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Director's Corner

E pluribus unum

From many, one. This famous Latin motto is often used as a call to unity. I think it captures well the spirit of the range of activities undertaken by KIAA during this past hectic year. With the institute more or less in a reasonable state of equilibrium after the initial period of adjustment after I arrived, I turned more attention this year to strengthen much-needed bonds with the domestic community throughout China, both with universities and institutes of the Chinese Academy of Sciences, as well as initiate new ties with regional partners in East Asia, and beyond. More than any set of academic achievements, I firmly believe that KIAA's ability to serve as a platform for communication and dialog may, in the long run, leave its most enduring, most significant impact.

We engaged the community on multiple fronts. Continuing a tradition established for some time, we kicked off 2015 with the annual gathering of "Jing Guang Xia" (universities from Beijing, Guangzhou, Guangxi, and Xiamen), hosted by Guangxi University in Nanning. It was my first time attending, and it struck me how quickly astronomy has spread to smaller universities in the country. We held a bilateral workshop with Shanghai Astronomical Observatory, a bilateral workshop with Nanjing University and Purple Mountain Observatory, and a thematic meeting with Xinjiang Astronomical Observatory on probing active galaxies with radio techniques. We spearheaded the "South China Astronomy/Astrophysics Forum" at the Hong Kong University of Science and Technology, bringing together nine universities in southern mainland China (Xiamen, Guangzhou, Zhongshan, Guangxi, and Yunnan), Hong Kong, and Macau. All who took part agreed that these initial get-togethers were worthwhile, in the hopes that collaborations may develop, and that these activities should be sustained. As our largest and most ambitious event, we hosted the 2015 annual meeting of the Chinese Astronomical Society. This was the largest Society meeting in history, with nearly 800 participants from all sectors of the astronomical community in China. The theme of the conference: "Unity… promotion of cooperation and exchange between research institutes and universities in astronomical research and personnel training." I am extremely grateful to my dedicated staff and students, who worked so hard to make this event successful. We proudly showcased the best of PKU astronomy. Lastly, we wrapped up the year with our annual KIAA/PKU Astrophysics Forum, entitled "Optical and Infrared Observational Facilities for Chinese Astronomy," one of the most urgent problems facing the future of astronomy in

China. Unlike typical meetings, this forum devoted considerable time to discussions, which were open, lively, and at times even heated, as participants expressed their views on some of the most pressing issues for the future development of optical/IR astronomy. More than just talk. I hope that concrete plans and real action will emerge from the grassroots of our community, with the guidance and support of our senior colleagues.

Apart from these domestic activities, we also took several initial steps to engage the wider international community. These ranged from participation in the East Asian Observatory; academic interactions with the network of Kavli institutions; collaborations and student exchanges with the University of California at Santa Cruz, the University of Arizona, and the University of Western Australia; and an instrumentation project for Palomar Observatory with Caltech.

Were these efforts successful? Honestly, I don't know. It's too early to tell. But at least we tried, and we tried hard. And we'll continue to do so next year, and the years to come. My message is plain, simple, and consistent: the Chinese astronomical community has many opportunities but also considerable challenges. We must be unified to maximize our strengths and mitigate our weaknesses; we must reach out to be globally integrated and internationally competitive.

All of these external activities did not leave the institute itself unattended. We continued to make steady progress in several directions, including recruitment of an excellent new faculty member (Yingjie Peng), a record number of KIAA postdoctoral fellows, and a new science secretary (Shuyan Liu). After eight years of usage, the KIAA building badly needed some freshening up, and we gave it a makeover. Our science output continues to be strong, the overall academic and social atmosphere healthy, and morale remains high.

It is easy to be complacent and self-congratulatory. Are we really doing OK? We got consistently positive feedback from the Kavli Foundation delegation that visited (President Bob Conn, Executive Vice President of Science Programs Miyoung Chun, and Science Program Officer Chris Martin), from new Peking University President Jianhua Lin and Vice President Jie Wang, as well as from our international Science Advisory Committee, which in essence served as a visiting committee, during its first formal visit to KIAA. Certainly we can still do better in some areas. However, it was very encouraging to know that we are on the right track. A newly appointed Governing Board will provide more rigorous oversight of our management and operations, as KIAA moves forward and continues to grow.

Luis C. Ho
Director, KIAA

Developments

PKU Astronomy Highlights 2015

1.Renovation of the KIAA Building: After eight years of operation, some aspects of the KIAA building required renovation and upkeep. This is especially true of the exterior paint of the building. The entire exterior of the KIAA building and some portions of its interior were renovated in late spring/early summer.

2.Visit by the Science Advisory Committee (SAC): KIAA's international SAC, chaired by Simon D. M. White, convened for the first time at KIAA on 28–29 March 2015. The SAC was presented with a detailed status update on the structure, management, finances, and strategic plan for the institute. Science highlights were presented by a representative student, postdoc, and faculty member.

3.Visit by the Kavli Foundation: In early June, KIAA hosted Kavli Foundation President Robert Conn, Executive Vice-President for Science Miyoung Chun, and Science Program Officer Christopher Martin. The Kavli delegation held various meetings with PKU officials, including with PKU President Jianhua Lin, Vice-President Jie Wang, and PKU Education Foundation Director Ya Deng, to discuss the current status and future development of KIAA.

4.Formation of the Governing Board: The Governing Board, responsible for oversight of the management and operations of KIAA, has been officially formed. The GB is co-chaired by PKU Vice-President Jie Wang and Robert E. Williams, former president of the International Astronomical Union and former director of the Space Telescope Science Institute. Other members of the Governing Board include Jiansheng Chen (Academician, PKU and NAOC), Luis C. Ho (ex *officio*; KIAA Director), Anthony N. Lasenby (Deputy Director, Kavli Institute for Cosmology, Cambridge), Simon D. M. White (Director, Max Planck Institute for Astrophysics), and Xincheng Xie (Dean, School of Physics, PKU).

5.Faculty Recruitment: After a broad international search, we recruited Yingjie Peng from Cambridge University as a new Assistant Professor at KIAA.

6.Faculty Tenure Review: Two of KIAA's faculty underwent a tenure and promotion review, following the rigorous process required by PKU.

7.Postdoc Recruitment: We recruited a record number of four new KIAA Postoctoral Fellows in 2015 (Yonghwi Kim, Alexander Kolodzig, Petchara Pattarakijwanich, and Smitha Subramanian). Several additional postdocs were hired under other funding channels.

8.KIAA–CAS Postdoctoral Fellowship: We received a special funding initiative from the Chinese Academy of Sciences to enhance collaboration between CAS and PKU. We used these funds to establish a special joint postdoctoral fellowship, to begin in 2016.

9.Visiting Scholars: We hosted a total of 48 visiting scholars from 39

institutions worldwide. We continued the Kavli Visiting Scholars program. This initiative, generously supported by special funds from the Kavli Foundation, aims to bring senior colleagues from other Kavli astrophysics institutes to stay in residence at KIAA for extended visits, to facilitate interaction and build scientific collaborations within the Kavli network.

10.Prominent Visitors: Among the many visitors we had throughout the year, particularly notable were Alex Filippenko from U. C. Berkeley (to deliver the Centennial Physics Lecture), Sandra Faber from U. C. Santa Cruz (to visit PKU Vice-President Yansong Li concerning a PKU–U. C. Santa Cruz MOU), U. C. Santa Cruz Chancellor George Blumenthal (to visit PKU President Jianhua Lin concerning the Thirty Meter Telescope and other avenues of cooperation), Nobel Laureate and Australian National University President-elect Brian Schmidt (to deliver a public lecture and to discuss possible collaborations), and Steward Observatory Director Buell Januzzi (to renew the MOU with the University of Arizona and initiate new collaborations).

11.Palomar Double Spectrograph: KIAA received special funds from PKU to lead the upgrade of the Double Spectrograph at the Palomar 5 m telescope.

12.Publications: A total of 223 papers published or accepted in refereed journals, including two in Nature (Xuebing Wu; Chengyuan Li and Richard de Grijs) and one in Science (Subo Dong).

13.Grants: A total of six new NSFC grants, including one NSFC Key Grant and two NSFC–CAS Joint Key Grants, as well as 2 Youth Thousand Talents Grants.

14.Honors and Awards: Linhua Jiang and Ran Wang received the Youth Thousand Talents Award, Xuebing Wu received the Huang Runqian prize, a newly established senior research prize of the Chinese Astronomical Society, and Douglas Lin received the Bruce Medal from the Astronomical Society of the Pacific.

15.Conferences: KIAA faculty organized a total of 14 meetings, including

- The 9th Jing–Guang–Xia Astrophysics Meeting, Nanning, 23–24 January 2015.
- Quasars and Active Galactic Nuclei over Cosmic Time, KIAA, 17–18 March 2015.
- 2015 Beijing–Nanjing Astrophysics Forum, Nanjing, 2–3 April 2015.
- 2015 KIAA–SHAO Bilateral Workshop, KIAA, Peking, 18–19 May 2015.
- Probing AGNs with Radio Techniques, Yining (Xinjiang), 21–25 May 2015.
- Black Hole Accretion and AGN Feedback, Shanghai, 1–5 June 2015.
- Xinjiang Qitai Radio Telescope Science Colloquium Series I, Ming'antu (Inner Mongolia), 2–3 July 2015.
- East Asia AGN Workshop, Changchun, 14–16 July 2015.
- Frontiers in Radio Astronomy, Guiyang, 29–31 July 2015.
- KIAA Workshop on Astroparticle Physics, 28–29 September 2015.
- Chinese Astronomical Society, Annual Meeting, PKU, Beijing, 19–21 October 2015.
- KIAA/PKU Astrophysics Forum: Optical and Infrared Observational Facilities for Chinese Astronomy, KIAA, Beijing, 16–17 November 2015.
- South China Astronomy/ Astrophysics Forum, Hong Kong, 10 December 2015.

Featured science

Pairwise velocities of merging galaxy clusters: the "El Gordo" cluster and the Sunyaev–Zel'dovich/X-ray offsets

Congyao Zhang

Clusters of galaxies, the largest virialized systems known in the Universe, are ideal laboratories to explore the nature of dark matter (DM) and the dissipative physics of baryons in dense environments. Under the current hierarchical paradigm, galaxy clusters are thought to form from accretion and mergers of small structures. Mergers of galaxy clusters, with relative velocities up to several hundred or several thousand km s^{-1}, are probably the most energetic events since the Big Bang, which re-distribute both the DM and the baryonic matter in colliding clusters on megaparsec scales.

A number of observational features indicate that some clusters are undergoing mergers or are the remnants of recent mergers, e.g., sharp X-ray surface brightness discontinuities in cluster images interpreted as shocks or "cold fronts". The distinctive features are expected to provide deep insights not only into the merging process but also into the physics of large-scale structure formation. For example, studies of the Bullet cluster (1E 0657–56) have demonstrated almost exclusively the collisionless nature of DM, and also revealed that the relative velocity (~3000 km s^{-1}) required for the merger to form the Bullet cluster may be too high to be compatible with the prediction from the Λ Cold Dark Matter (CDM) model.

ACT-CL J0102–4915 ("El Gordo"), a Bullet cluster-like cluster at a high redshift (z = 0.87), was recently discovered by the Atacama Cosmology Telescope (ACT) through its Sunyaev–Zel'dovich (SZ) effect. Multi-frequency observational follow up, including in the optical, X-ray, infrared, and radio bands, have shown that ACT-CL J0102–4915 is a rare and exceptional system, and they have suggested that it is probably undergoing a major merger with high relative velocity. For example, ACT-CL J0102–4915 is the most massive X-ray and SZ-bright cluster (~ 2×10^{15} $M_{\odot}$) at z > 0.6 discovered so far; the morphology of its X-ray emission is elongated with two extended faint tails; and the offset between its SZ and X-ray centroids is quite large (~600 kpc).

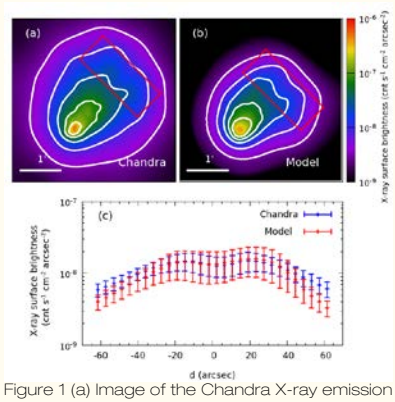


Figure 1 (a) Image of the Chandra X-ray emission of ACT-CL J0102–4915, and (b) a mock Chandra X-ray image resulting from the fiducial model. The intersections of the X-ray surface brightness distribution across the wake region in the red boxes are shown in panel (c).

To understand these distinctive observed features of "El Gordo", PhD student Congyao Zhang, Prof. Qingjuan Yu (KIAA), and Prof. Youjun Lu (NAOC, CAS) investigated the detailed merging behavior of ACT-CL J0102–4915 by performing N-body/ hydro-numerical simulations. We found that an off-axis merger can lead to a good match to various observations of ACT-CL J0102–4915, e.g., the morphology of the X-ray emission with a remarkable wake-like substructure trailing after the secondary cluster, the X-ray luminosity and the temperature distributions, and also the SZ temperature decrement (see Figure 1). The initial relative velocity required for the merger (~2500 km s^{-1}) turned out to be extremely high and rare compared with that inferred from currently available ΛCDM cosmological simulations, which raises a potential challenge to the ΛCDM model, in addition to the case of the Bullet cluster.

Regarding the challenge of the "El Gordo" and Bullet clusters to the standard ΛCDM model, the crux is to figure out the probability of high relative velocities (e.g., > 3000 km s^{-1}) of galaxy cluster mergers that has been widely discussed through cosmological simulations. However, currently there are few constraints from observations, since direct measurement of the cluster motion is difficult and the accuracy is limited by projection effects. In our study, we discussed a new method, i.e., measuring the offsets between the X-ray and the SZ-effect peaks, to provide a possible probe of the pairwise velocity distribution of galaxy clusters.

We systematically studied the spatial offsets between the maxima of the X-ray and the SZ surface brightness of the merging clusters, which are the most straightforward observational quantities and could be easily obtained in large cluster surveys. As the SZ effect and the X-ray brightness of a cluster have a different dependence on gas temperature and density distribution, the peak of the X-ray brightness is likely offset from that of the SZ effect because of the re-distribution of the gas in the cluster merging process. Recent SZ cluster surveys, including with the South Pole Telescope (SPT) and the ACT have shown a significant SZ–X-ray offset in some clusters (e.g., in the cluster "El Gordo"). From our simulations, we found that such significant SZ–X-ray offsets are mainly caused by a "jump effect" that occurs between the primary and the secondary pericentric passages of the two merging clusters. During these passages, the X-ray peak may jump to the densest gas region located near the center of the small cluster, but the SZ peak remains near the center of the large one.

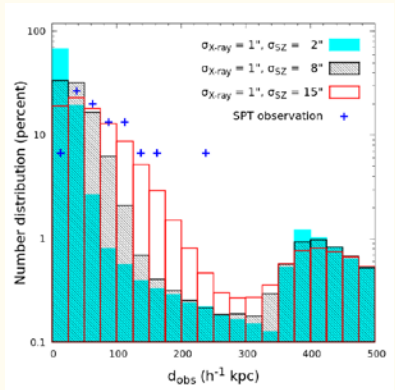


Figure 2 Observational and modeled distributions of the offsets between X-ray and SZ peaks of galaxy clusters, i.e., the percentage of the cluster number in each offset bin.

We further investigated the statistical distribution of the SZ–X-ray offset sizes and found that the number distribution of the offset sizes is bimodal with one peak located at low offsets ~ 0 and the other at large offsets ~350–450 h^{-1} kpc (see Figure 2). The distribution is sensitive to the underlying pairwise velocity distribution and the merger rate of clusters. We propose that the SZ–X-ray offsets provide a probe to the cosmic velocity fields on the cluster scale and the cluster merger rate, and future observations on the SZ–X-ray offsets for a large number of clusters (e.g., SPT-3G, eROSITA) may place strong constraints on them.

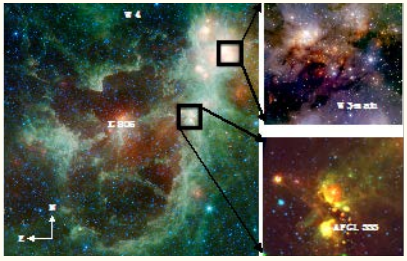
Low- and high-mass star-formation activity in the W3/W4 giant molecular cloud complex

Jessy Jose

Stars are born deep inside the densest part of interstellar gas and dust known as molecular clouds. Molecular clouds span a range of masses, with high-mass clouds containing gas as large as 1,000,000 times the mass of the Sun. High-mass stars (greater than 8 times the mass of the Sun) will likely form in high-mass clouds. The closest high-mass star-forming region to our Sun is the famous M42 region in the constellation Orion, which is located at a distance of ~1300 light-years.

Most stars form within massive star-forming regions. The hot and luminous O-type stars in massive star-forming regions influence their environments by creating HII regions, generating wind-blown bubbles, and exploding as supernovae. The presence and abundance of the short-lived radio-isotopes in the early solar nebula suggests that even our own Sun was formed in close proximity to one or more massive star(s). The feedback from massive stars can disperse a large fraction of the original molecular clouds and thus may terminate the star-formation process. On the other hand, cloud compression caused by ionization fronts and expanding wind bubbles may also trigger the formation of new generations of stars in the compressed clouds. The balance of these two opposing processes determines the global evolution, i.e., the star-formation history and the resulting star-formation efficiency of a given region. However, the physical processes involved are not yet well understood. It is still debated whether the feedback from massive stars is more important than primordial turbulence in the clouds, and the efficiency of star formation in feedback-influenced regions is still uncertain. These questions are also of fundamental importance for understanding the star-formation process in (extragalactic) starburst regions, where the number of very massive stars is much higher than in the largest Galactic star-forming regions.

One of the nearest examples of intense, massive star-forming sites in our Galaxy is W3/W4, which is a large (mass >10^5 $M_\odot$) molecular cloud complex. Located about 6,400 light-years from earth, the W3/W4 complex forms part of the Perseus spiral arm of our Milky Way Galaxy. The presence of so many massive stars in the central cluster IC 1805, with their powerful stellar winds and ionizing radiation, have blown away the nearby material and created the W4 giant bubble. The W3 giant molecular cloud is located at the western periphery of W4 and is considered a prime example of a feedback-influenced star-forming region. Most of the star formation within W3 is concentrated in three main subregions, called W3-main, W3-OH, and AFGL333. The star-formation activity within the W3/W4 complex is studied with Prof. Gregory Herczeg at Peking University, along with our collaborators at the University of Arizona (USA). We obtained deep ground-based observations in the near-infrared with the NEWFIRM instrument on the 4m Mayall Telescope



Infrared mosaic image of the W3/W4 star-forming complex taken with NASA's Wide-field Infrared Survey Explorer (WISE). Color in this image represents specific infrared wavelengths. Blue represents light emitted at 3.4 μm wavelengths and cyan (blue green) represents 4.6 μm, both of which come mainly from hot, massive stars. Relatively cooler objects, such as the dust of the nebulae, appear green and red. Green represents 12 μm light and red represents 22 μm light. W3 is located at the western periphery of W4 and two main subregions of W3 (W3-main and AFGL333) are shown in the boxes and are highlighted on the right, using images in the J, H, K bands.

(Kitt Peak National Observatory, USA) and mid-infrared observations with IRAC on the Spitzer Space Telescope to conduct a census of the young stellar content associated with the subregions of the W3/W4 complex. The young stellar members are identified based on their infrared excess emission due to the presence of circumstellar disk material around them. We identified ~800 and ~2000 candidate young stellar objects within AFGL333 and W3-main, respectively. The fraction of stars with circumstellar disks is about 50% in both regions. The average age of the regions is approximately 2–3 million years. The density structure of the molecular clouds is measured by mapping the interstellar extinction, calculated from the near-infrared colors of background stars. The combination of the gas density maps and the stellar census allows us to estimate the star-formation rate, i.e., the rate at which the diffuse molecular material is converted into stars. Our analysis shows that AFGL333 is forming stars with an efficiency of ~4–5% and at a rate of 2–3 $M_\odot$ every million year per square parsec area (2–3 $M_\odot$ Myr^{-1} pc^{-2}). In contrast, the star-formation efficiency of W3-main is ~40–45% and the star-formation rate is ~110–160 $M_\odot$ Myr^{-1} pc^{-2}, 50 times higher than that of AFGL333.

The star-formation activity within AFGL333 is comparable to that in nearby, low-mass molecular clouds, whereas W3-main is similar to a mini-starburst region, with an intense star-formation activity resulting in an exceptionally abundant production of massive stars. In W3-main, the overall gas density level is much higher, including a higher fraction of dense gas that satisfies the threshold for massive star formation. However, AFGL333 does not satisfy the gas density threshold for high-mass star formation and is forming primarily low-mass stars.

Does the stellar feedback from the massive stars in IC 1805 influence AFGL333? Since AFGL333 is closer than W3-main to IC 1805 of the W4 superbubble, our analysis shows that the feedback from massive stars of W4 might not have significantly influenced the star-formation activity within AFGL333. The results suggest that the density structure, particularly the dense gas fraction of molecular clouds, play a key role in determining their star-forming properties. We are involved in further analysis of a large sample of externally influenced regions in order to strengthen the hypothesis as to whether stellar feedback measurably affects the star-formation process in massive star-forming regions.

We are also working on the star–disk interaction of young stellar objects, which is a PhD project of our group member Zhen Guo. Using spectroscopic observations of more than 40 classical T Tauri stars, we are trying to map the inner disk structure, as well as the accretion variability of young stellar objects. This is supplemented with long-term multi-band photometric monitoring of two potential young sources that are undergoing periodic dimming events owing to the presence of a disk asymmetry. This work will strongly contribute to the understanding of inner disk structure of accreting young systems.

Discovering the most luminous object with the most massive black hole in the early Universe

Xue-Bing Wu

Based on initial observations with a domestic telescope and follow-up observations using several telescopes outside China, an international team led by Prof. Xue-Bing WU from Peking University announced the discovery of an ultra-luminous object containing the most massive black hole in the early Universe. It is located at a distance of 12.8 billion light-years from the Earth, and has a power that is 430 trillion times greater than the power of the Sun.

In the center of this object, there is a giant black hole with a mass of 12 billion solar masses. The paper was published in Nature on 26 February 2015 and was highlighted as one of the four papers on the issue's cover. *Nature* issued a press release entitled "Young black hole had monstrous growth spurt" on 25 February 2015 and invited a German scientist to write a *News and Views* article, "Young black hole had monstrous growth spurt" in the same issue to introduce the discovery. Hundreds of news media, including *CNN, Time,* the *Washington Post,* the *LA Times, National Geographic, Discovery Channel,* and *Scientific American* in the USA, *Reuters* and the *Guardian* in the UK, *Der Spiegel* and *Bild* in *Germany,* as well as *CCTV, Xinhua Net*, the *People's Daily, Guangming Daily, China Daily,* and *China Science Daily,* all reported this discovery as important news.

This object belongs to a class of quasars, which look very similar to the stars in our Milky Way in optical morphology, but are actually very distant and luminous objects. Their huge power comes from the released gravitational energy of the matter surrounding the massive black holes in the centers of quasars. In recent years, a team led by Prof. Wu has developed a new method to select candidates of quasars with redshifts greater than 5 based on optical and infrared photometric data and discovered many high-redshift quasars using spectroscopic observations with several telescopes. Among them, SDSS J0100+2802, is the quasar with the highest redshift in their program. The first spectrum of it was taken on 29 December 2013 with the 2.4m Lijiang telescope of Yunnan Observatory, Chinese Academy of Sciences, and it was identified as a

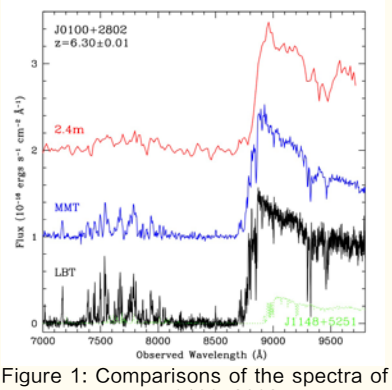


Figure 1: Comparisons of the spectra of the new quasar, J0100+2802, taken with the 2.4m Lijiang telescope at Yunnan Observatory, the MMT, and the LBT, with the spectrum of the most luminous high-redshift quasar previously known, J1148+5251 (the spectra of the 2.4m and the MMT have been shifted up by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

quasar at a redshift higher than 6.2. Follow-up observations done with the *MMT*, the Large Binocular Telescope *(LBT)*, and the *Gemini* and *Magellan* telescopes (outside China) confirmed that it is a quasar at a redshift of 6.30. Using spectroscopic data, the team estimated that the luminosity of this new quasar is 430 trillion times greater than the solar luminosity and seven times higher than the luminosity of the most distant quasar (at a distance of 13 billion light-years from the Earth). The central black hole mass was estimated at 12 billion solar masses, making it the most luminous quasar with the most massive black hole in the early Universe. The discovery of this ultra-luminous object provides us with a unique chance to study the structure of the early Universe. The existence of such a black hole with a mass of 12 billion solar masses at redshift 6.3 presents challenges to theories of black hole formation and growth and the evolution of galaxies in the early Universe.

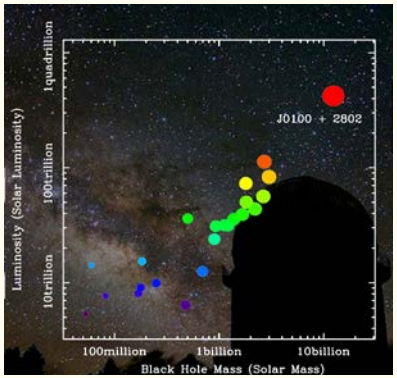


Figure 2: Comparison of the black hole mass and luminosity of the new quasar, J0100+2802, with those of other, previously known z > 5.7 quasars (the background photo is the 2.4 m Lijiang telescope dome and the sky at that location).

This work was supported by NSFC key and general grants, the pilot-B program of the Chinese Academy of Sciences, and the 973 program of the Ministry of Science and Technology in China.

Peking University astronomy in the news

1 June 2015

On 1 June 2015, the *People's Daily* published an article entitled *"They are listening to the breath of the Universe,"* based on interviews with eight astronomers at the KIAA and the Department of Astronomy on May 27th. Astronomy is still a 'cold' discipline in China; only a few universities have astronomy departments. However, Chinese astronomy has been growing rapidly in the last few years. The recent achievements made by PKU astronomers have attracted a lot of attention from the news media, including the *People's Daily,* the most authoritative newspaper in China.

KIAA Director, Luis Ho, briefly introduced KIAA and explained the importance of international collaborations in observational astronomy. DoA Chairman, Fukun Liu, gave an example of doing creative research from his work on supermassive black hole binaries. Two KIAA astronomers, Xuebing Wu and Linhua Jiang, described the advantages of PKU in training the next generation of scientists. Haibo Yuan, Xuebing Wu and a PhD student, Chengyuan Li, explained the importance of astronomy in developing science and technology, which are seldom realized by other disciplines.

10 July 2015

Douglas N. C. Lin, Founding Director of KIAA, Awarded the Catherine Wolfe Bruce Gold Medal by the Astronomical Society of the Pacific

Douglas N. C. Lin, Professor of Astronomy and Astrophysics at the University of California Santa Cruz and Director Emeritus of KIAA (2007–2011), has been awarded the prestigious Catherine Wolfe Bruce Gold Medal by the Astronomical Society of the Pacific (ASP), one of the oldest and most respected science education organizations in the U.S. The Bruce Medal, the highest award given by the ASP, recognizes lifetime outstanding achievement in research in astronomy.

Quoting from the press release by the ASP, Professor Lin "is recognized for his significant and seminal achievements in a variety of domains, including the orbital motion of the Magellanic Clouds, the formation and evolution of exoplanets, the physics of cataclysmic variables and accretion disks, and the dynamics, structure, and evolution of Saturn's Rings.

Professor Lin has made major contributions to our understanding of the dynamics of the Magellanic Clouds within our Galaxy's dark halo—a campaign that Dr. Lin was the driving force on for decades. His writing on the subject remains a classic reference and his study of dark matter in dwarf spheroidal galaxies started a new subfield.

Professor Lin has also investigated the evolution of planetary systems and is responsible for the models that help interpret the findings from exoplanet studies. Shortly after the discovery of a 'hot Jupiter' in 51 Pegasus, Professor Lin wrote the seminal paper on how these objects could have obtained such close proximity to their host star."

https://www.astrosociety.org/society-news/the-astronomical-society-of-the-pacific-honors-dr-douglas-n-c-lin-with-its-prestigious-catherine-wolfe-bruce-gold-medal/

de Grijs, Richard:

◆ An in-depth interview with Richard de Grijs appeared in the EURAXESS (Researchers in Motion) Newsletter, June 2015 (No. 62, p. 9) – http://ec.europa.eu/euraxess/index.cfm/links/singleNews/49594

◆ A second in-depth interview appeared in Future Magazine, November 2015, p. 29–31: "A Dialogue with a Dutch Professor of Astronomy at Peking University; 推进中国天文学研究国际化，对话北大荷兰籍教授何锐思 Richard de Grijs" – http://future360.com.cn/post/12279

◆ Richard de Grijs was interviewed on 11 May 2015 by CCTV America for a news item on the process to obtain Chinese permanent residency (a "green card"). The interview was aired on 1 June 2015 – http://www.cctv-america.com/2015/06/01/expanding-residency-rights-for-foreign-workers-in-china

Ho, Luis:

◆ Interview by New York Times writer Claudia Dreifus, in her column "Conversations With", in an article entitled "Luis Ho Pushes China Into World Astronomy Club," published on 1 December 2015: http://www.nytimes.com/2015/12/01/science/luis-ho-pushes-china-into-world-astronomy-club.html?_r=0


SCIENCE

Luis Ho Pushes China Into World Astronomy Club

Luis Ho, 48, is the director of the Kavli Institute for Astronomy and Astrophysics and a professor at Peking University in Beijing. As an American researcher who has worked for more than two years in China, he has a unique perspective on the country's scientific ambitions.

Dr. Ho is on leave from Carnegie Observatories in Pasadena, Calif. We spoke for nearly three hours this summer at his office there – it once

Jiang, Linhua:

◆ Featured in Scientific Chinese, in press

Kouwenhoven, M. B. N. (Thijs):

◆ Thijs Kouwenhoven was interviewed by Taiwan Want Want Group Television on 18 September 2015 on the theme "Great Dreams in Chinese Universities."

Wu, Xue-Bing:

KIAA Scientists Discover the Most Luminous Quasar with an Ultramassive Black Hole in the Distant Universe

Press coverage: More than 400 domestic press items appeared (including by CCTV, Xinhua News, People's Daily, Guangming Daily, China Daily, and China Science Daily) and more than 500 international stories covered this research (including CNN, Time, Washington Post, LA Times, National Geographic, Discovery Channel, Scientific American in the USA, Nature, Reuters, and the Guardian in the UK, and der Spiegel and Bild in Germany).

Figure 1: Artist's impression of a quasar with a supermassive black hole in the distant Universe. (Credits: Zhaoyu Li. The background images are from NASA/JPL–Caltech and Misti Mountain Observatory.)

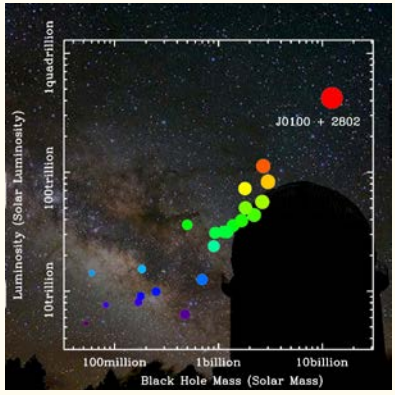


Figure 2: The newly discovered quasar SDSS J0100+2802 harbors the most massive black hole and has the highest luminosity of all known distant quasars (Credits: Zhaoyu Li. The background photo, provided by Yunnan Observatories, shows the dome of the 2.4meter Lijiang Telescope and the local sky.)

Liu, Fukun:

◆ Feature in the bi-monthly magazine The World of Chinese, vol. 50 (16 March 2015): Physics Fever: Binary Black Holes; http://www.theworldofchinese.com/2015/03/physics-fever-binary-black-holes/

Spurzem, Rainer and Wang, Long:

◆ Rainer Spurzem and Wang Long were interviewed about the DRAGON project (http://silkroad.bao.ac.cn/dragon/index.html)

Wu, Yuefang:

◆ News item on New research progress on outflows and inflows in the Orion KL region, covered by Shanghai Astronomical Observatory's Scientific Progress updates (http://english.shao.cas.cn/rh/scientific/)

Yu, Hao-Ran and Yuan, Shuo:

◆ News item on CCTV-13 (13 May 2015): Chinese scientists successfully run the world's largest N-body simulation on the world's number 1 "Tianhe-2" supercomputer, simulating dark matter and neutrinos over the 13.7-billion-year evolution of the Universe – http://news.cntv.cn/2015/05/13/VIDE1431504362887543.shtml

This story was also covered by RenMin Daily (人民日报), China Science Daily (中国科学报), Science and Technology Daily (科技日报), JieFangJun Daily (解放军报), Guangming Daily (光明日报), and numerous other major newspapers.

Additional coverage:

-http://news.sciencenet.cn/htmlnews/2015/5/319105.shtm

-http://news.xinhuanet.com/2015-05/13/c_1115275115.htm

-http://news.ifeng.com/a/20150516/43768652_0.shtml

-http://military.people.com.cn/n/2015/0514/c1011-26998593.html?t=1431702212002

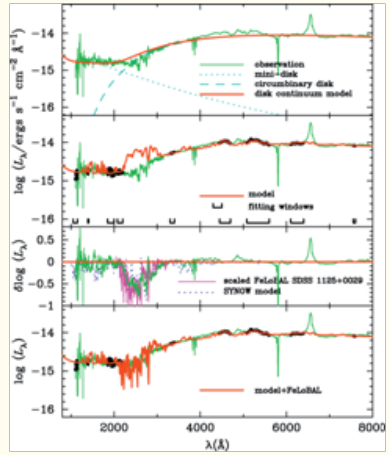
Yu, Qingjuan:

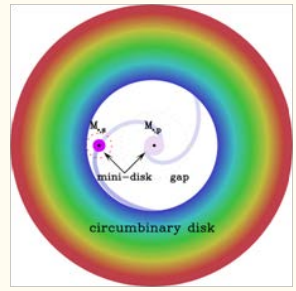
Discovery of a massive binary black hole in the nearest quasar

Prof. Qingjuan Yu and her collaborators (Youjun Lu, Changshuo Yan, and Xinyu Dai) discovered a

massive binary black hole (BBH) hiding in the nearest quasar, Markarian 231. This work was published in The Astrophysical Journal. They investigated the optical–ultraviolet continuum spectrum from the core of Markarian 231 and found that the "surprising and extreme feature," a deficit, in the optical to ultraviolet continuum of Markarian 231, can be explained well by a model involving a massive BBH. Their research paves the way to systematically search for BBHs based on their ultraviolet light emission. Discoveries of massive black holes in the Universe will provide important implications for our understanding of hierarchical structure formation and the evolution of the Universe, black hole physics, the detection of gravitational wave radiation, etc.

The best explanation of the observational deficit in the optical to UV spectrum is that the center of the accretion disk, which is expected to glow in UV light, is carved out by the action of two black holes orbiting each other. The small black hole orbits at the inner edge of the accretion disk and has its own mini-disk with UV glow. The central BH is estimated to be 150 million solar masses, and the companion weighs in at 4 million solar masses. The dynamic duo completes an orbit around each other every 1.2 years, with a separation of only ~590 AU (2.9 mpc). The BBH is predicted to spiral in together and collide within a few hundred thousand years.





Top: Observational and model spectra of Mrk 231
Bottom: Schematic diagram of a BBH - disk accretion system.

Selected press coverage:

-Hubble Space Telescope news center: http://hubblesite.org/news/2015/31

-American Astronomical Society Nova: http://aasnova.org/2015/08/24/hidden-pair-of-supermassive-black-holes/

-CNN: http://www.cnn.com/2015/08/31/us/double-black-hole-nasa-hubble-feat/

-China Daily: http://www.chinadaily.com.cn/micro-reading/dzh/2015-09-02/content_14155785.html

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. These range from formal occasions such as the weekly PKU astronomy colloquia and a small number of focused internal and external workshops and conferences held throughout the year (including the annual PKU astronomy postdoc day, spearheaded by Thijs *Kouwenhoven*), to the more informal Monday lunch talks, the Tuesday pizza lunches organized by our active postdoctoral researchers, Thursday morning astrocoffee discussions, and "Happy Hours" on Friday afternoons.

Peking University astronomy colloquia

◆ 15 January 2015: **Junfeng Wang** (Xiamen University, China), *The Local Universe with High Resolution X-ray Imaging: From Galactic Massive Star Forming Regions to Nearby Active Galaxies*

◆ 19 January 2015: **Liubin Pan** (Harvard–Smithsonian Center for Astrophysics, USA), *Turbulence-induced collision velocity of dust particles*

◆ 21 January 2015: **Haibo Yuan** (KIAA/PKU, Beijing, China), *Galactic Tomography with the LAMOST and SDSS*

◆ 5 March 2015: **Xuebing Wu** (KIAA/Department of Astronomy, Peking University, China), *An Ultra-luminous Quasar with Most Massive Black Hole in the Distant Universe*

◆ 12 March 2015: **Yong Shi** (Nanjing University, China), *Star formation law of nearby galaxies*

◆ 19 March 2015: **Fabian Walter** (Max Planck Institute for Astronomy, Germany), *What drives the Star Formation History of the Universe?*

◆ 26 March 2015: **Hsiao-Wen Chen** (University of Chicago/KICP, USA), *Characterizing Circumgalactic Gas with Absorption Spectroscopy*

◆ 30 March 2015: **Tom Abel** (Stanford University/KIPAC, USA), *Dark Matter Dynamics*

◆ 9 April 2015: **Zhongxiang Wang** (Shanghai Astronomical Observatory, Shanghai, China), *Millisecond pulsar binaries at transition*

◆ 16 April 2015: **Michael Ireland** (Australian National University, Canberra, Australia), *Probing Planetary Formation at the Angular Resolution Frontier*

◆ 23 April 2015: **Di Li** (National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China), *A Scheme for Star Formation — Molecules, Cores, Filaments, and Psychology*

◆ 30 April 2015: **Doug Johnstone** (National Research Council Canada – Herzberg Astronomy and Astrophysics, Canada), *The Evolution of Star-Forming Cores in Molecular Clouds: Using Theoretical Models to Inform Observations*

◆ 7 May 2015: **Alex Filippenko** (University of California at Berkeley, USA), *The Lick Observatory Supernova Search with the Katzman Automatic Imaging Telescope*

◆ 14 May 2015: **Xi Kang** (Purple Mountain Observatory, Nanjing, China), *Modeling galaxy formation and distribution*

◆ 21 May 2015: **Alberto Rebassa-Mansergas** (KIAA/PKU, Beijing, China), *White dwarfs: intrinsic properties and applications*

◆ 28 May 2015: **Jiangpei Dou** (NAOC/NIAOT, China), *Direct Imaging Research of Exoplanets with Current Middle-sized Telescopes and Future Projects*

◆ 4 June 2015: **Qi Guo** (National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China), *Galaxy formation in the cosmological context*

◆ 8 June 2015: **Ramesh Narayan** (Harvard University, USA), *Numerical Simulations of Black Hole Accretion*

◆ 11 June 2015: **Baitian (Patrick) Tang** (Washington State University, USA), *Investigating [X/Fe], IMF and Compositeness in Integrated Models*

◆ 18 June 2015: **Jianning Fu** (Beijing Normal University, China), *High duty-cycle time-series photometric observations in multiple colors for asteroseismology from Dome A, Antarctica*

◆ 9 July 2015: **Xuening Bai** (Harvard–Smithsonian Center for Astrophysics, USA), Cosmic-ray Streaming Instabilities using MHD-Particle-in-Cell Method

◆ 23 July 2015: **Jing Wang** (Australia Telescope National Facility, Australia), *Footprints of gas accretion in low redshift massive galaxies*

◆ 10 September 2015: **Lister Staveley-Smith** (ICRAR/ University of Western Australia, Australia), *Recent Results from the Australian SKA Site*

◆ 17 September 2015: **Bo Qin** (National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China), *Preparing for the SKA*

◆ 21 September 2015: **Angela Olinto** (University of Chicago/KICP, USA), *The High Energy Astroparticle Physics Frontier*

◆ 8 October 2015: **Haining Li** (National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China), *Searching for chemical relics of the first stars with LAMOST*

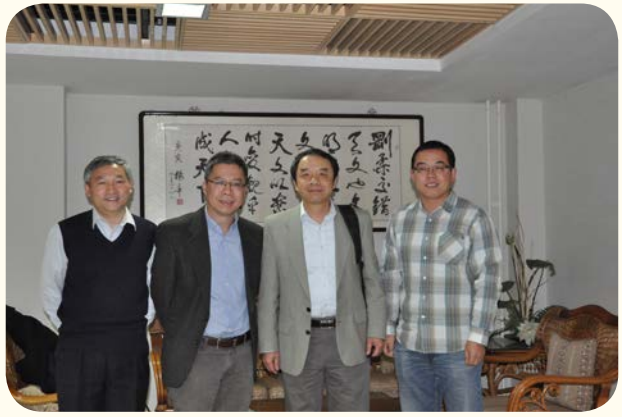
◆ 15 October 2015: **Noriyuki Matsunaga** (University of Tokyo, Japan), *Infrared photometric/spectroscopic observations of Cepheid variable stars as tracers of the Milky Way*

◆ 22 October 2015: **Jarah Evslin** (Institute of Modern Physics, Chinese Academy of Sciences, Lanzhou, China), *Giant Monopoles as a Dark Matter Candidate*

◆ 29 October 2015: **Roberto Maiolino** (University of Cambridge, UK), *AGN-driven outflows, stellar feedback and strangulation: the multiple routes to quench star formation*

◆ 5 November 2015: **Fazeel Mahmood Khan** (Institute of Space Technology, Islamabad, Pakistan), *Supermassive Black Hole Binary Evolution in Galaxy Mergers – A stellar dynamical perspective*

◆ 12 November 2015: **Fulai Guo** (Shanghai Astronomical Observatory, Shanghai, China), *The Physics and Roles of Black Holes and Cosmic Rays in Cosmic Structure Evolution*



◆ 19 November 2015: **Yifang Wang** (Institute for High-Energy Physics, Beijing, China), *Neutrino Oscillations: Past, Present and Future*

◆ 26 November 2015: **Youjun Lu** (National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China), *Supermassive binary black holes in Active Galactic Nuclei: theoretical and observational perspectives*

◆ 3 December 2015: **Yohai Meiron** (KIAA/PKU, Beijing, China), *Interaction of stars with discs around AGNs*

◆ 10 December 2015: **Ondrej Pejcha** (Princeton University, USA), *Landscape of the Core-Collapse Supernova Explosions*

◆ 17 December 2015: **Gayoung Chon** (Max-Planck-Institüt für Extraterrestrische Physik, Germany), *Cosmological studies with the REFLEX cluster survey*

Lunch talks

◆ 5 January 2015: **Kuo Liu** (Max-Planck-Institüt für Radioastronomie, Germany), *Large European Array of Pulsars*

◆ 16 January 2015: **Fuyan Bian** (Australian National University, Canberra, Australia), *Local Analogs of High-redshift Galaxies: Resembling the Physical* Conditions of Interstellar Medium in *High-redshift Galaxies.*

◆ 4 March 2015: **Ji Wang** (Yale University, USA), *Planet Formation in Different Environments*

◆ 6 March 2015: **Shuo Zhang** (Columbia Astrophysics Laboratory, USA), *Investigating the Physics of Hard X-ray Outbursts from the Galactic Center's Supermassive Black Hole Sagittarius A* with NuSTAR*

◆ 9 March 2015: **Lijing Shao** (School of Physics, Peking University, Beijing, China), *Testing Spacetime Symmetries with Radio Pulsars*

◆ 11 March 2015: **Z. Lucas Uhm** (KIAA/PKU, Beijing, China), *The Physics of Gamma-ray Burst Prompt Emission and Afterglow*

◆ 30 March 2015: **Fred K. Y. Lo** (National Radio Astronomy Observatory, USA), *Mega-maser Cosmology Project: Hubble Constant, M– σ relationship and Accretion Disks*

◆ 17 April 2015: **Alexander Zakharov** (Institute of Theoretical and Experimental Physics, Russia), *The Galactic Center as a unique laboratory for a new physics*

◆ 6 May 2015: **Ryan Shannon** (CSIRO, Australia), *Cosmological applications of pulsars: Gravitational waves and fast-radio bursts*

◆ 8 May 2015: **Mark A. Thompson** (University of Hertfordshire, UK), *Needles in a haystack of galaxies: searching for debris disks in wide area extragalactic surveys*

◆ 11 May 2015: **R.T. Gangadhara** (Indian Institute of Astrophysics, Bangalore, India), *Influence of Perturbations on Pulsar Radio Emission*

◆ 13 May 2015: **Hsiang-Kuang Chang** (National Tsinghua University, Taiwan), *The Compton Spectrometer and Imager (COSI) Project*

◆ 22 May 2015: **May Chiao** (Nature Physics), *How to get published in Nature Physics*

◆ 17 June 2015: **Ye Li** (University of Nevada, USA), *Can life survive Gamma-Ray Bursts in the high-redshift Universe?*

◆ 19 June 2015: **Yu Lu** (Carnegie Observatories, USA), *Revealing the mysteries behind galaxy formation feedback using Bayesian computation and back-of-the-envelope calculation*

◆ 31 July 2015: **Chin-Fei Lee** (ASIAA, Taiwan), *The early phase of star formation: Disk and Jet formation*

◆ 2 September 2015: **Liuyi Pei** (University of California, Irvine, USA), *Investigating Properties of AGNs Through Multi-wavelength Reverberation Mapping*

◆ 9 September 2015: **Xiaping Tang** (University of Virginia, USA), *Gamma-ray emission from supernova remnants interacting with molecular clumps*

◆ 22 September 2015: **Wei Deng** (University of Nevada, USA), *MHD simulations of collision-induced magnetic reconnection in Poynting-flux-dominated jets and interpretation to the polarization observations of GRBs and blazar flares*

◆ 24 September 2015: **Xian Chen** (Pontificia Universidad Católica, Chile), *The gamma-ray afterglow of tidal disruption events*

◆ 12 October 2015: **Guangxing Li** (Max-Planck-Institut für Astrophysik, Germany), *What is gravity doing in star-forming regions? An observational view*

◆ 13 October 2015**: Shuo Kong** (University of Florida, USA), *The Deuteration Clock for Massive starless Cores*

◆ 14 October 2015, **Xun Shi** (Max-Planck-Institut für Astrophysik, Germany), *Non-thermal pressure in galaxy clusters: what astrophysics can do for cosmology and vice versa*

◆ 26 October 2015: **Zhiqi Huang (**CITA, University of Toronto, Canada), *σ8 tension and Horndeski Gravity*

◆ 28 October 2015: **Alain Omont** (Institute

d'Astrophysique de Paris, France), *H2O in Herschel high-z galaxies, a new diagnosis of their dense cores*

◆ 2 November 2015: **Buell Jannuzi** (Steward Observatory, University of Arizona, USA), *The University of Arizona and the Next Generation of Astronomical Observatories*

◆ 20 November 2015: **Kenneth Wong** (ASIAA, Taiwan), *The Innermost Mass Distribution of the Gravitational Lens SDP.81 from ALMA Observations*

◆ 23 November 2015: **Jihye Shin** (KIAA/PKU, Beijing, China), *Hydrodynamic Simulations of the Central Molecular Zone with a Realistic Galactic Potential*

◆ 1 December 2015: **Nami Mowlavi** (Geneva Observatory, Switzerland), *The Gaia mission*

◆ 4 December 2015, **Yanbin Yang** (Observatoire de Paris, France), *The Magellanic Stream: "Ram pressure plus collision" scenario*

◆ 9 December 2015: **Areg Mickaelian** (Byurakan Astrophysical Observatory, Armenia), *Active galaxies among X-ray, IR, and radio sources*

◆ 11 December 2015: **Christian Henkel** (Max-Planck Institute for Radio Astronomy, Bonn, Germany), *Kinetic Temperatures of Molecular Gas: The Galactic Center Region*

◆ 21 December 2015: **Xiaoting Fu** (SISSA, Italy), *Lithium evolution from pre-main sequence to the Spite plateau: An environmental solution to the cosmological lithium problem*

◆ 28 December 2015: **Enping Zhou** (Peking University, Beijing, China), *Relativistic deformability of compact stars*

Tuesday pizza lunch talks

(Pizza lunch speakers are usually local scientists, unless otherwise stated.)

◆ 13 January 2015: **Daniel Fabrycky** (University of Chicago, USA), *Circumbinary Planets*

◆ 27 January 2015: **Yohai Meiron**, *Mars*

◆ 27 March 2015: **Hsiao-Wen Chen** (University of Chicago, USA), *Mining the SDSS spectroscopic archive*

◆ 14 April 2015: **Haoran Yu**, *Cosmic velocity field*

◆ 29 April 2015: **Doug Johnstone** (National Research Council – Herzberg Astronomy and Astrophysics, Canada), *From Cloud Cores to Protostars (Facts, Fiction, and Speculation)*

◆ 12 May 2015: **James Taylor** (University of Waterloo, Canada), *The Efficiency of Galaxy Formation on the Smallest Scales: Lessons from Virgo*

◆ 26 May 2015: **Song Huang** (Kavli IPMU, University of Tokyo, Japan), *Hyper-Suprime Camera Survey: Trailer and the First Year*

◆ 16 June 2015: **Stephen Justham** (National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China), *Escaping the explosion: understanding fast and slow runaways from Type Ia supernovae*

◆ 30 June 2015: **Thijs Kouwenhoven**, *Volcanism on Venus*

◆ 26 August 2015: **Yan-Fei Jiang** (Harvard–Smithsonian Center for Astrophysics, USA), *How do massive stars get their super-Eddington luminosity?*

◆ 30 October 2015: **Youjun Lu** (National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China), *Radiative efficiency of quasars*

◆ 10 November 2015: **Chao Liu** (National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China), *The secular evolution of the Milky Way disk*

◆ 24 November 2015: **Petchara Pattarakijwanich**, *Large Surveys in Astronomy (with Particular Focus on SDSS and LSST)*

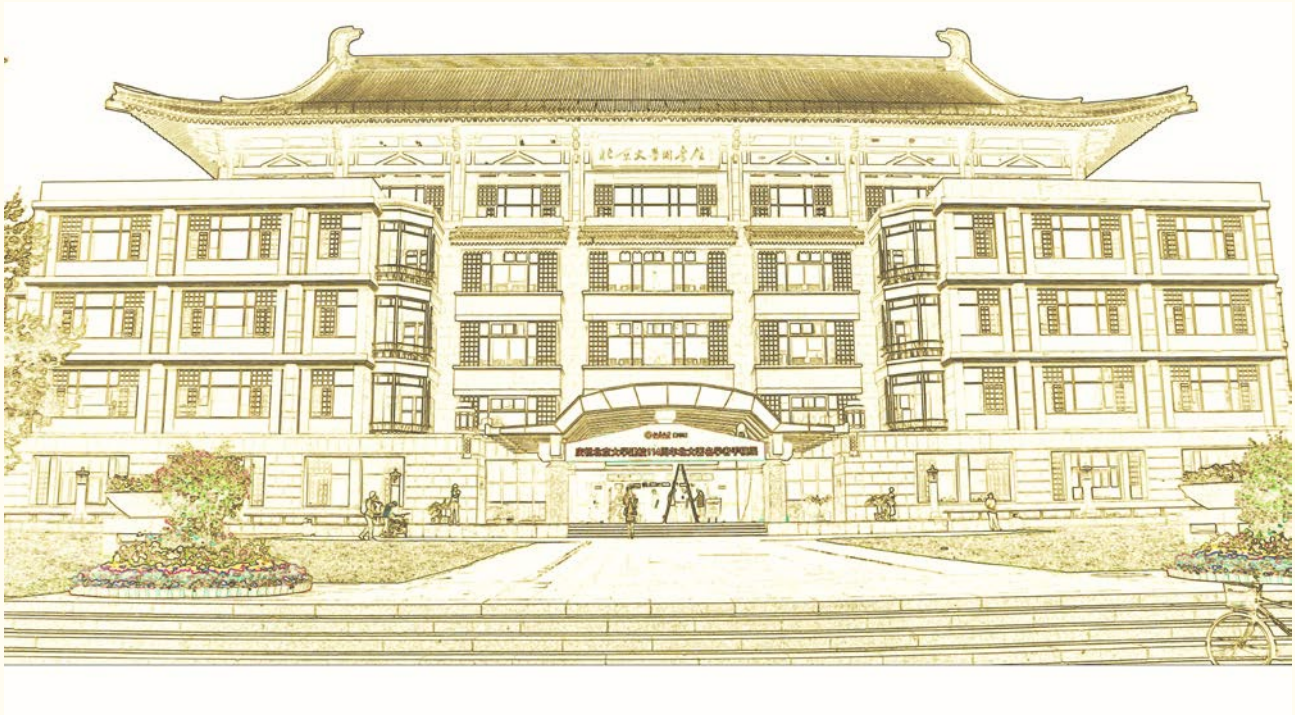
◆ 2 December 2015: **Alexander Kolodzig**, *Past and future X-ray surveys – A brief and biased overview*

◆ 8 December 2015: **Sungsoon Lim**, *The first instruments of TMT and GMT*

◆ 15 December 2015: **Michael Anthony Gully-Santiago**, Inference techniques for stellar spectroscopy

◆ 22 December 2015: **Zhijia Tian**, *Ground-based and Space Missions for Asteroseismology*

◆ 29 December 2015: **Jessy Jose**, *Filamentary structures in the ISM – The Herschel view*



Graduate student Monday dinner talks

◆ 12 January 2015: **Ming Yang** (Nanjing University, China), *Eclipsing Binaries From the CSTAR Project at Dome A, Antarctica*

◆ 19 January 2015: **Beibei Liu**, *Migration and Growth of Embryos in Protoplanetary Disks*

◆ 31 August 2015: **Yangwei Zhang** (Yunnan Astronomical Observatory, Kunming, China), *The Systematic Search of Dual AGN and As Probe to Study the Coevolution Between Host Galaxy and Black Hole*

◆ 7 September 2015: **Jiayi Sun** (Tsinghua University, Beijing, China), *A Comprehensive Inspection of an AGN/Host Spectral Decomposition Technique*

◆ 14 September 2015: **Yiming Hu** (Glasgow University, UK), *Bayesian Inference in Gravitational Wave Data Analysis*

◆ 21 September 2015: **Yong Zheng** (Columbia University, USA), *Gas Kinematics in A Galaxy's Circumgalactic Medium (CGM): Simulations and Observations*

◆ 2 November 2015: **Sarah Bird** (Shanghai Astronomical Observatory, Shanghai, China), *Dynamical and Chemical Structure of Galactic Halos*

◆ 11 November 2015: **Matthias Kühtreiber** (University of Vienna, Austria), *Simulating the Chemo-Dynamical Evolution of Dwarf-Galaxy Discs*

◆ 18 November 2015: **Petchara Pattarakijwanich**, *Modeling Stellar Populations From Multi-wavelength Galaxy SEDs*

◆ 23 November 2015: **Rui She** (Tsinghua University, Beijing, China), *A Chandra Archive Survey of AGNs in Nearby Galaxies*

◆ 30 November 2015: **Michael Gully-Santiago**, *Modern Resources for Data Science in Astronomy*

◆ 7 December 2015: **Yang Huang**, *Studying the Kinematics and Chemical Evolution of the Milky Way Using LSS–GAC Data*

◆ 14 December 2015: **Smitha Subramanian**, *The Disk of the Small Magellanic Cloud as Traced By Cepheids*

21 December 2015: **Yonghwi Kim**, *Gaseous structures and mass drift in spiral galaxies*

Peer-reviewed publications

Articles in peer-reviewed journals published or accepted for publication in 2015 by members of the Peking University astronomy community

1. **Ai Y.L., Wu X.-B., Yang J., Yang Q., Wang F., Guo R.,** Zuo W., **Dong X**., Zhang Y.-X., Yuan H.-L., Song Y.-H., Wang J., Dong X., Yang M., Wu H., Shen S.-Y., Shi J.-R., He B.-L., Lei Y.-J., Li Y.-B., Luo A.-L., Zhao Y.-H., Zhang H.-T., 2015, The Large Sky Area Multi-Object Fiber Spectroscopic Telescope Quasar Survey: Quasar Properties from the First Data Release, AJ, in press (arXiv:1511.01647)
2. Alam S., for the SDSS collaboration (incl. **Jiang L**.), 2015, The Eleventh and Twelfth Data Releases of the Sloan Digital Sky Survey: Final Data from SDSS-III, ApJS, 219, 12
3. Ardila D.R., Johns-Krull C., **Herczeg G.J.**, Mathieu R.D., Quijano-Vodniza A., 2015, Magnetospheric Accretion in Close Pre-main-sequence Binaries, ApJ, 811, 131
4. Babak S., Petiteau A., Sesana A., Brem P., Rosado P.A., Taylor S.R., Lassus A., Hessels J.W.T., Bassa C.G., Burgay M., Caballero R.N., Champion D.J., Cognard I., Desvignes G., Gair J.R., Guillemot L., Janssen G.H., Karuppusamy R., Kramer M., Lazarus P., **Lee K.J.,** Lentati L., Liu K., Mingarelli C.M.F., Osłowski S., Perrodin D., Possenti A., Purver M.B., Sanidas S., Smits R., Stappers B., Theureau G., Tiburzi C., van Haasteren R., Vecchio A., Verbiest J.P.W., 2015, European Pulsar Timing Array Limits on Continuous Gravitational Waves from Individual Supermassive Black Hole Binaries, MNRAS, 455, 1665
5. Bennett D.P., Bhattacharya A., Anderson J., Bond I.A., Anderson N., Barry R., Batista V., Beaulieu J.-P., DePoy D.L., **Dong S.,** Gaudi B.S., Gilbert E., Gould A., Pfeifle R., Pogge R.W., Suzuki D., Terry S., Udalski A., 2015, Confirmation of the Planetary Microlensing Signal and Star and Planet Mass Determinations for Event OGLE-2005-BLG-169, ApJ, 808, 169
6. Bialas D., Lisker T., Olczak C., **Spurzem R.,** Kotulla R., 2015, On the occurrence of galaxy harassment, A&A, 576, A103
7. Bian F., Stark D.P., Fan X., **Jiang L.,** Clement B., Egami E., Frye B., Green R.F., McGreer I.D., Cai Z., 2015, LBT/LUCI Spectroscopic Observations of z ~ 7 Galaxies, ApJ, 806, 108
8. Bowler B.P., Andrews S.M., Kraus A.L., Ireland M.J., **Herczeg G.J.,** Ricci L., Carpenter J., Brown M.E., 2015, An ALMA Constraint on the GSC 6214–210 B Circum-substellar Accretion Disk Mass, ApJL, 805, L17
9. Bowler B.P., Shkolnik E.L., Liu M.C., Schlieder J.E.; Mann A.W.; Dupuy T.J., Hinkley S., Crepp J.R., Johnson J.A., Howard A.W., Flagg L., Weinberger A.J., Aller K.M.,

Allers K.N., Best W.M.J., Kotson M.C., Montet B.T., **Herczeg G.J.,** Baranec C., Riddle R., Law N.M., Nielsen E.L., Wahhaj Z., Biller B.A., Hayward T.L., 2015, Planets Around Low-mass Stars (PALMS). V. Age-dating Low-mass Companions to Members and Interlopers of Young Moving Groups, ApJ, 806, 62

10. Buta R.J., Sheth K., Athanassoula E., Bosma A., Knapen J.H., Laurikainen E., Salo H., Elmegreen D., **Ho L.C.,** Zaritsky D., Courtois H., Hinz J.L., Muñoz-Mateos J.-C., Kim T., Regan M.W., Gadotti D.A., Gil de Paz A., Laine J., Menéndez-Delmestre K., Comerón S., Erroz Ferrer S., Seibert M., Mizusawa T., Holwerda B., Madore B.F., 2015, A Classical Morphological Analysis of Galaxies in the Spitzer Survey of Stellar Structure in Galaxies (S^4G), ApJS, 217, 32

11. Caballero R.N., **Lee K.J.,** Lentati L., Desvignes G., Champion D.J., Verbiest J.P.W., Janssen G.H., Stappers B.W., Kramer M., Lazarus P., Possenti A., Tiburzi C., Perrodin D., Osłowski S., Babak S., Bassa C.G., Brem P., Burgay M., Cognard I., Gair J.R., Graikou E., Guillemot L., Hessels J.W.T., Karuppusamy R., Lassus A., Liu K., McKee J., Mingarelli C.M.F., Petiteau A., Purver M.B., Rosado P.A., Sanidas S., Sesana A., Shaifullah G., Smits R., Taylor S.R., Theureau G., van Haasteren R., Vecchio A., 2015, The noise properties of 42 millisecond pulsars from the European Pulsar Timing Array and their impact on gravitational wave searches, MNRAS, in press (arXiv:1510.09194)

12. **Cai M.X.,** Gieles M., Heggie D.C., Varri A.L., 2016, Evolution of star clusters on eccentric orbits, MNRAS, 455, 596

13. **Cai M.X., Meiron Y., Kouwenhoven M.B.N.,** Assmann P., **Spurzem R.,** 2015, Block Time Step Storage Scheme for Astrophysical N-body Simulations, ApJS, 219, 31

14. Cai Z., Fan X., **Jiang L.,** Dave R., Oh S.P., Yang Y., Zabludoff A., 2015, Constraining Very High Mass Population III Stars through He II Emission in Galaxy BDF-521 at z = 7.01, ApJL, 799, L19

15. Carson D., Barth A.J., Seth A.C., den Brok M., Cappellari M., Greene J.E., **Ho L.C.,** Neumayer N., 2015, The Structure of Nuclear Star Clusters in Nearby Late-type Spiral Galaxies from Hubble Space Telescope Wide Field Camera 3 Imaging, AJ, 149, 170

16. **Chen B.-Q., Liu X.-W., Xiang M.-S., Yuan H.-B., Huang Y.,** Huo Z.-Y., **Sun N.-C., Wang C., Ren J.-J., Zhang H.-W., Rebassa-Mansergas A.,** Yang M., Zhang Y., Hou Y.-H., Wang Y.-F., 2015, The LAMOST spectroscopic survey of globular clusters in M31 and M33. I. Catalog and new identifications, RAA, 15, 1392

17. **Chen B.-Q., Liu X.-W., Yuan H.-B., Huang Y., Xiang M.-S.,** 2015, Dust-to-gas ratio, XCO factor and CO-dark gas in the Galactic anticentre: an observational study, MNRAS, 448, 2187

18. **Chen X., de Grijs R.,** Deng L., 2015, A search for open cluster Cepheids in the Galactic plane, MNRAS, 446, 1268

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Awards (2015)

The Peking University astronomy community is forcefully making headway beyond its campus.

Highlights of awards and honors received in 2015 are included in this chapter.

de Grijs, Richard

◆ Outstanding doctoral dissertation award (Chengyuan Li, Peking University): award shared between Ph.D. student and supervisor

◆ Inclusion on the *Elsevier/Scopus* Most Influential Chinese Scholars in 2014 list

◆ Nomination, Top-10 achievement in astrophysics research in China (2014), Chinese Astronomical Society

◆ Asian Scientist Writing Prize 2015, Honorary Mention, *Asian Scientist Magazine/Science* Centre Singapore

Jiang, Linhua

◆ Youth 1000 Talents Plan (Youth Qianren), Chinese Government

Li, Chengyuan

◆ Nomination, Top-10 achievement in astrophysics research in China (2014), Chinese Astronomical Society

Liu, Fukun

◆ Number 1 achievement in astrophysics research in China (2014), Chinese Astronomical Society (elected)

◆ *Tang Lixin Distinguished Lecturer Award,* Peking University

Ren, Juan-Juan

◆ LAMOST fellowship, January 2015–present

Tian, Zhijia

◆ *LAMOST* fellowship, start date to be determined

Wang, Ran

◆ Youth 1000 Talents Plan (Youth Qianren), Chinese Government

Wu, Xue-Bing

◆ 2015 *Huang Runqian Prize* for Astrophysics Fundamental Research Chinese Astronomical Society

◆ Wu Xue-Bing's results published in *Nature* in February 2015 were selected as one of the *Top-10 Science and Technology Advances at Chinese Universities* (2015), Ministry of Education of the P. R. China

Yu, Hao-Ran

◆ First prize for the best paper award by young scholars, Chinese Gravity and Relativistic Astrophysics Society

Yu, Qingjuan

◆ Inclusion on the *Elsevier/Scopus* Most Influential Chinese Scholars in 2014 list

Grants awarded in 2015

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.

de Grijs, Richard:

- 2015 Postgraduate course development in English, RMB 50,000
- International Space Science Institute–Beijing workshop proposal, *Astronomical distance determination in the space age*, € 35,000 (in kind)

Dong, Subo:

- National Natural Science Foundation of China (NSFC) General Programme, *Extrasolar Planet Distribution from Complete Samples of the Kepler Mission and Second-Generation Microlensing Survey,* RMB 854,000 (2016–2019)

Extrasolar planet research has transited from discovering and exploring one or a few planets to systematically analyzing large samples of planets and studying the statistics. This project will embark on an investigation of two frontier, complete samples of planets, including the extrasolar planets accumulated from 4 years of NASA's *Kepler* mission and the ongoing second-generation microlensing planet survey. First, we will use the *LAMOST* spectra of tens of thousands of *Kepler* target stars to obtain the parameters of planet host stars and the "background" stellar parameter distributions. The goal is to get the distribution of planets within 1 AU and down to 1 Earth radius as well as the planet frequency as a function of host star stellar type and metallicity. Second, we plan to use adaptive optics imaging from the *Magellan* telescope to characterize the masses and distances of microlensing planet host stars. This is to obtain the distribution of long-period planets near the "snow line" and to study the correlation between planet frequency and host star mass and stellar population (bulge versus disk). These results will potentially yield planet distributions in different stellar environments and help advance our understanding of planet formation and evolution.

Herczeg, Gregory:

- 2015 Postgraduate course development in English, RMB 50,000

Jiang, Linhua:

- Youth 1000 Talents Plan (Youth Qianren), RMB 3,000,000

High-redshift (z > 6) galaxies and quasars are powerful tools to study early galaxy formation and evolution, the birth and growth of the earliest supermassive black holes, and the epoch of cosmic reionization. We are aiming to carry out large spectroscopic surveys of high-redshift galaxies and quasars, and use these objects to study various physical properties of galaxies, quasars, massive black holes, and their connections at early epochs. These objects will also be used to understand cosmic reionization.

Jose, Jessy:

- China Postdoctoral Science Foundation General Grant, *Stellar content of filaments: Towards the onset of cluster formation,* RMB 50,000

The project focuses on the identification and characterization of embedded clusters associated with the dark filamentary clouds in massive star-forming regions. Using multi-wavelength photometry, we plan to study the star formation processes and stellar initial mass function in selected filamentary regions. This information is key to assess whether or not the outcome of the star-formation process in regions undergoing spherically symmetric collapse are different from

those regions where the filamentary cloud is fragmenting to form distinct structures within them.

Kouwenhoven, M. B. N. (Thijs):

◆ National Natural Science Foundation of China (NSFC) General Programme, *The evolution of planetary systems: from their birth in dense stellar environments to their observable properties today,* RMB 800,000 (2016–2019)

Exoplanet surveys have led to fascinating new discoveries, but the field suffers from two major problems: (i) the formation and early evolution of planetary systems remain a mystery, and (ii) it is not known how the observed planetary systems achieved their current, sometimes inexplicable, orbital configurations. Even explaining the origin of our own Solar system is still challenging. Clearly, both internal dynamics and external effects play a role. It is important to quantify how the architecture of these planetary systems and their debris populations were shaped by the environments in which they were born and in which they lived. This study will focus on unraveling the mystery of planet formation and dynamics by carrying out a comprehensive computational analysis of the evolution of planetary systems in crowded environments, with the aim of deepening our understanding of the formation, evolution, and habitability of exoplanets.

Lee, Kejia:

◆ Co-PI, national 973 basic research program (2015CB857101), *"Key research with a 110 m fully steerable large aperture radio telescope"*, RMB 2.95M

Lee and colleagues will study the feasibility and draw up the science plan for the proposed Xinjiang Qitai 110 m (QTT) radio telescope. The QTT science targets are planets, pulsars, molecular clouds, star formation, and galaxies, thus covering all scale in the Universe. Pulsar timing and searches using the future QTT may lead to a breakthrough in gravitational wave detection and use of the nano-Hz band.

◆ Co-PI (with Qiao Guojun), National Natural Science Foundation grant 11373011, RMB 900,000

The project focuses on studying the pulsar radiation mechanism and student education. The major aim of the project is to study the pulse profile evolution

and stability using current Chinese telescopes, to aid the fine-tuning of instruments, to build the data processing pipeline, and to offer Peking University students a chance to be involved in the future radio astronomy projects.

Peng, Eric:

◆ 2015 Postgraduate course development in English, RMB 50,000

◆ National Natural Science Foundation of China (NSFC) General Programme, *Uncovering the Fossil Remnants of Galaxy Formation in the Next Generation Virgo Cluster Survey,* RMB 720,000 (2016–2019)

One of the main challenges in the current paradigm of structure formation is explaining the assembly of low-mass baryonic structures on the scales of dwarf galaxies and star clusters. This realization has created a strong interest in the detailed properties of dwarf galaxies, globular star clusters, and the stellar halos of more massive galaxies in which they may eventually reside. At a distance of 16.5 Mpc, the Virgo Cluster is the center of the Local Supercluster and the dominant mass concentration within 35 Mpc. It is the most thoroughly studied cluster of galaxies in the Universe and the best target for a systematic study of baryonic substructures from high to low mass. Our program follows up successful, early results from the Next Generation Virgo Cluster Survey (NGVS), a new, deep, and wide *CFHT*/MegaCam survey of the entire Virgo Cluster. This project will produce a comprehensive study of globular cluster systems, dynamical studies of Virgo Cluster galaxy stellar halos, and the detailed stellar and dynamical properties of ultra-compact dwarfs and the supermassive black holes they may host. These studies will address the formation of the oldest stars, the relationship between star and star cluster formation, and the origin of and relationship between low-mass stellar systems.

Shin, Jihye:

◆ National Natural Science Foundation of China, International Cooperation and Exchange Program: *Formation and Evolution of Globular Clusters in the Cosmological Frame,* RMB 200,000

This project aims to investigate the formation of globular clusters (GCs) in the hierarchical clustering context of cold dark matter (CDM) cosmology through detailed numerical studies, and also focuses on exotic stellar systems that have similar properties to GCs, such as ultra-compact dwarf galaxies (UCDs), ultra-faint dwarf galaxies (UFDs), and nucleated dwarf galaxies (NDs). To accomplish the research goals, we have developed a new cosmological hydrodynamical code based on the existing pure N-body solver, GOTPM (Dubinsky, Kim, Park & Humble 2003), which was used for one of the largest-volume simulations: Horizon Runs 1, 2, and 3 (Kim et al. 2009, 2011). Using this very efficient simulation tool, we will focus on subgalactic structure formation in a ΛCDM universe, especially on the formation of GCs from the viewpoint of galaxy assembly histories.

Spurzem, Rainer:

◆ *Dynamical modelling of real star clusters in supercomputers,* Alexander von Humboldt Polish Honorary Research Fellowship, Alexander-von-Humboldt Foundation (Germany) and Polish Academy of Sciences, € 24,000: Support of Polish–German cooperation with the Nicolaus Copernicus Astronomical Center (Dr. Mirek Giersz)

Wang, Ran

◆ Youth 1000 Talents Plan (Youth Qianren), RMB 2,000,000

A large sample of quasars have been discovered at z>6, an epoch close to the end of cosmic reionization.We are pursuing millimeter and radio observations of the host galaxies of quasars discovered at the highest redshift. The goals are to probe the gas and dust components and star forming activities, and understand the formation of the first supermassive black hole-galaxy systems at the reionization era.

Wu, Xue-Bing:

-National Natural Science Foundation of China (NSFC) Key Project, *Observational studies of quasars at z>5 and their multi-wavelength properties*, RMB 3.78M; Co-Is: **Jiang, Linhua; Wang, Ran**

The team will study the selection criteria for quasars with redshifts greater than 5 based on recently updated optical and near-infrared photometric survey data. Using two 2 m diameter telescopes in China and several 2–8 m telescopes abroad, they aim to discover many new quasars with redshifts greater than 5 based on optical spectroscopic observations. Using multi-wavelength international facilities, they will carry out follow-up observations of these new quasars at z>5 and they anticipate making significant progress in studying their black hole masses, dust emission, host galaxies, and star formation properties.

Yu, Hao-Ran:

◆ China Postdoctoral Science Foundation, Second-Class General Financial Grant, RMB 50,000

◆ Canadian Institute for Theoretical Astrophysics (CITA), salary for a half-year visit in 2015

Zhang, Huawei:

◆ LAMOST Survey Key Project (NAOC), *The Metallicity Distribution Function of Galactic disk populations,* RMB 100,000

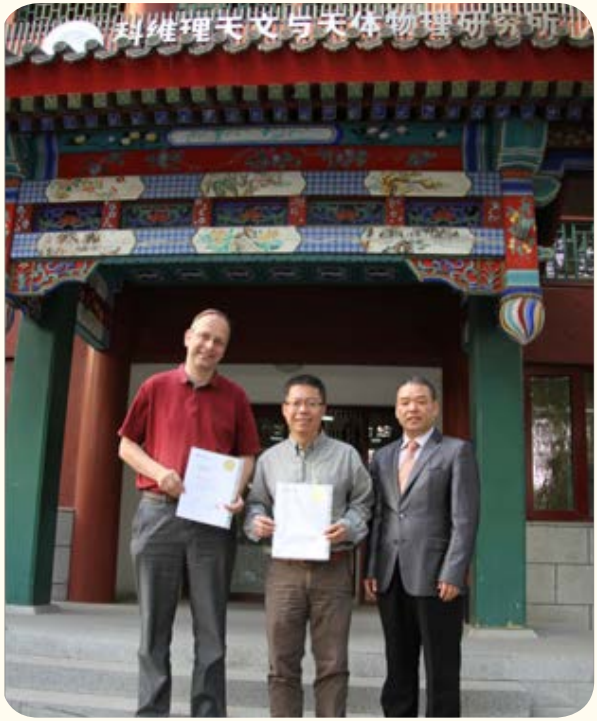
The Galactic disk is an important component of the Milky Way. Its formation and evolution are important, unresolved astrophysical problems. The *LAMOST* Galactic disk and Galactic anti-center surveys will obtain a few million spectra of Galactic disk stars. Based on spectral analysis, effective temperatures, gravities, and metallicity parameters will be derived. 3D positions and velocities will be calculated from proper motion, radial velocity, and photometric/spectroscopic distance data. A comprehensive study of metallicity, age, and kinematic parameters of a large sample of Galactic disk stars will allow us to refine and constrain various models of Galactic disk formation and evolution.

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)
- Discipline Scientist (Astrophysics), International Space



Science Institute–Beijing
- Fellow, Higher Education Academy (UK)
- Fellow and China representative, Institute of Physics (UK)
- Vice President, International Astronomical Union (IAU) Commission 37, *"Stellar Clusters and Associations"* (until August 2015)
- President, IAU Commission H4, *"Stellar Clusters Throughout Space and Time"* (from September 2015)
- Founding director, East Asian Regional Office of Astronomy for Development, IAU; Member, Task Force 1 on *"Astronomy for Universities and Research"*
- Thirty Meter Telescope (*TMT*) International Science Development Teams (ISDTs): *Formation of Stars and Planets, Milky Way and Nearby Galaxies*
- Ambassador for China, Open Researcher and Contributor ID (ORCID)
- Guest professor Shanghai Astronomical Observatory, China
- Visiting professor, Qiannan Normal College for Nationalities, Duyun City (Guizhou), China
- International Scientific Publishing Advisor to the Editorial Board of the *International Journal of MCH & AIDS* (MCH: Maternal and Child Health), which publishes original papers from authors in low- and middle-income developing countries

Dong, Subo:

- Thirty Meter Telescope (*TMT*) International Science Development Team: *Exoplanets*

Herczeg, Gregory:

- Thirty Meter Telescope (*TMT*) International Science Development Team: *Formation of Stars and Planets* (co-convener)

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
- Chair, Optical Advisory Committee, *Astronomy Mega Science Center,* Chinese Academy of Sciences
- 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
- Chair, FAST Science Working Group (*Extragalactic Science*)
- Thirty Meter Telescope (*TMT*) International Science Development Team: *Supermassive Black Holes, Early Universe*

Jiang, Linhua:

- Thirty Meter Telescope (TMT) International Science Development Team: *Supermassive Black Holes, Early Universe*

Kouwenhoven, M. B. N. (Thijs):

- Visiting professor, Qiannan Normal College for Nationalities, Duyun City (Guizhou), China
- Visiting Professor in Astrophysics, Department of Earth and Space Sciences, Rizal Technological University, Manila, Philippines
- Steering Committee Member, East Asian Regional Office of Astronomy for Development (International Astronomical Union)

Li, Li-Xin:

- Member, Science Working Group for XIPE, the X-ray Imaging Polarimetry Explorer

Peng, Eric:

- Co-chair, China's Telescope Access Program
- Member, Thirty Meter Telescope (*TMT*) International Science Development Team: *Milky Way and Nearby Galaxies*
- Member, TMT Science Advisory Committee (SAC)
- China representative, Canada–France–Hawai'i Telescope SAC
- China representative, Maunakea Spectroscopic Explorer Science Executive Committee

Spurzem, Rainer:

- Birds-of-Feather (BoF) Committee Member, International Supercomputing Conference (ISC): Annual High Performance Computing Conference. The BoF Committee reviews all BoF proposals and selects the sessions for presentation at the ISC. This Germany-based conference announces the annual Top 500 list of the fastest supercomputers in the world.

Wu, Xue-Bing:

- *Chair, LAMOST* User Committee
- Vice president, Beijing Astronomical Society

Xu, Renxin:

- Thirty Meter Telescope (*TMT*) International Science Development Team: *Fundamental Physics and Cosmology*
- *Associate* Editor in Chief, *Science in China Series G: Physics, Mechanics, & Astronomy*
- Science Review Panel Member, Square Kilometre Array (2014–2015)

Musings on the 2015 Chinese Astronomical Society meeting at Peking University

Linhua Jiang and Shuyan Liu

The 2015 Annual Meeting of the Chinese Astronomical Society (CAS) was held on the Peking University (PKU) main campus on 19–21 October 2015. The meeting was jointly organized by the Kavli Institute for Astronomy and Astrophysics (KIAA) and Department of Astronomy at Peking University. A record number of nearly 800 participants from university departments and Chinese Academy of Sciences institutes nationwide attended the meeting.

The opening ceremony of the annual meeting took place in the PKU Centennial Hall on 19 October. CAS Secretary General, Ji Yang, chaired the ceremony. In the opening speech, the President of the CAS Council, Xiangping Wu, welcomed all participants, and PKU Vice President, Jie Wang, congratulated the participants on the meeting. KIAA Director Luis C. Ho introduced recent developments of PKU Astronomy. Distinguished guests at the ceremony included CAS council consultant and academician, Xianqun Cui, academician Cheng Fang from Nanjing University, academician Tipei Li from Tsinghua University, Vice Director of the NSFC Mathematics and Physics Department, Guoxuan Dong, Xiaolin Chen from the PKU School of Physics, and South African astronomy delegates. During the opening ceremony, two famous CAS prizes, the Huang Shoushu Prize and the Huang Runqian Prized were awarded. Professor Xiaofeng Wang from Tsinghua University and Associate Professor Xin Chen from Nanjing University shared the Huang Shoushu Prize. Professor Yipeng Jing from Shanghai Jiaotong University and Professor Xuebing Wu from PKU shared the Huang Runqian Prize.

The main goal of this CAS annual meeting was to bring together all Chinese astronomers to seek future collaborations between universities and the institutes of the Chinese Academy of Sciences. The meeting covered cutting-edge topics in all branches of astronomy, as well as education and public outreach. The meeting presentations consisted of plenary lectures and parallel session talks and posters. The plenary lectures were given by about 10 well-established astronomers in the PKU Centennial Hall on the first day of the

meeting after the opening ceremony. These lectures covered some hot research fields in astronomy such as supermassive black holes in the distant Universe, local massive black holes with high accretion rates, gamma-ray bursts, etc., as well as the recent development of Chinese astronomical facilities, such as FAST and the Chinese South Pole Observatory.

On the second and third days, the annual meeting continued at the PKU Yingjie International Exchange Center through eight parallel sessions, including 1) radio astronomy; 2) solar and planetary systems; 3) stars and the Galaxy; 4) instrumentation, time-keeping; 5) astro-mechanics and astrometry; 6) high-energy astrophysics; 7) galaxies and large-scale structure; and 8) astronomical history, education, and public outreach. These topics cover nearly all branches of modern astronomy, astrophysics, and cosmology. Over the course of two days, more than 300 scholars and students presented their research work.

During the annual meeting, the PKU Local Organizing Committee, together with the PKU Youth Astronomical Society, organized several education and outreach events. In particular, the former and founding director of the KIAA, Professor Douglas N. C. Lin, gave a public lecture on the search for exoplanets in the evening of 19 October. This high-level lecture brought attention to an audience of hundreds of PKU students and as well as to students from nearby universities.

The Chinese Astronomical Society council meeting was held at the KIAA on Sunday 18 October, thus introducing many council members to the KIAA's beautiful premises for the first time. In addition, *Research in Astronomy and Astrophysics*, the flagship domestic astrophysics journal, celebrated its 15th anniversary with a seminar at KIAA on 20 October.

The 2015 CAS annual meeting lasted three days. This major astronomy event was widely reported by many Chinese media, including by *Xinhua* News Agency, *PKU News, China Youth Daily, and China Science Daily.*

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

9–12 February 2015: **East Asian Young Astronomers Meeting 2015 (EAYAM2015),** Taipei, Taiwan

- SOC: **Zhang, Hong-Xin**

The East Asian Young Astronomers Meeting (EAYAM) was first organized in 2003 to promote interaction and collaboration between young astronomers in East Asia. The success of the initial meeting in Taiwan was followed by EAYAM 2006 in Japan, EAYAM 2008 in China, and EAYAM 2011 in Korea.

2–6 March 2015: **MODEST 15 – Modelling and Observing Dense Stellar Systems in Chile,** Universidad de Concepción, Chile

- SOC: **Spurzem, Rainer**

9–11 March 2015: **Hands-on N-body Workshop,** Universidad de Concepción, Chile

- Instructors: Aarseth, Sverre; Assmann, Paulina; **Wang, Long**

17–20 March 2015: **Quasars and Active Galactic Nuclei over Cosmic Time,** KIAA, Peking University

- SOC: **Ho, Luis; Jiang, Linhua; Shen, Yue; Wang, Ran; Wu, Xue-Bing**

The KIAA hosted a workshop entitled "Quasars and Active Galactic Nuclei over Cosmic Time." Its main goals were to review the recent progress of surveys and observational studies of quasars and active galactic nuclei at all redshifts, and to develop future collaborations focused on large telescope programs, e.g., using ALMA, the VLT, Magellan, the LBT, etc. The workshop consisted of a main conference with invited and contributed talks on Tuesday and Wednesday, 17–18 March 2015, followed by group discussions and a collaboration meeting during the rest of the week.

2–3 April 2015: **2015 Nanjing–Beijing Bilateral Astrophysics Workshop,** Nanjing, China

◆ SOC: **Dong, Subo; Herczeg, Gregory** (co-chair); **Ho, Luis; Li, Li-Xin; Li, Zhuo; Liu, Fukun** (co-chair); **Wang, Ran**

The goal of this workshop was to strengthen ties between KIAA and Purple Mountain Observatory/Nanjing University astronomers, encourage new friendships, and provide a platform for future collaborations.

11–15 May 2015: **IAU Symposium 314, Young Stars & Planets Near the Sun,** Atlanta (GA), USA

◆ SOC: **Herczeg, Gregory**

18–19 May 2015: **2015 KIAA–SHAO Bilateral Workshop,** KIAA, Peking University

◆ SOC: **de Grijs, Richard; Ho, Luis C.; Jiang, Linhua** (co-chair); **Li, Kejia; Li, Zhuo; Liu, Fukun**

The goal of this workshop was to strengthen ties between KIAA and Shanghai Astronomical Observatory, encourage new friendships, and provide a platform for future collaborations.

21–25 May 2015: **Probing AGNs with Radio Techniques,** Yining (Xinjiang), China

◆ SOC: **Ho, Luis** (co-chair)

KIAA co-sponsored the meeting "Probing Active Galactic Nuclei with Radio techniques", which was held during 21–25 May 2015 in Yining, a city in northwestern Xinjiang Province in China. Yining is the seat of the Ili Kazakh Autonomous Prefecture. The purpose of this meeting was to gather researchers to exchange new results and views, especially with expertise in employing radio techniques to probe AGN. This is both an opportunity for mainland Chinese astronomers to get to know each other and form collaborations, and for them to interact with foreign experts, especially from neighboring countries/region such as Japan, Taiwan, South Korea, and India, all of whom have substantial communities of radio astronomers whose research focuses on AGN.

1–5 June 2015: **Black Hole Accretion and AGN Feedback,** Shanghai, China

◆ SOC: **Ho, Luis** (co-chair)

29 June–3 July 2015: Summer school: **New Era of the Cosmic Distance Scale,** University of Tokyo, Japan

◆ SOC: **de Grijs, Richard**

2–3 July 2015: **Xinjiang Qitai Radio Telescope Science Colloquium Series I,** Ming'antu, Inner Mongolia, China

◆ SOC: **Lee, Kejia (**chair)

The detection of the first celestial radio source was achieved in the 1930s by Karl Jansky. Ever since then, there has never a been lack of excitement in the radio window, especially since we had the unique chance to know, to study, and to explore the dark and violent side of the Universe. The Xingjiang Qitai Radio Telescope (QTT) is now officially in the planning phase. It is designed to be a fully steerable 110 m single-dish telescope capable of high-frequency observations, to serve the global astronomical community, and to promote radio astronomical research in China. Meanwhile, It will also boost related technology developments.

The QTT science cases cover a very wide range of topics, from the moon to black holes, from the stellar nurseries (molecular clouds) to their graveyards (compact stars), from our neighborhood (planets) to the farthest reaches (high redshift galaxies) to the whole Universe. A clear definition of the science program will not only aid the design and engineering processes of the telescope, but also make the telescope a

cutting-edge scientific instrument. It is absolutely necessary to bring related scientists from around the world on board to plan the detailed science cases for the QTT in its design phase.

3–5 July 2015: **FAST Pulsar Symposium 4,** Ming'antu, Inner Mongolia, China

◆ SOC: Xu, Renxin (chair)

Radio astronomy plays an important role in astronomy and astrophysics. The Five-hundred-meter Aperture Spherical radio Telescope (FAST), the largest single-dish radio telescope to be built, will not only promote science and technology in China, but also be beneficial to astronomers worldwide. Focusing on the scientific goals that FAST could achieve in the future, the Ministry of Science and Technology of China (MOST) has funded a "973 key project" to support science efforts related to FAST exploitation. The project consists of six research groups, including one focusing on pulsar research (PI: Renxin Xu). The pulsar group organizes annual meetings of pulsar astronomers to exchange ideas on recent developments, provoke discussion, and foster collaborations.

14–16 July 2015: **East Asian AGN Workshop 2015,** Changchun, China

◆ SOC: **Wu, Xue-Bing**

This was the third of a series of workshops aimed at bringing together scientists working in the East Asian region in the AGN field. About 80 participants from Japan, Korea, and China attended the workshop.

29–31 July 2015: **Frontiers in Radio Astronomy,** Guiyang, China

◆ SOC: **Ho, Luis**

3–7 August 2015: **The General Assembly of Galaxy Halos: Structure, Origin, and Evolution,** International Astronomical Union General Assembly Symposium 317, Honolulu (HI), USA

◆ SOC: **Peng, Eric**

11–14 August 2015: **Formation, Evolution, and Survival of Massive Star Clusters,** International Astronomical Union General Assembly Symposium 316, Honolulu (HI), USA

◆ SOC: **de Grijs, Richard**

12–14 August 2015: **Stellar Physics in Galaxies Throughout the Universe,** International Astronomical Union General Assembly Focus Meeting 7, Honolulu (HI), USA

◆ SOC: **de Grijs, Richard**

16–23 August 2015: **China–New Zealand–South Africa Joint SKA Summer School,** Kunming (Yunnan), China

◆ SOC: **Xu, Renxin**

24–28 August 2015: **10th Zhang Heng conference on Molecular Clouds and Star formation, Delingha** (Qinghai), China

◆ SOC: **Wu, Yuefang**

28–29 September 2015: **KIAA workshop on Astroparticle Phsics,** KIAA, Peking University, Beijing, China

◆ SOC: **Xu, Renxin** (co-chair); **Li, Zhaosheng**

The KIAA hosted the "KIAA workshop on Astroparticle Phsics" (KIAA–WAP). The lead organizers were PKU Professor Renxin Xu and Kavli Visiting Scholar Angela Olinto (KICP, Chicago). The long-standing quest to understand the fundamental laws of Nature has led to the new field of Astroparticle Physics where observations of the Universe are used to probe particle interactions. This small workshop aimed at bringing together astroparticle physics experts to provoke discussion and foster collaboration, especially between members of Kavli Institutes.

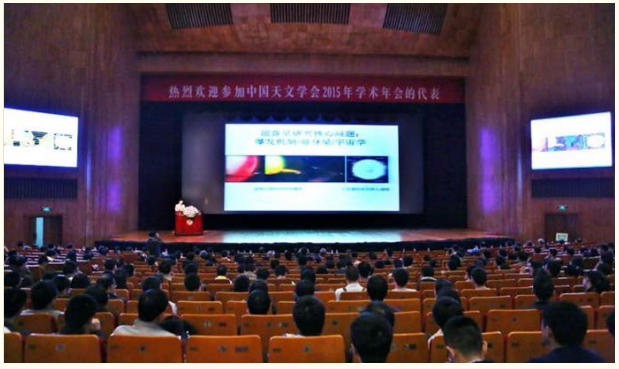
19–21 October **2015: 2015 Chinese Astronomical Society Annual Meeting,** Peking University, Beijing, China

◆ LOC: **Ho, Luis** (chair)

20–23 October 2015: **Advances in Space Research, 65th Fesenkov Readings,** Almaty, Kazakhstan

◆ Programme committee: **Spurzem, Rainer**

16–17 November 2015: **KIAA/PKU Astrophysics Forum: *Optical and Infrared Observational Facilities for Chinese Astronomy,*** KIAA, Beijing, China



◆ SOC: **Dong, Subo**; Ho, Luis (co-chair); **Peng, Eric**

On 16–17 November 2015, KIAA hosted the second annual KIAA–PKU Astrophysics Forum, with this year's topic being "Optical and Infrared Facilities for Chinese Astronomy." The workshop was open to the entire Chinese astronomical community, and welcomed over 70 participants. The meeting

was organized around short talks and a panel discussion focusing on six different topics: 1. Future large optical–IR telescopes, 2. International optical–IR facilities, 3. Future domestic facilities, 4. Potential Chinese participation in large international projects, 5. Sites for future facilities, and 6. Astronomical instrumentation. Each topic had a lively panel discussion in which the panel moderator, the panel members, and the audience engaged in lively debate. The KIAA–PKU Astrophysics Forum is an annual event that KIAA hosts to enable open discussion on issues of common interest in the Chinese community.

29 November–4 December 2015: **Extreme Solar Systems III**, Hawai'i, USA

◆ SOC: **Dong, Subo**

10 December 2015: **South China Astronomy/ Astrophysics Forum,** Hong Kong, Hong Kong SAR

◆ SOC: **Ho, Luis** (co-chair)

Oral contributions at conferences

de Grijs, Richard:

◆ 4–8 January 2015: 225th *American Astronomical Society Winter Meeting* 2015, Seattle (WA), USA; Session chair, Chambliss poster award judge

◆ 22–31 January 2015: Regional coordinators conference, Office of Astronomy for Development (International Astronomical Union), Cape Town, South Africa; invited participant

◆ 2–6 March 2015: *MODEST-15 – Modelling and Observing Dense Stellar Systems in Chile,* Concepción, Chile; invited speaker, session chair

◆ 11–12 March 2015: *6th VVV (VISTA Variables in the Vía Láctea) Science meeting,* Puerto Varas, Chile; invited speaker

◆ 13–17 April 2015: *Gamma-ray bursts: A tool to explore the young Universe,* International Space Science Institute–Beijing, China; invited review

◆ 28–31 May 2015: *7th Tourism Industry Development Conference, Libo* (Guizhou), China; special invitation

as Director of the East Asian Office of Astronomy for Development (International Astronomical Union)

◆ 29 June–3 July 2015: Summer school: *New Era of the Cosmic Distance Scale,* University of Tokyo, Japan; introductory and summary lectures

◆ 7 August 2015: *IAU Division H Science Meeting,* IAU XXIXth General Assembly, Honolulu (HI), USA; invited talk

◆ 11–14 August 2015: *Formation, Evolution and Survival of Massive Star Clusters,* IAU Symposium 316, IAU XXIXth General Assembly, Honolulu (HI), USA; invited review, discussion chair

◆ 19–21 August 2015: *The Milky Way: Disk and open clusters,* Delingha (Qinghai), China; invited review

◆ 10–12 September 2015: *Chinese Physical Society annual conference*, Changchun (Jilin), China; keynote speaker

◆ 19–21 October 2015: *2015 Chinese Astronomical Society annual meeting;* contributed talk

◆ 10–15 December 2015: *International Conference on Science and Civilization on the Silk Roads,* Urumqi (Xinjiang), China; invited speaker

Dong, Subo:

◆ 2–3 April 2015: *Nanjing–Beijing Bilateral Astrophysics* Workshop, Nanjing, China; invited speaker

◆ 18 April 2015: *Gezhi Young Physicists Forum,* School of Physics, Peking University, Beijing, China; contributed talk

◆ 25–26 April 2015: *China Ground-based Optical/Infrared Facility Consultative Conference,* National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China; invited talk

◆ 17–18 October 2015: *Hebei Normal University Astrophysics Forum,* Hebei Normal University, Shijiazhuang,

China; invited talk

◆ 27–29 October 2015: China–Japan–Korea Exoplanet Workshop, Yunnan, China; invited talk

◆ 2 November 2015: *Pilot B Science Highlights Meeting, Beijing,* China; invited talk

◆ 16–17 November 2015: *KIAA–PKU Forum 2015, Optical and Infrared Observational Facilities for Chinese Astronomy,* KIAA, Beijing, China; invited talk, session and panel discussion chair

◆ 26 November 2015: *China–South Africa Collaboration Planning Meeting,* National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China; session and discussion chair

◆ 30 November–4 December 2015: *Extreme Solar Systems III,* Hawai'i, USA; contributed talk

Fan, Zuhui:

◆ 9–10 March 2015: 3rd *Beijing–Chicago Workshop on Detector R&D, Future Colliders, and Cosmology,* Beijing, China; Member, Working Group 3 (Cosmology)

Gully-Santiago, Michael:

◆ 12–13 November 2015: *High Resolution Spectroscopy with IGRINS Conference,* Seoul, Republic of Korea; invited speaker

Herczeg, Gregory:

◆ 23–27 March 2015: *Sino–German Workshop on Star and Planet Formation,* Nanjing, China; invited speaker

◆ 2–3 April 2015: Nanjing–Beijing Bilateral Astrophysics Workshop, Nanjing, China; invited speaker

◆ 23–25 June 2015: *Thirty Meter Telescope Science Forum,* Washington (DC), USA; invited speaker

◆ 2–5 November 2015: *MaTYSSE Workshop,* Toulouse, France; invited speaker

◆ 12–13 November 2015: *High Resolution Spectroscopy with IGRINS Conference,* Seoul, Republic of Korea; invited speaker

Ho, Luis:

◆ 23–24 January 2015: 9th *Jing–Guang–Xia Astrophysics Meeting,* Nanning, China; invited talk

◆ 9–12 February 2015: *East Asian Young Astronomers Meeting,* Taipei, Taiwan; invited talk

◆ 16–20 March 2015: *Quasars and Active Galactic Nuclei over Cosmic Time,* Beijing, China; invited talk

◆ 21–25 May 2015: *Probing AGNs with Radio Techniques,* Yining (Xinjiang), China; invited talk

◆ 1–5 June 2015: *Black Hole Accretion and AGN Feedback,* Shanghai, China; invited talk

◆ 14–16 July 2015: *East Asian AGN Workshop,* Changchun (Jilin), China; invited talk

◆ 29–31 July 2015: *Frontiers in Radio Astronomy,* Guiyang, China; invited talk

◆ 21–22 September 2015: *Madame Ye Shuhua Forum,* Shanghai, China

◆ 14–16 October 2015: *Research Excellence Initiative International Workshop,* Tokyo, Japan

◆ 18–20 November 2015: *Black Hole Accretion conference,* Xiamen, China

◆ 4–6 December 2015: *Astrophysics Symposium,* Suzhou (Jiangsu), China; invited talk

◆ 10 December 2015: *South China Astronomy/ Astrophysics Forum,* Hong Kong, Hong Kong SAR; invited talk

Jiang, Linhua:

◆ 17–20 March 2015: *Quasars and Active Galactic Nuclei over Cosmic Time,* Peking University, China; invited talk

◆ 26–27 July 2015: *Supermassive Black Holes and*

Galaxies, Hefei, China; invited talk

Kolodzig, Alexander:

- 16 November 2015: *2015 ESAC Alumni Trainee Meeting,* European Space Astronomy Centre, Madrid, Spain; invited talk

Kouwenhoven, M. B. N. (Thijs):

- 19–21 October 2015: 2015 *Chinese Astronomical Society annual meeting;* contributed talk
- 20–22 November 2015: Symposium on *"Climate Change and Health,"* Xi'an Jiaotong–Liverpool University, Suzhou, China; invited talk

Li, Li-Xin:

- 4 April 2015: *Li–Paczyński Macronova Workshop,* Purple Mountain Observatory, Nanjing, China; invited talk
- 26–27 October 2015: *eXTP (enhanced X-ray Timing and Polarization Satellite) Workshop,* IHEP, Beijing, China; invited talk
- 27 November 2015: *Workshop on Gamma-Ray Bursts and Einstein's Relativity,* Beijing Normal University, Beijing, China; invited talk

Li, Zhaosheng:

- 10–16 May 2015: *STARS2015 – 3rd Caribbean Symposium on Cosmology, Gravitation, Nuclear and Astroparticle Physics/SMFNS2015 – 4th International Symposium on Strong Electromagnetic Fields and Neutron Stars,* Havana, Cuba; contributed talk
- 28–29 September 2015: *KIAA Workshop on Astroparticle Physics,* KIAA/PKU, Beijing, China; contributed talk, session chair

Li, Zhuo:

- 9–11 July 2015: *JUNO Neutrino Astronomy and Astrophysics Workshop,* Institute for High-Energy Physics, Beijing, China; invited talk
- 22–23 July 2015: *973 Project Gamma-Ray Bursts Meeting,* Nanjing, China; invited talk
- 28–29 September 2015: *KIAA Workshop on Astroparticle Physics,* KIAA–PKU, Beijing, China; invited talk
- 13–17 October 2015: *Black Hole Astrophysics Meeting,* Kunming (Yunnan), China; contributed talk
- 27 November 2015: *Gamma-Ray Bursts and Einstein's Relativity Workshop,* Beijing Normal University, Beijing, China; invited talk
- 3–18 December 2015: *28th Texas Symposium on Relativistic Astrophysics,* Geneva, Switzerland; contributed talk

Lim, Sungsoon:

-15–17 April 2015: *Korean Astronomical Society 2015 Spring Meeting,* Seoul, Republic of Korea; contributed talk

Liu, Fukun:

- 22–24 January 2015: *9th Beijing–Guangzhou–Xiamen Workshop on Astrophysics,* Nanning (Guangxi), China
- 17–18 March 2015: *Workshop on Quasars and Active Galactic Nuclei over Cosmic Time,* KIAA–Peking University, Beijing, China; invited talk
- 21–25 May 2015: *Workshop on Probing Active Galactic Nuclei with Radio Techniques,* Yining (Xinjiang), China

Peng, Eric:

- 2–3 April 2015: *Nanjing–Beijing Bilateral Astrophysics Workshop,* Nanjing, China; invited talk
- 3–7 August 2015: *IAU Symposium 317, The General Assembly of Galaxy Halos: Structure, Origin, and Evolution,* Honolulu (HI), USA; contributed talk, session chair

◆ 2 November 2015: *Pilot B Science Highlights Meeting,* Beijing, China; invited talk

◆ 16–17 November 2015: *KIAA–PKU Forum 2015, Optical and Infrared Observational Facilities for Chinese Astronomy;* 2 invited talks, panel discussion chair

Spurzem, Rainer:

◆ 17–22 January 2015: *2015 Aspen Winter Conference: Black Holes in Dense Star Clusters,* Aspen (CO), USA; invited talk

◆ 2–6 March 2015: *MODEST 15 – Modelling and Observing Dense Stellar Systems in Chile, Concepción,* Chile; invited talk, session chair

◆ 15–22 March 2015: *Workshop on Chinese–South African research collaboration,* Cape Town, South Africa; invited talk

◆ 12–18 July 2015: *14th Marcel Grossmann Meeting* (MG14), Rome, Italy; invited talk in Parallel Session DM4, Self Gravitating Systems and Dark Matter

◆ 13–17 July 2015: *ASIAA Numerical Astrophysics School,* Taipei, Taiwan; invited lecture

◆ 7–9 September 2015: *Science Applications for Exascale Computing*, Bad Honnef, Germany; invited talk

◆ 16–18 September 2015: *NBODY Workshop,* Lund, Sweden: invited talk

◆ 20–23 October 2015: *Advances in Space Research, 65th Fesenkov Readings,* Almaty, Kazakhstan; invited talk

◆ 7–11 December 2015: *MODEST 15S – Modelling and Observing Dense Stellar Systems,* Kobe, Japan; invited talk

Wang, Long:

◆ 2–6 March 2015: *MODEST-15 – Modelling and Observing Dense Stellar Systems in Chile, Concepción*, Chile; invited speaker

◆ 16–18 September 2015: *2015 NBODY Workshop,* Lund University, Sweden; invited speaker

◆ 7–12 December 2015: *MODEST 15-S – Modelling and Observing Dense Stellar Systems,* Kobe, Japan; invited speaker

Wang, Ran:

◆ 14–16 July 2015: *East Asia AGN Workshop,* Changchun (Jilin), China; contributed talk

◆ 2–3 April 2015: Nanjing–Beijing Bilateral Astrophysics Workshop, Nanjing, China; contributed talk

Wu, Xue-Bing:

◆ 23–24 January 2015: *9th Jing–Guang–Xia Astrophysics Meeting,* Nanning, China; invited talk

◆ 16–20 March 2015: *Quasars and Active Galactic Nuclei over Cosmic Time,* Beijing, China; contributed talk

◆ 30 March–1 April 2015: *Black Holes and Friends Workshop,* Fudan University, Shanghai, China; invited talk

◆ 2–3 April 2015: *Nanjing–Beijing Bilateral Astrophysics Workshop,* Nanjing, China; invited speaker

◆ 18 April 2015: *Gezhi Young Physicists Forum,* School of Physics, Peking University, Beijing, China; invited talk

◆ 4–8 May 2015: *International Conference on Gravitation and Cosmology/ Fourth Galileo–Xu Guangqi Meeting,* Beijing, China; invited talk

◆ 21–25 May 2015: *Probing AGN with Radio Techniques*, Yining (Xinjiang), China; invited talk

◆ 21–26 June 2015: *2015 Annual Meeting of the Chinese Physical Society, Division of Gravitation and Relativistic Astrophysics,* Hangzhou, China; plenary talk

◆ 14–16 July 2015: *East Asian AGN Workshop,* Changchun (Jilin), China; plenary talk

◆ 25–27 July 2015: CfA@USTC Symposium on *"Supermassive black holes and galaxies",* Hefei (Anhui), China; invited talk

◆ 11–14 August 2015: IAU Symposium 319, Galaxies at high redshift and their evolution over cosmic time; invited talk

◆ 24–25 September 2015: *2015 Workshop on 2 m telescopes in China,* National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China; invited talk

◆ 10–12 October 2015: *Workshop on the Chinese 10 m optical/IR telescope,* Kunming (Yunnan), China; invited talk

◆ 14–16 October 2015: 8th Workshop on Black Hole Astrophysics, Kunming (Yunnan), China; contributed talk

◆ 16–18 October 2015: *Beijing Normal University workshop on gravitation,* Beijing, China; invited talk

◆ 19–21 October 2015: *2015 Chinese Astronomical Society annual meeting;* invited plenary and topical talks

◆ 2 November 2015: *Pilot B Science Highlights Meeting, Beijing,* China; invited talk

◆ 18–20 November 2015: *Black Hole Accretion conference,* Xiamen, China; invited talk

Wu, Yuefang:

◆ 23–27 March 2015: *3rd Sino–German Conference on the formation of stars and planets,* Nanjing, China; contributed talk

◆ 28 June–1 July 2015: *Conference of Radio Astronomy and Technical Frontiers,* Mingantu (Inner Mongolia), China; contributed talk

◆ 2–3 July 2015: *Xinjiang Qitai Radio Telescope Science Colloquium Series I,* Ming'antu (Inner Mongolia), China; contributed talk

◆ 29–31 July 2015: *2nd Conference of Radio Frontiers and Early Science with FAST,* Guiyang, China; contributed talk

◆ 24–28 August 2015: *10th Zhang Heng conference on Molecular Clouds and Star Formation,* Delingha (Qinghai), China; invited talk

◆ 6–11 September 2015: *6th Zermatt ISM Symposium 2015, Zermatt,* Switzerland; contributed talk

◆ 14–16 October 2015: *4th China–U.S. Workshop on Radio Astronomy Science and Technology,* Shanghai, China; 2 contributed talks

◆ 14–17 December 2015: *11th Pacific Rim Conference on Stellar Astrophysics: Physics and Chemistry of the Late Stages of Stellar evolution,* Hong Kong, Hong Kong SAR; contributed talk

Xu, Renxin:

◆ 2–3 April 2015: *Nanjing–Beijing Bilateral Astrophysics Workshop,* Nanjing, China; invited talk

◆ 19 June 2015: *Workshop on radio astronomy with large facilities*, Guiyang, China; invited talk

◆ 29–31 July 2015: *Frontiers of Radio Astronomy and FAST Early Science Symposium*, Guiyang, China; invited talk

◆ 7–14 October 2015: *International Workshop on Quark Phase Transitions in Compact Objects and Multi-messenger Astronomy: Neutrino Signals, Supernovae, and Gamma-Ray Bursts*, Nizhnij Arkhyz, Russia; invited talk, session chair

◆ 16 October 2015: *100 Years of General Relativity,* Beijing Normal University, Beijing, China; invited talk

Yu, Hao-Ran:

◆ 10–12 August 2015: *Cosmic Flows (and other novelties on Large Scales),* Perimeter Institute, Waterloo (ON), Canada; invited talk

Yu, Qingjuan:

◆ 17–18 March 2015: *Quasars and Active Galactic Nuclei over Cosmic Time,* KIAA/PKU, Beijing, China; invited talk

◆ 28–29 March 2015: *KIAA international scientific advisory committee meeting,* Beijing, China; invited speaker

◆ 2–3 April 2015: *Nanjing–Beijing Bilateral Astrophysics Workshop,* Nanjing, China; invited speaker

◆ 25–27 July 2015: *CfA@USTC Symposium on "Supermassive black holes and galaxies",* Hefei (Anhui), China; invited talk

◆ 19–21 October 2015: *2015 Chinese Astronomical Society annual meeting;* contributed talk

Yuan, Haibo:

◆ 9–12 February 2015: *East Asian Young Astronomers Meeting,* Taipei, Taiwan; contributed talk

◆ 25–26 April 2015: *China Ground-based Optical/Infrared Facility Consultative Conference,* National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China; invited talk

◆ 7–9 July 2015: *LAMOST User Training Meeting 2015,* National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China; invited talk

Seminars and colloquia

de Grijs, Richard:

◆ January 2015: (1) University of Cape Town, South Africa; (2) South African Astronomical Observatory, South Africa

◆ March 2015: (1) Universidad de Concepción, Chile; (2) Pontificia Universidad Católica, Santiago, Chile; (3) Universidad Nacional Andrés Bello/Universidad Diego Portales joint colloquium, Santiago, Chile

◆ April 2015: (1) Northwestern University, Evanston (IL), USA; (2) University of Chicago/Kavli Institute for Cosmological Physics (IL), USA; (3) Arizona State University, Tempe (AZ), USA

◆ June 2015: (1) Purple Mountain Observatory, Nanjing, China; (2) Shanghai Astronomical Observatory, China; (3) Kavli Institute for the Physics and Mathematics of the Universe, Tokyo, Japan

◆ September 2015: Institute for Modern Physics, Chinese Academy of Sciences, Lanzhou (Gansu), China

◆ November 2015: (1) Osaka University, Japan; (2) 15th Annual Academic Session of the Postgraduate "Lushan Forum", Hunan Normal University, Changsha, China (keynote speaker)

◆ December 2015: (1) National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China; (2) DragonIStar Plus 2nd Webinar, Participation in Chinese Research and Innovation Programmes

Dong, Subo:

◆ October 2015: Shanghai Astronomical Observatory, Shanghai, China

Herczeg, Gregory:

◆ February 2015: Harvard–Smithsonian Center for Astrophysics, Cambridge (MA), USA

◆ June 2015: (1) Tsinghua University Colloquium, Beijing, China; (2) Yunnan Astronomical Observatory Colloquium, Kunming, China

◆ July 2015: University of Michigan, Ann Arbor (MI), USA

Kolodzig, Alexander:

◆ November 2015: Max Planck Institute for Astrophysics, Garching, Germany

Kouwenhoven, M. B. N. (Thijs):

◆ September 2015: Shanghai Astronomical Observatory, Shanghai, China

◆ October 2015: Department of Mathematical Sciences, Xi'an Jiaotong–Liverpool University, Suzhou, China

Jose, Jessy:

◆ March 2015: National Center for Radio Astrophysics, Pune, India

Lim, Sungsoon:

◆ March 2015: Gemini Observatory, Hilo (HI), USA

Liu, Fukun:

◆ May 2015: (1) Yunnan Astronomical Observatory, Kunming, China; (2) Yunnan Normal University, Kunming, China

◆ June 2015: Xiamen University, Xiamen, China

◆ November 2015: (1) Morningside Seminar in General Relativity and Astrophysics, National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China; (2) Tsinghua Center for Astrophysics, Tsinghua University, Beijing, China

Peng, Eric:

◆ November 2015: Shanghai Astronomical Observatory, Shanghai, China

Spurzem, Rainer:

◆ March 2015: Pontificia Universidad Católica, Santiago, Chile

Wu, Xue-Bing:

◆ January 2015: School of Astronomy and Space Science, Nanjing University, Nanjing, China

◆ February 2015: National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China

◆ March 2015: (1) Shanghai Astronomical Observatory, Chinese Academy of Science, Shanghai, China; (2) Kavli Institute for Astronomy and Astrophysics, Peking University, Beijing, China; (3) Department of Physics, Tsinghua University, Beijing, China; (4) Institute for Theoretical Physics, Chinese Academy of Sciences, Beijing, China

◆ April 2015: (1) School of Physics, Hebei Normal University, Shijiazhuang (Hebei), China; (2) Physics school, East China Normal University, Shanghai, China; (3) Department of Physics and Astronomy, Shanghai Jiaotong University, Shanghai, China

◆ May 2015: (1) School of Physics, Huazhong University of Science and Technology, Wuhan, China; (2) Institute for Particle Physics/School of Physics, Central China Normal University, Wuhan, China

◆ June 2015: Institute for Applied Physics and Computational Mathematics, Beijing, China

◆ August 2015: (1) Department of Astronomy, University of California at Berkeley, Berkeley (CA), USA; (2) Space Telescope Science Institute, Baltimore (MD), USA; (3) Department of Astrophysical Science, Princeton University, Princeton (NJ), USA

◆ September 2015: Xingjiang Astronomical Observatory, Urumuqi (Xingjiang), China

◆ October 2015: Department of Astronomy, Yunnan University, Kunming (Yunnan), China

◆ November 2015: Hubei Engineering University, Xiaogan (Hubei), China

Xu, Renxin:

◆ November 2015: Xinjiang University, China; Tian-shan colloquium

◆ December 2015: Shanghai Jiaotong University, Shanghai, China

Yu, Qingjuan:

◆ December 2015: Xiamen University, China

Yuan, Haibo:

◆ January 2015: Peking University, Beijing, China

◆ February 2015: National Central University, Taoyuan, Taiwan

◆ April 2015: Tsinghua University, Beijing, China

Zhang, Hong-Xin:

◆ January 2015: (1) Nanjing University, Nanjing, China; (2) Purple Mountain Observatory, Nanjing, China

Student highlights 2015

Chen, Yuguang:

◆ PhD position in astrophysics, California Institute of Technology, USA

Dai, Shi:

◆ PhD thesis, Multi-wavelength studies of pulsar-like compact stars; defended successfully on 18 June 2015. Supervisor: **Xu, Renxin**

Associated papers:

Dai S., Hobbs G., Manchester R.N., Kerr M., Shannon R.M., van Straten W., Mata A., Bailes M., Bhat N.D.R., Burke-Spolaor S., Coles W.A., Johnston S., Keith M.J., Levin Y., Osłowski S., Reardon D., Ravi V., Sarkissian J.M., Tiburzi C., Toomey L., Wang H.G., Wang J.-B., Wen L., Xu R.X., Yan W.M., Zhu X.-J., 2015, A study of multifrequency polarization pulse profiles of millisecond pulsars, MNRAS, 449, 3223

Dai S., Smith M.C., Lin M.X., Yue Y.L., Hobbs G., Xu R.X., 2015, Gravitational Microlensing by Neutron Stars and Radio Pulsars: Event Rates, Timescale Distributions, and Mass Measurements, ApJ, 802, 120

◆ Destination: Postdoctoral researcher at the Australia Telescope National Facility

Jia, Siyao:

◆ PhD position in astrophysics, University of Hawaii, USA

Li, Biao:

◆ PhD thesis, The dynamics of stars and globular clusters in low-mass early-type galaxies; defended successfully on 16 June 2015. Supervisor: **Peng, Eric**

Associated paper:

Li B., Peng E.W., Zhang H.-X., Blakeslee J.P., Côté P., Ferrarese L., Jordán A., Liu C., Mei S., Puzia T.H., Takamiya M., Trancho G., West M.J., 2015, A Gemini/GMOS Study of Intermediate Luminosity Early-type Virgo Cluster Galaxies. I. Globular Cluster and Stellar Kinematics, ApJ, 806, 133

◆ Destination: Physics teacher, Renmin University High School, Beijing, China

Li, Chengyuan:

◆ PhD thesis, Not-so-simple stellar populations in massive star clusters; defended successfully on 27 May 2015. Supervisors: de Grijs, Richard; Deng, Licai (National Astronomical Observatories, Chinese Academy of Sciences, Beijing)

◆ Awarded an Outstanding PhD Dissertation Prize by Peking University

◆ First Prize, ZhongShengBiao Academic Forum, Peking University

◆ Destination: Faculty member at Purple Mountain Observatory, Nanjing, China (seconded as Macquarie Fellow to Macquarie University, Sydney, Australia)

Li, Yun:

◆ PhD thesis, The dynamical evolution of disc-fragmented multiple systems; defended successfully on 19 October 2015. Supervisor: **Kouwenhoven, M. B. N. (Thijs).**

Associated paper:

Li Y., Kouwenhoven M.B.N., Stamatellos D., Goodwin S.P., 2015, The dynamical evolution of low-mass hydrogen-burning stars, brown dwarfs and planetary-mass objects formed through disk fragmentation, ApJ, 805, 116

Liu, Beibei:

◆ PhD thesis, Growth and Migration of Embryos in Protoplanetary Disks; defended successfully on 27 May 2015. Supervisor: **Lin, Douglas N. C.**

Associated paper:

Liu B.B., Zhang X.J., Lin D.N.C., Aarseth S.J., 2015, Migration and Growth of Protoplanetary Embryos. II. Emergence of Proto-Gas-Giant Cores versus Super Earth Progenitors, ApJ, 798, 62

◆ Destination: Postdoctoral researcher at the University of Amsterdam, Netherlands

Liu, Xiangkun:

◆ PhD thesis, Weak Lensing Peak Statistics; defended successfully on 5 June 2015. Supervisor: **Fan, Zuhui.**

Associated paper:

Liu X.K., Pan C., Li R., Shan H., Wang Q., Fu L., Fan Z., Kneib J.-P., Leauthaud A., Van Waerbeke L., Makler M., Moraes B., Erben T., Charbonnier A., 2015, Cosmological constraints from weak lensing peak statistics with Canada–France–Hawai'i Telescope Stripe 82 Survey, MNRAS, 450, 2888

◆ Awarded a prize as Outstanding Graduate of Peking University

◆ Destination: Postdoctoral researcher at Peking University, Beijing, China

Molloy, Matthew:

◆ PhD thesis, Galactic Archaeology with N-body Simulations; defended successfully on 3 July 2015. Supervisors: **Herczeg, Gregory**; Smith, Martin C. (Shanghai Astronomical Observatory)

Associated papers:

Molloy M., Smith M.C., Evans N.W., Shen J., 2015, Resonant Orbits and the High Velocity Peaks toward the Bulge, ApJ, 812, 146

Molloy M., Smith M.C., Shen J., Evans N.W., 2015, Resonant Clumping and Substructure in Galactic Disks, ApJ, 804, 80

Wang, Long:

◆ Scholarship for Academic Excellence (专项奖学金), Peking University

◆ Winner, First realistic million-body simulation of globular clusters using a direct N-body code, awarded in Kobe (Japan) in December 2015 at the MODEST-15s conference by Prof. Douglas Heggie.

Ye, Fengdan:

◆ PhD position in biophysics, Rice University, Houston (TX), USA

Zhang, Chaoli:

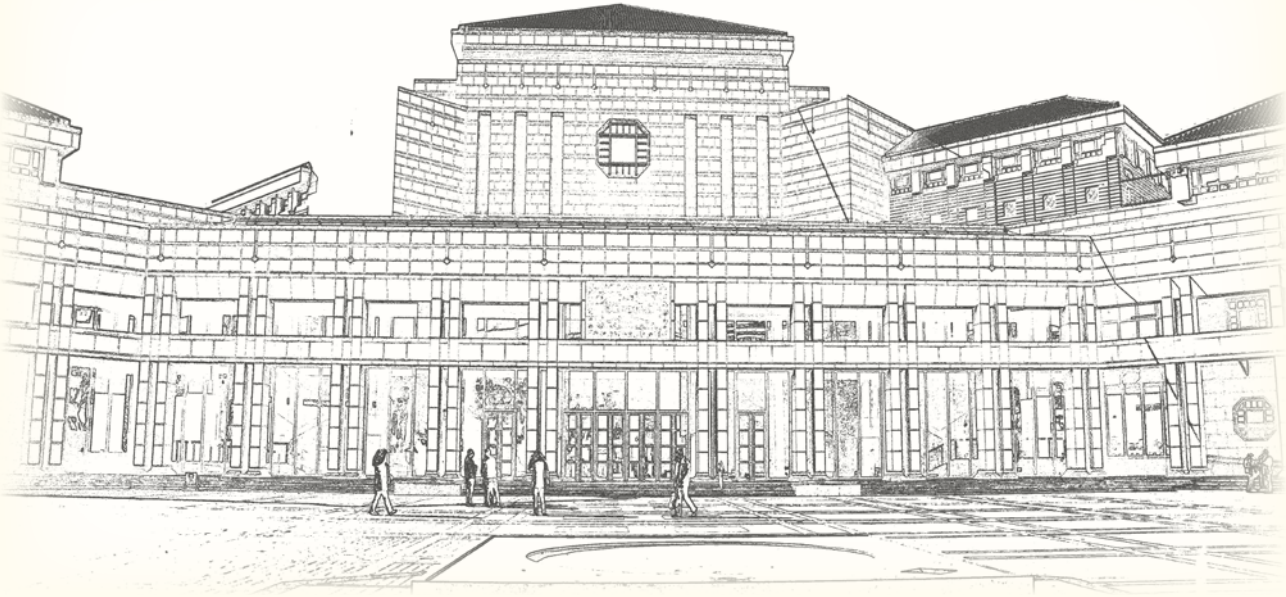
◆ PhD offer in astrophysics, Oxford University, UK

Zheng, Xiaochen:

◆ PhD thesis, The dynamical fate of planetary systems: affected by environmental and internal factors; defended successfully on 24 December 2015. Supervisors: **Kouwenhoven, M.B.N. (Thijs);** Lin, Douglas (University of California at Santa Cruz, USA)

Associated paper:

Zheng X., Kouwenhoven M.B.N., Wang L., 2015, The dynamical fate of planetary systems in young star clusters, MNRAS, 453, 2759



Peking University Youth Astronomy Society (PKU-YAS): achievements in 2015

1.Recruitment in the spring semester. PKU-YAS recruited about 100 new members on 13 and 14 March 2015.

2.Earth hour. PKU-YAS organized an event related to Earth Hour, "dark night and bright stars" from 8 p.m. to 10 p.m. on 28 March 2015.

3.Astronomy Month. April is global astronomy month. During April 2015, PKU-YAS organized the following activities: Observation of the total lunar eclipse on 4 April; Measurement of the Earth's radius; Creation of astronomical art; Birthday party of PKU-YAS on 25 April; Visit to Beijing Planetarium on 12 April; Closing ceremony of astronomy month on 30 April.

4.Lecture on dark matter by Alex Filippenko. The lecture was hosted by the Department of Astronomy; PKU-YAS helped with publicity. The lecture was held on 8 May 2015 at PKU's Ying Jie communication center.

5.Lecture on black holes by Xuebing Wu. The lecture was hosted by PKU-YAS and the main participants were students from the Chinese University of Hong Kong. The lecture was held on 16 May 2015.

6.Observations in the suburbs of Beijing. PKU-YAS organized an observation session of the spring starry sky at Gubeikou, Miyun county, on 16 May 2015; 49 people participated.

7.Mourning for Tuantu Zhou. Tuantu Zhou, PKU-YAS honorary member, passed away in May. We organized a mourning activity.

8.Lecture by Brian Schmidt, Nobel Prize laureate. PKU-YAS assisted KIAA and DoA with the Lecture. It was held on 9 September 2015.

9.Observations at Guanting. Six committee members participated in this observation at Guanting Reservoir, Hebei Province, on 12 September 2015. They mainly observed some deep sky objects in the autumn night sky and also took a few photos of the starry sky.

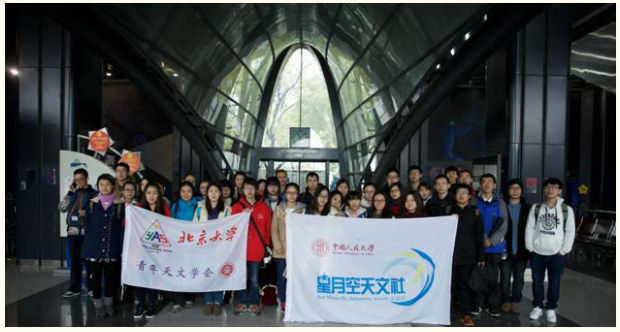
10.Recruitment in the autumn semester. PKU-YAS recruited 216 new members, including 23 from the PKU Health Science Center, at the end of September, reaching a new record membership count in recent years.

11.Public lecture at the 2015 CAS annual meeting. PKU-YAS was mainly responsible for publicity and layout of the lecture hall. The lecture was given by Douglas Lin and hosted by Jin Zhu. It was held from 8:00 p.m. to 9:30 p.m. on 19 October 2015. The lecture covered "Finding planets and life beyond the solar system". The lecture hall was crowded with people and the atmosphere was really warm.

12.Visit to Beijing Planetarium with the Star Moon Sky Society of RUC. 25 participants of PKU-YAS visited Beijing Planetarium and watched two dome films on 21 November 2015.

13."Top 10 Club of PKU". PKU-YAS was ranked 2nd in the 2015 Top 10 Clubs of Peking University competition; Professor Huawei Zhang, PKU-YAS instructor, won the title of outstanding instructor.

14.Observations in the Beijing suburbs. PKU-YAS organized an observation session of Geminids meteor shower in Gubeikou, Miyun county, on 12 December 2015; 53 people participated.



Peking University astronomy summer camp

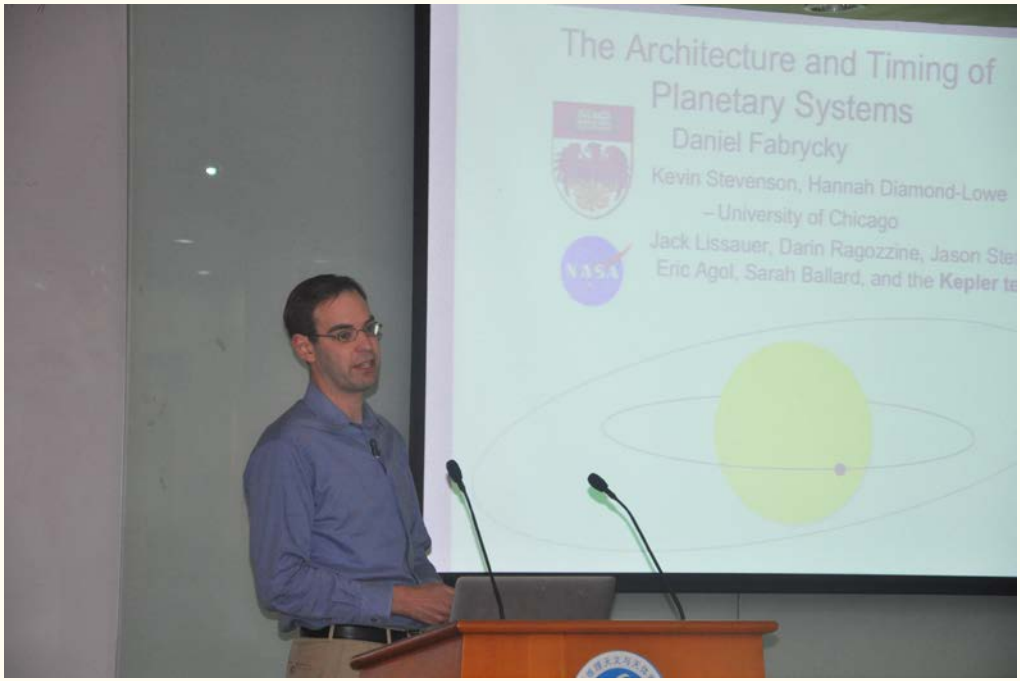
The Astronomy Summer Camp aims to familiarize middle- and high-school students with astronomy in general and with the research fields pursued at Peking University in particular. Another important aim is to select excellent students to join us, cultivating their interest in exploring the Universe and triggering their enthusiasm to study astronomy and astrophysics. The school is mainly targeted at middle/high-school sophomores in China. Since 2008, we have successfully held seven summer camps 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 camp is an important channel for PKU Astronomy to attract excellent students.

In 2015, 141 of the 918 applicants, hailing from all over the country, were selected to attend the summer camp, which was held from 27 to 30 July 2015. Most activities were held at the KIAA. Through subject navigation, lectures, mutual activities, a visit to Xinglong Observatory, an examination, and interviews, the summer camp provides an opportunity for our 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.

Visitors hosted in 2015

The Kavli Visiting Scholars program:

With the financial support of the Kavli Foundation, the Kavli Institute for Astronomy and Astrophysics (KIAA) has initiated the Kavli Visiting Scholars program. The program supports astrophysicists from across the Kavli network to spend a meaningful period of time (2 to 4 weeks) in residence at the KIAA on the campus of Peking University (PKU). During the visit, the Kavli Visiting Scholar is expected to give a KIAA/PKU colloquium and he or she is encouraged to participate in various formal and informal activities to facilitate interaction with members and students at the KIAA and the PKU Department of Astronomy. The Kavli Visiting Scholars programme is part of an effort to stimulate scientific interactions, broaden the scientific horizons of KIAA members, and potentially foster new collaborations.



Individual visitors to the Kavli Institute for Astronomy and Astrophysics and the Department of Astronomy at Peking University, 2015.

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

◆ 1 October 2014 to 31 May 2015: **Chaoli Zhang** (Leiden University, Netherlands)
◇ Host: Richard de Grijs
◇ Research interests: Near-infrared stellar photometry; star cluster dynamics

◆ 29 December 2014 to 2 January 2015: **Wei Hao** (Max-Planck Institute for Astrophysics, Germany)
◇ Hosts: Thijs Kouwenhoven and Rainer Spurzem
◇ Research interests: Planetary Dynamics

◆ 5–16 January 2015: **Daniel Fabrycky** (University of Chicago, USA)
◇ Host: Subo Dong (Kavli Scholar)
◇ Research interests: Extrasolar planets

◆ 8–26 January 2015: **Alex Lazarian** (University of Wisconsin-Madison, USA)
◇ Host: Huirong Yan
◇ Research interests: MHD Theory; Interstellar Dust; Interstellar Turbulence; Circumstellar Regions and Comets; Molecular Clouds

◆ 10–17 January 2015: **Song Huang (**Kavli IPMU, University of Tokyo, Japan)
◇ Host: Luis Ho
◇ Research interests: Galaxy formation and evolution; massive galaxies

◆ 11–17 January 2015: **Stijn Wuyts (**Max-Planck-Institut für Extraterrestrische Physik, Germany)
◇ Host: Eric Peng
◇ Research interests: Galaxy evolution; surveys

◆ 15 January 2015: **Andreas Schulze** (Kavli IPMU, University of Tokyo, Japan)
◇ Hosts: Luis Ho, Richard de Grijs
◇ Research interests: Active Galactic Nuclei, Quasars, Surveys

◆ 16 January 2015: **Fuyan Bian** (Mt Stromlo Observatory, Australia National University, Australia)
◇ Host: Xue-Bing Wu
◇ Research interests: High redshift galaxies and quasars

◆ 24–28 January 2015: **Jenny Greene** (Princeton University, USA)
◇ Host: Luis Ho
◇ Research interests: Supermassive black holes and their co-evolution with galaxies

◆ 27 January 2015 to 6 February 2015: **Yulong Zhuang** (Yunnan Astronomical Observatory, Chinese Academy of Sciences, China)
◇ Host: Thijs Kouwenhoven
◇ Research interests: Star cluster dynamics, stellar populations, N-body simulations

◆ 14–30 March 2015: **Hsiao-Wen Chen** (University of Chicago/KICP, USA)

◇ Hosts: Richard de Grijs, Luis Ho (Kavli Scholar)

◇ Research interests: Observational extragalactic astronomy, galaxy-intergalactic medium connection, quasar absorption lines, gamma-ray burst afterglows

◆ 27 March 2015: **Harry Blom** (Vice President, Springer Academic Publishers, USA)

◇ Host: Richard de Grijs

◆ 27–31 March 2015: **Tom Abel** (Stanford University/ SLAC/KIPAC, USA)

◇ Host: Luis Ho (Kavli Scholar)

◇ Research interests: Computational cosmology; the first stars

◆ 28–30 March 2015: **Fred Lo** (National Radio Astronomy Observatory, USA)

◇ Host: Luis Ho

◇ Research interests: Interacting galaxies, dwarf galaxies, megamasers, Galactic Center

◆ 7–9 April 2015: **Chengze Liu** (Shanghai Jiaotong University, Shanghai, China)

◇ Hosts: Eric Peng and Karla Alamo–Martínez

◇ Research interests: Stellar populations, galaxies

◆ 28 April 2015 to 8 May 2015: **Doug Johnstone (**National Research Council–Herzberg Institute for Astrophysics, Canada)

◇ Host: Gregory Herczeg

◇ Research interests: Star formation; molecular clouds; pre-stellar cores; protostars; circumstellar disks

◆ 3–9 May 2015: **Alex Lazarian** (University of Wisconsin-Madison, USA)

◇ Host: Huirong Yan

oResearch interests: MHD Theory; Interstellar Dust; Interstellar Turbulence; Circumstellar Regions and Comets; Molecular Clouds

◆ 6–10 May 2015: **Mark Thompson** (University of Hertfordshire, UK)

◇ Host: Yuefang Wu

◇ Research interests: Massive star formation and JCMT observations

◆ 7–8 May 2015: **Alex Filippenko** (University of California at Berkeley, USA)

◇ Host: Luis Ho

◇ Research interests: Supernovae, active galaxies, black holes, gamma-ray bursts, and the expansion of the Universe

◆ 11–22 May 2015: **James Taylor** (University of Waterloo, Canada)

◇ Hosts: Eric Peng, Jihye Shin

◇ Research interests: Dark matter, numerical simulations, gravitational lensing, galaxy dynamics

◆ 12 May 2015 to 6 July 2015: **Dongming Jin** (University of Texas at Brownsville, USA)

◇ Host: Richard de Grijs

◇ Research interests: Stellar variability

◆ 18–22 May 2015: **Sarah Bird** (Shanghai Astronomical Observatory, Shanghai, China)

◇ Host: Eric Peng

◇ Research interests: Galactic halos, galactic kinematics, stellar populations

◆ 21–22 May 2015: **May Chiao** (Senior Editor, Nature Physics, UK)

◇ Hosts: Luis Ho, Richard de Grijs

◆ 25–31 May 2015: **Song Huang** (Kavli IPMU, University of Tokyo, Japan)

◇ Host: Luis Ho

◇ Research interests: Galaxy formation and evolution; massive galaxies

◆ 25–26 May 2015: **Sungsoo Kim** (Kyung Hee University, Republic of Korea)

◇ Hosts: Jihye Shin, Richard de Grijs

◇ Research interests: Galactic dynamics

◆ 25 May 2015 to 10 June 2015: **Eunbin Kim** (Kyung Hee University, Republic of Korea)

◇ Hosts: Jihye Shin, Richard de Grijs

◇ Research interests: Star formation in barred galaxies

◆ 8 June 2015: Ramesh Narayan (Harvard University, USA)

◇ Host: Luis Ho

◇ Research interests: accretion disks, gravitational lensing, compact objects

◆ 6–10 July 2015: **Xuening Bai** (Harvard–Smithsonian Center for Astrophysics, USA)

◇ Host: Gregory Herczeg

◇ Research interests: Planet formation; high-energy astrophysics; computational astrophysics

◆ 7–8 July 2015: **Difeng Guo** (University of Amsterdam, Netherlands)

oHost: Thijs Kouwenhoven

oResearch interests: Star cluster dynamics, GAIA

◆ 9–25 July 2015: **Meicun Hou** (Nanjing University, China)

◇ Host: Eric Peng

◇ Research interests: Extragalactic astronomy; X-ray astronomy

◆ 10 June 2015 to 20 July 2015: **Bo Peng** (University of Rochester, USA)

◇ Host: Thijs Kouwenhoven

◇ Research interests: Planet formation

◆ 23 July 2015 to 21 August 2015: **Chin-Fei Lee** (ASIAA, Taiwan)

◇ Hosts: Luis Ho, Yuefang Wu, Gregory Herczeg

◇ Research interests: Star formation and Stellar Evolution; Radio Observations and MHD Numerical Simulations

◆ 24–26 August 2015: **Yanfei Jiang** (Harvard–Smithsonian Center for Astrophysics, USA)

◇ Host: Luis Ho

◇ Research interests: Radiation transfer; Numerical simulations

◆ 17 September 2015 to 14 Dececember 2015: **Matthias Kühtreiber** (University of Vienna, Austria)

◇ Host: Rainer Spurzem

◇ Research interests: the chemo-dynamical evolution of dwarf galaxies, dark matter and numerical simulations.

◆ 17 September 2015 to 2 October 2015: **Angela Olinto** (University of Chicago/KICP, USA)
◇ Host: Renxin Xu (Kavli Scholar)
◇ Research interests: Cosmic rays; magnetic fields

◆ 21–23 September 2015: **Yong Zheng (**Columbia University, USA)
◇ Host: Richard de Grijs

◆ 8–14 October 2015: **Chengyuan Li** (Purple Mountain Observatory, Nanjing, China)
◇ Host: Richard de Grijs
◇ Research interests: Multiple stellar populations in intermediate-age star clusters in the Magellanic Clouds

◆ 14–17 October 2015: **Noriyuki Matsunaga** (University of Tokyo, Japan)
◇ Host: Richard de Grijs
◇ Research interests: Variable stars

◆ 26–30 October 2015: **Alain Omont** (Institut d'Astrophysique de Paris, Université Pierre et Marie Curie and CNRS, France)
◇ Host: Ran Wang
◇ Research interests: High-redshift dust and molecules; Star formation and evolution of high redshift galaxies and QSOs

◆ 26–30 October 2015: **Roberto Maiolino** (Kavli Institute for Cosmology Cambridge/Cavendish Laboratory, University of Cambridge, UK)
◇ Host: Ran Wang
◇ Research interests: Observational investigations of galaxy formation and galaxy–black hole co-evolution

◆ 29 October 2015 to 11 November 2015: **Sarah Bird** (Shanghai Astronomical Observatory, Shanghai, China)
◇ Host: Eric Peng
◇ Research interests: Milky Way, stellar populations and dynamics

◆ 11–18 November 2015: **Minjin Kim** (Korea Astronomy and Space Science Institute, Republic of Korea)
◇ Host: Luis Ho
◇ Research interests: Co-evolution of galaxies and black holes

◆ 24 November 2015: **Denis Therien** (Canadian Institute for Advanced Research, Canada)
◇ Host: Xuebing Wu
◇ Research interests: Cosmology

◆ 25–27 November 2015: **Tsolmon Renchin** (National University of Mongolia, Mongolia)
◇ Hosts: Richard de Grijs, Thijs Kouwenhoven
◇ Research interests: Astronomy for development

◆ 16–20 November 2015: **Youkyung Ko** (Seoul National University, Republic of Korea)
◇ Host: Sungsoon Lim
◇ Research interests: Globular cluster system of early-type galaxies

◆ 19 November 2015: **Wang Yifang** (Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China)
◇ Host:Luis Ho
◇ Research interests: neutrino physics, e+ e– collision physics, cosmic rays, astrophysics, detector design and construction, and methods of data analysis

◆ 20–23 November 2015: **Gerhard Hensler** (University of Vienna, Austria)

◇ Host: Matthias Kühtreiber and Rainer Spurzem
◇ Research interests: Chemical and Dynamical Evolution of Galaxies, Computational Astrophysics

◆ 6–13 December 2015: **Christian Henkel** (Max-Planck-Institut für Radioastronomie, Bonn, Germany)
◇ Host: Yuefang Wu
◇ Research interests: ISM and star formation including Planck clump studies, molecular probes

◆ 7–11 December 2015: **Pin-Gao Gu** (ASIAA, Taiwan)
◇ Host: Subo Dong
◇ Research interests: planet–disk interactions, hot-Jupiter atmospheres

◆ 9–13 December 2015: **Ondrej Pejcha** (Princeton University, USA)
◇ Host: Subo Dong
◇ Research interests: theory and observations of core-collapse supernovae, neutron star and black hole formation, stellar mergers, stellar and planetary dynamics, stellar variability and transients

◆ 9 December 2015: **Areg Mickaelian** (Byurakan Astrophysical Observatory, Armenia)
◇ Hosts: Richard de Grijs, Thijs Kouwenhoven
◇ Research interests: active galactic nuclei; astronomy for development

Wider engagement

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

de Grijs, Richard:

◆ 11 February 2015: Consultant, Office of Astronomy for Development mid-term review (International Astronomical Union)

◆ 9 April 2015: Public lecture, Beijing Researchers' Night 4.0 ("The International Year of Light"); introduction to the theme

◆ 30 May 2015: Public lecture, Qiannan Normal College for Nationalities, Guizhou

◆ 13 June 2015: Keynote speaker, Orange Tulip Scholarships award ceremony, embassy of the Kingdom of the Netherlands to China, Beijing

◆ 29 June 2015: Public lecture, University of Tokyo, Japan

◆ October–November 2015: Facilitator, "AuthorAID Online Course in Research Writing", a 6-week course for early-stage researchers from developing countries, covering all aspects of writing research papers for publication in peer-reviewed journals. Enrolment: ~1800 (supported by 20 facilitators)

◆ Runner-up, 2015 AuthorAID writing competition: Beyond the niche: how AuthorAID has expanded my academic horizons (Office of Astronomy for Development's guest blog: http://www.astro4dev.org/blog/2015/08/14/beyond-the-niche-how-authoraid-has-expanded-my-academic-horizons/; Institute of Physics blog: http://www.iopblog.org/beyond-the-niche-how-authoraid-expands-academic-horizons/)

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

Thijs Kouwenhoven and **Richard de Grijs** alternate monthly to contribute feature articles to The Amateur Astronomer. Features published in 2015:

◆ January: Star clusters as "not-so-simple" stellar populations (de Grijs, Richard)

◆ February: Occultations by Pluto – exploring climate change on a distant world (Kouwenhoven, M.B.N.)

◆ March: New insights into the structure of the nearest galaxies in our Local Group (de Grijs, Richard)

◆ April: HIP85605 – A star on a collision course with the Solar system? (Kouwenhoven, M.B.N.)

◆ May: Cosmological insights from our backyard: the "missing satellite problem" solved? (de Grijs, Richard)

◆ June: Micrometeorites in our solar system (and on your rooftop) (Kouwenhoven, M.B.N.)

◆ July: The oldest Milky Way "globular" star clusters finally give up their secrets! (de Grijs, Richard)

◆ August: Volcanism on Venus (Kouwenhoven, M.B.N.)

◆ September: The search for life beyond Earth is heating up! (de Grijs, Richard)

◆ October: Searching for signs of advanced extraterrestrial technologies (Kouwenhoven, M.B.N.)

◆ November: Einstein revisited: Searching for the elusive "gravitational waves" (de Grijs, Richard)

◆ December: (1) The Double Star Cluster in Perseus

(Kouwenhoven, M.B.N.);

(2) Bolvormige sterrenhopen, de LEGO-blokjes van het heelal (Globular clusters, basic building blocks of the Universe) (de Grijs, Richard), Zenit (Dutch amateur astronomy magazine)

Coordinated by KIAA faculty member Richard de Grijs and 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.

Spurzem, Rainer:

◆ 12 November 2015: Public lecture, Beijing Researchers' Night 5.0 ("The Silk Road"); invited speaker

Wu, Xue-Bing:

◆ March 2015: an article "Discover the brightest 'star' in the Universe" (in Chinese) in "Amateur Astronomer" magazine

◆ May 2015: an article "Discover the biggest black hole in the deep Universe" (in Chinese) in "Science World" magazine (together with Zuo, Wenwen)

◆ November 2015: an article "Discover the supper massive black hole in the Universe" (in Chinese) in "Knowledge is Powerful" magazine (together with Zuo, Wenwen)

◆ 4 December 2015: Public lecture, Tsinghua University, Beijing, China: Secrets of the Universe

Xu, Renxin:

◆ 25 October 2015: Preschool/Primary School Talk for Children, Wangjing (Beijing), China: The Universe

Zhang, Huawei:

◆ 22 August 2015: Public dialogue on New Horizon's Pluto flyby, China Science and Technology Association (http://tech.qq.com/original/kpzg/kp254.html)

◆ 29 August 2015: Public dialogue on the discovery of "another Earth": Kepler 452b, China Science and Technology Association (http://tech.qq.com/a/20150915/026478.htm)

The Peking University astronomy "family"

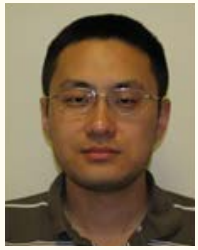
KIAA Faculty:

Chen, Jiansheng

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



Dong, Subo

youth Qianren research professor

Research interests:

Extrasolar planets, gravitational microlensing, dynamics, Type Ia supernovae, time-domain astronomy

Herczeg, Gregory J

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

Jiang, Linhua

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

deGrijs, Richard

professor

Research interests:

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

Fan, Xiaohui

visiting chair professor (Qianren B)

Research interests:

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

Ho, Luis C

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

Kouwenhoven, M.B.N.

Bairen research professor

Research interests:

formation and evolution of binary and multiple stellar systems, dynamics of planetary systems, star formation, N-body simulations, the initial mass function

Lee, Kejia

youth Qianren research professor

Research interests:

pulsars, gravitational waves

Peng, Yingjie

assistant professor

Research interests:

observational cosmology, galaxy formation and evolution

Wu, Xue-Bing

professor, associate director

Research interests:

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

Yu, Qingjuan

professor

Research interests:

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

Li, Li-Xin

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

Wang, Ran

youth Qianren research professor

Research interests:

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

Yan, Huirong

Bairen research professor
(until September 2015)

Research interests:

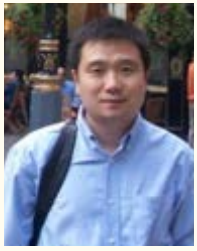
cosmic ray physics, ISM theories, astrophysical magnetic field, turbulence, dust dynamics, supernovae, cluster of galaxies, GRBs, accretion disk

Joint KIAA/Department of Astronomy (DoA) Faculty:

Fan, Zuhui
professor, associate director of the DoA
Research interests:
cosmology, gravitational lensing, clusters of galaxies, galactic dynamics

Liu, Fukun
professor, director of the DoA
Research interests:
supermassive black hole binaries, accretion disks and active galactic nuclei

Peng, Eric W.
associate professor
Research interests:
galaxy formation and evolution, stellar populations, galaxy dynamics, globular cluster systems



Zhang, Bing
Chang Jiang visiting chair professor
Research interests:
high-energy astrophysics, gamma-ray bursts and relativistic jets, black holes, neutron stars, multi-messenger astrophysics

Li, Zhuo
Bairen research professor
Research interests:
gamma-ray bursts and supernovae, high-energy cosmic rays and neutrinos, relativistic collisionless shocks

Liu, Xiao-Wei
professor
Research interests:
wide-field astronomy, spectroscopy, Galactic archeology and near-field cosmology, interstellar medium, atomic and molecular processes, radiation mechanisms

Xu, Renxin
professor
Research interests:
particle astrophysics, pulsars, quark stars, neutron stars

Zhang, Hua-Wei
associate professor
Research interests:
stellar abundances, Galactic structure

Zhang, Jian
associate professor
Research interests:
Radio astronomical instruments, hard X-ray emission from solar flares

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

Postdoctoral Researchers:

Alamo-Martinez,Karla
CAS–CONICYT China–Chile Fellow (until June 2015)
Research interests:
galaxy evolution, globular cluster systems, galaxy clusters, fossil groups

Chen, Bingqiu
DoA Postdoc
Research interests:
three-dimensional extinction maps; dust, interstellar medium, structure of the Milky Way; pulsating stars; photometric/spectroscopic surveys

Gully-Santiago, Michael Anthony
KIAA Postdoc (from October 2015)
Research interests:
optical/near-infrared identification, spectral modeling, and characterization of young and low mass stars

Jose, Jessy
KIAA Postdoc
Research interests:
Galactic HII regions, embedded star clusters, triggered star formation, young stellar objects

Kolodzig,Alexander
KIAA Fellow (from October 2015)
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

Dong, Xiaoyi
DoA Postdoc
Research interests:
active galactic nuclei, galactic star formation, supermassive black holes

Subramanian Hari Sharma,Smitha
KIAA Fellow (from October 2015)
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

Kim,Yonghwi
KIAA Fellow (from October 2015)
Research interests:
galaxy formation and evolution, gas dynamics in disk galaxies and galaxy clusters, instability

Lim, Sungsoon
DoA Postdoc
Research interests:
galaxy formation and evolution, starburst galaxies, star clusters, globular cluster systems, ultra-compact dwarf galaxies

Flores Fajardo,Nahiely
DoA postdoc (until June 2015)
Research interests:
Interstellar medium; photoionization models and spectroscopic observations; diffuse ionized gas in galaxies and the ionization source; protoplanetary discs (proplyds) in the Orion Nebula, the ionization from θ^1C and θ^2A stars; chemical abundances in photo-ionized nebulae.

Liu,Xiangkun

DoA Postdoc (from July 2015)

Research interests:

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

Meiron, Yohai

KIAA Fellow (until December 2015)

Research interests:

stellar dynamics

Pattarakijwanich,Petchara

KIAA Fellow (from October 2015)

Research interests:

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

Rebassa-Mansergas,Alberto

LAMOST Fellow (until March 2015)

Research interests:

formation and evolution of compact binaries; physical properties of white dwarfs and low-mass main sequence stars; supernovae Ia progenitors; protoplanetary disk evolution; surveys and data mining.

Ren, Juanjuan

DoA Postdoc

Research interests:

Bbinary stars, astronomical data mining, the Milky Way, spectroscopic surveys

Shin, Jihye

KIAA Fellow (until December 2015)

Research interests:

cosmological origin of globular clusters, dynamical evolution of globular cluster systems

Tian,Zhijia

DoA Postdoc (from October 2015)

Research interests:

stellar structure and evolution; stellar oscillations; stellar populations synthesis

Uhm, Z. Lucas

KIAA Postdoc (until March 2015)

Research interests:

Gamma-ray bursts, hydrodynamics, radiation processes, relativistic shock waves

Xie,Yanxia

KIAA Postdoc (from October 2015)

Research interests:

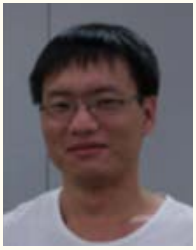
infrared properties and dust content in active galaxies

Yuan, Haibo

LAMOST Fellow, KIAA Fellow (until September 2015)

Research interests:

wide-field photometric and spectroscopic surveys, data mining, Galactic archaeology, near-field cosmology (e.g., M31), astrophysics of emission-line nebulae, photoionization modeling

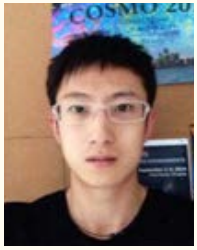


Zhang, Hongxin

CAS–CONICYT China–Chile Fellow (until March 2015)

Research interests:

star formation in galaxies, dwarf galaxies, globular cluster systems, ultra-compact dwarf galaxies



Yu, Hao-Ran

KIAA–CITA Joint Postdoctoral Fellow

Research interests:

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

Zhang, Fupeng

KIAA Postdoc (until September 2015)

Research interests:

stellar dynamics around massive black holes, general relativity, active galactic nuclei

Administration and Support Staff

Jie Yao
Institute Manager

Lili Liu
Administration Assistant

Shuyan Liu
Science Secretary

Shuo Zhang
Administration Assistant

Shuxian Li
Administration Assistant

Graduate students

◆ **Cao, Rong; 曹荣** (class of 2013)
◇ PhD supervisor: Liu, Fukun

◆ **Chen, Ping; 陈平** (class of 2015)

◆ **Chen, Xiaodian; 陈孝钿** (class of 2011)
◇ PhD supervisors: Richard de Grijs, Licai Deng (NAOC)

◆ **Chen, Yunfeng; 陈云峰** (class of 2012)
◇ PhD supervisor: Yu, Qingjuan

◆ **Dai, Shi; 代实** (class of 2010)
◇ PhD supervisor: Xu, Renxin

◆ **Dou, Jing; 窦晶** (class of 2015)

◆ **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)

◆ **Guo, Zhen; 郭震** (class of 2012)
◇ PhD supervisor: Gregory Herczeg

◆ **Huang, Yan; 黄艳** (class of 2015)

◆ **Huang, Yang; 黄样** (class of 2011)
◇ PhD supervisor: Liu, Xiaowei

◆ **Li, Jia–nan; 李佳男** (class of 2015)

◆ **Li, Qiong; 李琼** (class of 2014)
◇ PhD supervisor: Wang, Ran

◆ **Li, Yun; 李云** (class of 2009)
◇ PhD supervisor: Thijs Kouwenhoven

◆ **Liu, Dezi; 刘德子** (class of 2012)
◇ PhD supervisor: Fan, Zuhui

◆ **Liu, Xunchuan; 刘训川** (class of 2015)

◆ **Liu, Yiqing; 刘逸清** (class of 2011)
◇ PhD supervisor: Eric Peng

◆ **Long, Feng; 龙凤** (class of 2013)
◇ PhD supervisor: Gregory Herczeg

◆ **Lu, Jiguang; 卢吉光** (class of 2012)
◇ PhD supervisor: Xu, Renxin

◆ **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)

◆ **Man, Zhongyi; 满中意** (class of 2015)

◆ **Men, Yunmeng; 门云鹏** (class of 2014)
◇ PhD supervisor: Xu, Renxin

◆ **Molloy, Matthew; 马强** (class of 2011)
◇ PhD supervisor: Gregory Herczeg

◆ **Ren, Fangzhou; 任方舟** (class of 2015)

◆ **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: Thijs Kouwenhoven

◆ **Sun, Hui; 孙惠** (class of 2012)
◇ PhD supervisor: Zhang, Bing

◆ **Sun, Ningchen; 孙宁晨** (class of 2013)
◇ PhD supervisor: Richard de Grijs

◆ **Wang, Bitao; 王碧涛** (class of 2015)

◆ **Wang, Bin; 汪斌** (class of 2009)
◇ PhD supervisor: Li, Zhuo

◆ **Wang, Chun; 王春** (class of 2013)
◇ PhD supervisor: Liu, Xiaowei

◆ **Wang, Feige; 王飞格** (class of 2012)
◇ PhD supervisors: Fan, Xiaohui; Wu, Xuebing

◆ **Wang, Jianfeng; 王健锋** (class of 2014)
◇ PhD supervisor: Yu, Qingjuan

◆ **Wang, Long; 王龙** (class of 2011)
◇ PhD supervisors: Thijs Kouwenhoven, Rainer Spurzem

◆ **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, Siyao; 徐思遥** (class of 2011)
◇ PhD supervisor: Zhang, Bing

◆ **Xu, Ziyan; 徐紫嫣** (class of 2015)

◆ **Yang, Jinyi; 杨锦怡** (class of 2011)
◇ PhD supervisor: Wu, Xue-Bing

◆ **Yang, Qian; 杨倩** (class of 2012)
◇ PhD supervisor: Wu, Xue-Bing

◆ **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, Chengpeng; 张程鹏** (class of 2014)
◇ PhD supervisor: Peng, Yingjie

◆ **Zhang, Congyao; 张从尧** (class of 2010)
◇ PhD supervisor: Yu, Qingjuan

◆ **Zhao, Yulin; 赵玉琳** (class of 2013)
◇ PhD supervisor: Luis Ho

◆ **Zheng, Xiaochen; 郑晓晨** (class of 2010)
◇ PhD supervisor: Thijs Kouwenhoven

◆ **Zhou, Enping; 周恩平** (class of 2012)
◇ PhD supervisor: Xu, Renxin

◆ **Zhou, Zhiqin; 周智勤** (class of 2014)
PhD supervisor: Liu, Fukun