nuclei in Local Galaxies, MNRAS, 466, 4917

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Awards (2017)

The Peking University astronomy community is forcefully making headway beyond its campus. Highlights of awards and honors received in 2017 are included in this chapter.

de Grijs, Richard:

- Inclusion on the Elsevier/Scopus Most Influential Chinese Scholars in 2016 list
- Erskine Award (2017), University of Canterbury (New Zealand)

- Merit Prize, Asian Scientist Writing Prize (Science Centre Singapore)
- Finalist (written category), 2017 Flame Challenge, Alda–Kavli Learning Center for Science Communication, Stonybrook University, New York (USA)

Dong, Subo:

- Sixth Su-Shu Huang Prize, Chinese Astronomical Society
- Top 10 Achievements in Astronomical Science and Technology in 2016, Chinese Astronomical Society and National Astronomical Observatories, Chinese Academy of Sciences (leading "Discovery of the most luminous supernova" and co-leading "LAMOST reveals the extrasolar planet orbital eccentricity distribution")

Wu, Xuebing:

- First class Award in the Natural Sciences at Chinese Universities in 2017, Ministry of Education of China, for “Discovering the most luminous quasar with the most massive black hole in the early Universe.” (Wu Xue-Bing, Wang Feige, Wang Ran, Zuo Wenwen, Yi Weimin, Kong Minzhi) – http://www.cutech.edu.cn/cn/zxgz/2017/12/1510274358959405.htm

Yu, Qingjuan:

- Inclusion on the Elsevier/Scopus Most Influential Chinese Scholars in 2016 list

Grants awarded in 2017:

Members of the Peking University astronomy community engage in a wide variety of high-level scientific pursuits. This chapter recognizes the leading roles many of our community members play, as evidenced by competitive grant awards.

Chakraborty, Chandrachur:

Research Fund for International Young Scientists /NSFC: Strong gravity Lense-Thirring effect at the inner edge of accretion disc and QPOs; 2018, CNY 150,000 (first class)

Herczeg, Greg:

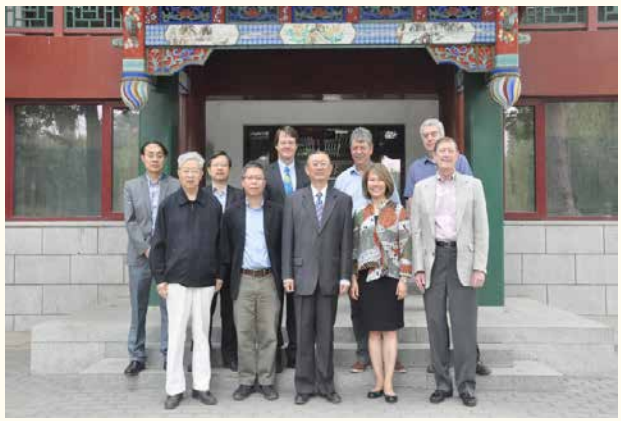
National Natural Science Foundation of China, general grant (11773002): The evolution of protoplanetary disks and their host stars; 2018–2021, CNY 630,000

The origin of our own planetary system was set when the Sun was still young and surrounded by a circumstellar disk. Although the evolutionary sequence of star formation is now well charted, the physical phenomena that drive these changes are still poorly understood. These differences determine whether and what types of planets will form, around stars of different masses and in different environments. Here, we study disk evolution first by using state-of-the-art observations to measure dust and chemical structures in protoplanetary disks, and second by developing innovative techniques to improve models of pre-main-sequence stellar evolution and ages of young stars and their disks. Our exploration of protoplanetary disks will focus on an approved ALMA survey led by scientists at the KIAA, supplemented by existing data and future ALMA and JWST proposals, supported by disk models within our team. Our investigations into pre-main-sequence evolution exploits high-resolution optical and near-IR spectra from archives and from new instruments, such as IGRINS, IRTF/iSHELL, and CFHT/SPIRou, combined with newly developed spectral inference techniques, to quantify the role of spots in modulating the convective efficiency of the atmosphere. These related research plans into young stars and their disks combined will help to reveal the physical processes that drive the evolution of young stars and their disks.

Ho, Luis:

National Natural Science Foundation of China (NSFC) group innovation program: Quasars and Galaxies; 2018–2023

Co-I's: Jiang, Linhua; Liu, Fukun; Wang, Ran; Wu, Xuebing; Yu, Qingjuan



The research group on galaxies and quasars, led by Luis C. Ho, received the prestigious Group Innovation Project fund from the National Natural Science Foundation of China. The other group members are Xue-Bing Wu, Fukun Liu, Qingjuan Yu, Linhua Jiang, and Ran Wang. The group consists of internationally recognized theorists and multiwavelength observers who have played critical, leading roles in the fields of supermassive black holes, quasars, and their influence on galaxy formation and evolution. Over the course of the next six years, the group will conduct a comprehensive investigation of the formation and growth of black holes and their connection with galaxy evolution, over the entire cosmic history during the last 13 billion years, covering the following topics: the birth and death of black holes, measurements of the masses of black holes, the luminosity function of high-redshift quasars and the black holes mass function, the maximum and minimum masses of black holes at low-redshift, the bolometric luminosity, the Eddington ratio and mass accretion rate of active galaxies, the properties of host galaxies, binary black holes, tidal disruption events, and stellar dynamics in the Galactic Center.

Li, Zhuo:

National Natural Science Foundation of China, general grant: Multi-messenger researches on the origin and propagation of high energy cosmic rays; 2018–2021, CNY 640,000

High energy cosmic-ray (CR) astrophysics is one of the frontiers in high-energy astrophysics and the discipline combining particle physics and astrophysics. In this project we will study the origin and propagation of high-energy CRs using the latest or upcoming observational results of multi-messenger approaches.

Peng, Yingjie:

National Natural Science Foundation of China, general grant: Studying star formation quenching and feedback in galaxies via their gas content; 2018–2021, CNY 640,000

Throughout the whole life of the Universe, less than 5% of the baryons have been converted into stars, implying that some physical processes must be responsible for suppressing star formation in galaxies. Within this context, one of the most hotly debated open questions is the identification of the process responsible for quenching star formation in galaxies and transforming them into passive and quiescent systems. Theories of galaxy formation have proposed various possible mechanisms, such as gas removal by powerful outflows or ram pressure stripping, heating and photoionization of the interstellar medium, turbulent or gravitational quenching, and halt of the gas supply inflow (often referred to as ‘strangulation’). However, the relevance and relative role of these mechanisms (as a function of cosmic epoch and galaxy properties) is not yet clear, because the constraints provided by observational data, such as star formation rate, metallicity, morphology, and structure, have not yet been able to clearly discriminate among the different scenarios.

One of the keys to tackle this major outstanding open issue is the gas content in galaxies, in both atomic phase and molecular phase. Since gas is the fuel of star formation, it will provide direct observational evidence of how quenching happens. In this project, we will use the gas content measured by different observational facilities, including Arecibo, IRAM, APEX, the JCMT, and the FAST HI survey in the future. More specifically, the premise of this project is to identify and quantify the dominant quenching and feedback mechanisms proposed by theories in galaxies, as a function of galaxy properties and as a function of environment.

The Peking University astronomy community and its impact beyond the campus

Many Peking University astrophysicists play leading roles or hold high honors in external organizations. This chapter summarizes the main highlights of their impact beyond the campus gates.

de Grijs, Richard:

- Deputy Editor, The Astrophysical Journal Letters (American Astronomical Society); Member, Asian Council of Science Editors
- Discipline Scientist (Astrophysics), International Space Science Institute–Beijing
- Fellow, Higher Education Academy (UK); Fellow and China representative, Institute of Physics (UK)
- President, International Astronomical Union (IAU) Commission H4, Stellar Clusters Throughout Space and Time; Steering Committee Member (ex officio), IAU Division H (Local Universe); Member, Office of Astronomy for Development Task Force 1 (Astronomy for Universities and Research)
- Convener, Thirty Meter Telescope (TMT) International Science Development Team (ISDT): Stars, Stellar Physics and the ISM
- Member, TMT ISDT: Milky Way and Nearby Galaxies
- Member, Board of Directors, Open Researcher and Contributor ID (ORCID); Chair, 2018 ORCID Board Nomination Committee
- Guest professor, Shanghai Astronomical Observatory, China
- Joint professor, China West Normal University, Nanchong (Sichuan), China; Science Advisory Committee member, China West Normal University (Department of Astronomy)
- Visiting professor, Qiannan Normal College for Nationalities, Duyun City (Guizhou), China
- Member of the Editorial Board, astroEDU (International Astronomical Union)

Herczeg, Greg:

- Science Advisory Committee, Thirty Meter Telescope (TMT)
- Convener, TMT International Science Development Team (ISDT): Star and Planet Formation
- Telescope Access Program, Time Allocation Committee Chair for 2018A; organisation

Ho, Luis:

- Advisory Panel Member, Academia Sinica Institute for Astronomy and Astrophysics
- Editorial Committee Member, Annual Reviews of Astronomy and Astrophysics
- Associate Editor, The Astrophysical Journal Letters (American Astronomical Society)
- Board Member, East Asian Observatory
- Advisory Committee Member, Key Laboratory for Galaxies and Cosmology, Chinese Academy of Sciences

◆ Advisory Committee Chair, Key Laboratory for Optical Astronomy, Chinese Academy of Sciences

◆ Advisory Committee Member, Chinese Academy of Sciences

◆ Member, Five-hundred-meter Aperture Spherical radio Telescope (FAST) Science Advisory Committee

◆ Thirty Meter Telescope (TMT) International Science Development Team: Supermassive Black Holes

◆ Science Advisory Committee Chair and Board Member, Chinese Large Optical–Infrared Telescope

◆ Advisory Committee Member, Southern University of Science and Technology

◆ Advisory Committee Member, Laboratory of Space Research, University of Hong Kong

Jiang, Linhua:

◆ Member, Thirty Meter Telescope (TMT) International Science Development Teams: Early Universe, Supermassive Black Holes

◆ Scientific coordinator (Chinese team), Dark Energy Spectroscopic Instrument (DESI)

◆ Group leader, Chinese Space Station Telescope (CSST); galaxy science working group

Peng, Eric:

◆ Co-chair, Telescope Access Program

◆ Member, Thirty Meter Telescope (TMT) Science Advisory Committee (SAC)

◆ Co-convener, TMT International Science Development Team, Milky Way and Nearby Galaxies

◆ China representative, Canada–France–Hawaii Telescope SAC

◆ China representative, Maunakea Spectroscopic Explorer Science Executive Committee

Peng, Yingjie:

◆ Member, Mauna Kea Spectroscopic Explorer (MSE) Science Advisory Committee

◆ Member, Multi-Object Optical and Near-infrared Spectrograph (MOONS) Science Team

Wang, Ran:

◆ Member, JCMT Time Allocation Committee; host of the November 2017 meeting

Wu, Xuebing:

◆ Vice President, Beijing Astronomical Society

◆ Chair, LAMOST User Committee (National Astronomical Observatories, Chinese Academy of Sciences)

◆ LAMOST Fellowship Outstanding Scholar

◆ Editor, Acta Astronomica Sinica and 天文爱好者

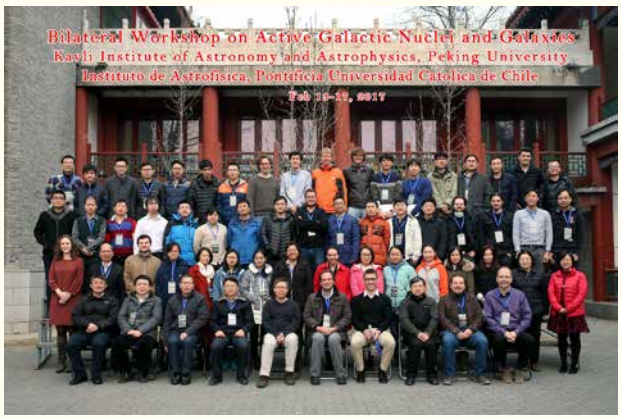
Scientific dissemination

Peking University astrophysicists actively engage with their respective communities through conference organization and high-profile contributions, in addition to disseminating their latest research achievements through talks at external institutes. A summary of their main achievements is included in this chapter.

Conference organization and SOC membership

13–17 February 2017: **Bilateral workshop (Kavli Institute for Astronomy and Astrophysics, Peking University; Instituto de Astrofísica, Pontificia Universidad Católica de Chile) on Active Galactic Nuclei and Galaxy Evolution,** KIAA/Peking University, Beijing, China

◆ SOC: **Chen, Xian; de Grijs, Richard; Peng, Eric; Peng, Yingjie; Wang, Ran (chair); Wu, Xuebing**



From 13 to 17 February 2017, the KIAA hosted a Bilateral Workshop between the Kavli Institute for Astronomy and Astrophysics, Peking University, and the Instituto de Astrofísica, Pontificia Universidad Católica de Chile on Active Galactic Nuclei (AGN) and Galaxies. Over 60 participants came to the workshop, including 11 participants from Chile. The workshop was organized in the form of short talks in the morning and group discussions in the afternoon, focusing on (1) AGN accretion and high-energy emission; (2) tidal disruption events; (3) gaseous and dusty environments of AGN; (4) AGN and galaxy co-evolution; and (5) Surveys and studies of galaxy formation and evolution. The workshop provided a great opportunity for KIAA-PKU and PUC members to discuss open questions in recent studies of AGN and galaxies, develop collaborations, and plan for new projects and telescope proposals.

14–15 February 2017: **JCMT–Transient Survey Team Meeting,** Purple Mountain Observatory, Nanjing, China

◆ Organiser: **Herczeg, Greg**

4 May 2017: **KIAA Ten-Year Anniversary Symposium,** KIAA/PKU, Beijing, China

23–24 May 2017: **BHOLE Group 3 Workshop,** KIAA/

PKU, Beijing, China

BHOLE (Black hole-Host Lifecycle Evolution) is a National Key Program for Science and Technology Research and Development, supported by the Ministry of Science and Technology of China. The BHOLE project aims at studying the physical connection between supermassive black holes and galaxies through cosmic time. It consists of four research groups, and Group 3 focuses on the high-redshift Universe and cosmic reionization.

The workshop covered the following topics: searches for very high-redshift quasars (and supermassive black holes) and galaxies, physical properties of these objects and their implications for reionization, connections between black holes and their host galaxies in the early Universe, theory and simulations, and so on.

28 May–1 June 2017: **Pulsar Timing Array in China,** KIAA/PKU, Beijing, China

◆ SOC: **Lee, Kejia** (chair); **Xu, Renxin**

On 30–31 May 2017, the first Chinese Pulsar Timing Array meeting was held at KIAA. Pulsar timing arrays (PTAs) are a method to detect nano-Hertz gravitational waves. At present, there are basically three PTA collaborations in the world, including the European Pulsar Timing Array (EPTA), the North American Nanohertz Observatory for Gravitational Waves (NANOGrav), and the Parkes Pulsar Timing Array (PPTA).

Over 50 participants joined the two-day conference, of whom 20 presented recent research progress. Topics related to the science drivers, technology development, and recent results of PTA were covered.

12–15 June 2017: **Elusive AGN in the Next Era,** George Mason University, Fairfax (VA), USA

◆ SOC: **Ho, Luis**

19–21 June 2017: **Gravitational-wave astrophysics and electromagnetic counterparts of gravitational waves,** Beijing, China

◆ SOC: **Yu, Qingjuan**

1–2 July 2017: **2017 LAMOST User Meeting,** Beijing, China

◆ SOC: **Wu, Xuebing** (chair)

27–29 July 2017: **5th China–US Workshop in Radio Astronomy,** Charlottesville (VA), USA

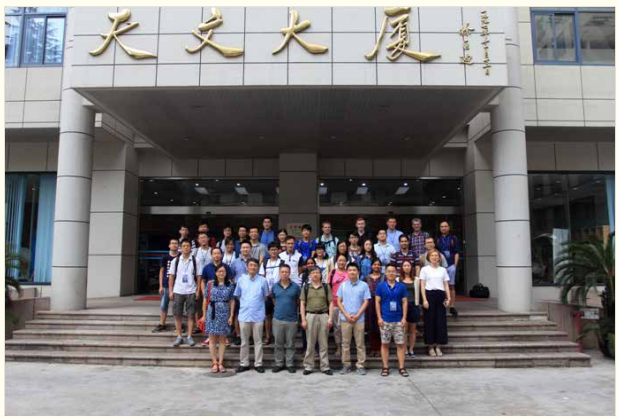
◆ SOC: Ho, Luis

17–19 August 2017: **Workshop on Astroparticle Physics II, KIAA/PKU,** Beijing, China

◆ SOC: **Li, Zhuo; Xu, Renxin**

The Kavli Institute for Astronomy and Astrophysics (KIAA) successfully organized the 'Workshop on Astroparticle Physics II' from 17 to 19 August 2017. The long-standing quest to understand the fundamental laws of Nature has motivated development of the new field of astroparticle physics, where observations of the Universe are used to probe particle interactions. KIAA-WAPs (Workshops on Astroparticle Physics) series are meant to promote this research.

KIAA-WAP II focused on the physics and detection of cosmic rays, neutrinos, gamma rays, and new achievements using major facilities. Special attention was paid to future projects and techniques for strategic planning following the Chinese LHAASO construction. More than 70 participants, including from the United States, Europe, and Japan, attended the KIAA for the workshop. For more details, see: http://kiaa.pku.edu.cn/aph2017/



24–25 August 2017: **SHAO–PKU Bilateral Workshop,** Shanghai Astronomical Observatory, Shanghai, China

◆ SOC: **Peng, Yingjie** (co-chair)

The 2017 SHAO–PKU Bilateral Workshop took place at Shanghai Astronomical Observatory (SHAO) on 24 and 25 August. This workshop aimed to strengthen ties between SHAO and PKU, encourage new friendships, and provide a platform for future collaborations. The following topics were covered during the workshop: Planetary systems, planets, and exoplanets; Stars and stellar populations: evolution and dynamics; Supermassive black holes and AGNs; Large-scale structure, galaxy formation and evolution; High-energy astrophysics and compact objects.

11–15 September 2017: **Stellar Populations and the Distance Scale – A conference in honour of Jeremy Mould,** Peking University, China

◆ SOC: **de Grijs, Richard** (co-chair); **Ho, Luis C.; Peng, Yingjie**

From 11 to 15 September 2017, the Kavli Institute for Astronomy and Astrophysics hosted a high-level international conference on Stellar Populations and the Distance Scale, honoring the career achievements of Professor Jeremy Mould (Swinburne University of Technology, Melbourne, Australia).

Spanning almost five days of excellent contributions by both junior and senior scientists hailing from all continents, the participants concluded that much progress had been made in understanding the astronomical distance scale, but that systematic uncertainties continue to affect our complete understanding of this fundamental aspect of our place in the Universe. Major efforts are underway to remedy the remaining discrepancies, not least aided by the European Gaia spacecraft.

In addition to the formal scientific (and public) talks, lengthy breaks allowed the participants to network and plan for the next major steps needed to achieve a robust distance scale throughout the Universe on the basis of our detailed understanding of the physics of stars, galaxies, and the large-scale structure of our Universe as a whole. The excellent atmosphere and strong interpersonal relationships among the participants, old and new friends, contributed significantly to a highly successful conference.

2–6 October 2017: **The Role of Gas in Galaxy Dynamics,** Valletta, Malta

◆ SOC: **Ho, Luis**

16–19 October 2017: **Transients from Compact Objects, KIAA/PKU,** Beijing, China

◆ SOC: **Dong, Subo** ; **Li, Zhuo** (co-chair)

We invited a group of leading theorists and observers to interact within the framework of a loosely organized workshop, in which much of the time was devoted to interaction and discussion of the open questions and of ways to address them. The workshop focused on timely open questions related to topics which are and will be rapidly developing thanks to developments in time-domain astronomy: the sources of gravitational waves; the sources of fast radio bursts; and the mechanisms of supernova explosions.

27 October 2017: **BHOLE annual meeting, KIAA/PKU,** Beijing, China

On 27 October 2017, the annual meeting of the BHOLE (Black hole–Host Lifecycle Evolution) project was held at the Kavli Institute for Astronomy and Astrophysics, Peking University (KIAA/PKU). Qihuang Gong, Vice President of PKU, Peiwen Ji, Former Executive Deputy Director of Division of Mathematics & Physics, National Natural Science Foundation of China, Gang Zhao, Associate Director of National Astronomical Observatories of CAS, Suijian Xue, Associate Director of

National Astronomical Observatories of CAS, Academicians Jingxiu Wang and Youyuan Zhou, Shude Mao, Director of Astrophysics Center at Tsinghua University, Zonghong Zhu, Professor from Beijing Normal University, Tinggui Wang, Director of Astronomy Center at University of Science & Technology of China, Fukun Liu, Director of Department of Astronomy at PKU, and members of the project attended the meeting.

Luis C. Ho, Principal Investigator of the project, gave the

project's annual performance report, introducing the research achievements, academic exchanges, science popularization, talent training, and budget performance, as well as existing challenges and improvement measures. Group leaders also gave reports on each group's work.

Since its inception in July 2016, the project has made remarkable achievements in research, having completed 91 papers in top international SCI journals, including two papers in Nature, one submitted to Science, and two listed as AAS Highlights in ApJ. The project has recruited seven new postdocs, organized five domestic workshops and three international conferences. Research highlights include

◆ Tidally disrupted dusty clumps as the origin of broad emission lines in active galactic nuclei (J.-M. Wang et al. 2017, Nature Astronomy)

◆ The close environments of accreting massive black holes as shaped by radiative feedback (Ricci et al. 2017, Nature)

◆ A giant protocluster of galaxies at redshift 5.70 (L. Jiang et al. 2017, Science, submitted)

◆ Discovery of 16 new z ~ 5.5 quasars: filling in the redshift gap of quasar color selection (Yang, Fan, X.-B. Wu, et al. 2017, ApJ, AAS Highlight)

◆ Gas dynamics of the luminous z = 6.13 quasar ULAS J1319+0950 revealed by ALMA high-resolution (Shao, R. Wang, et al. 2017, ApJ, AAS Highlight).

The project is supported by the Ministry of Science and Technology of China (MOST). It is a collaboration of 17 core investigators from six institutions in China (KIAA, Institute of High-energy Physics, National Astronomical Observatories of China, Shanghai Astronomical Observatory, Nanjing University, and University of Science and Technology of China). More information about the project can be found at http://kiaa.pku.edu.cn/bhole

30 October–1 November 2017: **Open Skies from China to South Africa – Sharing Resources and Building Collaborations in Optical and Infrared Astronomy,** Lijiang (Yunnan), China

◆ SOC: **Dong, Subo** (co-chair)

1–2 November 2017: **JCMT–Transient Survey Team Meeting,** Korea Astronomy and Space Science Institute (KASI), Republic of Korea

◆ Organiser: **Herczeg, Greg**

14–15 November 2017: **The 2017 KIAA–PKU Astrophysics Forum, KIAA–PKU,** Beijing, China

◆ SOC: Fan, Xiaohui; Jiang, Linhua; Wu, Xuebing (chair)

The 2017 KIAA–PKU Astrophysics Forum was held on 14–15 November 2017 on the topic Science with LSST and CSST. The Large Synoptic Survey Telescope (LSST) and the Chinese Space Station Telescope (CSST) will carry out two ground-breaking surveys of the sky that will help reshape astronomy in the 2020s. The 2017 Forum brought together members of the community to discuss the science that can and will be done by Chinese astronomers with these data. Prof. Mario Juric (University of Washington), Coordinator of the Data Management System Science Team for LSST, presented the current status of the LSST project, which expects to see first light in 2020. Prof. Hu Zhan (NAOC) presented the status and goals for the CSST.

Spanning the two days of the Forum, there were talks and discussions on a wide range of science topics, from asteroids to dark energy. PKU, with other institutes in China, is a member of the LSST–China consortium through which roughly 50 investigators will have access to LSST data.

24–25 November 2017: **11th Jing-Guang-Xia Astrophysics Meeting,** Guangzhou, China

- SOC: **Wu, Xuebing**

3–7 December 2017: **East Asian AGN Workshop 2017,** Kagoshima, Japan

- SOC: **Wu, Xuebing**

7–9 December 2017: **Future Exploration of Star and Planet Formation with Subaru,** Academia Sinica Institute of Astronomy and Astrophysics (ASIAA), Taipei, Taiwan

- SOC: **Herczeg, Greg**

Contributions to conferences

Bose, Subhash:

◆ 6–10 March 2017: *Astronomical Society of India meeting,* Jaipur, India

◆ 5–7 June 2017: *Recent Trends in the study of Compact Objects: Theory and Observation (RETCOIII)*, Trivandrum, India; ***invited speake***r

◆ 17–18 August 2017: *NOT Unbiased Transient Survey (NUTS),* Stockholm, Sweden

de Grijs, Richard:

◆ 3–7 January 2017: *229th American Astronomical Society Winter Meeting 2017,* Grapevine (TX), USA; Chambliss poster award judge

◆ 13–16 February 2017: Workshop on *Active Galactic Nuclei and Galaxy Evolution,* KIAA/Peking University, Beijing, China; ***invited speaker, SOC member***

◆ 20–24 February 2017: *"Frontiers in Theoretical and Applied Physics",* American University of Sharjah, UAE; ***invited speaker***

◆ 11–15 September 2017: *Stellar Populations and the Distance Scale – A conference in honour of Jeremy Mould,* Peking University, China; ***invited speaker, SOC co-chair***

◆ 9–11 October 2017: *XIth Luoxiahong Astrophysics workshop, Nanchong* (Sichuan), China; ***review speaker, co-chair***

◆ 6 November 2017: *Workshop on High-Resolution Spectroscopy,* TMT Forum 2017, Mysore, India; ***organizer, session chair, summary speaker***

◆ 7–9 November 2017: *Thirty Meter Telescope Forum 2017,* Mysore, India; ***invited speaker*** (main Forum)

Dong, Subo:

◆ 17–20 July 2017: *Ninth Joint Meeting of Chinese Physicists Worldwide,* Tsinghua University, Beijing, China; ***keynote speaker***

◆ 7–10 August 2017: *Chinese Astronomical Society Annual Meeting,* Urumqi (Xinjiang), China; ***plenary speaker***

◆ 16–19 October 2017: *Transients from Compact Objects,* KIAA/PKU, Beijing, China; ***session chair***

◆ 30 October–1 November 2017: *Open Skies from China to South Africa – Sharing Resources and Building Collaborations in Optical and Infrared Astronomy,* Lijiang (Yunnan), China; ***session chair***

◆ 11–15 December 2017: *Exoplanets & Planet Formation,* Shanghai, China; ***invited speaker, session chair***

Herczeg, Greg:

◆ 14–15 February 2017: *JCMT-Transient Team Meeting, Purple Mountain Observatory,* Nanjing, China; ***host, lead organiser***

◆ 22–24 March 2017: *Subaru International Partnership Science and Instrumentation Workshop,* National Astronomical Observatory of Japan, Tokyo, Japan; ***invited speaker***

◆ 12–14 July 2017: *The Accreting Universe,* Shanghai,

China; ***invited review***

◆ 7–10 August 2017: *Chinese Astronomical Society Annual Meeting*, Urumqi (Xinjiang), China

◆ 24–15 August 2017: *SHAO–PKU Bilateral Meeting,* Shanghai Astronomical Observatory, China

◆ 17–22 September 2017: *Ages2: Taking stellar ages to the next power*, Elba, Italy; ***invited review***

◆ 7–9 November 2017: *Thirty Meter Telescope Forum 2017,* Mysore, India; ***contributed review***

Ho, Luis:

◆ 31 May 2017: *Dr. Fred Lo Memorial Workshop,* ASIAA, Taipei, Taiwan; ***invited speaker***

◆ 1 July 2017: *Cross-Straits Astrophysics Symposium,* ASIAA, Taipei, Taiwan; ***invited speaker***

Jiang, Linhua:

◆ 12–13 January 2017: *6.5m Telescope Project Workshop,* Sun Yat-sen University, Guangzhou (Guangdong); ***invited speaker***

◆ 20–24 March 2017: *Snowbird Cosmic Lyman-Alpha Workshop,* Snowbird (UT), USA

◆ 18–20 August 2017: *Active Galactic Nuclei and Galaxies Workshop,* Weihai (Shandong); ***invited speaker***

◆ 16–18 October 2017: *Workshop on the Chinese Space Station Optical Survey,* Beijing, China; ***invited speaker***

◆ 14–15 November 2017: *The 2017 KIAA–PKU Astrophysics Forum,* KIAA–PKU, Beijing, China; ***invited speaker***

◆ 24–26 November 2017: *The 2017 Jing-Guang-Xia Astrophysics Forum,* Guangzhou (Guangdong), China

Jose, Jessy:

◆ 3–7 April 2017: *Multi-scale star formation,* Morelia, Mexico

Kolodzig, Alex:

◆ 3–7 April 2017: *Physics of the Intra-Cluster Medium,* Beijing, China

◆ 6–9 June 2017: *The X-ray Universe 2017,* ESA conference, Rome, Italy

Li, Zhuo:

◆ 18–19 January 2017: *LHAASO Collaboration Meeting 2017,* Yunnan University, Kunming, China; ***invited speaker***

◆ 8–10 May 2017: *Ice Cube Particle Astrophysics Symposium 2017,* University of Wisconsin–Madison, Madison (WI), USA

◆ 18 July 2017: *High energy transient astrophysics workshop,* Nanjing University, Nanjing, China; invited speaker

◆ 17–19 August 2017: *2nd KIAA Workshop on Astroparticle Physics,* KIAA/PKU, Beijing, China; ***invited speaker***

◆ 24–25 August 2017: *SHAO–KIAA Bilateral Workshop,* Shanghai Astronomical Observatory, Shanghai, China

◆ 3–6 November 2017: *Observational and theoretical research on transient astrophysics,* Wuhan University, Wuhan, China; ***invited speaker***

◆ 26–27 November 2017: *11th Jing-Guang-Xia Astrophysics Meeting,* Guangzhou, China

◆ 11–12 December 2017: *8th International workshop on Air Shower Detection at High Altitudes,* Shanghai Astronomical Observatory, Shanghai, China; ***invited speaker***

Peng, Eric:

◆ 13–16 February 2017: *Workshop on Active Galactic Nuclei and Galaxy Evolution,* KIAA/Peking University, Beijing, China; ***invited speaker***

◆ 5–9 June 2017, *Globular Cluster Systems and their Host Galaxies,* Sexten, Italy; ***invited speaker***

◆ 11–15 September 2017: *Stellar Populations and the Distance Scale – A conference in honour of Jeremy Mould,* Peking University, China; ***invited speaker***

◆ 30 October–1 November 2017: *Open Skies from China to South Africa (China–South Africa Bilateral Workshop),* Lijiang (Yunnan), China; ***invited speaker***

◆ 7–9 November 2017: *Thirty Meter Telescope Forum 2017*, Mysore, India; ***invited speaker***

Peng, Yingjie:

◆ 13–17 February 2017: *Workshop on Active Galactic Nuclei and Galaxy Evolution,* KIAA/Peking University, Beijing, China

◆ 22 May 2017: *BHOLE workshop,* KIAA–PKU, Beijing, China

◆ 31 July–4 August 2017: *The 4th Workshop on Key Problems in Galaxy Evolution,* Kunming (Yunnan), China

◆ 24–25 August 2017: *2017 SHAO–PKU Bilateral Workshop,* Shanghai, China

◆ 5–8 September 2017: *NSFC–RGC Mainland China and Hongkong Young Scholars Forum,* Guiyang (Guizhou), China

◆ 26–27 September 2017: *High Level Forum on Education,* Qianwei (Sichuan), China

◆ 22–23 November 2017: *The growth of the central black hole and gas in the Galaxy,* Xiamen University, Xiamen (Fujian), China

Ricci, Claudio:

◆ 23–26 January 2017: *XIVth Annual Meeting of the Chilean Astronomical Society,* Marbella, Chile

◆ 13–17 February 2017: *Workshop on Active Galactic Nuclei and Galaxy Evolution,* KIAA/Peking University, Beijing, China

◆ 6–9 June 2017: *The X-ray Universe 2017,* Rome, Italy

◆ 12–15 June 2017: *Elusive AGN in the Next Era, George Mason University,* Fairfax (VA), USA; ***invited speaker***

◆ 29–30 June 2017: *Accreting Black Holes at their Extremes Symposium, European Week of Astronomy and Space Science,* Prague, Czech Republic

◆ 3–7 July 2017: *Behind the curtains of dust II, the molecular and multi-wavelength view of activity in (U)LIRGs,* Sexten, Italy; ***invited speaker***

◆ 15–20 October 2017: *INTEGRAL Symposium 2017,* Venice, Italy; ***invited speaker***

Wang, Ran:

◆ 13–16 February 2017: *Workshop on Active Galactic*

Nuclei and Galaxy Evolution, KIAA/Peking University, Beijing, China; ***invited speaker, SOC member***

◆ 24–27 July 2017: *Black hole accretion, outflows, and AGN feedback,* Harbin (Heilongjiang), China

◆ 24–15 August 2017: *SHAO–PKU Bilateral Meeting,* Shanghai Astronomical Observatory, China

Wang, Shu:

◆ 24–28 April 2017: *International Astronomical Union (IAU) Symposium 330, Astrometry and Astrophysics in the Gaia Sky,* Nice, France

◆ 2–7 July 2017: *2017 Asia–Pacific Regional IAU Meeting,* Taipei, Taiwan

◆ 11–15 September 2017: *Stellar Populations and the Distance Scale (a conference in honour of Jeremy Mould),* Beijing, China

◆ 9–11 October 2017: *Star clusters and the Milky Way, the XIth Luoxiahong workshop in Astrophysics,* Nanchong (Sichuan), China; ***session chair***

◆ 16–19 October 2017: *Piercing the Galactic Darkness, Heidelberg,* Germany

Wu, Xuebing:

◆ 14–15 January 2017: *2017 CfA@USTC workshop on theories and observations on black hole accretion at different scales,* Hefei (Anhui), China

◆ 29–30 March 2017: *Workshop on Observations and Theoretical Studies of AGNs at all Wavelengths,* Guangzhou, China

◆ 23–24 May 2017: *BHOLE Group 3 Workshop,* KIAA/PKU, Beijing, China

◆ 3–7 July 2017: *2017 Asia–Pacific Regional IAU Meeting,* Taipei, Taiwan

◆ 25–27 July 2017: *Workshop on black hole accretion, outflow and AGN feedback,* Harbin (Heilongjiang), China

◆ 18–20 August 2017: *Workshop on AGN and Galaxies,* Weihai (Shandong), China

◆ 24–25 August 2017: *2017 SHAO–PKU Bilateral Workshop,* Shanghai, China

◆ 9–13 October 2017: *Workshop on molecular clouds and star formation,* Yichang (Hubei), China

◆ 24 October 2017: *NAOC–Caltech/COO Collaboration Symposium,* Beijing, China

◆ 30 October–1 November 2017: *Open Skies from China to South Africa (China–South Africa Bilateral Workshop),* Lijiang (Yunnan), China

◆ 14–15 November 2017: *2017 KIAA–PKU Astrophysics Forum on 'Science with LSST and CSST,'* KIAA/PKU, Beijing, China

◆ 21–22 November 2017: *Gas on galactic scales and black hole growth, Xiamen University,* Xiamen (Fujian), China

◆ 25–26 November 2017: *11th Jing-Guang-Xia Astrophysics Meeting,* Guangzhou, China

◆ 4–6 December 2017: *East Asia AGN workshop 2017,* Kagoshima, Japan

Wu, Xinji:

◆ 7–10 August 2017: *Chinese Astronomical Society*

Annual Meeting, Urumqi (Xinjiang), China

Yu, Qingjuan:

◆ 13–16 January 2017: *Theory and observations of black hole accretion at different scales, USTC,* Hefei (Anhui), China,

◆ 13–16 February 2017: *Workshop on Active Galactic Nuclei and Galaxy Evolution,* KIAA/Peking University, Beijing, China; ***invited speaker***

◆ 4 May 2017: *KIAA 10th Anniversary Symposium,* KIAA/Peking University, Beijing, China

◆ 23–24 May 2017: *BHOLE group 3 workshop,* KIAA/Peking University, Beijing, China

◆ 30–31 May 2017: *Workshop on Pulsar Timing Array in China,* KIAA/Peking University, Beijing, China; ***invited speaker***

◆ 19–21 June 2017: *Gravitational-wave astrophysics and electromagnetic counterparts of gravitational waves,* KIAA/Peking University, Beijing, China; ***invited speaker***

◆ 25–30 June 2017: *2017 annual meeting of the division of gravitation and relativistic astrophysics,* Chengdu (Sichuan), China

◆ 12–14 July 2017: *Workshop on the accreting Universe, TDLI institute,* Shanghai, China

◆ 21–23 July 2017: *CfA@USTC workshop on Frontiers in Astrophysics,* Hefei (Anhui), China

◆ 24–27 July 2017: *Workshop on Black holes, outflows, and AGN feedback,* Harbin (Heilongjiang), China

◆ 18–21 August 2017: *Workshop on Active Galaxies and Normal Galaxies,* Weihai (Shandong), China

◆ 24–25 August 2017: *2017 SHAO–PKU bilateral symposium,* Shanghai, China

◆ 16–19 October 2017: *Gravitational Wave Astrophysics (IAU Symposium 338),* Baton Rouge (LA), USA

Seminars and colloquia

de Grijs, Richard:

- January 2017: Shanghai Astronomical Observatory, China
- March 2017: Villanova University (PA), USA; TMT Headquarters (CA), USA
- May 2017: University of Canterbury, New Zealand
- June 2017: University of Auckland, New Zealand
- August 2017: (1) Macquarie University, Australia; (2) University of Surrey, UK
- September 2017: (1) University of Groningen, Netherlands; (2) University of Amsterdam, Netherlands
- November 2017: (1) Xi'an Jiaotong–Liverpool University, Suzhou (Jiangsu), China; (2) University of Science and Technology of China, Hefei (Anhui), China
- December 2017: China West Normal University, Nanchong (Sichuan), China

Dong, Subo:

- January 2017: Department of Physics and Astronomy, Shanghai Jiaotong University, Shanghai, China
- June 2017: Nanjing Institute of Astronomical Optics and Technology, Nanjing, China
- August 2017: Department of Physics and Astronomy, University of Utah (UT), USA

Herczeg, Greg:

- March 2017: (1) University of North Carolina, Chapel Hill (NC), USA; (2) University of Texas, Austin (TX), USA
- April 2017: National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China
- May 2017: Xiamen University, Xiamen, China
- June 2017: East Asian Observatory, Hilo (HI), USA
- September 2017: INAF–Rome, Italy

Ho, Luis:

- January 2017: (1) Shanghai Astronomical Observatory, Shanghai, China; (2) Aryabhatta Research Institute of Observational Sciences, Nainital, India; (3) Inter-University Centre for Astronomy and Astrophysics, Pune, India; (4) National Centre for Radio Astrophysics, Pune, India; (5) Indian Institute of Astrophysics, Bangalore, India
- February 2017: Instituto de Astrofísica de Andalucía, Granada, Spain
- March 2017: School of Life Sciences, Peking University, China
- October 2017: Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena (CA), USA
- November 2017: University of California, Riverside (CA), USA

Jiang, Linhua:

- June 2017: (1) Xiamen University, Xiamen (Fujian), China; (2) Shanghai Astronomical Observatory, Shanghai, China

Koldzig, Alex:

- September 2017: (1) Harvard–Smithsonian Center

for Astrophysics, Cambridge (MA), USA; (2) Massachusetts Institute of Technology/Kavli Institute, Cambridge (MA), USA; (3) Yale University, New Haven (CT), USA

Li, Zhuo:

◆ August 2017: Sun Yat-sen University, Zuhai (Guangdong), China

Peng, Yingjie:

◆ May 2017: (1) KIAA SAC meeting (science highlight talk), KIAA/PKU, China; (2) Department of Astronomy, Beijing Normal University, China

Ricci, Claudio:

◆ February 2017: Xiamen University, Xiamen (Fujian), China

◆ May 2017: Joint ALMA Observatory, Santiago, Chile

Wu, Xuebing:

◆ January 2017: National Astronomical Observatory of Japan, Mitaka, Japan

◆ February 2017: (1) Kavli IPMU, University of Tokyo, Japan; (2) Department of Astronomy, Kyoto University, Kyoto, Japan

◆ April 2017: Qujing Teacher's College, Qujing (Yunnan), China

◆ September 2017: School of Physics and Technology, Nanjing Normal University, Nanjing, China

◆ November 2017: (1) 'Cai Zhai Lecture Hall,' Graduate School of Peking University, Beijing, China; (2) School of Physics and Astronomy, Sun Yat-Sen University, Zhuhai (Guangdong), China; (3) School of Physics and Technology, Wuhan University, Hubei, China

Wu, Xinji:

◆ August 2017: Xinjiang Astronomical Observatory, Urumqi (Xinjiang), China

Yu, Qingjuan:

◆ June 2017: Shanghai Jiaotong University, Shanghai, China

◆ September 2017: Tsinghua University, Beijing, China

Student highlights 2017

de Grijs, Richard:

◆ Undergraduate student **Yuhan Yao** was the proud lead author of *Mira Variable Stars from LAMOST DR4 Data: Emission Features, Temperature Types, and Candidate Selection,* ApJS, 232, 16. She identified and characterized well over 100 new Mira variables in the LAMOST survey data.

Herczeg, Greg:

◆ Undergraduate student **Qiliang Fang** led publication of *Age Spreads and the Temperature Dependence of Age Estimates in Upper Sco,* ApJ, 842, 123; explained a temperature discrepancy in Upper Sco with age spreads.

Wu, Xuebing:

◆ **Feige Wang** (PhD 2017), now postdoctoral researcher at the University of California, Santa Barbara, USA: Feige Wang's first-author paper *'An Ultra-Luminous Quasar at z=5.363 with a Ten Billion Solar Mass Black Hole and A Metal-Rich DLA at z~5'* was awarded the first-class prize of excellent youth paper in science and technology of the Beijing Astronomical Society.

◆ **Jinyi Yang** (PhD 2017), now postdoctoral researcher at the University of Arizona, USA: Jinyi Yang's first-author paper *'Discovery of 16 New z~5.5 Quasars: Filling in the Redshift Gap of Quasar Color Selection'* was awarded the second-class prize of x excellent youth paper in science and technology of the Beijing Astronomical Society.

Peking University astronomy summer school

The Astronomy Summer School aims to familiarize middle-school students with astronomy in general and with the research fields pursued at Peking University in particular. Another important aim is to select excellent students to join us, trying to cultivate their interests in exploring the Universe and trigger their enthusiasm to study astronomy and astrophysics. This activity is mainly targeted at high-school sophomores in China. Since 2008, we have successfully held ten summer schools, in collaboration with the National Astronomical Observatories of the Chinese Academy of Sciences (NAOC), Beijing Planetarium, and Beijing Normal University. Increasing numbers of applications are received every year. Thus, the summer class is an important channel for PKU Astronomy to attract excellent students.

In 2017, 125 applicants from all over the country were selected to attend the summer school, which was held from 20 to 23 July 2017. Most activities were held at the KIAA. Through subject navigation, lectures, mutual activities, a visit to Xinglong Observatory, an examination, and interviews, the summer school provides an opportunity for high-school students to become familiar with astronomy as a science, and it offers a good platform for them to understand the Universe and to communicate with each other.

Twelve middle-school teachers from 10 famous high schools attended the summer school. We hope that by inviting more high-school teachers to participate in the summer school, increasing numbers of high-school students will get to know and like astronomy through their teachers' enthusiasm.

Report of the PKU Youth Astronomy Society (2017)

Routine Activities:

Routine Observations: The Youth Astronomy Society (PKUYAS) organizes routine observations on the Jingyuan Lawn at PKU when the sky is clear and the phase of the Moon is suitable. During routine observations, core members of the YAS would act as guides of the sky for all students present. Students also use small telescopes to observe planets, the Moon, and deep-sky objects. Sometimes, the YAS organizes observations with a special theme, such as to admire the Moon and eat moon cakes on Chinese Mid-Autumn Day, and to observe the Gemini meteor shower. In 2017, the YAS organized routine observations more than 10 times.

Astronomical Training: Aiming at introducing basic astronomical knowledge, we organized five lectures for all YAS members, especially for new members. These lectures have broadened the scope of astronomical knowledge and widened the horizons of YAS members.

Group Activity: The meteor group, the astrophotography group, the theoretical astronomy group, the meteorology group, and the space science group organized activities more than 10 times, including lectures, discussions, and practice sessions.

Significant activities:

25 February 2017: Several YAS core members went to Huahai Garden for observations. They took pictures of constellations like Virgo and Cygnus, and also of deep-sky objects like the Flame Nebula, the Horsehead Nebula, the California Nebula, etc.

11–12 March 2017: Spring Recruitment. We recruited about 50 new YAS members.

12 March 2017: YAS organized the lecture “Back to those days with Mr. Tuantu” by Dr. Quanzhi Ye from CalTech. This lecture was the first lecture in the Tuantu Memorial Lecture series, which was founded to remember the famous amateur astronomer Mr. Tuantu Zhou. The speaker, Dr. Quanzhi Ye, was the best friend of Tuantu during Tuantu’s lifetime. Dr. Quanzhi Ye is now a postdoctoral fellow at CalTech, with a focus on planetary science. This lecture covered meteor astronomy, meteorology, and remote observations.

1 April 2017: YAS organized observation at Huahai Garden in Yanqing District, far from the center of Beijing. During the observations, YAS core members shared their knowledge of the

stars and of astronomy. Under the instruction of core members, participants observed Mercury, constellations like Cancer, Leo, Virgo, and deep-sky objects like M34, M76, M48, M50, etc. Participants also observed that Alpha Tau was obscured by the Moon. The observations were completely successful.

30 April 2017: YAS organized observations at the Guanting reservoir. Participants took pictures of Scorpius, Sagittarius, M8, M101, etc. The sky was clear all night. The observations were successful.

(Group photo during the observations at Huahai Garden)

13 May 2017: YAS organized the lecture "Who will dominate the Universe," which was delivered by Academician Xiangping Wu from NAOC, CAS. Prof. Wu gave a vivid introduction to two hot areas in recent cosmology research, dark energy and dark matter, and also explained some of the misunderstandings that the public holds. In an active atmosphere, several listeners asked questions and received wonderful answers form Prof. Wu.

24 June 2017: Some YAS core members headed for Huahai Garden, for observing and photographing.

13 September 2017: YAS successfully co-organized the public lecture "Dark Ages to Dark Endings: The Life Cycles of Galaxies in the New Cosmology," given by Professor Robert Kennicutt from Cambridge University. In about one and a half hours, Prof. Kennicutt explained the formation and evolution of galaxies and some of the cutting-edge research in this area. After the lecture, several members of YAS engaged in academic discussions with Prof. Kennicutt.

22–23 September 2017: Autumn recruitment. More than 210 new members were recruited. A welcome gathering was held in the Chinese and History Building on 27 September, where we distributed the self-made introductory book A guide to welkin and briefly introduced our basic activities as well as with several core members.

4 October 2017: YAS organized students to observe the full Moon at Jingyuan on Chinese Mid-Autumn festival. We

(Group photo after Prof. Kennicutt's lecture)

provided telescopes and moon cakes for participants while our core members introduced basic knowledge of the Moon and the ancient Chinese astronomical calendar. One section was especially designed for participants to take photos of the Moon with smart phones under our instruction. Most students were captivated by the beauty of the Moon as well as Chinese traditional culture.

17 November 2017: YAS organized sunspot observations with the student union of the School of Earth and Space Science, Peking University. The sky was clear and participants observed one small sunspot near the edge of the solar disk. Core members of YAS interpreted some basic knowledge of the sun and sunspots.

25 November 2017: PKUYAS and the RUC Star Moon Sky Society cooperated in organizing students to visit Beijing Planetarium. Our primary members were responsible for elucidating astronomical concepts and phenomena. We successfully motivated participants' interest in astronomy and further promoted friendly relations between PKUYAS and the RUC Star Moon Sky Society.

9 December 2017: YAS organized observations at Guanting reservoir. During the observations, YAS core members shared their knowledge of the stars and of astronomy. Under the instruction of core members, participants observed constellations like Cygnus, Cassiopeia, Orion, Gemini, Taurus, and deep-sky objects like M33, M37, M42, M57, NGC869, NGC884, etc. Some participants took photos themselves under the stars. Participants were very satisfied with several meteors and made wishes. Observations were completely successful.

(PKUYAS and RUC Star Moon Sky Society at Beijing Planetarium)

(Group photo during the observations at Guanting reservoir)

Visitors hosted in 2017

Individual visitors to the Kavli Institute for Astronomy and Astrophysics and the Department of Astronomy at Peking University, 2017.

(Research interests are indicated for those visitors who stayed for longer than one day and for collaborative purposes.)

4–24 January 2017, **Nicolas Caballero** (Max Planck Institute for Radio Astronomy, Germany)

- Host: Kejia Lee
- Research interests: Pulsar timing, gravitational wave detection, noise characterisation of (millisecond) pulsars radio astronomy

11–26 February 2017, **Pau Amaro-Seoane** (CSIC-IEEC, Spain)

- Research interests: stellar dynamics, LIGO/Virgo/LISA black holes, data analysis and gravitational-wave search algorithms, planetesimal dynamics, scalar fields and collisional dark matter, and GPU computing

12–24 February 2017, **Alexey Mints** (Max Planck institute for Solar System research, Germany)

- Host: Xiaowei Liu
- Research interests: Galactic structure, galactic archaeology

12 February 2017–15 March 2017, **Claudio Ricci** (Universidad Católica de Chile, Chile)

- Research interests: Active Galactic Nuclei

20–23 February 2017, **Roland de Putter** (California Institute of Technology, USA)

- Research interests: Inflation, dark energy, dark matter, neutrino physics, the cosmic microwave background, weak gravitational lensing and galaxy clustering.

20–23 February 2017, **Xuening Bai** (Harvard–Smithsonian Center for Astrophysics, USA)

- Research interests: Planet formation, particularly on the dynamics of gas and dust in protoplanetary disks, high-energy astrophysics

20–23 February 2017, **Lixin Dai** (University of Maryland, USA)

- Research interests: Black hole accretion and jets, TDE, GRMHD simulations

21 February 2017–21 March 2017, **Yangwei Zhang** (Yunnan Observatories, CAS, China)

- Host: Xiaowei Liu
- Research interests: Dual AGN and their kinematics

23–27 February 2017, **Sun Kwok** (The University of Hong Kong)

- Host: Luis C. Ho
- Research interests: Stellar evolution, interstellar

chemistry, space astronomy

27 February 2017–1 March 2017, **Amelia Stutz** (University of Concepción, Chile)

◆ Hosts: Subo Dong and Greg Herczeg

◆ Research interests: Star formation, molecular clouds, the formation of stellar clusters, mm/sub-mm/IR observations, kinematics, spectroscopy.

2 March 2017, **Ye-Fei Yuan** (University of Science and Technology of China)

◆ Research interests: Relativistic astrophysics, focusing on compact objects (neutron stars, black holes and white dwarfs), and nuclear astrophysics (physics of dense nuclear matter, high energy neutrinos)

8 March 2017, **Andreas Schulze** (NAOJ, Japan)

◆ Host: Xue-Bing Wu

◆ Research interests: Active Galactic Nuclei, quasars, surveys

10–16 March 2017, **Robin Dong** (University of Arizona, USA)

◆ Host: Gregory Herczeg

◆ Research interests: The general area of extrasolar planets. Specifically, how to connect the theories of planet formation with observations of protoplanetary disks

13 March 2017–7 June 2017, **Paula Andrea Sánchez** (Universidad de Chile, Chile)

◆ Host: Luis C. Ho

◆ Research interests: Active galactic nuclei (AGN) variability and its connection with AGN physical properties, time domain astronomy, variable stars, big data analysis, data science.

27 March 2017–5 April 2017, **Stuart Wyithe** (University of Melbourne, Australia)

◆ Host: Kavli Visiting Scholar, hosted by Qingjuan Yu

◆ Research interests: Evolution of the earliest galaxies, gravitational lensing

31 March 2017, **James Binney** (University of Oxford, UK)

◆ Research interests: Modelling the Galaxy, galaxy formation, orbits in our Galaxy, Galactic warps

6 April 2017, **Taka Kajino** (International Research Center for Big-Bang Cosmology and Element Genesis, Japan)

16 May 2017, **Matt Johns** (Mirror Laboratory, Steward Observatory, University of Arizona, USA)

◆ Host: Luis C. Ho

19 May 2017, **Bruno Merín** (ESAC Science Data Centre, Spain)

◆ Research interests: Star and planet formation, disk evolution; exo-planets population models; infrared and multi-wavelength astronomy; machine learning and discovery; computational Bayesian statistics; space data science

20 May 2017–27 June 2017, **Nicolas Caballero** (Max Planck Institute for Radioastronomy, USA)

◆ Host: Kejia Lee

◆ Research interests: Pulsar timing, gravitational wave detection, noise characterisation of (millisecond) pulsars radio

astronomy

24–28 May 2017, **Ian Czekala** (Stanford University, USA)

◆ Host: Gregory Herczeg

◆ Research interests: Young stars, protoplanetary disks, pre-main sequence evolution, and exoplanets

1 June 2017, **Zachariah Etienne** (West Virginia University, USA)

◆ Research interests: Compact binary inspirals & mergers: simulations in fully dynamical spacetimes, black hole accretion, new techniques for performing compact object and compact binary simulations, gravitational wave astrophysics & data analysis

5–15 June 2017, **Daniel Harsono** (Leiden University, Netherlands)

◆ Host: Gregory Herczeg

◆ Research interests: Testing of radiative transfer tools for ALLEGRO ALMA arcnode, accretion disk formation around low-mass stars

8 June 2017, **Xu Kong** (University of Science and Technology of China)

◆ Research interests: Stellar population synthesis and its application, two dimension properties of low-z/high-z galaxies, formation and evolution of low-z/high-z galaxies, dust attenuation and the IRX–β relationship

9 June 2017, **Nan Li** (University of Chicago, USA)

◆ Research interests: Machine learning and gravitational lensing, interactive lens modeling, simulations of time delays in galaxy scale lensing

9–17 June 2017, **Pau Amaro-Seoane** (Max-Planck Institute for Gravitational Physics, Germany)

◆ Research interests: Stellar dynamics, LIGO/Virgo/LISA black holes, data analysis and gravitational-wave search algorithms, planetesimal dynamics, scalar fields and collisional dark matter, and GPU computing

12–16 June 2017, **Zheng Zheng** (University of Utah, USA)

◆ Host: Subo Dong

◆ Research interests: Cosmology, large-scale structure, galaxy formation and evolution, and Lyman-α radiative transfer

14 June 2017, **Zhi-Yu Zhang** (University of Edinburgh, UK/ESO, Germany)

◆ Host: Ran Wang

◆ Research interests: Submillimeter astronomy

19–23 June 2017, **Weichen Wang** (Johns Hopkins University, USA)

◆ Host: Luis C. Ho

◆ Research interests: Understanding galaxy formation, dust geometry and star formation features using large extragalactic surveys conducted on the Hubble Space Telescope (CANDELS, 3D-HST, etc.).

19 June 2017–14 August 2017, **Rohan Potham Naidu** (Yale–NUS College, Singapore)

◆ Host: Linhua Jiang

◆ Research interests: Cosmic reionization, high-redshift extragalactic astronomy, machine learning applications in astronomy, supernova cosmology

22 June 2017, **Xilong Fan** (Tsinghua University, China)

◆ Host: Xian Chen

◆ Research interests: Gravitational wave astronomy, gravitational wave data analysis, galaxy properties by galactic chemical and SED models

23 June 2017, **R. N. (Dick) Manchester** (CSIRO Astronomy and Space Science, Australian Academy of Science, Australia)

◆ Host: Kejia Lee

◆ Research interests: Precision timing of pulsars and its applications, origin and evolution of pulsars, pulsar beaming, polarization and the pulse emission mechanism, effects of circumstellar and interstellar propagation, especially Faraday rotation and the galactic magnetic field, structure and evolution of supernova remnants, especially SNR 1987A

28 June 2017–1 July 2017, **Banibrata Mukhopadhyay** (Indian Institute of Science, India)

◆ Host: Yingjie Peng

◆ Research interests: Theoretical astrophysics of black holes, white dwarfs and neutron stars, astrophysical fluids, particle astrophysics, cosmology and gravity

30 June 2017, **Huanian Zhang** (Steward Observatory, University of Arizona, USA)

◆ Host: Luis C. Ho

◆ Research interests: Galaxy formation and evolution, specifically on the circumgalactic media of nearby galaxies and the Milky Way galaxy, searching the globular clusters in the local group and searching the ultra diffuse galaxies (UDGs)

4–10 and 15–21 July 2017, **Doug Johnstone** (National Research Council Canada)

◆ Host: Kavli Visiting Scholar, hosted by Gregory Herczeg

◆ Research interests: Millimeter-wave astronomy (single dish/interferometry), star formation, molecular clouds, pre-stellar cores, proto-stars, circumstellar disks.

8–13 July 2017, **Zheng Zheng** (University of Utah, USA)

◆ Host: Subo Dong

◆ Research interests: Cosmology, large-scale structure, galaxy formation and evolution, and Lyman-α radiative transfer

10 July 2017, **Lloyd Knox** (UC Davis, USA)

◆ Host: Luis C. Ho

◆ Research interests: Cosmology

10–19 July 2017, Wei Zhu (The Ohio State University, USA)

◆ Host: Subo Dong

◆ Research interests: Gravitational microlensing, planet detection and characterization, planet–star correlation

14 July 2017, **David Blair** (AIGRC, University of Western Australia, Australia)

◆ Host: Bing Zhang

◆ Research interests: Methods of detecting gravitational waves

15–23 July 2017, **Yuexing Cindy Li** (Penn State University, USA)

- Host: Yuefang Wu
- Research interests: Cosmology, radiative transfer

23–28 July 2017, **Albrecht Karle** (University of Wisconsin–Madison, USA)

- Host: Zhuo Li
- Research interests: High-energy neutrino astronomy and astrophysics

31 July 2017–3 August 2017, **Thijs Kouwenhoven** (Xi'an Jiatong–Liverpool University, China)

- Host: Richard de Grijs
- Research interests: Star clusters, planets, stellar dynamics

14 August 2017–9 September 2017, **Yohai Meiron** (Eötvös University, Hungary)

- Research interests: Stellar dynamics

11–20 September 2017, **Yi-Fei Jin** (RSAA/ANU, Australia)

- Host: Luis C. Ho
- Research interests: Galaxy formation and evolution, gas flows and chemical evolution.

18–29 September 2017, **Barbara Catinella** (University of Western Australia/ICRAR, Australia)

- Host: Kavli Visiting Scholar, hosted by Jing Wang
- Research interests: Gas in galaxies

29 September 2017, **Charles Alcock** (Harvard–Smithsonian Center for Astrophysics, USA)

- Host: Luis C. Ho
- Research interests: Massive compact halo objects, comets and asteroids

9–20 October 2017, **Laura Sales** (University of California Riverside, USA)

- Host: Kavli Visiting Scholar, hosted by Eric Peng
- Research interests: Galaxy formation and evolution, dynamical modeling of galaxies, dwarf galaxies, Milky Way and Local Group cosmology, nature of feedback, physics of the ISM, hydrodynamics, numerical simulations

15–28 October 2017, **Eli Waxman** (The Weizmann Institute of Science, Israel)

- Host: Kavli Visiting Scholar, hosted by Zhuo Li
- Research interests: theoretical astrophysics, high-energy and particle astrophysics

25 October 2017, **Shri Kulkarni** (Palomar Observatory, California Institute of Technology, USA)

- Host: Luis C. Ho
- Research interests: Planetary astronomy, planetary science

26–31 October 2017, **Minjin Kim** (KASI, Republic of Korea)

- Host: Luis C. Ho
- Research interests: Coevolution of black holes and galaxies

26–31 October 2017, Woowon Byune (KASI, Republic of Korea)

◆ Host: Luis C. Ho

◆ Research interests: Extragalactic astronomy, galaxy outskirts, supermassive black holes, AGNs

26–31 October 2017, Yun-Kyeong Sheen (KASI, Republic of Korea)

◆ Host: Luis C. Ho

◆ Research interests: Galaxy formation and evolution in galaxy clusters using deep optical imaging and IFU spectroscopy

28 October 2017–4 November 2017, Alberto Sesana (University of Birmingham, UK)

◆ Host: Xian Chen

◆ Research interests: Gravitational waves; massive black holes (binaries); stellar dynamics, dense stellar systems; hyper-velocity stars and the nature and environment of Sgr A*; gas dynamics and accretion theory; structure formation and galaxy evolution.

8–17 November 2017, Masami Ouchi (The University of Tokyo, Japan)

◆ Host: Kavli Visiting Scholar, hosted by Linhua Jiang.

◆ Research interests: Galaxy formation, observational cosmology, deep surveys

13–29 December 2017, Sherry Suyu (Max Planck Institute for Astrophysics, Germany)

◆ Host: Kavli Visiting Scholar, hosted by Richard de Grijs

◆ Research interests: Cosmology, galaxy formation/evolution, gravitational lensing

21 December 2017–15 January 2018, Antonios Tsokaros (University of Illinois at Urbana–Champaign, USA)

◆ Host: Kavli Visiting Scholar, hosted by Renxin Xu

◆ Research interests: General relativity; numerical relativity; astrophysics; alternative theories of gravity; cosmology; dynamical systems.

Wider engagement

Many Peking University astrophysicists engage in external outreach and education efforts. Here are the year's main highlights.

de Grijs, Richard:

1. Public talks and other outreach:

◆ January 2017: Shanghai Astronomical Observatory, China

◆ February 2017: Royal Asiatic Society China, Beijing

◆ 19 February 2017: Food for thought and nourishment in Beijing, Institute of Physics/IOP Life blog: http://www.iopblog.org/food-for-thought-and-nourishment-in-beijing/

◆ March 2017: EURAXESS/Delegation of the European Union to China, Beijing

◆ May 2017: Canterbury Astronomical Society, New Zealand

◆ June 2017: Netherlands embassy, Beijing; introduction of a delegation of visiting Dutch university presidents to Chinese business etiquette

◆ July 2017: Commencement address, Peking University School of Physics

◆ October 2017: China West Normal University, Nanchong (Sichuan), China

◆ November 2017: Netherlands embassy, Beijing; Keynote lecture, PhD workshop

◆ December 2017: (1) Chengdu Astrophiles, Sichuan, China; (2) Royal Asiatic Society China, Beijing (book promotion)

◆ Joint organizer, monthly science cafés in English ("Understanding Science")

NSFC-funded Documentary, Science of Heaven:

◆ Screenings: 11 January 2017 (Netherlands embassy, Beijing); 15 and 16 January 2017 (Shanghai Jiaotong University Museum, Shanghai Astronomical Observatory); 18 March 2017 (Tianjin); 6 April 2017 (Royal Asiatic Society Beijing/The Bookworm)

◆ Press coverage: 16 August 2017: Documentary explores the history of astronomy in China, Physics World blog post; http://blog.physicsworld.com/2017/08/16/documentary-explores-the-history-of-astronomy-in-china/

2. External lecturing:

◆ March 2017: National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China

◆ May–June 2017: Erskine lecture course on 'Distance Measurement in Astronomy,' University of Canterbury, Christchurch, New Zealand

◆ July 2017: Academic skills lectures at four universities across Indonesia

◆ November 2017: National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China (Xinglong School)

◆ December 2017: (1) China West Normal University, Nanchong (Sichuan), China; (2) Remote Sensing and Digital Earth Institute, Chinese Academy of Sciences, Beijing, China

◆ April–May and November–December 2017: Senior Facilitator, AuthorAID Online Course in Research Writing, a 7-week course for early-stage researchers from developing countries, covering all aspects of writing research papers for publication in peer-reviewed journals. Enrolment: ~2000–2500; awarded Star Guest Facilitator badges.

Every second month, Richard de Grijs contributes feature articles to The Amateur Astronomer. Features published in 2017:

◆ January: Pure water in a Japanese mine offers clues to the nature of supernova explosions

◆ March: Pulsars—enigmatic objects that remain as mysterious as when they were first discovered...

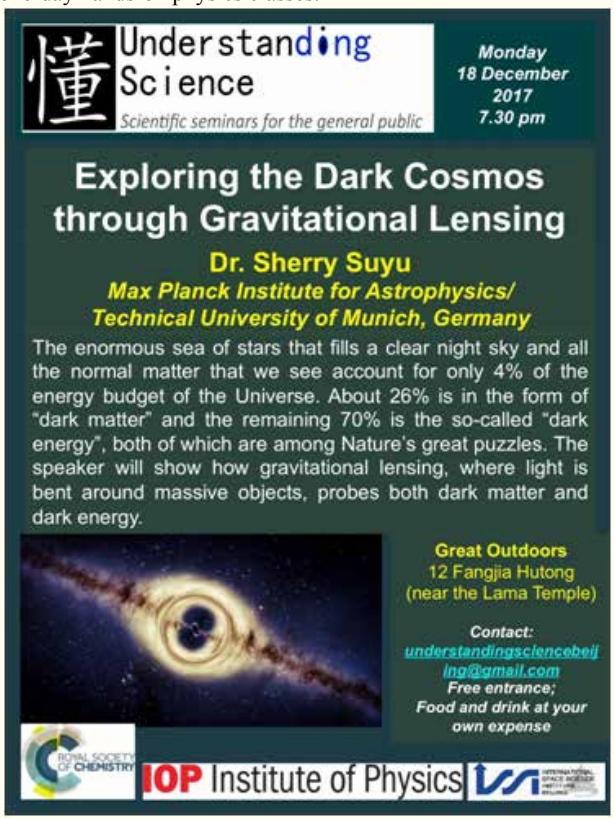
◆ May: 'Citizen science' on the rise

◆ July: Planetary formation is disks of dust and gas unveiled

◆ September: Starbirth and violent death: now directly observable in unprecedented detail

◆ November: The hunt is on for chemical analysis of atmospheres outside our solar system

In association with the Migrant Children's Foundation, Peking University undergraduate and graduate students reach out to children in migrant communities on a monthly basis, offering one-day hands-on physics classes.



Peng, Eric:

◆ 19 October 2017: Public talk, Beijing International Society, Delegation of the European Union to China, Beijing, China

Wu, Xuebing:

◆ 16 April 2017: Public talk on Discovering the brightest 'star' in the Universe, Qujing No. 1 Middle School, Qujing (Yunnan), China

◆ 21 July 2017: Public talk on Black holes in the Universe, 2017 Astronomy Summer School for excellent high school students, Peking University, Beijing, China

◆ 12 October 2017: Public talk on Interstellar: from the Earth to the deep Universe, Yichang No. 1 Middle School, Yichang (Hubei), China

Wu, Xinji:

◆ Popular article, The Australian Parkes radio telescope and its pulsar survey (marking the 50th anniversary of the discovery of pulsars), Journal of Science, 6, 43–49 (Shanghai Science and Technology Press)

The Peking University astronomy "family"

KIAA Faculty:

Chen, Jiansheng, (陈建生)

coordinator, professor, joint appointment with the PKU Department of Astronomy

Research interests:

wide-field astronomy, quasar surveys, large-scale structure of the Universe, galaxy formation and evolution

de Grijs, Richard (何锐思)

professor

Research interests:

young massive star clusters, internal star cluster dynamics, distance determination in astronomy

Dong, Subo (东苏勃)

youth Qianren research professor

Research interests:

extrasolar planets, supernovae, gravitational microlensing, dynamics, time-domain astronomy

Fan, Xiaohui (樊晓晖)

visiting chair professor (Qianren B)

Research interests:

first light and reionization, surveys of high-redshift galaxies and quasars, supermassive black holes, intergalactic medium

Herczeg, Gregory J. (沈雷歌)

youth Qianren research professor

Research interests:

accretion onto young stars, disk dissipation mechanisms and disk structure, observational diagnostics of wind-launching mechanisms, pre-main sequence stellar evolution, chromospheric and coronal activity around dwarf stars

Ho, Luis C. (何子山)

director, university chair professor

Research interests:

processes in galactic nuclei, accretion disks and jets, massive black holes, origin of the Hubble sequence, extragalactic star formation, star clusters, interstellar medium

Jiang, Linhua (江林华)

youth Qianren research professor

Research interests:

Extragalactic astronomy and cosmology, high-redshift quasars/active galactic nuclei and supermassive black holes, high-redshift galaxies, cosmic reionization

Lee, Kejia (李柯伽)

youth Qianren research professor

Research interests:

pulsars, gravitational waves

Li, Li-Xin (李立新)

professor

Research interests:

black hole physics, accretion disks, X-ray binaries and quasi-periodic oscillations, gamma-ray bursts and supernovae, active galactic nuclei and jets, cosmology, gravitational lensing, dark matter and dark energy, brane world and extra dimensions

Peng, Yingjie (彭影杰)

Youth Qianren Research Professor

Research interests:

observational cosmology, galaxy formation and evolution

Wang, Jing (王菁)

Youth Qianren Research Professor

Research interests:

Galaxy formation and evolution

Wang, Ran (王然)

youth Qianren research professor

Research interests:

formation and co-evolution of supermassive black holes and their host galaxies in the early Universe

Wu, Xue-Bing (吴学兵)

professor, associate director

Research interests:

quasars and active galactic nuclei, supermassive black holes, accretion physics, X-ray binaries

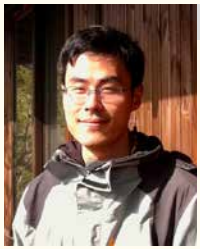
Yu, Qingjuan (于清娟)

professor

Research interests:

black hole physics, planetary and stellar dynamics, galaxy formation and evolution, galactic nuclei, and cosmology

Joint KIAA/Department of Astronomy (DoA) Faculty:



Chen, Xian(陈弦)

Assistant Professor

Research interests:

dynamics and radiation processes in the vicinity of black holes, Galactic Center dynamics, gravitational-wave astrophysics

Fan, Zuhui (范祖辉)

professor, associate director of the DoA

Research interests:

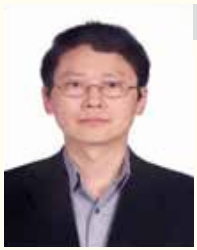
cosmology, gravitational lensing, clusters of galaxies, galactic dynamics

Li, Zhuo (黎卓)

Associate Professor

Research interests:

gamma-ray bursts and supernovae, high-energy cosmic rays and neutrinos, relativistic collisionless shocks



Liu, Fukun (刘富坤)

professor, director of the DoA

Research interests:

supermassive black hole binaries, accretion disks and active galactic nuclei

Liu, Xiao-Wei (刘晓为)

professor

Research interests:

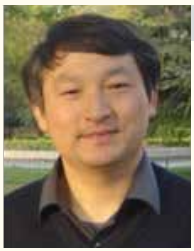
wide-field astronomy, spectroscopy, Galactic archeology and near-field cosmology, interstellar medium, atomic and molecular processes, radiation mechanisms

Peng, Eric W. (彭逸西)

associate professor

Research interests:

galaxy formation and evolution, stellar populations, galaxy dynamics, globular cluster systems

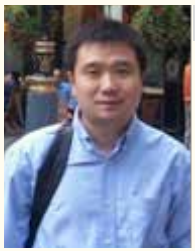


Xu, Renxin (徐仁新)

professor

Research interests:

particle astrophysics, pulsars, quark stars, neutron stars



Zhang, Bing (张冰)

Chang Jiang visiting chair professor

Research interests:

high-energy astrophysics, gamma-ray bursts and relativistic jets, black holes, neutron stars, multi-messenger astrophysics

Zhang, Hua-Wei (张华伟)

associate professor

Research interests:

stellar abundances, Galactic structure

Joint KIAA/NAOC Faculty:

Spurzem, Rainer

professor

Research interests:

modeling dense stellar systems, galactic nuclei with black holes, relativistic dynamics, N-body simulations, parallel many-core and accelerated computing

Amaro-Seoane, Pau

visiting faculty

Research interests:

stellar dynamics, LIGO/Virgo/LISA black holes, data analysis and gravitational-wave search algorithms, planetesimal dynamics, scalar fields and collisional dark matter, and GPU computing

Postdocs:

Baug, Tapas

KIAA Postdoc

Research interests:

Galactic open clusters, Galactic high mass star-forming regions, Wolf–Rayet stars, High angular resolution of late-type stars.

Bose, Subhash

KIAA Postdoc

Research interests:

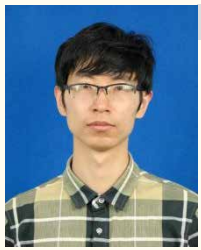
Supernovae, supernova distance scale, supernova–circumstellar medium interaction

Chakraborty, Chandrachur

KIAA Postdoc

Research interests:

General Relativity with applications to Astrophysics: High-energy astrophysical phenomena, Accretion mechanism in strong gravity, Black holes, Naked singularities, Pulsars



Du, Min（杜敏）

KIAA Postdoc

Research interests:

General Relativity with applications to Astrophysics: High-energy astrophysical phenomena, Accretion mechanism in strong gravity, Black holes, Naked singularities, Pulsars

Graham, John

KIAA Fellow

Research interests:

Gamma-Ray Bursts, Host Galaxies, Metallicity, Star Formation, Population Statistics, Transients, Supernovae, Unknown targets of opportunity, Galaxy Morphology, Astrometry, Nod & Shuffle Spectroscopy, Multiband Dichroic Imaging

Guo, Kexin（郭可欣）

KIAA Postdoc

Research interests:

galaxy formation and evolution

Guo, Jincheng（郭金承）

DoA Postdoc

Research interests:

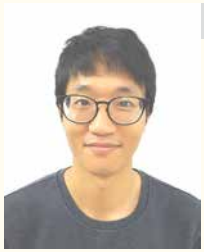
Multi-wavelength observations of compact objects, white dwarfs, debris disks, black holes, soft X-ray sources, structure and evolution of the Milky Way

Hayashi, Kohei

KIAA Fellow (until September)

Research interests:

Dark matter distribution of dwarf spheroidal galaxies, formation history of the Milky Way and its satellites, Galactic archaeology, numerical simulations



Hong, Jongsuk

KIAA Fellow

Research interests:

Stellar dynamics, globular clusters, multiple populations, gravitational waves, numerical simulations

Huang, Yang (黄样)

DoA postdoc, LAMOST Fellow

Research interests:

large-scale spectroscopic surveys, Galactic dynamics, stellar populations, stellar physics, AGN

Joshi, Ravi

KIAA Fellow

Research interests:

Galactic HII regions, embedded star clusters, triggered star formation, young stellar objects

Jose, Jessy

KIAA Postdoc (until September)

Research interests:

Galactic HII regions, embedded star clusters, triggered star formation, young stellar objects

Kim, Yonghwi

KIAA Fellow

Research interests:

galaxy formation and evolution, gas dynamics in disk galaxies and galaxy clusters, instability

Ko, Youkyung

DoA Postdoc

Research interests:

galaxy formation and evolution, globular cluster systems, merger remnant galaxies

Li ,Ye (李晔)

KIAA Fellow

Research interests:

high-energy astrophysics, Gamma-Ray Bursts, Fast Radio Bursts, Active Galactic Nuclei

Kolodzig, Alexander

KIAA Fellow (until September)

Research interests:

large-scale structure studies with active galactic nuclei, angular correlation studies of the cosmic X-ray background with Chandra and XMM–Newton surveys, and related topics

Lim, Sungsoon

DoA Postdoc

Research interests:

galaxy formation and evolution, starburst galaxies, star clusters, globular cluster systems, ultra-compact dwarf galaxies

Lin, Ming-yi (林明仪)

KIAA postdoc

Research interests:

Active galactic nuclei (AGN) and star formation, AGN feeding and feedback mechanism, gas and stars kinematics, and multi-wavelength observations

Liu, Xiangkun (刘项琨)

DoA Postdoc

Research interests:

cosmology, weak gravitational lensing, large-scale structure, numerical simulations

Longobardi, Alessia

DoA Postdoc

Research interests:

cosmology, weak gravitational lensing, large-scale structure, numerical simulations

Pattarakijwanich, Petchara

KIAA Fellow (until September)

Research interests:

Multi-wavelength modeling of stellar populations in SDSS galaxies, post-starburst quasars and their role in star-formation quenching

Randriamampandry, Toky Herimandimby

KIAA postdoc

Research interests:

dynamics and kinematics of nearby disk galaxies; Non-circular motions in barred spiral galaxies

Ricci, Claudio

Chile–China Postdoc Fellow

Research interests:

AGN

Shao, Li (邵立)

ANU–KIAA Fellow

Research interests:

Active galactic nuclei, active galaxies, galaxy evolution, star formation, infrared astronomy, high energy astronomy

Subramanian Hari Sharma, Smitha

KIAA Fellow (until September)

Research interests:

AGN and black hole masses in void galaxies, the structure of the Magellanic Clouds, Generation of the near-infrared guide-star catalog for Thirty Meter Telescope observations

Shi, Jingjing (史晶晶)

KIAA Fellow

Research interests:

Galaxy formation and evolution, numerical simulations, galaxy clustering.

Tian, Zhijia (田志佳)

DoA Postdoc

Research interests:

stellar structure and evolution; stellar oscillations; stellar populations synthesis

Wang, Shu (王舒)

KIAA Fellow

Research interests:

Interstellar UV, optical, IR extinction law and its variation with environments, Anomalous extinction and dust properties, Interstellar grain models, PAHs, sub-millimeter excess of dwarf galaxies

Kai Wang (王凯)

DoA Postdoc

Research interests:

Gamma-Ray Bursts, cosmic radiation

Xie, Yanxia (谢艳霞)

KIAA Postdoc

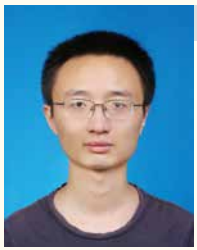
Research interests:

infrared properties and dust content in active galaxies

Yang, Xiaolong (杨小龙)

Research interests:

Active galactic nuclei, Supermassive binary black holes, Very long baseline interferometry

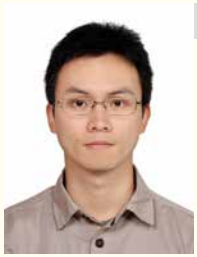


Yang, Yuanpei (杨元培)

KIAA–CAS Fellow

Research interests:

high-energy astrophysics, neutron stars, magnetars, fast radio bursts, gamma-ray bursts, electromagnetic counterparts of gravitational wave sources.



Yao, Su (姚苏)

KIAA–CAS Fellow

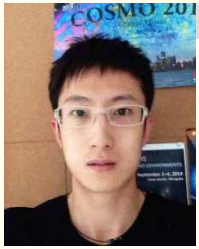
Research interests:

Active galactic nuclei, Supermassive black holes, Accretion and jets

Zhao, Dongyao (赵冬瑶)

Research interests:

galaxy morphology and decomposition; AGNs; brightest cluster galaxies (BCGs); galaxy clusters



Yu, Hao-Ran (于浩然)

KIAA–CITA Joint Postdoctoral Fellow (until June)

Research interests:

cosmology, large-scale structure, weak gravitational lensing, N-body simulations, supercomputing

Graduate students (December 2017):

- **Cao, Chunyang; 曹春洋** (class of 2016)
  PhD supervisor: Liu, Fukun
- **Cao, Rong; 曹荣** (class of 2013)
  PhD supervisor: Liu, Fukun
- **Chen, Ping; 陈平** (class of 2015)
  PhD supervisor: Dong, Subo
- **Chen, Yunfeng; 陈云峰** (class of 2012)
  PhD supervisor: Yu, Qingjuan
- **Dou, Jing; 窦晶** (class of 2015)
  PhD supervisor: Peng, Yingjie
- **Duan, Xiaowei; 段晓苇** (class of 2017)
- **Feng, Xiaotong; 冯晓瞳** (class of 2016)
  PhD supervisor: Wu, Xuebing
- **Fu, Yuming; 傅煜铭** (class of 2016)
  PhD supervisor: Wu, Xue-Bing
- **Ge Yifei, 盖逸飞** (class of 2017)
- **Gao, Hua; 高桦** (class of 2013)
  PhD supervisor: Luis Ho
- **Guo, Yanjun; 郭彦君** (class of 2014)
  PhD supervisor: Xu, Renxin
- **Guo, Yucheng; 郭昱程** (class of 2015)
  PhD supervisor: Jiang, Linhua
- **Guo, Zhen; 郭震** (class of 2012)
  PhD supervisor: Gregory Herczeg
- **Huang, Tianqi; 黄天奇** (class of 2016)
  PhD supervisor: Li, Zhuo
- **Huang, Yan; 黄艳** (class of 2015)
  PhD supervisor: Li, Zhuo
- **Jiang Jinchen; 姜金辰** (class of 2017)
- **Li, Jia-nan; 李佳男** (class of 2015)
  PhD supervisor: Wang, Ran
- **Li, Qiong; 李琼** (class of 2014)
  PhD supervisor: Wang, Ran
- **Li Yang; 李洋** (class of 2017)
- **Liu, Xunchuan; 刘训川** (class of 2015)
  PhD supervisor: Wu, Yuefang
- **Liu Yuanqi; 刘媛琪** (class of 2017)
- **Long, Feng; 龙凤** (class of 2013)
  PhD supervisor: Gregory Herczeg
- **Luo, Rui; 罗睿** (class of 2013)
  PhD supervisor: Lee, Kejia
- **Ma, Chao; 马超** (class of 2013)
  PhD supervisors: Richard de Grijs, Luis Ho
- **Ma, Qinchun; 马芹春** (class of 2015)
  PhD supervisor: Wu, Xuebing
- **Man, Zhongyi; 满中意** (class of 2015)
  PhD supervisor: Peng,Yingjie
- **Men, Yunpeng; 门云鹏** (class of 2014)
  PhD supervisor: Xu, Renxin
- **Ning, Yuanhang; 宁远航** (class of 2016)
  PhD supervisor: Jiang, Linhua

- **Ren, FangZhou; 任方舟** (class of 2015)
  PhD supervisor: Richard de Grijs
- **Shangguan, Jinyi; 上官晋沂** (class of 2012)
  PhD supervisor: Luis Ho
- **Shao, Yali; 邵亚莉** (class of 2013)
  PhD supervisor: Wang, Ran
- **Shu, Qi; 舒琦** (class of 2014)
  PhD supervisor: Rainer Spurzem
- **Sun, Ningchen; 孙宁晨** (class of 2013)
  PhD supervisor: Richard de Grijs
- **Sun, Weijia; 孙唯佳** (class of 2016)
  PhD supervisor: Richard de Grijs
- **Wang, Bitao; 汪碧涛** (class of 2015)
  PhD supervisor: Wang, Jing
- **Torres Orjelia, Alejandr; 韩德龙** (class of 2017)
- **Wang Bojun; 王铂钧** (class of 2017)
- **Wang Cha; 王超** (class of 2017)
- **Wang, Chun; 王春** (class of 2013)
  PhD supervisor: Liu, Xiaowei
- **Wang Fei; 王飞** (class of 2017)
- **Wang, Jianfeng; 王健锋** (class of 2014)
  PhD supervisor: Yu, Qingjuan
- **Wang Kaixiang; 王凯翔** (class of 2017)
- **Wang, Shu; 王澍** (class of 2014)
  PhD supervisor: Jiang, Linhua
- **Wu, Jin; 吴晋** (class of 2014)
  PhD supervisor: Jiang, Linhua
- **Wu, Junfei; 吴骏飞** (class of 2013)
  PhD supervisor: Eric Peng
- **Xia, Moran; 夏默然** (class of 2011)
  PhD supervisor: Yu, Qingjuan
- **Xie, Xiaojia; 解小佳** (class of 2014)
  PhD supervisor: Dong, Subo
- **Xu, Heng; 胥恒** (class of 2016)
  PhD supervisor: Lee, kejia
- **Xu, Ziyan; 徐紫嫣** (class of 2015)
  PhD supervisor: Gregory Herczeg
- **Yang, Qian; 杨倩** (class of 2012)
  PhD supervisor: Wu, Xue-Bing
- **Yang, Yujiao; 杨玉姣** (class of 2016)
  PhD supervisors: Deng, Licai, Richard de Grijs.
- **Yu, Niankun; 余捻坤** (class of 2016)
  PhD supervisor: Luis Ho
- **Yuan, Shuo; 袁硕** (class of 2013)
  PhD supervisor: Fan, Zuhui
- **Yu, Siyue; 余思悦** (class of 2014)
  PhD supervisor: Luis Ho
- **Zhang, Bing; 张兵** (class of 2013)
  PhD supervisor: Li, Zhuo
- **Zhang Chunfeng; 张春风** (class of 2017)
- **Zhang, Chengpeng; 张程鹏** (class of 2014)
  PhD supervisor: Peng, Yingjie
- **Zhang Lulu; 张路路** (class of 2017)
- **Zhang Meng; 张萌** (class of 2017)

- **Zhang, Xiaoyue; 张晓悦** (class of 2016)
  PhD supervisor: Fan, Zuhui
- **Zhao, Yulin; 赵玉琳** (class of 2013)
  PhD supervisor: Luis Ho
- **Zheng, Yun; 郑沄** (class of 2016)
  PhD supervisor: Wang, Jing
- **Zhou, Enping; 周恩平** (class of 2012)
  PhD supervisor: Xu, Renxin
- **Zhou Xingyu; 周星宇** (class of 2017)
- **Zhou, Zhiqin; 周智勤** (class of 2014)
  PhD supervisor: Liu, Fukun
- **Zhu Jingping; 朱锦平** (class of 2017)
- **Zhuang, Mingyang; 庄明阳** (class of 2016)
  PhD supervisor: Luis Ho

Administration and Support Staff

Jie Yao
Institute Manager

Lili Liu
Administration Assistant

Shuyan Liu
Science Secretary

Min Sun
Science Secretary

Jing Xie
Administration Assistant

Shuo Zhang
Administration Assistant

Shikai Fu
IT Manager (part-time)