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Scientific Organizing Committee

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- Sungki CHO (KASI)
- Makoto INOUE (ASIAA, Co-Chair)
- Mareki HONMA (NAOJ)
- Norio KAIFU (NAOJ, Advisor)
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- Chin-Fei LEE (ASIAA)
- Jifeng LIU (NAOC)
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Programs (Subject to Change)

Sunday October 13, 2013	
18:00-21:00	Reception at Hotel Kuva Chateau 3F Conference Room "花舞軒"
Monday October 14, 2013	
08:30~09:00	Registration
09:00~09:15	Welcome/Opening Remarks Chair: Paul HO (ASIAA) Speakers: NCU President, Prof. JOU; IoA Director KO
	I. EA Astronomy Status Chair: Makoto INOUE (ASIAA)
09:20~09:48	EACOA Status and Prospects Paul HO (*Academia Sinica Institute of Astronomy and Astrophysics*)
09:50~10:08	Roles of SEAAN on the Development of Astronomy in Southeast Asia Boonrucksar SOONTHORNTHUM (*National Astronomical Research Institute of Thailand*)
10:10~10:28	Inhomogeneities in protoplanetary disks: the observational properties of disks with inhomogeneities and the population of exoplanetary systems Yasuhiro HASEGAWA (*ASIAA*)
10:30~10:50	***Group Photo***
10:50~11:10	***Tea Break***
	II. Large-Scale Projects (1) Chair: Chin-Fei LEE (ASIAA)
11:10~11:28	The status of ALMA East Asia and the activities of East-Asian ALMA Regional Center Ken'ichi TATEMATSU (*National Astronomical Observatory of Japan*)

11:30~11:48	ALMA-Taiwan Activities and Science Patrick KOCH (*ASIAA*)
11:50~12:10	Discussion
12:10~14:00	***Lunch***
	III. Large-Scale Projects (2) Chair: Wing-Huen IP (NCU)
14:00~14:18	TMT project in Japan and prospects for collaborations in ELT era Wako AOKI (*National Astronomical Observatory of Japan*)
14:20~14:38	TMT-China Shude MAO (NAOC)
14:40~14:58	K-GMT: Korean Extremely Large Telescope Project Narae HWANG (*Korea Astronomy and Space Science Institute (KASI)*)
15:00~15:20	Discussion
15:20~15:38	SKA-related activities in Japan Hiroyuki NAKANISHI (*Kagoshima university*)
15:40~15:58	Scientific Activities Related to SKA in Taiwan Hiroyuki HIRASHITA (*ASIAA*)
16:00~16:10	Discussion
16:10~16:30	***Tea Break***
	IV. Large-Scale Projects (3) Chair: Sungki CHO (KASI)
16:30~16:48	The next-generation Infrared Astronomy Mission SPICA Hideo MATSUHARA (*Institute of Space and Astronautical Science, JAXA*)
16:50~17:08	The Mid-Infrared Camera and Spectrometer for SPICA: general overview and Taiwan's contribution Ciska KEMPER (*ASIAA*)
17:10~17:28	Korean Contribution to SPICA: Development of NIR Instrument, FPC Woong-Seob JEONG (*KASI*)
17:30~17:50	Discussion

Tuesday October 15, 2013	
	V. Large-Scale Projects (4) Chair: Jifeng LIU (NAOC)
09:00~09:18	The ASTRO-H project Hironori MATSUMOTO (*Nagoya University*)
09:20~09:38	The next-generation space solar observatory SOLAR-C Hirohisa HARA (*National Astronomical Observatory of Japan*)
09:40~10:00	Discussion
	VI. Regional Collaboration (1) Chair: Chun-Ming KO (NCU)
10:00~10:18	Merger signatures in cluster early-type galaxies Chang Hee REE (*Korea Astronomy and Space Science Institute*)
10:20~10:38	Studying BH/NS/WDs with LAMOST Jifeng LIU (*NAOC*)
10:40~11:00	***Tea Break***
11:00~11:18	LiteBIRD - a future satellite for the studies of B-mode polarization and Inflation from cosmic background Radiation Detection Masashi HAZUMI (*KEK*)
11:20~11:38	Recent Activities of KASI for Solar Physics Kyungsuk CHO (*Korea Astronomy & Space Sceince Institute*)
11:40~11:58	Introduction on China's several space astronomical missions Shu ZHANG (*Institute of High Energy Physics,CAS*)
12:00~13:30	***Lunch***
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13:30~13:48	Herschel/HST studies of ULIRGs at z~2 Jiasheng HUANG (*NAOC/Harvard*)
13:50~14:08	The Transition from Atomic to Molecular ISM and Observational Opportunities in the Next 5 Years Di LI (*National Astronomical Observatories of China*)

14:10~14:23	The statistical nature of the brightest group galaxies Shiyin SHEN (*Shanghai Astronomical Observatory*)
14:25~14:38	Studies on galaxy formation using high resolution deep imaging of high-z QSO fields Yiping WANG (*NAOC*)
14:40~14:53	Mode of accretion, Jet Dynamics and Particle Acceleration physics in radio galaxies Chiranjib KONAR (*ASIAA*)
14:55~15:13	KaVA collaboration of KJ/JK joint AGN WG and K-SKA WG activities Bong Won SOHN (*KASI*)
15:15~15:40	***Tea Break***
	VIII. Regional Collaboration (3) Chair: Jiasheng HUANG (NAOC/CfA)
15:40~15:58	Exploring the Gamma-ray skies with the Fermi Gamma-ray Space Telescope and the Fermi Asian Network (FAN) Albert KONG (*National Tsing Hua University*)
16:00~16:18	Gamma-Ray Burst sciences with EA collaborations Yuji URATA (*NCU*)
16:20~16:38	X-ray and gamma-ray study of cosmic-ray acceleration in supernova remnants Yasunobu UCHIYAMA (*Rikkyo University*)
16:40~16:53	Super-Eddington accreting massive black holes Jian-Min WANG (*Institute of High Energy Physics*)
16:55~17:13	A Report on TANGO and the PTF/iPTF Project Wing-Huen IP (*Institute of Astronomy, National Central University*)
17:15~17:33	Distance Scale and Variable Stars Research at National Central University Chow-Choong NGEOW (*National Central University*)
17:35~17:53	Fast photometry at the Thai 2.4m telescope Andrea RICHICHI (*National Astronomical Research Institute of Thailand (NARIT)*)
17:55~18:10	Discussion
19:00	***Conference Banquet (Hotel Kuva Chateau 1F)***

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	IX. Regional Collaboration (4) Chair: Chorng-Yuan HWANG (NCU)
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09:20~09:38	The status of Transneptunian Automated Occultation Survey (TAOS Ⅱ) Shiang-Yu WANG (*ASIAA*)
09:40~09:58	The University of Tokyo Atacama Observatory (TAO) Project Mamoru DOI (*The University of Tokyo*)
10:00~10:18	Current Status of the Pan-STARRS Project and Beyond Wen-Ping CHEN (*National Central University*)
10:20~10:40	***Tea Break***
	X. Regional Collaboration (5) Chair: Mareki HONMA (NAOJ)
10:40~10:58	Kyoto Univ. 3.8m New Technology Telescope Mikio KURITA (Kyoto U)
11:00~11:18	An East-Asian Collaboration in VLBI Astronomy Kenta FUJISAWA (*Yamaguchi University*)
11:20~11:38	Current Status of the KVN Do-Young BYUN (*KASI*)
11:40~11:58	Greenland Telescope for submm VLBI Makoto INOUE (*ASIAA*)
12:00~12:13	Cryogenic Wideband MMIC-LNA development in SHAO Ying CHEN (*Shanghai Astronomical Observatory,Chinese Academy of Sciences*)
12:15~13:30	***Lunch***

	XI. Regional Collaboration (6) Chair: Hyung Mok LEE (SNU)
13:30~13:48	The latest status of the Submillimeter array (SMA) Naomi HIRANO (*ASIAA*)
13:50~14:08	The Status of the AMiBA Project Jiun-Huei Proty WU (NTU)
14:10~14:23	Synergy of wide-field cyclical surveys and 4-channel simultaneous imager "Dogioya" Daisuke KINOSHITA (*Institute of Astronomy, National Central University*)
14:25~14:38	The SED Machine - Fast Classification of Transient Objects Andreas RITTER (*NCU*)
14:40~14:58	Data-Intensive Astronomy Masatoshi OHISHI (*National Astronomical Observatory of Japan*)
15:00~15:18	Numerical simulations of cosmic structures Yipeng JING (*Shanghai Jiaotong University/Shanghai Astronomical Observatory*)
15:20~15:33	Silk Road Project - an Asian and international collaboration on supercomputing and gravitational wave research Rainer SPURZEM (*National Astronomical Observatories, Chinese Academy of Sciences*)
15:35~15:53	AKARI data reduction and archive project Satoshi TAKITA (*ISAS/JAXA*)
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	XII. Regional Collaboration (7) Chair: Yipeng JING (SJTU)
16:20~16:38	Observation of Electromagnetic Waves Associated with Gravitational Wave Events Hyung Mok LEE (*Seoul National University*)
16:40~16:58	Superflares on solar-type stars Hiroyuki MAEHARA (*The University of Tokyo*)

17:00~17:18	Detection and characterization of extra-solar planets by infrared radial velocity and high-contrast imaging instruments Takayuki KOTANI (*National Astronomical Observatory of Japan*)
17:20~17:38	Studies of Exoplanetary Systems with Subaru Telescope Masayuki KUZUHARA (*Tokyo Institute of Technology*)
17:40~17:53	The Asteroid Rotation Period Study Using PTF Data Chan-Kao CHANG (*Institute of Astronamy, National Central University, Taiwan*)
17:55~18:08	Designing Science Classroom for Astronomy in Mongolian Traditional Home Tsolmon RENCHIN (*National University of Mongolia*)
18:10~18:20	Discussion

Thursday October 17, 2013	
	XIII. Regional Collaboration (8) Chair: Michitoshi YOSHIDA (Hiroshima U)
09:00~09:18	Status and Future Plans of the NAOJ Masahiko HAYASHI (*NAOJ*)
09:20~09:38	Infrared Polarimetric Studies toward Star and Planet Forming Regions Jungmi KWON (*National Astronomical Observatory of Japan*)
09:40~09:53	Polarization and Magnetic Field in Star formation Ya-Wen TANG (*ASIAA*)
09:55~10:08	Multi-wavebands study of Supernova remnants Xiaohong CUI (*National Astronomical Observatories, Chinese Academy of Sciences (NAOC)*)
10:10~10:23	location the stars in n>3-dimenitions Hsihchia HSIEH (*providence univ*)
10:25~10:38	Binary nature revealed in circumstellar spiral-shell patterns Hyosun KIM (*ASIAA*)

10:40~10:53	CIBER: Sounding rocket experiment to observe the near-infrtared background Toshio MATSUMOTO (*ASIAA*)
10:55~11:10	Discussion
11:10~11:25	***Tea Break***
	XIV. Regional Collaboration (9) Chair: Ji YANG (PMO)
11:25~11:43	Conditions and Development of Ali Site, Tibet Yongqiang YAO (*National Astronomical Observatories, Chinese Academy of Sciences*)
11:45~12:03	A China-Japan Collaborative Site Survey in west Tibet - Sky clearness at Gar/Ali, Tibet - Toshiyuki SASAKI (*NAOJ*)
12:05~12:23	HiNOTORI: Hiroshima 50cm telescope project in Tibet area Michitoshi YOSHIDA (*Hiroshima University*)
12:25~12:40	Discussion
12:40~14:00	***Lunch***
	XV. Status Update & Prospects Chair: Wen-Ping CHEN (NCU)
14:00~14:18	Status of the Subaru Telescope Nagayoshi OHASHI (NAOJ)
14:20~14:38	HSC and the status of Subaru Telescope Satoshi MIYAZAKI (*National Astronomical Observatory of Japan*)
14:40~14:58	The Future of the JCMT: Observing the Present through the Distant Past Doug JOHNSTONE (*Joint Astronomy Centre*)
	XVI. EACOA into the Future Chair: Paul HO (ASIAA)
15:00~15:18	Cooperation in Astronomy: Past and Future Norio KAIFU (*NAOJ*)
15:20~15:33	Report of EAYAM: East Asian Young Astronomers Meeting Hidekazu HANAYAMA (*NAOJ*)
15:35~15:55	Discussion
15:55~16:00	Closing Remarks Norio KAIFU, Paul HO

Friday October 18, 2013	
	ASIAA Colloquium place: ASIAA (Taipei) Auditorium (Room 1203)
15:00~16:00	The Evolution of Star-Forming Cores in Molecular Clouds: Using Theoretical Models to Inform the Observations Doug JOHNSTONE (*JCMT*)

Presentation Abstracts

Oct 14, I. EA Astronomy Status : Invited Talk

Roles of SEAAN on the Development of Astronomy in Southeast Asia

Boonrucksar Soonthornthum

National Astronomical Research Institute of Thailand

The Southeast Asia Astronomy Network (SEAAN) was established in 2007. The aim of SEAAN is to establish effective mechanism for nurturing and sharing the development and experiences in astronomy research and education among Southeast Asian countries and its important mission is to seek for collaboration in astronomy in the region. The SEAAN meeting is held annually to discuss on the progress of the network and plans the future projects as well as scientific presentations. Recently, some joint research projects, such as the "Eclipsing Binaries' Minima Monitoring (BIMA) Project", Joint Project on the "Development of Radio Astronomy", were initiated. The SEAAN Workshop on "Modeling and Data Analysis in Astronomy (SEA MODA)" has just organized in 2013 and the proposal for the "Program Group - High Performance Computing (PG-HPC)" during the SEA MODA business meeting was approved to coordinate the use of HPC facilities within the member countries of SEAAN. The 1st SEAAN School, namely the "Time Variability in Modern Astrophysics" is planned to organize in 2014. One of the vision of SEAAN is to encourage interaction and collaborations between young astronomers from all Southeast Asian nations , future generations to take up a career in astronomy and to promote interaction between young astronomers in SEA and other young astronomers worldwide, the South East Asia Young Astronomers Collaboration (SEAYAC) was also established under the support of SEAAN.

Oct 14, I. EA Astronomy Status

Inhomogeneities in protoplanetary disks: the observational properties of disks with inhomogeneities and the population of exoplanetary systems

Yasuhiro Hasegawa (ASIAA), Ralph Pudritz (McMaster),

Sienny Shang (ASIAA), Pin-Gao Gu (ASIAA)

The large number of recent high-resolution observations shows that protoplanetary disks have a various kind of “structures” in their properties. For example, SMA observations infer a radial discontinuous structure in the gas-phase CO column density. It is well recognized that these kinds of structures, or “inhomogeneities”, in disks are the consequence of the mixture of a number of physical and chemical processes taking place in the disks. Here, we present a very comprehensive study of disk inhomogeneities in which we investigate how the disk inhomogeneities alter the observables of disks such as SEDs and images and explore how the inhomogeneities affect planet formation that proceeds in the disks. We demonstrate that disk inhomogeneities give rise to planet traps – specific sites in protoplanetary disks at which rapid type I migration is halted. We show that up to three types of traps (heat transitions, ice lines and dead zones) can exist in a single disk, and that they capture and transport planetary cores from large to small orbital periods very slowly, as the disk accretion rate decreases with time. We also demonstrate that planetary populations, that are generated by the combination of the standard core accretion scenario with planet traps, are consistent well with the observations of exoplanets, wherein most gas giants are piled up around 1 AU with a large number of low-mass planets in tight orbits. We finally discuss the observational properties of disks with inhomogeneities. It is important that such disk properties may be examined by ALMA observations.

Oct 14, II Large-Scale Projects (1)

The status of ALMA East Asia and the activities of East-Asian ALMA Regional Center

Ken Tatematsu

National Astronomical Observatory of Japan

I will report the current status and prospects of the Atacama Large Millimeter/submillimeter Array (ALMA) from the point of the East Asian executive, and also explain the activities of East Asian ALMA Regional Center.

Oct 14, II Large-Scale Projects (1)

ALMA-Taiwan Activities and Science

Patrick Koch (ASIAA)

We present progress and status of Taiwan's involvement in the ALMA project, highlighting both engineering development efforts and science cases.

Oct 14, III Large-Scale Projects (2)

TMT project in Japan and prospects for collaborations in ELT era

Wako Aoki (National Astronomical Observatory of Japan)

Thirty Meter Telescope (TMT) is a next generation extremely large optical/infrared telescope planned by an international collaboration. The construction will start at Mauna Kea in Hawaii next year. TMT-Japan is starting the production of the segment mirrors for the telescope primary mirror and the design and development of the telescope structure and instruments. I will review the current status of the TMT project and discuss the possible future collaborations in the East Asian community with large optical/infrared telescopes.

Oct 14, III Large-Scale Projects (2)

TMT-China

Shude Mao (NAOC)

The Thirty Meter Telescope (TMT) project is an international partnership to build the next-generation extremely large optical/IR telescope on Mauna Kea, Hawaii. A consortium of Chinese institutes are involved in the effort to participate in many high-tech aspects of TMT. I will briefly review the status of these efforts and outline the opportunities and challenges ahead.

Oct 14, III Large-Scale Projects (2)

K-GMT: Korean Extremely Large Telescope Project

Narae Hwang, Byeong-Gon Park, Young-Soo Kim, In-Soo Yuk,

Jae-Joon Lee, Yang-Noh Yoon (KASI)

The Giant Magellan Telescope (GMT) is a next generation extremely large telescope with 25m aperture, composed of seven 8.4m segmented mirrors. The GMT is being constructed at Las Campanas, Chile and will be in early operational stage in 2019. Korea Astronomy and Space Science Institute (KASI) is a founding member of the GMT consortium, representing Korea, and is playing an active role to realize this ambitious project in terms of construction, instrumentation, and science. We will give a brief overview of K-GMT Project with an expectation of close collaboration among East Asian communities in the era of 2020.

Oct 14, III Large-Scale Projects (2)

SKA-related activities in Japan

Hiroyuki Nakanishi (Kagoshima university) and Japan SKA consortium

The square kilometer array (SKA) will be the largest radio interferometer covering frequency of 70 MHz - 10 GHz in the world in the next decades.

We will talk about current activities led by Japan SKA consortium in both aspects of science and engineering. Also an international collaboration in the East Asia region is being discussed.

Oct 14, III Large-Scale Projects (2)

Scientific Activities Related to SKA in Taiwan

Hiroyuki Hirashita, Tzu-Ching Chang, *et al. (ASIAA)*

We present our SKA-related activities in Taiwan, aiming at establishing collaboration in the East-Asian region. The main scientific topics are (i) extended radio emissions around AGNs, (ii) galaxy evolution traced by H I and radio continuum, and (iii) radio activities in young stellar objects. Finally we will also briefly mention our activities of instrumental development. Receivers and correlators are promising items for East-Asian collaboration for us.

Oct 14, IV. Large-Scale Projects (3)

The next-generation Infrared Astronomy Mission SPICA

Hideo Matsuhara, Takao Nakagawa, Yasuhiro Kawakatsu,

Mitsunobu Kawada (ISAS,JAXA)

SPICA is the next-generation, space infrared observatory, following in the footsteps of IRAS, ISO, Spitzer, AKARI and Herschel. With its 3.2-meter telescope cryogenically cooled to 6 Kelvin, SPICA provides an extremely low background level environment. With its instrument suite, designed with state-of-the art detectors to fully exploit this low background, SPICA will provide high spatial resolution and unprecedented sensitivity in the mid- and far-infrared. SPICA will be placed at L2 point.

These unique capabilities will bridge the gap between ALMA/large submm ground telescopes and JWST/large ground opt.-IR telescopes. Thus astronomers will be allowed to address key problems in resent-day astronomy in many research areas, ranging from the formation of planets to the large scale star-formation history of the Universe. SPICA is proposed as a Japanese-led mission, with extensive international collaboration. The satellite is targeted for launch in 2022 with a nominal mission lifetime of three years.

Oct 14, IV. Large-Scale Projects (3)

The Mid-Infrared Camera and Spectrometer for SPICA: general overview and Taiwan's contribution

Ciska Kemper (ASIAA)

The Mid-Infrared Camera and Spectrometer (MCS) is a focal-plane instrument for SPICA developed in collaboration between Japan and Taiwan. It will operate from 5-38 micron and features both imaging and spectroscopic observing modes. The camera consists of short and a long wavelength part, each allowing for ~18 different filters to provide a good photometric and grism coverage over the full wavelength range. The spectroscopic capabilities are covered by two slit modes: HRS-L with a spectral resolution of 20,000-30,000 and a wavelength coverage of 12-18 micron, and MRS-L/S a spectral resolution of 1000-2000 and a wavelength coverage of 12.2 - 37.5 micron. In this talk I will provide a general overview of the instrument and its capabilities. I will also discuss specific science cases, in line with the three major scientific objectives defined by JAXA (birth and evolution of galaxies; planetary system formation; the life cycle of dust in the Universe). Although a relatively new partner to the SPICA project, Taiwan boasts a growing infrared community, and proves to be a strong partner in the MCS instrument. I will highlight the role of the Taiwanese community in the technical development of MCS, as well as the contributions of Taiwan-based astronomers to the development of the science case for MCS.

Oct 14, IV. Large-Scale Projects (3)

Korean Contribution to SPICA: Development of NIR Instrument, FPC

Woong-Seob Jeong, Dae-Hee Lee (KASI),

Toshio Matsumoto (ASIAA, ISAS/JAXA), Kohji Tsumura (ISAS/JAXA),

Myungshin Im (SNU),

SPICA/FPC Team (KASI, ASIAA, SNU, KHU, ISAS/JAXA, NAOJ)

The SPICA (SPace Infrared Telescope for Cosmology & Astrophysics) is a next-generation infrared space telescope optimized for mid- and far-infrared observation with a cryogenically cooled 3m-class telescope. Owing to unprecedented sensitivity and high spatial resolution, the focal plane instruments will challenge to reveal many astronomical key issues from the star-formation history of the universe to the planetary formation.

The Korean contribution to SPICA as an international collaboration is the development of the near-infrared instrument, FPC (Focal Plane Instrument). The proposed FPC has two near-infrared cameras: FPC-G (Guider) for a system instrument as a part of Attitude and Orbit Control System (AOCS) and FPC-S (Science) for a scientific observation in the near-infrared as well as a backup function of FPC-G. The FPC-G will perform the fine guiding complementing the attitude information from AOCS. The backup instrument of FPC-G, FPC-S has the capabilities of both low-resolution imaging spectroscopy (R~20) and wide-band imaging. The proposed observational strategies such as the near-infrared specttocopic survey and the parallel imaging survey will strengthen advantages of the FPC-S. The legacy science from FPC-S is to probe the origin of cosmic near-infrared background radiation and the star formation history at high redshift. The large area imaging survey in parallel imaging mode gives us opportunities to study the rare, bright objects such as quasars, bright star-forming galaxies and ultra-cool brown dwarfs.

Oct 15, V. Large-Scale Projects (4)

The ASTRO-H project

Hironori Mastumoto (Nagoya University)

The ASTRO-H mission is developed by an international collaboration led by ISAS/JAXA, and the satellite will be launched in 2015. ASTRO-H covers a wide energy band from 0.3 to 600keV and provides high energy-resolution X-ray spectroscopy in the 0.3-12 keV band. ASTRO-H will open a new frontier of high-energy astrophysics with high-resolution, high-throughput spectroscopy with moderate angular resolution.

Oct 15, V. Large-Scale Projects (4)

The next-generation space solar observatory SOLAR-C

Hirohisa Hara (NAOJ) and JAXA SOLAR-C Working Group

The SOLAR-C is a planned satellite mission that is planned by the JAXA SOLAR-C working group as the 4th Japanese space solar observatory that follows the 3rd satellite mission, Hinode. Hinode equips three major science payloads to cover from the photosphere to the corona simultaneously and has revealed the ubiquitous emergence/submergence of small-scale bipolar fields and the formation of kilo Gauss magnetic flux tubes from vector magnetic field measurements on the photosphere, unexpected dynamical phenomena in the chromosphere, spectral signatures of small-scale coronal heating events near the chromosphere below its spatial resolution, and so forth. These are the universal magnetized plasma activity in the nearest star, and the essential energy source of the phenomena is of magnetic-field origin coupled with photospheric convective motion. To elucidate the newly-found solar active phenomena and the problems that have been tackled for a long time in solar physics, we try to understand the causal linkage between solar magnetic fields and active phenomena on the Sun in the true sense by high-resolution (0.1-0.3 arcsecs) instruments in space. SOLAR-C will observe photospheric and chromospheric activity by imaging and measure chromospheric magnetic fields by spectro-polarimetry, in addition to photospheric magnetic fields. It visualizes the site of dynamical events for chromospheric and coronal heating by imaging and spectroscopy with comparable resolution for high-resolution chromospheric magnetometry. In addition, SOLAR-C essentially contributes to space weather by estimating the stored magnetic energy in the corona via measurements of chromospheric magnetic fields. The mission plan is being prepared by the international collaboration with experienced US and European institutes and associated space agencies at the moment.

Oct 15, VI. Regional Collaboration (1)

Merger signatures in cluster early-type galaxies

Chang H. Ree (KASI),

GEM-DREAM collaboration (Yonsei, KASI, Carnegie, Concepcion)

Massive galaxies form through hierarchical galaxy mergers. Although recent major merger events are rare and mostly dry compared to high-z galaxies, merger accretion is an important channel for stellar mass growth of massive galaxies. In order to investigate the environmental dependence of galaxy mergers, we are conducting a deep imaging survey campaign for the rich galaxy clusters at $z < 0.2$ to find the direct evidences of recent merger history of massive early-type galaxies. I will report on our first results of the post-merger signatures of cluster early-type galaxies (Sheen et al. 2012) and on the current status of the survey program.

Oct 15, VI. Regional Collaboration (1)

Studying BH/NS/WDs with LAMOST

Jifeng Liu (NAOC)

The advent of the Large Sky Area Multiple Object fiber Spectroscopic Telescope (LAMOST) provides a unique opportunity for studying the compact objects in the Milky Way. We are carrying out a spectroscopic survey of a sample of UV-excess sources, which will yield black hole (neutron star) binaries in the low state, and many high mass accreting white dwarfs. Studies of these sources will (hopefully) allow us to adddress the questions such as the missing small-mass stellar black holes in the Milky Way, and the SN Ia progenitors.

Oct 15, VI. Regional Collaboration (1)

LiteBIRD - a future satellite for the studies of B-mode polarization and Inflation from cosmic background Radiation Detection

Masashi Hazumi (KEK)

LiteBIRD is a satellite to map the polarization of the cosmic microwave background (CMB) radiation over the full sky at large angular scales with unprecedented precision. Cosmological inflation, which is the leading hypothesis to resolve the problems in the Big Bang theory, predicts that primordial gravitational waves were created during the inflationary era. Measurements of polarization of the CMB radiation are known as the best probe to detect the primordial gravitational waves.

The LiteBIRD working group is authorized by the Japanese Steering Committee for Space Science (SCSS) and is supported by Japan Aerospace Exploration Agency (JAXA). It has more than 60 members from Japan, USA and Canada. Studies in the working group are in progress toward the mission definition review, with a target launch year around 2020. The scientific objective of LiteBIRD is to test all the representative inflation models that satisfy single-field slow-roll conditions and lie in the large-field regime. To this end, the requirement on the precision of the tensor-to-scalar ratio, r, at LiteBIRD is equal to or less than 0.001.

The optical system of LiteBIRD consists of a rotating half-wave plate with a diameter of 30cm and two reflective mirrors with a diameter of about 60cm. The angular resolution is half a degree at 150 GHz, which is sufficient for detecting both reionization and recombination peaks of the B-mode power spectrum. The focal plane of LiteBIRD is an array of multichroic superconducting polarimeters that are read out with high multiplexing factors in the frequency domain. This technology allows a compact focal plane with 6 frequency bands between 50 and 320 GHz. In case of TES bolometers, the total sensitivity of 2 microKarcmin is achieved with about 2000 sensors at 100mK. The cryogenic system is based on the Stirling/JT technology developed for SPICA, and the continuous ADR system shares the design with future X-ray satellites.

Oct 15, VI.Regional Collaboration (1)

Recent Activities of KASI for Solar Physics

Kyung-Suk Cho, Su-Chan Bong, Eunkyung Lim, Yeon-Han Kim,

and Young-Deuk Park

The solar group in the Korea Astronomy & Space Science Institute (KASI) has made efforts in construction of facilities for solar physics. The first one is a 1.6 meter off-axis New Solar Telescope (NST) at the Big Bear Solar Observatory (BBSO). The KASI have participated in the construction of the NST in collaboration with the BBSO, and installed the Fast Imaging Solar Spectrograph (FISS) on a vertical table of Coude lab of the NST, which was developed with the solar group of Seoul National University (SNU). It is a unique system that can do imaging of H-alpha and Ca II 8542 bands simultaneously, which is quite suitable for study of dynamics of chromosphere. The next one is the Asian data center for the Solar Dynamics Observatory (SDO), which is a result of an agreement with the NASA for dissemination of the SDO data. The SDO data are being transmitted from the Stanford University to the KASI at a speed of 10 Gbps via the Global Ring Network for Advanced Application Development (GLORIAD), and then archived in the KASI's storage, which is designed to store 650 terabytes of data per year. In this presentation, we will briefly introduce sciences using the NST and SDO data, which have been conducted by KASI scientists. Current status of NST observation and SDO data center will be reported to discuss a possible collaboration of solar physics in the East Asia Core Observatories Association (EACOA).

Oct 15, VI. Regional Collaboration (1)

Introduction on China's several space astronomical missions

Shu Zhang

Institute of High Energy Physics,CAS

I will briefly introduce several space astronomical missions that are either in developing currently or in considering for future in China. These projects include HXMT, POLAR, SVOM and XTP etc., which cover a rather wide energy band at X-ray domain. With these projects a large amount of the interesting issues from a variety of the front scientific research fields can be addressed and explored.

Oct 15, VII. Regional Collaboration (2)

Herschel/HST studies of ULIRGs at z~2

Jiasheng Huang

NAOC/Harvard-Smithsonian

I will presnt a study of large MIPS 24 micron selected sample of ULIRGs. With the detcetion of this sample in the HerMES survey, we are able to determine their FIR luminosities. The HST NIR imaging of these objects provide the rest-frame optical morphologies. Our study shows that this population contribute dominantly to star formation rate density at z~2.Their morphologies provide a clue of how these systems are formed.

Oct 15, VII. Regional Collaboration (2)

The Transition from Atomic to Molecular ISM and Observational Opportunities in the Next 5 Years

Di Li

National Astronomical Observatories of China

The Transition from atomic to molecular phase in the ISM is a key step in setting the initial conditions of star formation. Such transition is a key process that just begin to be implemented in cosmological and galaxy evolution simulations.

We have provided critical constraints for these modeling efforts through observational studies of Milky way gas clouds.

Our results including the time scale of the HI-H2 transition and the existence of dark gas.

In 5 years, China will operate the largest radio telescope, namely, the Five-hundred-meter Aperture Spherical radio Telescope (FAST). Together with development efforts in space radio astronomy and international collaboration, these projects will advance our understanding of HI-H2 transition, and in turn, the history of gas in the universe, greatly.

Oct 15, VII. Regional Collaboration (2) : Contributed Talk

The statistical nature of the brightest group galaxies

Shiyin Shen, Xiaohu Yang, Houjun Mo

We examine the statistical properties of the brightest group galaxies (BGGs) using a complete spectroscopic sample of groups/clusters of galaxies selected from the Data Release 7 of the Sloan Digital Sky Survey. We test whether BGGs and other bright members of groups are consistent with an ordered population among the total population of group galaxies. We find that the luminosity distributions of BGGs do not follow the predictions from the order statistics (OS). The average luminosities of BGGs are systematically brighter than OS predictions. On the other hand, by properly taking into account the brightening effect of the BGGs, the luminosity distributions of the second brightest galaxies are in excellent agreement with the expectations of OS. The brightening of BGGs relative to the OS expectation is consistent with a scenario that the BGGs on average have over-grown about 20 percent masses relative to the other member galaxies. The growth (ΔM) is not stochastic but correlated with the magnitude gap ($G_{1,2}$) between the brightest and the second brightest galaxy. The growth (ΔM) is larger for the groups having more prominent BGGs (larger $G_{1,2}$) and averagely contributes about 30 percent of the final $G_{1,2}$ of the groups of galaxies.

Oct 15, VII. Regional Collaboration (2) : Contributed Talk

Studies on galaxy formation using high resolution deep imaging of high-z QSO fields

Yiping Wang, NAOC T. Yamada, Tohoku Uni. of Japan Tanaka,

Subaru telescope, NAOJ M. Iye, NAOJ T. Ji, Polar research institute, China

Studies on the high-z Lyman Limit absorbers, as well as the high redshift QSO host galaxies have received increasing attention within these years. Driven by the frontier science, techniques which would provide high spatial resolution for the study of the faint objects or materials in extremely close proximity to bright QSOs have been developed significantly during these decades.

We will present here the primary results of our pilot study using ground-based 8m class telescope Subaru and its adaptive optics systems to detect the intervening galaxies close to the QSO sightlines, as well as resolve and study the QSO host galaxies at high redshift.

Oct 15, VII. Regional Collaboration (2) : Contributed Talk

Mode of accretion, Jet Dynamics and Particle Acceleration physics in radio galaxies

Chiranjib Konar, Martin Hardcastle

Radio Galaxies are the potential laboratories for studying the jet black hole symbiosis in extra-galactic black hole accretion system. I will give an overall picture of radio galaxy physics including our recent results. In our recent work, our theoretical plus observational study of jet and its dynamics in different episodes of jet activity has revealed various hitherto unknown aspects of the extra-galactic jets. We discover that the injection spectral indices are similar in the two different episodes for most of the Episodic Radio Galaxies in our sample. I will discuss the implications of this results in building a self-consistent theoretical picture of the dynamics of FRII jets and the particle acceleration (Fermi first order) physics at the hotspots. We have refined many subtle theoretical issues related to jet dynamics.

Oct 15, VIII. Regional Collaboration (3)

Exploring the Gamma-ray skies with the Fermi Gamma-ray Space Telescope and the Fermi Asian Network (FAN)

Albert Kong (National Tsing Hua University)

With the launch of the Fermi Gamma-ray Space Telescope (Fermi) in mid-2008, we have entered a new era of high-energy astrophysics. At National Tsing Hua University, we are leading an effort of the Fermi Asian Network (FAN) to study exotic astrophysical objects using the Large Area Telescope (20MeV-300GeV) onboard Fermi. We are the first non-NASA led Fermi team to publish papers in a regular basis using Fermi data. In this talk, I will review some of our important discoveries including gamma-ray emission of globular clusters, the discovery of gamma-rays associated with a newly born millisecond pulsar, the first study using Fermi of a gamma-ray binary, multi-wavelength studies of unidentified Fermi objects, discoveries of new gamma-ray sources, and gamma-ray pulsation search of millisecond pulsars. I will also describe some of the future activities.

Oct 15, VIII. Regional Collaboration (3)

Gamma-Ray Burst sciences with EA collaborations

Yuji Urata (NCU)

We will present our current ongoing efforts and planned projects with EA collaborations.

Oct 15, VIII. Regional Collaboration (3)

X-ray and gamma-ray study of cosmic-ray acceleration in supernova remnants

Yasunobu Uchiyama (Rikkyo University)

Diffusive shock acceleration at supernova-remnant (SNR) shock waves provides the most promising model for the origin of galactic cosmic rays. While observations of synchrotron X-ray emission near the shock waves can probe the highest energy electrons and the diffusion coefficient, the gamma-ray observations provide a means to confirm proton acceleration at SNR shocks and thereby to measure the acceleration efficiency and the electron-to-proton ratio of diffusive shock acceleration. Here we present our recent results from X-ray and GeV gamma-ray observations of SNRs. Particular emphasis will be placed on the detection of the characteristic spectral feature of pion-decay gamma rays in two SNRs W44 and IC443 with the Fermi Gamma-ray Space Telescope. We also discuss future X-ray observations with the ASTRO-H satellite, which is planned to be launched in 2015.

Oct 15, VIII. Regional Collaboration (3)

A Report on TANGO and the PTF/iPTF Project

Wing-Huen Ip and the TANGO Team

The TANGO (Taiwan New Generation OIR Astronomy) Project covers the scientific operation of the Lulin Observatory and international cooperation with the PTF/iPTF project led by Caltech as the main focus. The abbreviation “PTF” stands for Palomar Transient Factory and “iPTF” for intermediate PTF. The central pieces of the equipment are the P48 (1.2 m) Schmidt Telescope plus the P60 (1.5 m) telescope and the P200 (5 m) telescope at the Palomar Observatory. The wide-field surveys and science-oriented scheduling of the PTF project which started in 2009 have led to the detections of many different types of SNe at their early phases of brightening. In order to provide comprehensive follow-up observations, a new kind of IFU spectrograph called SED Machine will be installed on P60. The main thrusts of the TANGO consortium are on the study of solar system objects (i.e., asteroids and comets) variable stars and X-ray binaries in M31 and the Galaxy. Recent progress in these areas will be highlighted.

Oct 15, VIII. Regional Collaboration (3)

Distance Scale and Variable Stars Research at National Central University

Chow-Choong Ngeow (National Central University)

Cosmic distance scale ladder utilizes pulsating stars, such as classical Cepheids and RR Lyrae, in the local universe to calibrate secondary distance indicators (such as type Ia supernova and Tully-Fisher relation), with ultimate goal of determining Hubble constant within few percent level. In this talk, I review some of the recent work in distance scale and variable stars carried out at National Central University. These include: (a) Cepheids period-luminosity in the mid infrared; (b) Search of ultra-long period Cepheids in M31 using PTF data; (c) Multi-color follow-up observations of RR Lyrae stars in Kepler fields; and (d) Recent results of variable stars search using TAOS-I data. A number of meter-class and small aperture telescopes in Taiwan, Korea and USA (mainly in California and Arizona) have been involved in (b), (c) and (d), which demonstrate the power of these telescopes in time domain and variable stars research.

Oct 15, VIII. Regional Collaboration (3) : Invited Talk

Fast photometry at the Thai 2.4m telescope

Andrea Richichi (NARIT) Vik Dhillon (University of Sheffield, United Kingdom)

Puji Irawati (NARIT) Saran Poshyachinda (NARIT)

Agnieszka Slowikowska (University of Zielona Gora, Poland)

Boonrucksar Soonthornthum (NARIT)

Thanks to an ideal combination of telescope size, geographical location and instrumentation, the new Thai 2.4m national telescope (TNT) is ideally suited to carry out fast photometric observations of phenomena such as transits, occultations, oscillations, flickering, pulsars and others. We will discuss some of the science drivers and some selected results in this exciting, and often neglected, area of research. We will then describe the available instrumentation, which includes fast cameras in drift scan and subarray mode, the new ULTRASPEC state-of-the-art fast EMCCD camera, and the plans for the even faster OPTIMA instrument which utilizes SPAD detectors. Such research topics often require networked observations, and NARIT is open to collaborations especially in the East Asian region.

Oct 16, IX. Regional Collaboration (4)

The Wide Field Telescope

Ji Yang (PMO), Xianzhong Zheng (PMO), Ming Liang (PMO),

Jingquan Cheng (PMO), Dazhi Yao (PMO), and Haibin Zhao (PMO)

We have carried out the design of a wide field telescope. The main science motivations are emphasized on fundamental astronomy, solar system studies, the Galactic structure, local univers studies, and studies on large-scale structure. The telescope, with an aperture of 2.5m or above and 3 degrees of FoV , is designed to have unprecedented imaging quality over a broad spectral range. The results from the design study may provide useful references on the development of next-generation survey facilities.

Oct 16, IX. Regional Collaboration (4)

The status of Transneptunian Automated Occultation Survey (TAOS II)

Shiang-Yu Wang (ASIAA)

The Transneptunian Automated Occultation Survey is the second generation of TAOS project which aims to detect the stellar occultations generated by small outer solar system bodies. The small bodies (with diameter smaller than 20km) beyond Neptune are so small that they could not be directly imaged by any of the existing telescope.

TAOS II will build upon the successful operation of a precursor survey, TAOS I. The survey will operate three 1.3m telescopes at the Observatorio Astronomico Nacional (OAN) at San Pedro Mártir (SPM) in Baja California, México. Each telescope will be equipped with a custom high-speed camera capable of collecting image data on more that 10,000 stars at a readout cadence of 20 Hz. The resulting data volume will be enormous, with over 300 terabytes per year of raw image data.

Oct 16, IX. Regional Collaboration (4)

The University of Tokyo Atacama Observatory (TAO) Project

Mamoru Doi for TAO project

TAO project is to construct and operate a 6.5-m infrared-optical telescope at the summit of Cerro Chajnantor in northern Chile. Because of the highest altitude of the site as an astronomical observatory (5640m) in dry Atacama desert, new atmospheric windows in the infrared wavelength are open, which has been confirmed with observations of the 1-m miniTAO telescope. In this talk, overview of the project will be presented.

Oct 16, IX. Regional Collaboration (4)

Current Status of the Pan-STARRS Project and Beyond

W. P. Chen (NCU)

The Panoramic Survey Telescope And Rapid Response System (Pan-STARRS) aims to patrol cyclically the entire visible sky from Hawaii. The prototype, PS1, will end its 3.5 year mission by early 2014. So far every patch of the sky north of declination of -30 deg has been observed at more than 30 epochs in 5 filter bands. Some medium-deep fields have been observed in every observable night. PS1 provides unprecedented data on cosmic variability in time (gamma-ray bursts, supernovae, variable stars, etc.) and in position (solar-system bodies, stellar proper motions and parallaxes). On behalf of the PS1 team, I report on the current status of the project and the next steps after PS1.

Oct 16, X. Regional Collaboration (5)

Kyoto Univ. 3.8m New Technology Telescope

Mikio Kurita (Kyoto University), and Kyoto 3.8 m telescope project member

A 3.8 m segmented telescope is planned to be built at the Okayama Astrophysical Observatory by the joint program among Kyoto university, Nagoya university, NAOJ, and Nano-Optonics Energy Inc. This is the Japanese first segmented telescope whose primary mirror is composed of "petal-shaped" 18 segment mirrors. The operation will be started in beginning of 2015 and dedicated for time domain astronomy with half of the telescope time and for joint use program among the universities with the rest.

We newly developed advanced technologies; rapid process and metrologies for the optics, an optimization program for weight reduction of the telescope, and segmented mirror control system. We will introduce these techniques briefly.

Oct 16, X. Regional Collaboration (5)

An East-Asian Collaboration in VLBI Astronomy

Kenta Fujisawa, EAVN collaboration

We will present the status of the Japanese VLBI Network (JVN) and the collaboration among Chinese, Korean, and Japanese VLBI Networks. The combined network is called East-Asian VLBI Network (EAVN) which is one of the largest VLBI networks in the world. We also present the first scientific result with EAVN obtained in the field of the maser observation.

Oct 16, X. Regional Collaboration (5)

Current Status of the KVN

Do-Young Byun (KASI)

The Korean VLBI Network (KVN) is a mm-VLBI array composed of three 21-m radio telescopes. Through last 4-years operation, the system performance has been tested and many VLBI and single dish observations have been performed toward the key science targets. The KVN started open use operation to Korean astronomers this year and plan to extend the open use to world-wide astronomers next year. We present the current status and science activity of the KVN.

Oct 16, X. Regional Collaboration (5)

Greenland Telescope for submm VLBI

Makoto Inoue (ASIAA)

ASIAA has been working on a submm telescope to set it up at the summit of Greenland. The Greenland Telescope (GLT) produces VLBI baselines longer than 9,000 km to ALMA in Chile and SMA in Hawaii, achieving 20 micro arc-sec resolution at 350 GHz toward the Super Massive Black Hole (SMBH) in M87. With this superb resolution, we are aiming at imaging the shadow of the M87 SMBH. As M87 has a prominent jet, the high resolution image will provide us a lot of information to investigate not only black hole but relativistic jet. The GLT also needs many items to collaborate, VLBI and single dish science, data processing, telescope system and operation, etc.

Oct 16, X. Regional Collaboration (5) : Contributed Talk

Cryogenic Wideband MMIC-LNA development in SHAO

Ying Chen

Shanghai Astronomical Observatory,Chinese Academy of Sciences

The progress in the development of cryogenic wideband MMIC-LNA's in SHAO for radio-astronomical receivers will be presented. Three LNAs covering 4-8GHz, 5-10GHz, and 8-20GHz using WIN 0.15μm GaAs pHEMT process have been fabricated. Both room- and cryogenic-temperature measurements show a larger-than-20dB gain within their respective bandwidth; initial testing of their noise performance has also been carried out. A second tape-out using WIN 0.1μm GaAs pHEMT process is scheduled in late 2013 where LNA's targeting the much-higher K- and Q-bands will be designed. We will then give a brief introduction of the facilities in the SHAO cryogenic receiver lab, in the hope of technical collaboration with other observatories.

Oct 16, XI. Regional Collaboration (6)

The latest status of the Submillimeter array (SMA)

Naomi Hirano (ASIAA)

I will introduce the latest status of the SMA including the new capabilities of the wider bandwidth, and the recent science highlights.

Oct 16, XI. Regional Collaboration (6)

An Update on AMiBA

Jiun-Huei Proty Wu and AMiBA Team

The Y. T. Lee Array for Microwave Background Anisotropy (a.k.a. Array for Microwave Background Anisotropy, AMiBA) is an interferometric experiment designed to study cosmology via the measurement of Cosmic Microwave Background (CMB). With the system expanded to 13 elements of 1.2-m antennae, in the past few years we focused on solutions to hardware problems, such as radio-pointing errors and platform deformation, leading to successful observations of the Sunyaev-Zel'dovich Effects (SZE) for tens of galaxy clusters ($0.08 < z < 0.7$). These results are analyzed for the study of scaling relationship, baryonic fraction, cluster evolution and properties, Hubble parameter, etc.

Oct 16, XI. Regional Collaboration (6) : Contributed Talk

Synergy of wide-field cyclical surveys and 4-channel simultaneous imager "Dogioya"

Kinoshita Daisuke (National Central University),

and Dogioya Development Team

In order to carry out immediate follow-up observations for new discoveries by large scale cyclical astronomical surveys such as Pan-STARRS and Palomar Transient Factory, a visible 4-channel simultaneous imager "Dogioya" has been developed. Three dichroic mirrors are used to split the beam from the telescope, and images at four different pass bands are recorded simultaneously by four CCD cameras. The main scope of this instrument is to conduct efficient and reliable color measurements of moving and transient celestial objects, such as asteroids and supernovae, even under relatively poor condition nights. Optical multi-band color information of an astronomical object right after its discovery is a clue for understanding the origin, physical properties, and chemical composition of the body. Visible 4-channel simultaneous imager also improves the observing efficiency due to the fact that we are able to obtain the imaging data at different pass bands at the same time. We have successfully developed key components of the instrument, including a fully depleted CCD imager "NCUcam-1", and assembled the system in the laboratory. Four unit cameras, including "NCUcam-1" has been tested using existing 1-m telescope at Lulin observatory, and unit cameras have been characterized using the data both from the observatory and laboratory. The whole system of "Dogioya" is now ready to be tested with a telescope, and the shipping to Hawaii is planed at the end of 2013 for the test observation using 2.2-m telescope at the summit of Mauna Kea under the collaboration with University of Hawaii. We report the scientific objectives, design, development strategy, current status of the instrument, discuss the synergy of cyclical surveys and Dogioya, and give a near-future plan for the first-light observation of the whole Dogioya system.

Oct 16, XI. Regional Collaboration (6) : Contributed Talk

The SED Machine - Fast Classification of Transient Objects

Andreas Ritter (NCU, Taiwan) Nick Konidaris (Caltech, USA)

Robert Quimby (University of Tokyo, Japan)

Chow Choong Ngeow (NCU, Taiwan)

Sagi Ben-Ami (The Weizmann Institute of Science, Israel)

The field of time-domain astronomy is expected to enjoy a golden age during this decade. However, the traditional method for the classification of transient candidates using spectra obtained with medium- to large-aperture telescopes is extremely time consuming and struggling to keep up with the discovery rate. The Spectral Energy Distribution (SED) Machine uses a new approach in order to overcome this shortcoming. It employs a lenslet-based Integral-Field Unit (IFU) with a Field-of-View (FoV) of 26"x26" and 3,600 hexagonal ~0.675" spaxels, as well as a 4-colour Rainbow Camera (RC) for flux calibration. The nearly constant resolution of R~100 over an extremely wide wavelength range 370-920 nm is sufficient to effectively classify transients. The SED Machine is scheduled to start operation at the Palomar 60-inch (P60) telescope later in 2013.

Oct 16, XI. Regional Collaboration (6)

Numerical simulations of cosmic structures

Yipeng Jing

Shanghai Jiaotong University/Shanghai Astronomical Observatory

I will report two large simulations of cosmic structures being generated and studied by a large group of cosmologists in the Mainland China.

Oct 16, XI. Regional Collaboration (6) : Contributed Talk

Silk Road Project - an Asian and international collaboration on supercomputing and gravitational wave research

Rainer Spurzem

National Astronomical Observatories, Chinese Academy of Sciences

Silk Road Project is a collaboration led by NAOC/CAS on using new accelerator techniques for supercomputing for strophysical computational research, especially dense stellar systems with black holes (galactic nuclei and black holes), emitting gravitational waves. Collaborating teams are from China, Korea, Japan, Kazakhstan, Europe and United States.

Oct 16, XI. Regional Collaboration (6)

AKARI data reduction and archive project

Satoshi Takita (ISAS/JAXA) and AKARI team

AKARI is the first Japanese satellite mission dedicated for the infrared astronomy. AKARI was launched in February 2006 and carried out an all-sky survey and more than five thousands of pointed observations in its liquid helium cooling phase until August 2007. In the following period from June 2008 to February 2010 AKARI made about 13 thousands of pointed observations in the near-IR wavelengths using the mechanical cryocooler. AKARI was turned off in November 24, 2011.

The AKARI All-Sky Survey Far- and Mid-Infrared Point Source Catalogues were released in public in March 2010. The data nominate 1.3 million sources in total, and have been used in various fields in astronomy as one of standard database. Point Source Catalogues from the Large Magellanic Cloud survey and the North Ecliptic Pole survey become public recently. Asteroids catalogue have also been provided.

The AKARI project was reconfigured in April this year to continue data reduction and archiving. The team is actively working to revise the point source catalogues, to create All-Sky image maps, and to produce science ready processed data of pointed observations.

AKARI data have been used in various fields in astronomy from Solar system objects to galaxy formation. About 500-refereed paper has been published; in which about 170 are based on the All-Sky Point Source catalogues. In the presentation we will overview the AKARI mission, introduce its science hilights, and discuss what we can succeed to the SPICA era.

Oct 16, XII. Regional Collaboration (7)

Observation of Electromagnetic Waves Associated with Gravitational Wave Events

Hyung Mok Lee (Seoul National University)

The advanced detectors of gravitational waves to be available in a few years have sufficient sensitivity to make direct detection of merging of neutron star binaries. Subsequent observation of afterglows with telescopes will enable us to identify the nature of the sources and their host galaxies. However, the angular resolution of the gravitational wave detectors is estimated to be larger than 10 degrees in diameter, so that the pointing to right position in the sky is very difficult. Well coordinated observations among several telescope with large field of view are necessary to overcome such difficulties. In this talk, I will describe the current models for the afterglows associated with gravitational wave events, and make suggestions on the possible strategies to detect the electromagnetic radiation just after the gravitational wave bursts.

Oct 16, XII. Regional Collaboration (7)

Superflares on solar-type stars

Hiroyuki Maehara (University of Tokyo), Takuya Shibayama (Kyoto University),

Yuta Notsu (Kyoto University), Shota Notsu (Kyoto University),

Satoshi Honda (University of Hyogo), Daisaku Nogami (Kyoto University),

Kazunari Shibata (Kyoto University)

We present the results of a search for superflares (stellar flares releasing >10^33 ergs of energy) on solar-type (G-type main sequence) stars using the data obtained by the Kepler space telescope. We found more than 1500 flares on solar-type stars. The energy of detected flares ranges from 10^33 to 10^36 erg.

The occurrence frequency distribution of superflares can be fitted by a power-law function with the index of about -2 which is similar to that of solar flares. Moreover, the frequency distribution of superflares on Sun-like stars (solar-type stars with rotation period >10 days and with effective temperature of 5600-6000K) and that of solar flares are roughly on the same power-law line.

Most of superflare stars show quasi-periodic light variations, which are thought to be caused by the rotation of the star with starspots. The frequency of superflares roughly decreases as the square of rotation period for a period range above a few days. On the other hand, the maximum energy of superflares observed in a given period bin does not depend the rotation period. The energy of superflares correlates with the amplitude of quasi-periodic light variations which corresponds to the total area of starspots.

These results suggest superflares can occur not only on rapidly rotating stars but also on slowly rotating stars like our Sun and the presence of large starspot groups is one of the necessary condition for the generation of superflares.

Oct 16, XII. Regional Collaboration (7)

Detection and characterization of extra-solar planets by infrared radial velocity and high-contrast imaging instruments

Takayuki Kotani (National Astronomical Observatory of Japan),

Motohide Tamura (Univ. of Tokyo), T. Matsuo (Kyoto univ.),

N. Murakami (Hokkaido univ.), H. Kawahara (Univ. of Tokyo),

IRD team, SEIT team

We present our future instruments to detect extra-solar planets around nearby stars. We first talk about the Infrared Doppler (IRD), which is the near-infrared, high-spectral resolution spectrometer for the Subaru telescope aiming at detection of Earth-mass planets around M-type stars by high-precision radial velocity (RV) measurements. The expected RV precision of IRD is 1m/s and it enables us to conduct systematic RV surveys of nearby M stars aiming for down to one Earth-mass planet. Observational and theoretical studies of planets around M-types stars and stellar properties for the IRD science are also ongoing. Next we talk about Second Earth Imager for TMT (SEIT) project for the direct detection and characterization of Earth-mass planets in habitable-zone around nearby M-type stars. We describe the science case and the current design of the instrument to achieve 10^8 contrast at very high-angular resolution in the near infrared, which is required to directly detect one Earth-mass planets with TMT.

Oct 16, XII. Regional Collaboration (7)

Studies of Exoplanetary Systems with Subaru Telescope

Masayuki Kuzuhara (TiTECH), Motohide Tamrua (Univ. of Tokyo/NAOJ),
SEEDS/HiCIAO/AO188/Subaru Team

Observations of planetary systems beyond the Solar System provide us a deeper understanding of processes of planet formation and evolutions, which should be an important clue to uncover the origin of our Solar System. The Subaru 8-m Telescope has been used to study planets and disks around other stars. We mainly report the recent progresses of the SEEDS campaign, in which state-of-the-art observation techniques and near-infrared instruments are employed for direct imaging of exoplanets and circumstellar disks. These allow us to overcome extremely high brightness-contrast between planets/disks and their parent stars. The total SEEDS sample will reach 500 Sun-like or more massive stars whose ages are ranging from 1 to 1000 Myr. The survey is currently in its fourth year, and to date, it has identified intriguing structures close to the central stars (r < 100 AU), such as gaps or spirals, both in the protoplanetary and debris disks. Furthermore, SEEDS has detected new substellar companions including planets with properties that have not been known. These include a massive giant planet orbiting the B-type star kappa And and several Jupiter-mass planet orbiting a nearby Sun-like star GJ 504. The planet in the GJ 504 system has unique properties compared with the previously directly imaged planets. High-contrast imaging by SEEDS has also provided better characterizations of the exoplanet systems detected by indirect observation techniques. These results are reported and discussed, as well as the introductions for our planed future observation projects.

Oct 16, XII. Regional Collaboration (7) : Contributed Talk

The Asteroid Rotation Period Study Using PTF Data

Chang, Chan-Kao; Ip, Wing-Huen; Hsing-Wen Lin; Ngeow,

Chow-Choong and the PTF team

The data of PTF taken from the dedicated observation during Feb 15th to 18th 2013 and the previous high cadence observation before January 2013 are processed to search asteroid rotation period. We obtain 610 known asteroids with high reliable rotation period so far. Such huge amount of asteroid rotation period is valuable for wide variety of study, such as testing various physical mechanisms on the rotation evolution of asteroid (i.e., differences between with/without Yarkovsky-O'Keefe-Radzievskii-Paddack effect; Rubincam 2000), examining the size-dependent strength for small solar system bodies as described by Holsapple (2007, i.e., large size super-fast rotator). Moreover, it is possible to reveal new discovery like size dependent spin barrier (i.e., the spin limit is a function of asteroid's size), survey on the lightcurve profile of objects close to the spin barrier at the large size end (i.e., diameter ≥ 10 km), differences between the lightcurve profiles of the excess of slow-rotating objects and the others at kilometer size end, and the relationship between rotation period and various dynamical/taxonomic asteroid groups . . . etc.

Oct 16, XII. Regional Collaboration (7) : Contributed Talk

Designing Science Classroom for Astronomy in Mongolian Traditional Home

Tsolmon Renchin, Enkhjargal Natsagdorj, Dulmaa Altangerel,

Otgonjargal Behbat(National University of Mongolia)

There is a lack of training opportunities of astronomy for university students, amateurs and the public. Mongolian decision makers and development planners think of astronomy as an esoteric science with little relevance for economic development and do not concern themselves with the development of astronomy education. How can Mongolia justify large investments in telescopes and observatories and astronomical research while there are people living in poverty? Astronomy education falls even further behind other developing countries. We desperately need more research project and education in astronomy in Mongolia. One of education activity for astronomy is to have traditional Mongolian home (GER) planetarium. We are planning to establish the small educational planetarium in Mongolia first time. In order to establish it we will use traditional Mongolian home (GER) This planetarium will be first planetarium ever in Mongolia. The GER is a herder's most important home-school. GER is easy to put up and people make GER within one hour and it is simple bring from one place to other place. The lattice work forms the wall, and supports the long roof poles, which come together at the central ring. The round GER with round roof is very suitable for planetarium dome. It can easily accommodate the planetarium equipment and large star party. The small educational planetarium will be established in GER and can move any remote areas of Mongolia. We think Mongolian traditional GER can be used for designing the Science Classroom of the future. Furthermore, this Science Classroom will be used as the astronomical center that is widely open to serve the requirement of teachers, students, pupils and people in the remote areas of Mongolia. We hope that we will experience educational science classroom during “9th East Asian Meeting on Astronomy”.

Oct 17, XIII. Regional Collaboration (8)

Infrared Polarimetric Studies toward Star and Planet Forming Regions

Jungmi Kwon (JSPS/NAOJ), Motohide Tamura (UTokyo/NAOJ), SIRPOL teams

What is the origin of life on Earth? Where did life on Earth come from? Research into star and planet formation throws new light on these questions and arouses public curiosity. In this presentation, we show our recent circular and linear polarimetric studies of star forming regions in wide-fields. Our first systematic wide-field (~8 arcmin) circular and linear polarization survey of star forming regions with IRSF/SIRPOL has resulted in discovery of ubiquity of extended circular polarization in nebulae. The degrees and extents of the circular polarization have a clear trend with the masses of the forming stars.

Oct 17, XIII. Regional Collaboration (8) : Contributed Talk

Polarization and Magnetic Field in Star formation

Ya-Wen Tang, Patrick M. Koch and Paul T. P. Ho

Dust grains are known to align with their shorter axes parallel to the field lines in most circumstances. The plane-of-sky projected B field integrated along the line of sight can be traced by rotating the detected polarization of the thermal dust emission by 90 deg.

Stars form in giant molecular clouds under the threads of turbulence and large-scale magnetic (B) fields. Theoretically, the significance of the B field influences how structures are formed, such as the density contrast within structures, the star formation rate, and the suppressed fragmentation. However, the B fields in star-forming clouds are not well-constrained observationally, because they are difficult to detect.

In this talk I will present our current studies of the magnetic (B) field in the star forming cores and in the envelopes of molecular clouds. In order to trace the B field, the dust continuum at wavelengths of 870 micron and its linearly polarized emission were observed with the Submillimeter Array (SMA). The B morphologies are resolved with an angular resolution up to 0.3". Dense structures with a number density 10^5 to 10^7 cm^-3 are traced. The B morphologies of sources at different evolutionary stages, from the collapsing cores to the ultra-compact HII regions, will be presented.

In a sequence of increasingly higher resolution observations, it becomes manifest how the field morphologies change from the envelope surface layer to the inner core and disk. The B field morphologies vary from uniform in the cloud scale (a few pc) to cometary and hourglass-like in the star forming core scales (10s milli-pc), suggesting the interplay of the B field with other forces at various scales.

Oct 17, XIII. Regional Collaboration (8) : Contributed Talk

Multi-wavebands study of Supernova remnants

WenWu Tian, XiaoHong Cui, LingZhi Wang, Dan Wu,

Hongquan Su, Hui Zhu (NAOC)

Supernova Remnants (SNRs) are the most popular origin of Galactic Cosmic rays (CRs). The multi-waveband observations of SNRs and the SNR-molecular cloud system helps understand the acceleration and propagation of CRs. More than 100 TeV cosmic ray sources have so far been detected by Imaging Air Cherenkov Telescope. The following identification in low energy bands to the sources plays a key role to understand them. And next generation telescopes in radio and high-energy bands like SKA and LASSHO will be powerful in this project.

The multi-wavelength studies from radio, X-ray to gamma-ray bands including the identification of high-energy sources, distance and high-energy emissions of known SNRs will be presented.

Oct 17, XIII. Regional Collaboration (8) : Contributed Talk

location the stars in n>3-dimenitions

Hsieh Hsih-Chia and Pei-Gin Hsieh

The new star or virus is located in n>3 dimensions. Light and distance works like incentive or drug doses. Dynamic equilibrium angles locate the new star clustering in an innovative positive response in faster speed or time. Beyond the dynamic general equilibrium, an impulsive response angle is slower or negative. Dynamic propagation of angles is a transform mechanism of color or smell shifting. A sequence is a hierarchy ranking order, and is controlled and optimized by tracing and selecting the variables and models. Dynamic general equilibrium always exists. Equilibrium is an attractor and a test statistic and is unique, unbiased, and consistent for detecting distributions in the long-run and short run. Experimental estimates are tested for finite behaviors' motion, changing correlation or dependence for non-zero star, or policy dose, and stopping time of location.

Keywords:Convergence probability; General equilibrium in continuous space and time; non-deterministic polynomial(NP P) poblems on conflicts and resistances.
AMS subject classification: 62J05; 49K40; 92D20; 35B37.

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Oct 17, XIII. Regional Collaboration (8) : Contributed Talk

Binary nature revealed in circumstellar spiral-shell patterns

Hyosun Kim (ASIAA), Ronald E. Taam (ASIAA, Northwestern),

Sheng-Yuan Liu (ASIAA), I-Ta Hsieh (ASIAA)

It is only very recent that asymptotic giant branch (AGB) stars reveal the circumstellar spiral patterns with the advent of high resolution and high sensitivity observations. Such patterns can provide possible evidence for the existence of central binary stars embedded in outflowing circumstellar envelopes, which provides an important clue for the late stellar evolution as well as the onset of asymmetrical planetary nebulae. I will review the theoretical model for the binary-induced spiral-shell patterns on the AGB circumstellar envelopes, and the observational aspects in constraining the characteristics of the unknown, conceivable central binary stars.

Oct 17, XIII. Regional Collaboration (8) : Contributed Talk

CIBER: Sounding rocket experiment to observe the near-infrtared background

Toshio Matsumoto (ASIAA) and CIBER team

CIBER (Cosmic Infrared Background ExpeRiment) is a sounding rocket experiment which is in progress under the collaboration among Japan, USA, Korea and Taiwan. CIBER was designed to observe the spectrum and fluctuation of near-infrared background, particularly, near-infrared extra-galactic light which may trace the light of the first stars. I will show the current status of CIBER and the next step mission CIBER2.

Oct 17, XIV. Regional Collaboration (9)

Conditions and Development of Ali Site, Tibet

Yongqiang Yao

National Astronomical Observatories, Chinese Academy of Sciences

The 10 year site survey in western China shows that Ali area, Tibet, can be the best choice for astronomical observations over the East Asian regions. A new site in Ali area has been selected and begun construction for small telescopes and detailed site characterization. This talk presents site survey results to show advantages of Ali area, by comparing with other good sites in the world, and reports the conditions of Ali site and further plan for site monitoring and site development. Though it will take two years to finally identify the site quality, current infrastructure of Ali site allow to run small telescopes in advance, and we actively encourage the various cooperation.

Oct 17, XIV. Regional Collaboration (9)

A China-Japan Collaborative Site Survey in west Tibet - Sky clearness at Gar/Ali, Tibet -

Toshiyuki Sasaki(NAOJ), Yongqiang Yao(NAOC), Norio Ohshima(NAOJ),

Yoshitaka Mikami(NAOJ), Michitoshi Yoshida(Hiroshima Univ.),

Norio Okada(NAOJ), Hisashi Koyano(NAOJ),

Kazuhiro Sekiguchi(NAOJ), Liyong Liu(NAOC)

The high plateaus in west Tibet may provide suitable sites for astronomical observations with institute's middle-range telescopes and possibly with larger telescopes. Under China-Japan collaborations on site survey in west Tibet, we have been conducted to search for good sites and have monitored their astronomical observation characteristics for several years at Karasu (Xinjiang Uighur), Oma(Tibet) and currently at Gar/Ali(Tibet). Recent results of our site survey show sites in west Tibet are revealed with high possibility of good astronomical observations. We present the characteristics on weather conditions at Gar/Ali, compared to previous monitored data at Oma, and show its suitable high clear-sky ratios at Gar/Ali.

Oct 17, XIV. Regional Collaboration (9)

HiNOTORI: Hiroshima 50cm telescope project in Tibet area

Michitoshi Yoshida, Yousuke Utsumi

and Koji, S., Kawabata (Hiroshima University)

We report the current status of HiNOTORI (Hiroshima uNiversity Operating Tibet Optical Robotic Imager) project, which is a 50cm optical telescope project at Gar site in Tibet. The main purpose of this project is to conduct short- and long-term observations of transient objects including gamma-ray bursts, supernovae, blazars, etc. with UV-optical three color (u', R, I) imaging. This is also a pilot program for developing future world-wide electro-magnetic follow-up network of gravitational wave transients. Gar site is located close to the western edge of Tibet. The site testing data have indicated that this site would be one of the best astronomical sites in the world. Since there is no large astronomical facility around the Tibet area, the location and site condition of the site are thus very much valuable for 24 hours observations of transient objects. We report instrumentation and recent progress of HiNOTORI project. In addition, we show some results of site testing measurements of Gar site performed by us.

Oct 17, XV. Status Update & Prospects

HSC and the status of Subaru Telescope

Satoshi Miyazaki (NAOJ)

Hyper Suprime-Cam (HSC) is a next generation wide field camera (Field of view: 1.5 deg in diameter) built for 8.2 m Subaru telescope. The commissioning observation is underway and we demonstrated that the image quality is mostly natural seeing limited as designed: < 0.5 arcsec FWHM in its best case and the median ~ 0.6 arcsec. In this talk, we will introduce the performance and prospect of HSC as well as the current status of Subaru telescope.

Oct 17, XV. Status Update & Prospects : Invited Talk

The Future of the JCMT: Observing the Present through the Distant Past

Doug Johnstone (Joint Astronomy Centre)

In this talk I will highlight the many important scientific successes achieved at the James Clerk Maxwell Telescope (JCMT), concentrating on results from the new suite of instrumentation: SCUBA-2 and HARP.

TheJCMT, with a 15m dish, is the largest single-dish astronomical telescope in the world designed specifically to operate in the sub-mm wavelength regime. The JCMT is located close to the summit of Mauna Kea, Hawaii, at an altitude of 4092m.

The most recent addition to the JCMT's suite of instruments is the 10,000 bolometer sub-mm continuum instrument: SCUBA-2. SCUBA-2 operates simultaneously with 7' x7' foot print sub-arrays at both 450 and 850-microns. SCUBA-2's wide field surveying potential, combined with a 65% shared view of the sky from both sites, makes it the ideal instrument to provide complementary data for the ALMA Project. Furthermore, the SCUBA-2 sub-millimetre wavelength coverage and angular resolution complement existing Herschel observations.

A set of comprehensive surveys of the submillimetre sky is underway at the JCMT using SCUBA-2 and HARP, a heterodyne array receiver operating between 325 and 375 GHz. The JCMT Legacy Survey (JLS) is comprised of seven survey projects, and ranges in scope from the study of nearby debris disk systems, the study of star formation in nearby molecular cloud systems and more distant structures in our Galactic Plane, to the structure and composition of galaxies in our local neighbourhood and the number and evolution of submillimetre galaxies at high redshifts in the early Universe.

Oct 17, XVI.EACOA into the Future

Cooperation in Astronomy: Past and Future

Norio Kaifu (NAOJ)

Coopearation of astronomy in East Asian region is getting wider, and more powerful and important. This paper is to review the wide-range and succsessive activities of EAMA (East Asian Meeting on Astronomy) since 1990, try to find current achievments and standpoint, and to discuss and foresee the East Asian astronomy in future.

Oct 17, XVI.EACOA into the Future : Contributed Talk

Report of EAYAM: East Asian Young Astronomers Meeting

Hidekazu Hanayama (NAOJ)

TBD

Poster Abstracts

Poster No. 1

Determination of electronic density from observations in the solar corona of the total solar eclipse in 2008

Lkhagvajav Ch., Batmunkh D., Nyamsuren B., Tuvshinjargal B.,

Dulmaa A., Mordvinov A.V., Yazev S.A.

There carried out the analysis of observations of the total solar eclipse on August 1st, 2008, which are received during the expedition organized by Research center of Astronomy and Geophysics of Mongolian Academy of Science, Institute of solar-terrestrial physics of the Siberian Branch of the Russian Academy of Science and the Astronomical observatory of the Irkutsk' State University. During the observation of Total Solar Eclipse at “Uvdogiinузуур” in “Altay” сомон of “Khovd” aimag of Mongolia have been received original photos of the solar corona in white-light with a different exposure. On the basis of data of the total solar eclipse for August 01, 2008, a radial distribution of electronic density in the solar corona is estimated. The radial distributions of the brightness of the lower corona is defined in 12 coronal beam's structures of selected directions, these measurements were comparing to Baumbach's approximation. On the average, the radial distribution of electronic concentration received by us in the low corona with removal from the Sun is well described by the formula: n_e (r)=2· 〖 10〗 ^5 r^(-2)·e^((7.5/r)) 〖 sm〗 ^(-3). Data of our observations of the total solar eclipse shows that space distribution of brightness of the Solar corona is non-uniform. The received results have confirmed that in the deep minimum of solar activity the equatorially expanded corona in integral light is watched. The brightness measurements in a direction along streamers in an interval 1R to 2.2R from center of a disk of the Sun were made. The relation of brightness of the corona on distances 1.1R and 2.2R was approximately 10.

Poster No. 2

Formation of Partial Tori of Hydrogen Atoms around Host Stars of Hot Jupiters

Cheng Chen and Wing-Huen Ip

Because of intense heating by the radiation from the central stars, the upper atmospheres of some hot Jupiters like WASP-12b could expand and fill their Roche lobes. Gas escaping through the L1 Lagragian point would stream into the circumstellar regions leading to the formation of a gas ring surrounding the central star. We have set up numerical models to simulate the continuous injection of hydrogen atoms into the circumstellar space by computing their trajectories under the combined effect of stellar radiation pressure, photoionization and charge exchange process with the stellar wind. We will also discuss the various scenarios of star-planet interaction which might shed light on the transit observations.

Poster No. 3

Discovery of a New Member of the Inner Oort Cloud from The Next Generation Virgo Cluster Survey

Ying-Tung Chen (NCU), J. J. Kavelaars (HIA), Stephen Gwyn (HIA),

Laura Ferrarese (HIA), Patrick Cote (HIA), Andres Jordan (PUC de Chile),

Vincent Suc (PUC de Chile), Jean-Charles Cuillandre (CFHT),

and Wing-Huen Ip (NCU)

We report the discovery of 2010 GB174, a likely new member of the Inner Oort Cloud (IOC). 2010 GB174 is 1 of 91 trans Neptunian objects and Centaurs discovered in a 76 square degree contiguous region imaged as part of the Next Generation Virgo Cluster Survey (NGVS)—a moderate ecliptic latitude survey reaching a mean limiting magnitude of $g' \simeq 25.5$—using MegaPrime on the 3.6 m Canada–France–Hawaii Telescope. 2010 GB174 is found to have an orbit with a semi-major axis of $a \simeq 350.8$ AU, an inclination of $i \simeq 21.6$, and a pericenter of $q \sim 48.5$ AU. This is the second largest perihelion distance among known solar system objects. Based on the sky coverage and depth of the NGVS,we estimate the number of IOC members with sizes larger than 300km ($H_V \leqq 6.2$ mag) to be $\simeq 11{,}000$.

A comparison of the detection rate from the NGVS and the PDSSS (a characterized survey that "rediscovered" the IOC object Sedna) gives, for an assumed a power-law luminosity function for IOC objects, a slope of $\alpha \simeq 0.7 \pm 0.2$. With only two detections in this region this slope estimate is highly uncertain.

Poster No. 4

A Systematical Method to Search for Active Solar System Objects from the Pan-STARRS Postage Stamp Images

Y.-C. Cheng and W.-H. Ip

We developed a numerical method to analyze the Pan-STARRS postage stamp images on selected targets: 384 asteroids in cometary orbits (ACOs) and 11 main belt comets (MBCs), to search for the possible activity and outgassing event. We enquire the survey data from the end of 2009. In our preliminary result, we had analyzed more than 20,000 postage stamp images by comparing the intensity profile of both background stars and our target ACOs. We get a good detection for one active ACO and all the known active MBCs. We will apply this method as a routine works for the future monitoring on ACOs, Themis, Hilda family asteroids and even Jovian Trojan. Looking forward, our analytic method can also apply to the PTF surveying data on such study.

Poster No. 5

The orbital ephemeris of the partial eclipsing X-ray binary X1822-371

Hung-En Hsieh, Yi Chou, Chin-Ping Hu, Ting-Chang Yang,

Yi-Hao Su (Institute of Astronomy, National Central University, Taiwan)

X 1822-371 is a low mass X-ray binary with accretion disk corona exhibiting partial eclipses and pulsations in the X-ray band. We update its orbital ephemeris by combining the new RXTE observations and historical records, with total time span of 34 years. There were 11 RXTE observations in 2011 but the eclipsing profile can be seen in only 4 of them. The eclipsing center times were obtained by fitting the profile with the same model as previous studies. Combined with the eclipsing center times reported by Iaria et al (2012), the O-C analysis was processed. A quadratic model was applied to fit the O-C results and obtained the mean orbital period derivative of P ̇_orb=(1.339±0.025)×〖10〗^(-10) s/s, which is slightly smaller than previous records. However, we found that the cubic model is better to describe the orbital phase change with about 98% confidence level from F-test. The updated orbital parameters from eclipsing profile will be further compared with the ones from pulsar timing.

Poster No. 6

A Statistical Study of the Distribution and Dynamics of Icy Grains in the Enceladus Gas Plume by Cassini's Ion Neutral Mass Spectrometer

Jen-Kai Hsu Institute of Space Sciences, National Central University, Taiwan

A very interesting finding by the Ion Neutral Mass Spectrometer on Cassini is about the detection of tiny icy grains embedded in the Enceladus gas plume during close encounters of the Cassini spacecraft with this active icy satellite of Saturn. Entering of an icy grain into the antechamber of INMS would lead to the generation of a sharp spike superimposed on the countrate profile of the gas molecules in the mass channel under measurement. Employing Monte Carlo simulations and data analysis of the INMS instrument performance, Teolis et al. (2010) investigated the time histories of the "dust spikes" and the associated icy grain density distributions along the paths of the E3 and E5 encounters, respectively. Following similar method, we have studied the corresponding dust measurements from the E7, E14, E17 and E18 flybys. The different encounter geometries allow us to have a better understanding of the relation between the source regions of the "dust spikes" from INMS and the jet locations and directions identified by Spitale and Porco (2007). In addition, fitting of the gas plume density profiles provide constraints on the initial conditions of the gas outflow from which the trajectories of dust particles of different sizes could be computed and compared with the INMS measurements.

Poster No. 7

On the Evolution and Spectral Variation of QPO in RE J1034+396

Chin-Ping Hu, Yi Chou, Ting-Chang Yang, Yi-Hao Su, Hung-En Hsieh,

Po-Sheng Chuang, Ching-Ping Lin

RE J1034+396, a narrow-line Seyfert-1 active galactic nucleus (AGN), is the first example of AGN that shows an almost coherent Quasi-Periodic Oscillation (QPO) in X-ray observation. The spectral behaviors and the timing properties of the QPO were further studied since its discovery. We present our analysis of the QPO in RE J1034+396 based on the Hilbert-Huang transform (HHT). Since the HHT is optimize for the non-stationary and non-linear time series, the QPO is suitable for being analyzed by the HHT. We applied the HHT on the data collected by XMM-Newton in 2007. In contrast to other time-frequency analysis methods, the Hilbert spectrum gives us more detailed information in both time and frequency domains. Furthermore, the empirical mode decomposition provides us local band-pass filtered data that can be used in the O−C and correlation analysis. We suggested that the QPO is better to be divided into three epochs according to their different periodicities. Although the QPO cycle lengths vary dramatically even between neighboring cycles, they oscillate around a characteristic period in a specific epoch. From the phase-lag analysis, no significant phase-lags were detected between soft and hard energy bands. Finally, we applied the QPO phase-resolved analysis on the spectral behavior. During one QPO cycle, none of the spectral parameters but the normalizations exhibit significant variation. From the calculated model fluxes, we obtained that the fractional amplitude of the low-temperature Comptonized component is much smaller than that of the hard power law tail but the absolute amplitudes is quite opposite.

Poster No. 8

Characterization of the Young Galactic Star Cluster Stock 2 with 2MASS, PPMXL, and Pan-STARRS Data

Juei-Hwa Hu (IANCU) Wen-Ping Chen (IANCU)

We study the astrometry and photometry in the field of Stock 2, a rich and nearby star cluster. Using PPMXL proper motions, and 2MASS plus Pan-STARRS photometry, we identified a reliable list of members, with which a distance of 300 pc, an age of 5.6(+3.3/-2.8) Myr, and a reddening E(B-V)= 0.3 were derived. Member candidates with masses < 0.15 solar, i.e., close to the hydrogen-burning limit, are also selected. We present the stellar mass function and possible mass segregation of this very young cluster.

Poster No. 9

Identification of faint members in open cluster by Pan-STARRS and PPMXL data

Chung-Kai Huang (IANCU), Chien-Cheng Lin (IANCU), Wen-Ping Chen (IANCU)

Open Clusters play an important role in studying stellar evolution, as well as the formation and evolution of the Galactic disk. Identification of member stars in a star cluster is the first step to derive the fundamental physical parameters of the cluster, such as the distance, age, size, spatial distribution, reddening, and metallicity. In particular, possible tidal structure related to the internal dynamical evolution and external influence by the Galactic environments can be inferred. As a pilot program to identify and study the low-mass members in open clusters, or substellar objects for nearby clusters, we present here analysis of NGC752 to characterize its low-mass members by using the PPMXL proper motion and Pan-STARRS photometric data. The secured list of members allows us to determine reliably the cluster parameters including the distance, age, size, as well as any tidal structure as a trace of the dynamical history of this cluster in the Galactic environment.

Poster No. 10

A Study of the Dependence of the Superflare Frequencies on the Starspots Sizes of Solar-type Stars

Li-Ching Huang, Wing-Huen Ip, and Chi-Ju Wu

The continuous long-term observations of the KEPLER Space Telescope have provided a wealth of information on flare activities of different types of stars. Of particular interest has to do with the occurrence of superflares among some solar-type stars as first reported by Maehara et al.(2012). The radiative energy in optical emission of the largest superflares can reach as much as 10^38 ergs, namely, one million times of the largest solar flares ever observed. Such phenomenon has important implications on the formation and evolution of planetary systems and biospheres of exoplanets and our own Sun. Notsu et al. (2013) have subsequently pointed out that the energy of a superflare could be related to the magnetic energy stored in the high-field region of the star spot responsible for its generation. The flare energy – spot size relation is given by E(flare)~7*10^32[erg]*(f/0.1)*{[(B/(10^3)*G]^2}*(A(spot)/3*10^19cm^2)^3/2, where B is the average spot magnetic field strength and A is the amplitude of the stellar lightcurve due to the star spot. We have examined the dependence of superflare frequency distribution on the spot size and found that stars with smaller A values tend to have less activity of superflares, which is consistent with the model of Notus et al. (2013). However, in a sample of non-flaring solar-type stars we have also found a small fraction of them with very large A values but without superflares. It is interesting to note that similar behavior has been found in the case of the host star of the hot Jupiter Kepler-17b.

Maehara, Shibayama, Notsu et al., 2012, Nature, doi: 10.1038
Notsu, Shibayama, Maehara et al., 2013, ApJ, 771, 127
Shibata, Isobe, Hillier et al., 2013, PASJ, vol. 65, No. 3

Poster No. 11

Submillimeter Galaxies and Their Environments

Kihun Kim and Sungeun Kim

Department of Astronomy & Space Science, Sejong University, Seoul, South Korea

Submillimeter galaxies are the progenitors of massive galaxy formation, and therefore their interaction with the early intergalactic medium must be an important subject in the cosmology and galaxy astrophysics. However, their detailed relationship between the galaxies and surrounding environments is still largely unkown. In this poster, we will present the characteristics of their surrounding environments of a large sample of mm-detected submillimeter galaxies. We will also discuss the proposal for the future observations of these galaxies and their environments using the Atacama Large Millimeter Array.

Poster No. 12

DSMC Simulations of Global and Localized Outgassing and Dust Jets of Comet

Ian-Lin Lai(NCU), Lin Tu(NCU), Wing-Huen Ip(NCU), Cheng-Chin Su(NCTU), Jong-Shinn Wu(NCTU), Ying Liao(Universität Bern), and Nicolas Thomas(Universität Bern)

The application of a parallel 3D Direct Simulation Monte Carlo (DSMC) code, named PDSC++, using an unstructured grid, allows us to study the expansion of gas from surface or subsurface sublimation of volatile ices from the nucleus of comet 67P/C-G. Our calculations can automatically link the hydrodynamic flow region close to the nucleus surface to the Knudsen flow regime with infrequent collisions. In addition, because of the unstructured grid technique, it becomes much easier to conduct investigation of the gas emission and dust jet formation at different length-scales caused by the irregular topography and inhomogeneous composition distribution of the surface materials of the comet. Another computational advantage is that the geometry model of comet 67P can be used to produce the surface temperature distribution and its diurnal variation. In this work, we present our preliminary results on two types of gas/dust emission when comet 67P reaches a heliocentric distance of 3 AU at the point where the Rosetta spacecraft is about to perform its rendezvous mission. The first one has to do with the global structure of the gas and dust coma if most of the outgassing is concentrated at an active region of 0.056 km2 (about 0.14 % of the total surface area). It is found that the (1-10 μm sized) dust distribution is characterized by a sunward jet with radial speed of 1-9 m/s plus a disc of slow-moving dust particles which are nearly perpendicular to the sun-comet direction. The second category of model calculations is about the gas and dust emission from a small-scaled active area in the form of a concave-shaped crater or a convex-shaped dome. The size of these topographic structures is assumed to be 100 m. By taking into account the thermal conductivity of the surface materials (from water ice to dust mantle), we show that the collimated dust jet could have different temporal behaviors according to the solar insolation condition, thus providing a valuable probe to the physical properties of the subsurface material.

Poster No. 13

A Photometric and Spectroscopic Study on the Be Star CD−49 3441 with Large Near-Infrared Excess and Peculiar Variations

Chien-De Lee (Institute of Astronomy, National Central University),

Frederick Walter (Department of Physics and Astronomy, Stony Brook University),

and Wen-Ping Chen (Institute of Astronomy, National Central University)

CD-49 3441 is a Be star far away from any star-forming regions, so is a classical Be star. However, it shows many peculiarities, like extremely strong Hα flux, forbidden lines, and has among the largest near-infrared excess—which must be accounted for by thermal dust emission—in all known classical Be stars. The star should be on the verge of turning off the main sequence, and the expanding envelope cools off and condenses to form dust grains, which reprocess starlight to produce the observed excessive infrared emission. We present the results of photometric and spectroscopic observations carried out in 2011–2012 for which nearly simultaneous spectroscopic and photometric variations of CD−49 3441 were first found. A positive correlation was found between the brightness and the Hα equivalent width, signifying the causality between the gas activity and stellar mass loss.

Poster No. 14

Taiwan ALMA Regional Center Node (ARC node)

Chin-Fei Lee et al. (ASIAAA)

We will present the Taiwan ARC node activities.

Poster No. 15

Pattern Recognition Algorithms for Searching Merging Galaxies

Tse-Lin Lee (IANCU) and Chorng-Yuan Hwang (IANCU)

We present a pattern recognition method for rapidly searching possible merging galaxies from large astronomical surveys. Galaxy mergers usually have complex structures and might exhibit irregular shapes. Therefore, we develop algorithms to identify abnormal patterns appearing in images as merger candidates for visual verification. We apply our algorithms on real survey images selected from the Red Sequence Cluster Survey 2 to evaluate the efficiency and applicability. We also run a test on a set of visual identified merging galaxies that were provided by the Galaxy Zoo project for comparison. The results show that our approach can efficiently cut down the time and manpower consumption on searching for merging galaxies in large astronomical surveys.

Poster No. 16

Search for and Characterization of Open Clusters From Pan-STARRS1 3pi Survey

Chien-Cheng Lin (NCU), Wen-Ping Chen (NCU)

We have used a star-count algorithm based on the 3π survey data taken by the Panoramic Survey Telescope And Rapid Response System to identify and characterize uncharted open clusters (OCs). With completeness magnitudes of about 22 mag in gp1, rp1, ip1 bands and about 20 mag in zp1 and yp1 bands, our data are 100 times more sensitive than currently available surveys. We have analyzed a field of 20° × 20° toward the Galactic anticenter and found 1660 density enhancement regions of which 79 (out of 129) are known OCs, and 949 are OC candidates. The preliminary OCs characterization results are membership determinations of NGC 2158 and NGC 2168. NGC 2168 contains at least 3000 stars which is two times larger than previous study, and NGC 2158 contains ~ 500 stars which reached to the fainter (gp1 ~ 22 mag) i.e., lower mass stars ~ 0.75 Msun at this distance can be identified.

Poster No. 17

Preliminary Multi-bands Light Curves of Classical Cepheids from Pan-STARRS1 3π data using PSPS

I-Ling, Lin, Chow-Choong, Ngeow, Ying-Tung Chen, Jhen-Kuei,

Guo, Chien-Cheng Lin (IANCU)

Cepheids are useful standard candles that can be used to determine the distances to nearby galaxies. Properties of Cepheids are well investigated in BVI filters; however they are not well studied in grizy filters. Therefore, the main goal of our project is to characterize the known Galactic Cepheids and to derive their mean magnitudes in Pan-STARRS1 (PS1, the Panoramic Survey Telescope and Rapid Response System) grizy photometry system. This will allow us to calibrate the Cepheids' period-luminosity relations in PS1 system. PS1 is a multi-bands and multi-epoch survey project by using a dedicated 1.8 meter wide field telescope (located at Mount Haleakela, Mauna Kea, Hawaii). Observed data are reduced and analysed by IPP (Image Processing Pipeline) team located in University of Hawaii. There are multiple ways to retrieve the PS1 data, one of them being the Published Science Products Subsystem (PSPS) via Pan-STARRS Science Interface (PSI) – a web interface to allow user to access PS1 data. In this work, we downloaded PS1 3π data through PSI. We adapted a differential photometry method in our analysis to deal with possible calibration issue in PS1 3π data. Using this method, we can obtain relative light curves of Cepheids by removing systematic effects. Preliminary light curves for several Cepheids based on the differential photometry method are presented here.

Poster No. 18

The Contribution from Circumstellar Dust to the Integrated Spectral Energy Distribution of the Large Magellanic Cloud

Mei-Chun Lin (ASIAA/NTU), Ciska Kemper (ASIAA),

Massimo Marengo (Iowa State University),

Valsamo Antoniou (Harvard-Smithsonian Center for Astrophysics)

The spectral energy distribution (SED) of galaxies consists of contributions due to starlight (in the UV/optical and near-infrared) and thermal emission of interstellar dust (in the far-infrared). The excess flux in the near- and mid-infrared is usually explained as emission from interstellar polycyclic aromatic hydrocarbons (PAHs). Most popular SED models nowadays use stellar population synthesis models combined with stellar spectral libraries without dusty envelopes. This might be acceptable for starburst galaxies with a relatively large population of young stars, it might not accurately represent galaxies with a significant population of dusty Asymptotic Giant Branch (AGB) stars.

When inspecting the Spitzer IRAC images of the Large Magellanic Cloud (LMC), a nearby dwarf galaxy, it becomes clear that AGB stars are important contributors to the overall flux of the LMC at 3.6, 4.5 and 5.8 \mum, in addition to PAHs at 8.0 \mum (Melbourne & Boyer, 2013). However, the SED model for a dusty environment is still developing. (Nenkova et al., 2000, Bruzual & Charlot, 2003, Gonzalez-Lopezlira et al. 2010, Marigo & Girardi, 2011)

In order to estimate the contribution from circumstellar dust, we construct a complete SED of the LMC with several projects designed for it: MCPS (Magellanic Cloud Photometric Survey, in the bands of U, B, V, I), 2MASS 6x (in the bands of J, H, Ks), SAGE (Surveying the Agents of Galaxy Evolution, 3.6, 4.5, 5.8, 8.0, 24, 70, 160 \mum), and HERITAGE (HERschel Inventory of The Agents of Galaxy Evolution, 100, 160, 250, 350, 500 \mum). We plan to compare our observed SED to a population-synthesis-based modeled SED, which are fitted to the UV and optical fluxes and uses stellar spectral libraries without dusty envelopes. The near-infrared difference between the observed SED and the modeled starlight

contribution represents the contribution from circumstellar dust around evolved stars. We will also separate evolved stars into many sub-categories (i.e. O-rich AGB, C-rich AGB, Red Super Giant) by means of color-magnitude classification, in order to investigate the contribution from circumstellar dust of each category to the integrated SED of the LMC.

Poster No. 19

Broadband Photometry of asteroid 1998 QE2 (285263) during its closest approach of May-June 2013

Zhong-Yi Lin[1], Wing-Huen Ip[1,2], Chien-Hsien Lin[2] and Fumi Yoshida[3]

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NEA 285263(1998 QE2), hereafter QE2, was discovered on August 19, 1998, by LINEAR program. The object passed within 0.039 AU of the Earth on May 31, 2013 and has been identified as a PHA (Potentially Hazardous Asteroids). We performed photometric observations of QE2 from late May to early June 2013. The resulting rotational period of QE2 was determined to be 4.75hr. Based on our multicolor observations, we classified the QE2 into Ch-type taxonomy. In addition, we found there is no color variation throughout the entire the rotational period. This might imply the homogenous composition on QE2's surface.

Poster No. 20

Current situation of Astronomical telescopes for education in Mongolia

N. Enkhjargal, R.Tsolmon, A.Dulmaa, V.Oyudari, Ch. Munkhjargal

The paper is introducing current situation of astronomical telescopes for education which are used in the Mongolian universities. We use few telescopes in Mongolia and these are the Solar Coronagraph telescope (from the Carl Zeiss of Germany), FLI ML09000 CCD camera, AT-1, APU-75, PAS-3A telescope, Vixen telescopes, Vixen VMC110L, SPICA (D=40mm, 35x telescope kit). The telescopes are not satisfying for academic research. We need to use modern astronomy telescopes for research and high education. There are very limited researchers and organizations for astronomy in Mongolia. They are using telescopes for astrometry and photometry observation, Sun, planets and Moon observations.This paper discusses recent efforts to apply modern astronomical educational telescopes for research capacity in Mongolia with cooperation international organizations. We need to train astronomical specialists who will do research using modern astronomical telescopes. We are open to all scientists, amateurs and students, who want to work with us.

Poster No. 21

Molecular hydrogen emission in diffuse regions of LMC

Naslim Neelamkodan (ASIAA), Ciska Kemper (ASIAA),

Yao-Lun Yang (ASIAA), Karl Gordon (STScI), Oscar Morata (ASIAA)

We investigate gas and dust physical properties and chemistry of diffuse interstellar medium in the Large Magellanic Cloud (LMC). Most of the interstellar gas inhabit in photo dissociation regions (PDR) in galaxies, where FUV radiation from hot stars creates a layered structure. This includes, a layer of predominantly neutral gas residing outside HII regions and a layer of HI/C+/Si+, H2, and neutral oxygen. As part of these studies, the spectral maps of 12 diffuse regions in the LMC were taken over a region 1'X1' size using the Spitzer Infrared Spectrograph (IRS) with SAGE-spec. These IRS spectra shows emission lines due to pure rotational transitions of H2 (0-0) S(1) through 0-0 S(7)) along with ionic atomic emission lines Ar II, Ar III, S III, Si II and PAH features. We determined column density, excitation temperature and mass of H2 gas using a two temperature model fit. The measurements show that H2 gas temperature in the range 100 K to 1000K. Our main goal is the detailed understanding of chemical structure and dust to gas mass ratio of ISM in the LMC.

Poster No. 22

Measuring Rotational Speed by High-Dispersion Spectra of Classical Be Stars with Infrared Excess

Pei-Min Shen, Wen-Ping Chen, Chien-De Lee, Chien-Cheng Lin

Classical Be stars are B-type stars with the characteristic emission spectra and infrared excess. These stars are distinct from the pre-main sequence Herbig Ae/Be stars and are known to be rapid rotators, some perhaps close to break-up. They are surrounded by gaseous disks, which are responsible for many of the observed properties, including plausibly the dust condensation in the ejected cooling envelopes. We present the echelle spectra taken by Tai National Telescope(TNT) of NARIT of three classical Be stars BD+56573 ,HD50138, HD 50820. in order to derive their rotational velocities, and discuss the hypothesis of how fast rotation may have played a role in the Be phenomena.

Poster No. 23

Characterizing the Time-Frequency Properties of Quasi-Periodic Oscillations around Black Holes

Yi-Hao Su, Yi Chou, Chin-Ping Hu, Ting-Chang Yang,

Hung-En Hsieh (Institute of Astronomy, National Central University, Taiwan)

We present the results of Lomb-Scargle spectrograms and Hilbert-Huang transform (HHT) of quasi-periodic oscillations (QPOs) around two different mass-scale black holes. The resultant Hilbert spectra of the 4 Hz QPO in the black hole X-ray binary XTE J1550-564 demonstrate that the QPO is composed of a series of intermittent signals appearing occasionally. Comparing with the ~5 mHz QPO around the supermassive black hole in Swift J1644+57, we conclude that the intermittent feature of both QPOs rules out interpretations of continual frequency modulation.

Poster No. 24

Perspectives for exploring the progenitor systems of Type Ia Supernovae with the FAST

Lingzhi Wang(NAOC), Wenwu Tian (NAOC), Xiaohong Cui(NAOC),

Hui Zhu(NAOC), Hongquan Su(NAOC), Dan Wu(NAOC)

Type Ia supernovae (SNe) have been used as standard candles to demonstrate the acceleration of the expansion of the Universe. They are thought to originate from a thermonuclear explosion of an accretion carbon-oxygen white dwarf in a close binary system. Little has been known on their progenitor systems so far. Two primary theories on the progenitor system are Single Degenerate and Double Degenerate scenarios. The evolution of the progenitor system shapes the circumstellar environment, different scenarios might develop different relations between radio luminosity and the density of circumstellar material surrounding SNe. Five-hundred-meter Aperture Spherical radio Telescope (FAST) as the largest and most sensitive single dish radio telescope in the world, will enable astronomers to detect Type Ia SNe at luminosity L~3.7×10^23 erg s−1Hz−1 with the distance of 10Mpc (i.e. a sensitivity of 3.1μ Jy at 1.5 GHz). This radio luminosity suggests the mass loss rate of progenitor systems of ~2.3×10−9 Msun yr−1, placing direct constraints on the circumstellar environments of progenitor systems.

Poster No. 25

A Comparison of the Occurrence rates and Occurrence timing of the Solar Flares with Stellar Flares from Solar-type Stars

Wu, Chi Ju Ip, Wing-Huen Huang, Li Ching

The space weather effect caused by solar storms might reach the peak of the solar cycle in 2013. How about similar processes in other stellar objects? The Kepler mission of an Earth-orbiting space astronomical telescope for the search of habitable exoplanets provides a wealth of observational data concerning the time variability of stars in the Cygnus-Lyra region above the galactic plane. Some of the solar-type stars were found to exhibit large energy-release events with power as much as a million times of the large solar flares. An interesting question is whether they have the same flaring mechanism just like the case of the solar flares and when these flares occur. In this work, we report our study of the occurrence frequency distributions of the stellar flares of a number of selected solar-type stars and compare them to that of our Sun. Furthermore, we also represent the flares occurrence timing with respect to stellar spot rotation phase. We will discuss the similarities and dissimilarities of the frequency distributions and their implications on the generation mechanism, and those large flares occurred with small stellar brightness variation are considered that active regions are near polar region.

Poster No. 26

Multi-photometric observation of sub-km Main Belt Asteroids

Fumi Yoshida (NAOJ), Edward Lin, Wing-Huen Ip (NCU),

Ying-Tung Chen (ASIAA)

We observed sub-km MBAs by Subaru telescope + Suprime-Cam with the B-, v-, R-, I-filters for investigating their colors. We surveyed 6 fields of Suprime-Cam's FOV (in total 1.5 deg^2) near ecliptic plane and near opposition. We detected 163 MBAs with the 4 bands. We will report their color distribution and also a correlation between color and orbital distributions.

Poster No. 27

A Rotation Measure Gradient on the M87 VLA Jet

J. C. Algaba, K. Asada, M. Nakamura

Academia Sinica, Institute of Astronomy and Astrophysics

Faraday rotation measures (RMs) have proven to be an excellent tool to study magnetic field structures in AGNs. By stacking images over three years, we reveal, for the first time, systematic transverse gradients of the RM in several knots along the jet. Combining this result with polarization properties and the dynamics of the jet, we suggest the magnetic structure in several knots at kiloparsec scales consists of a systematically wrapped, tightly wound helical configuration. Our analysis brings us a new paradigm where the M87 jet is a fundamentally current carrying system produced in the vicinity of the supermassive black hole, transferring a huge amount of the electromagnetic energy over the host galaxy scale.

Information

Venue

1F/2F, K.T.Li Library Conference Hall, National Central University
中央大學國鼎圖書館國際會議廳
300, Jhongda Rd., Jhongli City, Taoyuan County, Taiwan

wireless internet service: no need password

Shuttle bus Schedule (Kuva Chateau ←→NCU Conference)

	Kuva Chateau → NCU Conference		Kuva Chateau ← NCU Conference	
	bus arrive	leave depart for NCU	bus arrive	bus depart from NCU
14-Oct	08:00	08:15	18:00	18:20
15-Oct	08:00	08:15	18:10	18:30 for banquet
16-Oct	08:00	08:15	18:20	18:40
17-Oct	08:00	08:15	16:00	16:20

Please wear your EAMA9 name tag when taking the bus.

If you drive：

Please get a ticket from the parking ticket dispensers at the Main/Rear Gate and get the stamp on the ticket at the EAMA registration desk in order to reduce the parking fee (NTD30 for 4 hours).

The closest available parking to the meeting venue is the parking lot in front of K.T.Li Library.

Bilingual Instruction for Asking Hotel Direction

Hotel Kuva Chateau
No.398, Minchuan Rd., Zhongli City, Taoyuan County 32055, Taiwan (R.O.C.)

古華花園飯店
桃園縣中壢市民權路 398 號

Map of NCU

N S

SCALE = 1:12000

往觀音、高鐵桃園站
To Guan-yin、
High Speed Rail Taoyuan Station

往中壢、中山高
(三民路右轉)
To Jhong-li、National Highway No.1
(turn right at Sanmin Rd.)

KT Li Library (meeting venue)

Main Gate

F3正門牌樓 Main Gate
F3 中大路 Jhong-da Road
中 央 大 學
F2 男九舍 Male Dormitory 9
F3 資源回收及垃圾處理場
F3 車庫 Bus Garage
F2 九舍餐廳 Cafeteria (in Male Dorm 9)
E2 便利商店 Convenience Store
F3 校長宿舍
E3 前門警衛室 Campus Security Office at front gate
E4 建校紀念塔 Monument
E3 前門崗亭 Sentry post at front gate
E2 烏龜池
E2 男十二舍 Male Dormitory 12
E2 中大會館 Guest House
E2 校園影印中心 Copy Service Center
E2 研究生宿舍 Graduates' Dormitory
E2 校園cafe Campus Café (B1, Graduates' Dormitory)
E3 國鼎圖書資料館 K.T. Li Library
E3 人文社會科學大樓 Humanities and Social Sciences Building
E3 行政大樓 Administration Building
E3 文學一館 Liberal Arts Building 1
E3 文學二館 (文學院) Liberal Arts Building 2 (College of Liberal Arts)
E3 總圖書館 Main Library
E4 科學一館(地球學院) Science Building 1 (College of Earth Sciences)
E4 國際學生宿舍 International Student Dormitory
D2 管理二館 Management Building 2
D2 志希館 (管理學院、電算中心) Zhi-xi Hall (School of Management、Computer Center)
D2 Fiesta餐廳 Fiesta Restaurant
D3 露天咖啡吧 Alfresco Café
D3 太極銅雕 Tai-ji Statue
D3 百花川松林步道 Pine-shaded Wooden Path
(學務處) D3 中正圖書館 (Office of Student Affairs) Zhong-zheng Library
D4 藝文中心 Art Center
D4 國泰樹
D4 露天咖啡吧 Alfresco Café
D2 科學五館 Science Building 5
D2 鴻經館 Hong-jing Hall
D2 綜教館 (語言中心) General Education Building (Language Center)
D2 科學三館 Science Building 3
D3 科學二館 (理學院) Science Building 2 (College of Science)
D4 化材系
D4 工程一館 (土木工程學系) Engineering Building 1 (Department of Civil Engineering)
D4 實習一廠
D4 女一舍 Female Dormitory 1
D4 女三舍 Female Dormitory 3
D4 便利商店 Convenience Store
D4 荷花池 Lotus Pond
C2 理學院教學館 (普化實驗大樓)
C2 科學四館 Science Building 4
C2 中大湖 Jhong-da Lake
C3 教學研究綜合大樓 (興建中) Teaching and Research Building & Multi-functional Auditorium
C3 疊球場 Softball Court
C4 資策會 Institute for Information Industry
C4 工程二館(資電學院) Engineering Building 2 (College of Electrical Engineering & Computer Science)
C4 女四舍 Female Dormitory 4
C5 中大幼稚園 Kindergarten
C4 露天咖啡吧 Alfresco Café
C4 創新育成中心 Innovation & Incubating Center
C4 教職員單一舍 Faculty Dormitory 1
C4 松苑餐廳 (一樓中餐部 二樓西餐部) Pine Garden Restaurant
C4 國際事務處 Office of International Affairs
C4 教職員單二舍 Faculty Dormitory 2
C4 教職員單四舍 Faculty Dormitory 4
C5 中大新村二區 Faculty Residence Halls-Unit 2
C3 溜冰場 Roller-skating Rink
C3 籃球場 Basketball Courts
C3 健身房 (羽球館) Gymnasium (Badminton Courts)
C3 依仁堂 Yi-ren Hall (Office of Physical Education)
C4 排球場 Volleyball Courts
C2 國鼎光電大樓 Kwoh-Ting Optoelectronics Building
B2 客家學院大樓 Hakka Studies Building
B3 網球場 Tennis Courts
B3 室內游泳池 Indoor Swimming Pool
B3 攀岩場 Rock Climbing Wall
B3 田徑場 Sports Field
B3 籃球場 Basketball Courts
B3 籃球場 Basketball Courts
B4 氣象觀測站 B4 實習三廠
B4 工程三館 (機械館) Engineering Building 3
B3 風洞實驗室及品保中心
B3 大型力學實驗室 Experiment Center for Civil Engineering
B4 機電實驗室
B4 中大新村三區 Faculty Residence Halls-Unit 3
A3 中大北村 Faculty Residence Halls -North Unit
A4 工程四館 Engineering Building 4 (環工化工館)
A4 研究中心大樓二期 Research Center Building 2
A4 工程五館 (工學院) Engineering Building 5 (College of Engineering)
A3 雷達站
A4 太空遙測研究中心 Center for Space & Remote Sensing Research (研究中心大樓一期) (Research Center Building 1)
E4 男五舍 Male Dormitory 5
E4 男十三舍 Male Dormitory 13
E4 游藝館 You-yi Hall (Student Club Center)
E4 大講堂 Grand Lecture Hall
E4 校史館 Museum of NCU History
E4 據德樓 Ju-de Hall (Student Club Center)
E5 男六舍 Male Dormitory 6
E5 七舍餐廳 Cafeteria (in Male Dorm 7)
E5 男七舍 Male Dormitory 7
E5 洗衣部 Launderette
E5 男十一舍 Male Dormitory 11
E5 美髮部 Barbershop
E5 敦煌書局 Bookstore
E5 眼鏡部 Opticians
E5 中央大學郵局 Post Office
E5 女十四舍 Female Dormitory 14
E5 賽場 Store
E5 餐廳 Cafeteria
D5 學生活動中心 Student Activity Center
D5 女五舍 Female Dormitory 5
D5 男三舍 Male Dormitory 3
D5 中大新村一區 Faculty Residence Halls-Unit 1
宵夜街 Late-night Snacks Lane
Rear Gate
C5 後門崗亭 Sentry post at rear gate
C5 後門警衛室 Campus Security Office at rear gate
To Jhong-li、Xin-wu

美髮部 Barbershop
哺(集)乳室 Breastfeeding Room
郵局 Post Office
游泳池 Swimming Pool
書店 Bookstore
機車停車場 Parking Lot
眼鏡行 Opticians
汽車停車場 Parking Lot
公車站牌 Bus Stop
便利商店 Convenience Store
餐廳(自助餐) Restaurant (Cafeteria)
無障礙廁所 Handicap Restroom
咖啡廳 Café
廁所 Restroom
緊急電話 Emergency Call
百花川松林步道 Pine-Shaded Wooden Path

製圖日期：中華民國九十九年三月二十五日

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