



中央研究院

天文及天文物理研究所

Institute of Astronomy and Astrophysics



SMA



TAOS



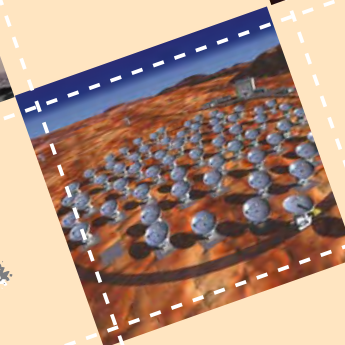
ALMA



AMBA



TIARA



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Introduction

The Institute of Astronomy and Astrophysics (ASIAA) was established in 1993 after approval by the Academia Sinica Council upon the recommendation of Academician C.C. Lin. It started as a Preparatory Office inaugurated with Prof. Frank H. Shu chairing the Advisory Panel, and with Dr. Typhoon Lee as the first director. Succeeding directors have been Prof. Chi Yuan (1994-1997), Prof. Fred K.Y. Lo (1997-2002), Prof. Sun Kwok (2003-2005), and Prof. Paul T.P. Ho (2002-2003, and Sept. 2005 - present). ASIAA currently has about 140 members, including research scientists, post-doctoral fellows, engineers, and technical and administrative staff. ASIAA is international and has members from many foreign countries, including Australia, Canada, France, India, Japan, Korea, Malaysia, Switzerland, U.S.A., and Vietnam.

ASIAA is officially still a Preparatory Office, which means that the major decisions, such as hiring, are made in fact by the Advisory Panel. The Advisory Panel provides oversight and advice to ASIAA, and helps formulate the future planning of the institute. ASIAA plans to become a full-fledged institute in a couple of years and grow by a factor of two in size in five to ten years.

ASIAA is located on the campus of the National Taiwan University (NTU) in Taipei, facilitating our collaboration with local universities. Students are encouraged and many have come from local universities to work with us on the forefront astronomical research for their Master and Ph.D. degrees.

In this booklet, we introduce our staff and their research. Our staff makes use of all the leading astronomical instruments in the world with research topics ranging from solar system studies to cosmology, and we aim to bring this access to the astronomical community in Taiwan. ASIAA also sponsors international workshops and conferences on a regular basis. The goal of ASIAA is to become a research institute competitive with the best in the world. Our current major research directions can be summarized as follows:





(1) Radio astronomy is currently our major focus. A sizable group of our staff is working on the forefront research with the world-best radio instruments, especially with interferometers that have high resolving powers. We also participate in the construction and operation of the following forefront radio instruments: (i) the Submillimeter Array (SMA), which is the first and currently the only interferometer operating in submillimeter wavelengths, in collaboration with the Smithsonian Astrophysical Observatory (SAO), (ii) the Array for Microwave Background Anisotropy (AMiBA), which is a forefront instrument for research in cosmology, in collaboration with NTU and the Australia Telescope National Facility (ATNF), and (iii) the Atacama Large Millimeter/submillimeter Array (ALMA), which is the advanced version of the SMA and the largest ground-based astronomical instrument to be completed, in collaboration through Japan and North America.



(2) A group of our staff is also working on the forefront research in the area of optical and infrared astronomy. In particular, we also constructed and operate the Taiwan-America Occultation Survey (TAOS) telescopes on Lulin Mountain, in collaboration with National Central University (NCU), Lawrence Livermore National Laboratory (LLNL), Yonsei University, and SAO. Exciting occultation results about small objects in the outer solar system have been reported recently in international journals. As a part of the Cosmology and Particle Astrophysics (CosPA) effort together with the AMiBA development, we also participated in the development of the Wide Field Infrared Camera (WIRcam) for the Canada-France-Hawaii Telescope (CFHT). We now move on to the development of the next generation wide field CCD camera, the Hyper Suprime-Cam (HSC), for the Subaru telescope. One major science goal is to constrain the cosmological model by studying the distribution of dark matter via weak gravitational lensing studies of galaxy clusters.

(3) In the area of astrophysics theory, a group working on Computational Fluid Dynamics and Magnetohydrodynamics (CFD/MHD) has developed numerical computation capabilities at the ASIAA. Exciting simulation results about astronomical phenomena have been published recently in international journals. In addition, the Theoretical Institute for Advanced Research in Astrophysics (TIARA) was established, promoting the collaboration between ASIAA and university groups in Taiwan on astrophysical theory as well as providing an integrated world-class program of research and education in theoretical astrophysics.

Administration

Ho, Paul, Director 賀曾樸，主任

Chen, Ming Tang, Assistant Director 陳明堂，副主任

Ohashi, Nagayoshi, Assistant Director 大橋永芳，副主任



Hsieh, Winny
Chief Administrator/ Senior Research Specialist
謝佳慧，行政室主管; 研究技師
State University of New York at Buffalo
Master of Business Administration



Shaw, Paul
Head of Project Management Office/Senior Research Specialist
蕭仰台，計劃辦公室主管; 研究技師
Chinese Culture University, MBA, Shipping Management



Chang, Guen-Min
Secretary to Director
張桂敏，所長秘書
National Open University



Chen, Juniper
Maintenance Officer
陳重模，工務
National Open University

Advisory Panel Members

Shu, Frank H. 徐遐生

(Chair of the Advisory Committee)

Affiliation: Univ. of California, San Diego Center for Astrophysics and Space Sciences

Research Speciality: Theoretical Astrophysics

Chu, YouHua 朱有花

Affiliation: Univ. of Illinois

Research Speciality:

X-ray astronomy, interstellar medium

Lo, Fred K.Y. 魯國鏞

Affiliation: NRAO

Research Speciality:

Radio Astronomy

Ho, Paul 賀曾樸

Affiliation: Academia Sinica

Research Speciality:

Radio Astronomy

Taam, Ronald E. 譚遠培

Affiliation: Northwestern Univ.

Research Speciality:

Theoretical Astrophysics

Lee, Typhoon 李太楓

Affiliation: Academia Sinica

Research Speciality:

Nuclear Astrophysics

Wu, Maw-Kuen 吳茂昆

Affiliation: Academia Sinica

Research Speciality:

Superconductivity and Magnetism

Lee, Lou-Chuang 李羅權

Affiliation:

National Science Council

Research Speciality:

Space Physics

Yee, Howard K. C. 余光超

Affiliation: Univ. of Toronto

Research Speciality:

Optical & Infrared Astronomy

Lin, Doug N. C. 林潮

Affiliation:

Univ. of California, Santa Cruz

Research Speciality:

Theoretical Astrophysics

Young, Erick 譚英元

Affiliation: Univ. of Arizona

Research Speciality:

Infrared Astronomy

Research Fellows & Specialists

專任研究人員簡介

迎之為僕宇宙神通
而碧傳則精細龐大
上窺造化學林氣概
米巴不出誰多爭鋒

賀阿米巴傳則為

朱新

八身年古不即寄
四任而七忙張一強

未手即米上戰場
數十負工盡然紅

六米主鏡精毫雙

凡無微波渡證學

大山雄峰外天降

疏收宇宙第一電

以重米波傳則為

賀阿米巴傳則為

朱新

Ho, Paul T.P.

賀曾樸

Distinguished
Research Fellow

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Education and Positions

- B.S., Physics, MIT, 1972
- Ph.D., Physics, MIT, 1977
- Postdoctoral Research Associate, FCRAO, University of Massachusetts, Amherst 1977-1979
- Miller Fellow, Research Associate, Radio Astronomy Lab, University of California, Berkeley, 1979-1982
- Assistant Professor, Department of Astronomy, Harvard University, 1982-1986
- Associate Professor, Department of Astronomy, Harvard University, 1986-1990
- Senior Astrophysicist, Smithsonian Astrophysical Observatory, 1989-present
- Director, Distinguished Research Fellow, ASIAA 2002-2003, 2005-present

Honors

- Miller Fellowship, 1979-1981
- Henri Chre'tian Award, 1982
- Alfred P. Sloan Research Fellowship 1984-1986
- Academician, Academia Sinica, 2008

Research Highlights

- Top 10 Astronomical Results in 1987: Ph.D. thesis of student Eric Keto on Collapsing Core in G10.6-0.4 was picked as one of the top 10 astronomical results in 1987 by the American Astronomical Society
- Finalist in Apker Award: Bachelor thesis of student Luis Ho was one of the three top undergraduate physics theses in the U.S. in 1990.
- M82 as NRAO Research Highlight in 1992: Ph.D. thesis of student Min Yun on M82 featured as the cover of NRAO yearly research report to NSF.
- Student Prizes: Goldberg Prizes to Luis Ho (1990), Lisa Norton (1991); Hoopes Prizes to Luis Ho (1989; 1990).

- Cover of Nature: M81-M82 Interacting System (1994).
- Highlighted in Nature: Gas Filaments in Orion (1996).
- Highlighted in Nature: Puff of Ejection of Water Masers in Cepheus A (2001).
- Submillimeter Array: Dedicated on Mauna Kea (2003).
- Special ApJ Letts. Volume: Submillimeter Array (2004).
- Yuan Tseh Lee Array for Microwave Background Anisotropy: Dedicated on Mauna Loa (2006).

Selected Publications

- Ho, P.T.P., & Townes, C.H. "Interstellar Ammonia", Ann. Rev. Astron. Astrophys. (1983) 21, 239.
- Ho, P.T.P., & Haschick, A.D. "Molecular Clouds Associated with Compact HII Regions. III. Spin-Up and Collapse in the Core of G10.6-0.4", ApJ (1986) 304, 501.
- Yun, M.S., Ho, P.T.P., & Lo, K.Y. "A High-Resolution Image of Atomic Hydrogen in the M81 Group of Galaxies", Nature (1994) 372, 530.
- Herrnstein, R.M., & Ho, P.T.P. "Hot Molecular Gas in the Galactic Center", ApJ (2002) 579, L83.
- Ho, P.T.P., Moran, J.M., & Lo, K.Y. "The Submillimeter Array", ApJ (2004) 616, L1.
- Shen, Z.-Q., Lo, K.Y., Liang, M.-C., Ho, P.T.P., & Zhao, J.-H "A Size of 1AU for the radio source Sgr A* at the centre of the Milky Way", Nature (2005) 438, 62.
- Ho, P.T.P. et al. "The Yuan-Tseh Lee Array for Microwave Background Anisotropy", ApJ (2009) in press.

Research Interests

Star and Planet Formation. Supermassive Black Holes. Cosmology and Early Universe. Interferometry.

Chen, Ming-Tang
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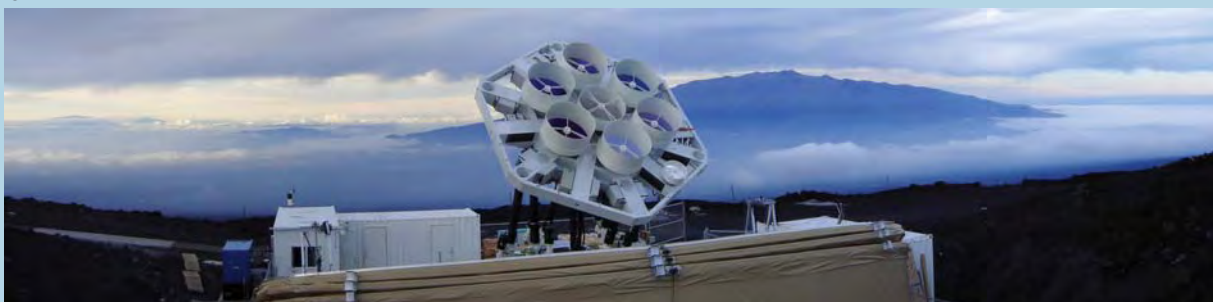
Education and Positions

- B.S., Physics, Nat'l Cheng-Kung University, 1986
- Teaching Assistant, Cheng-Kung University, 1989
- Ph.D., Physics, University of Illinois Urbana-Champaign, 1993
- Postdoctoral Fellow, Case Western Reserve University, 1993-95
- Research Assistant, ASIAA, 1995-96
- Assistant Research Fellow, ASIAA, 1996-99
- Associate Research Fellow, ASIAA, 1999-2004
- Research Fellow, ASIAA, 2004-Present
- Deputy Director, ASIAA Hawaii Operations, 2003-Present
- Assistant Director, ASIAA, 2008-Present

Professional Experience

- Directly involved in the Submillimeter Array, the Array for Microwave Background Anisotropy, and the Atacama Large Millimeter Array.
- Administration in research and multi-cultural organization. Scientific project management in the scale of tens of millions USD. Direct leadership of a technical team of 20+ personnel.
- Long-term international collaborations with US, Japan, Australia, and mainland China colleagues.
- Designing and building millimeter and sub-mm receiver and telescopes.
- Knowledge and hand-on experience: microwave and MMIC technology, cryogenics, photonics, CFRP, parallel kinematic, etc.

Figure -- A view of AMiBA on top of Mauna Loa in Hawaii



Selected Publications

- Hwang, H.-J., Rao, R., Christensen, R., Chen, M.-T, & Chu, T.-H. "Submillimeter-Wave Phasor Beam-Pattern Measurement Based on Two-Stage Heterodyne Mixing With Unitary Harmonic Difference", IEEE Trans. MTT (2007) 55(6), 1200.
- Lin, K.Y., et al., "AMiBA First-Year Observation", SPIE (2008) 7012, 701207.
- Huang, Y.D., et al., "Photogrammetry Measurement of the AMiBA 6-meter Platform", SPIE (2008) 7012, 70122H.
- Chen, M.-T. "From Millimeter-wave Technology to Cosmology – the AMiBA Telescope", Proc. of 2008 Global Symposium on Millimeter Waves (2008) 183-184 (Invited paper).

Invited Talks

- International Workshop on Frontiers In Space and Fusion Energy Sciences, Nat'l Cheng-Kung Univ., Tainan, Taiwan, Nov. 6-8, 2008, on the title of "Millimeter-wave Imaging in Astronomy".
- 2008 Global Symposium on Millimeter Waves, Nanjing, China, April 21-24, 2008, on the title of "From Millimeter-wave Technology to Cosmology – The AMiBA Telescope".

Research Interests

My main interest is in imaging technology and its applications with astronomy and/or other scientific fields. In particular, my work in the past has been mainly involved in signal detection and imaging in mm and sub-mm wavelength for astronomical purposes. Currently, I am trying to expand our expertise and application to different fields, such as plasma diagnostics, and bio-imaging. I am particularly pursuing utilizing Taiwanese semiconductor technologies, such as CMOS and SiGe, for the purpose of signal detection. High-speed data processing is also a key topic in developing a real-time radio imaging system. We are also developing skill and experience in this area of work.

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Education and Positions

- B.S., Physics, Macquarie University, Sydney, Australia, 1982-1984, 1985 (Hons)
- Ph.D., Astrophysics, Macquarie University, Sydney, Australia, 1986-1991
- Postdoctoral Fellow, University of Maryland, USA, 1991-1992
- Research Fellow, California Institute of Technology, USA, 1992-1994
- Distinguished Postdoctoral Fellow, ASIAA, 1995-1996
- Assistant Research Fellow, ASIAA, 1996-2000
- Adjunct Assistant Professor, National Central University, Chungli, Taiwan, 1999-2000
- Associate Research Fellow, ASIAA 2000-2008
- Adjunct Associate Professor, National Taiwan University, Taipei, Taiwan, 2005-present
- Research Fellow, ASIAA 2009-present

Selected Publications

- Lim, J. "Discovery of Remarkably Intense Radio Emission from a Young and Rapidly Rotating dMe Star", *ApJ* (1993) 405, L33.
- Lim, J., & White, S. M. "Limits to Mass Outflows from Late-Type Dwarf Stars", *ApJ* (1996) 462, L91.
- Lim, J., Carilli, C., White, S. M., Beasley, A. J., & Marston, R. G. "Large Convection Cells as the source of Betelgeuse's extended atmosphere", *Nature* (1998) 392, 575.
- Lim, J., & Ho, P. T. P. "Violent Tidal Disruptions of Atomic Hydrogen Gas in Quasar Host Galaxies", *ApJ* (1999) 510, L7.
- Lim, J., Leon, S., Combes, F., & D.-V.-Trung "Molecular Gas in the Powerful Radio Galaxies 3C 31 and 3C 264: Major or Minor Mergers?", *ApJ* (2000) 545, L93.

- Lim, J., & Takakuwa, S. "Properties and Formation of the Multiple Protostellar System L1551 IRS5", *ApJ* (2006) 653, 425.
- Lim, J., Ao, Y.-P., & Dinh, V.-T., "Radially-Infalling Molecular Gas in NGC 1275 from a X-ray Cooling Flow in the Perseus Cluster", *ApJ* (2008) 672, 252.

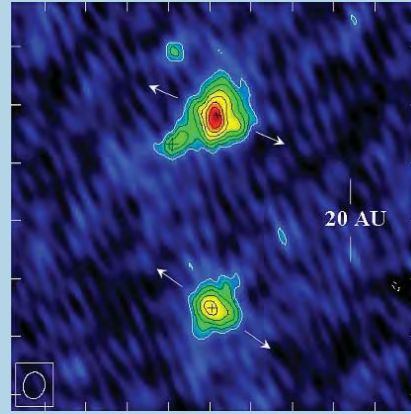


Figure -- The image of the binary protostellar system L1551 IRS5 obtained with the VLA.

Research Interests

My work spans the Sun to the most distant galaxies, and has provided crisp answers to questions at the frontier of research in a number of different fields in astrophysics. A few examples are: (1) What do other stars look like? Our image of the red supergiant Betelgeuse shows that this star has a highly extended and asymmetric atmosphere; (2) Unlike our Sun, most stars form as members of binary or multiple systems: how such systems form is one of the most important unanswered questions in star formation. Our observations of L1551 IRS5 provides the first direct evidence that multiple protostellar systems can form through the fragmentation of their surrounding molecular gas condensation, as is most commonly invoked by contemporary theoretical models. (3) The mechanism(s) that triggers luminous nuclear activity in galaxies has been an outstanding mystery ever since the discovery of quasars in the early 1960's. Our observations of active spiral galaxies in atomic hydrogen gas reveal that, tidal interactions is the dominant mechanism for initiating events that lead to relatively luminous nuclear activity in local spiral galaxies.

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Education and Positions

- M.S., Physics, Nagoya University, 1989
- Ph.D., Physics, Nagoya University, 1992
- JSPS Fellowship, Nobeyama Radio Observatory, 1992-1994
- Submillimeter Array Postdoctoral Fellow, Harvard-Smithsonian Center for Astrophysics, 1994-1997
- Assistant Research Fellow, ASIAA, 1997-2000
- Associate Research Fellow, ASIAA, 2000-2007
- Research Fellow, ASIAA, 2007-present
- SMART/SMA-Taiwan Project Scientist, 2000-present
- ALMA-Taiwan Project Manager, 2005-present
- Assistant Director, ASIAA, 2008-present

Honors

- NSC (Taiwan) Research Award, 1999, 2000
- The Astronomical Society of Japan (ASJ) Young Astronomer Award, 1999

Selected Publications

- Ohashi, N., Hayashi, M., Ho, P. T. P., & Momose, M. "Interferometric Imaging of IRAS 04368+2557 in the L1527 Molecular Cloud Core: A Dynamically Infalling Envelope with Rotation", ApJ (1997) 475, 211.
- Ohashi, N., Hayashi, M., Ho, P. T. P., Momose, M., Tamura, M., Hirano, N., & Sargent, A. I. "Rotation in the Protostellar Envelopes around IRAS 04169+2702 and IRAS 04365+2535: The Size Scale for Dynamical Collapse", ApJ (1997) 488, 317.
- Ohashi, N., Lee, S.-W., Wilner, D. J., & Hayashi, M. "CCS Imaging of the Starless Core L1544: An Envelope with Infall and Rotation", ApJ (1999) 518, L41.

- Aikawa, Y., Ohashi, N., & Herbst, E. "Molecular Evolution in Collapsing Prestellar Cores II: Effect of Grain-surface Reactions", ApJ (2003) 599, 906.
- Takakuwa, S., Ohashi, N., Ho, P. T. P., Qi, C., Wilner, D. J., Zhang, Q., Bourke, T. L., Hirano, N., Choi, M., & Yang, J. "Submillimeter Array Observations of L1551 IRS5 in CS (J=7-6)", ApJ (2004) 616, L15.
- Lin, S.-Y., Ohashi, N., Lim, J., Ho, P. T. P., Fukagawa, M., & Tamura, M. "Possible Molecular Spiral Arms in the Protoplanetary Disk of AB Aur", ApJ (2006) 645, 1297.
- Ohashi, N. & Momose, M. "Submillimeter Observations of the Protoplanetary Disk around HD 142527: A Gas-poor Dust Arc", ApJ (2009) submitted.

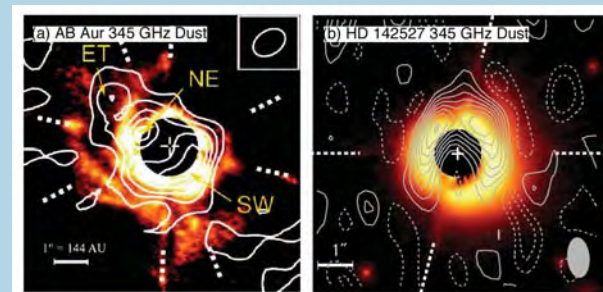


Figure -- SMA (contours) + Subaru (color scale) images of the two nearby proto-planetary disks.

Research Interests

How stars like the Sun and planets like the Earth are formed? In order to answer this question, I have been using radio telescopes, particularly radio interferometers, to observe nearby star and planet forming regions. Radio interferometers allow us to observe fine structures of dense cores and disks where stars and planets form. In order to have better observational tools, I also have been working to build radio telescopes (Submillimeter Array and Atacama Millimeter and Submillimeter Array). My near future goal is to image protoplanetary disks at a resolution of 0.01".

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王明杰

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Education and Positions

- B.S., Physics, National Tsing Hua University, Taiwan, 1989
- Ph.D., Physics, National Tsing Hua University, Taiwan, 1994
- Postdoctoral fellow, ASIAA, 1994-1999
- Assistant Research Fellow, ASIAA, 1999-2004
- Associate Research Fellow, ASIAA, 2004-2009
- Research Fellow, ASIAA, 2009-present

Selected Publications

- Wang, M.J., & Wu, M.K. "The Vortex State in YBa₂Cu₃O_{7-y} System", Chinese J. of Phys. (1993) 31, 6, 1043.
- Wang, M.J., Cheng, H. W., Ho, Y. H., Chin, C. C., & Chi C. C. "Low noise Nb-based SIS mixer for sub-millimeter wave detection", J. of Phys. and Chem. of Solids (2000) 62, 1731.
- Wang, M. J., Cheng, H. W., Chuang, P. K., Wu S. L., & Chi, C. C. "New AlO_x Thickness Control process for SIS Tunnel Junctions Fabrication", IEEE Trans. Appl. Supercond. (2003) 13, 1101-1103.
- Shan, W.L., Wang, M.J., Shi, S.C., Irimajiri, Y., & Noguchi, T. "Observation of an anomalous IF peak and its effect on the SIS mixing performance", Jpn. J. Appl. Phys., 43, 5A, L617.
- Wu, C.T., Wang, M. J., & Wu, M. K. "Study of High Temperature Superconducting p-n Junction", Physica C (2007) 460, 424.

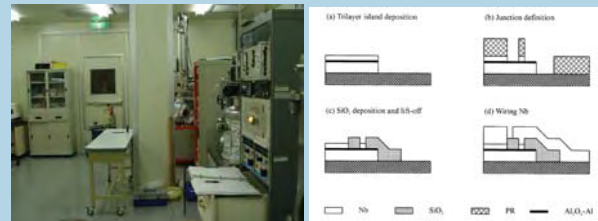
Research Interests

The topics of my research are related to the superconductivity of materials and devices. Developing SIS mixers for SMART telescopes is my major work. SIS mixers with quantum noise limit performance for 150GHz-600GHz frequency has been developed. Detectors for THz frequency are the ongoing plan for the future.

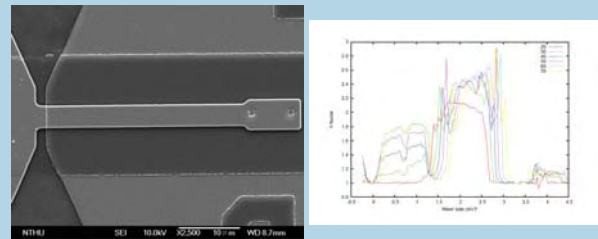
Many kinds of superconducting devices can be fabricated in our laboratory that could be used to construct a novel measurement system or to study the physical properties of devices. Furthermore, studying of new superconducting materials is always an interesting work to me. Currently I am working on the properties of FeSe superconductor.

Important results

Nb-based superconducting device fabrication



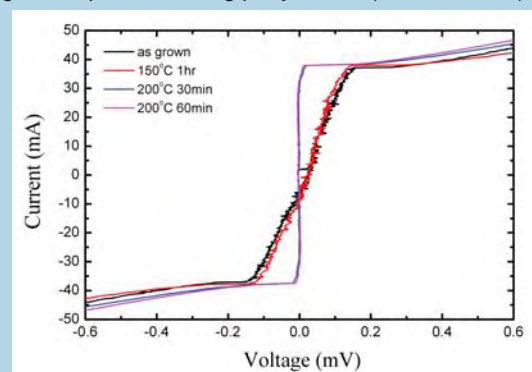
SIS mixer for sub-millimeter wave



Scanning SQUID chip and magnetic flux mapping



High T_c superconducting p-n junction (YBCO/PCCO)



Hasegawa, Tatsuhiro
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Associate
Research Fellow
副研究員

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Education and Positions

- M.S., Astronomy, Tohoku University, 1978
- Ph.D., Astronomy, Tohoku University, 1984
- Postdoctoral Fellow, CITA, 1986-1988
- Postdoctoral Fellow, St. Mary's Univ., 1988-1990
- Research Associate, Duke University, 1990-1991
- Research Associate, Ohio State Univ., 1991-1992
- Research Associate, St. Mary's Univ., 1992-1996
- Odin Project Scientist, Univ. Calgary 1998-2005
- Associate Research Fellow, ASIAA, 2005-present

Selected Publications

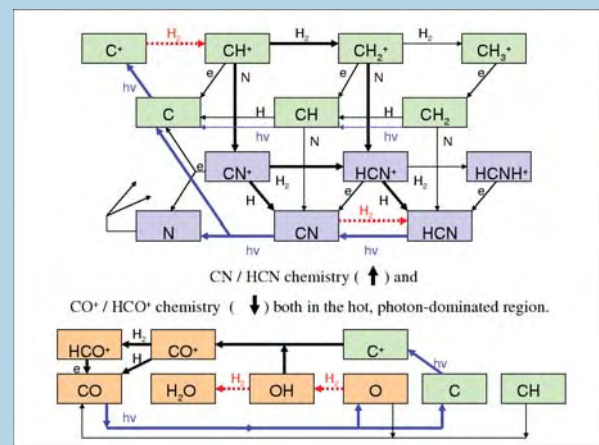
- Hasegawa, T.I. "Hydrostatic Models of Bok Globules", PASJ (1988) 40, 219.
- Hasegawa, T.I., Herbst, E., & Leung, C.M. "Models of Gas-Grain Chemistry in Dense Interstellar Clouds with Complex Organic Molecules", ApJS (1992) 82, 167.
- Hasegawa, T.I. & Herbst, E. "New Gas-Grain Chemical Models of Quiescent Dense Interstellar Clouds", MNRAS (1993) 261, 83.
- Hasegawa, T.I. & Herbst, E. "Three-Phase Chemical Models of Dense Interstellar Clouds", MNRAS (1993) 263, 589.
- Hasegawa, T.I., Mitchell, G.F., Matthews, H.E., & Tacconi, L. "Submillimeter Observations of CO in the W 3 Core", ApJ (1994) 426, 215.
- Hasegawa, T.I., Volk, K., & Kwok, S., "A Chemical Model of the Neutral Envelope of the Planetary Nebula NGC 7027", ApJ (2000) 532, 994.
- Hasegawa, T.I., & Kwok, S. "Molecular Line Emissions from the Photodissociation Region of NGC 7027", ApJ (2001), 562, 824.

Research Interests

Molecular Astrophysics – (a) Theoretical studies of chemistry in interstellar clouds and circumstellar envelopes. (b) Observational studies in the submillimeter band of abundances of various molecules in space.

Based on a database of a few thousand chemical reactions, my program generates a computer code that estimates the rates of formations and destructions of hundreds of molecular species. The computer simulations with such a chemical code are compared with observations of molecules in interstellar clouds. Observations of molecular lines are translated to the amounts of the emitting molecules through calculations of molecular excitations by collisions and radiation. Important chemical processes are identified after finding a best match between observations and chemical simulations for an astronomical object. The figure shows chemical processes in a region illuminated by a hot star.

My activities also include radio observations of the molecules. I have been a frequent visitor to Mauna Kea (Hawaii) for observations for twenty years. Most observations these days are carried out in a remote or queue (automated) mode.



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Education and Positions

- M.S., Astronomy, Tohoku University, 1984
- Ph.D., Astronomy, Tohoku University, 1987
- Postdoctoral Fellow, Nobeyama Radio Observatory, 1988-1989
- Postdoctoral Fellow of Japan Society for the Promotion of Science, 1989-1991
- Research Associate, Hitotsubashi University, 1991-2000
- Associate Research Astronomer, ASIAA, 2001-2006
- Associate Research Fellow, ASIAA, 2006-present
- Adjunct Associate professor, National Taiwan Normal University, 2005-2007

Selected Publications

- Hirano, N., Shinnaga, H., Dinh-V-Trung, Fong, D., Keto, E., Patel, N., Qi, C., Young, K., Zhang, Q., & Shao, J.H. "High-Velocity Bipolar Outflow and Disklike Envelope in the Carbon Star V Hydrae", *ApJ* (2004) 616, L43.
- Hirano, N., Liu, S.-Y., Shang, H., Ho, P.T.P., Huang, H.-C., Kuan, Y.-J., McCaughrean, M.J., & Shang, Q. "SiO J=5-4 in the HH211 Protostellar Jet Imaged with the SMA", *ApJ* (2006) 636, L141.
- Shang, H., Li, Z.-Y., & Hirano, N. "Jets and Bipolar Outflows from Young Stars: Theory and Observational Tests", *Protostars and Planets V*, 2007, 261.
- Lee, C.-F., Ho, P.T.P., Palau, A., Hirano, N., Bourke, T.L., Shang, H., & Zhang, Q. "Submillimeter Arcsecond-Resolution Mapping of the Highly Collimated Protostellar Jet HH 211", *ApJ* (2007) 670, 1188.
- Yeh, S.C.-C., Hirano, N., Bourke, T.L., Ho, P.T.P., Lee, C.-F., Takakuwa, S., & Ohashi, N. "The CO Molecular Outflows of IRAS 16293-2422 Probed by the Submillimeter Array", *ApJ* (2008) 675, 454.

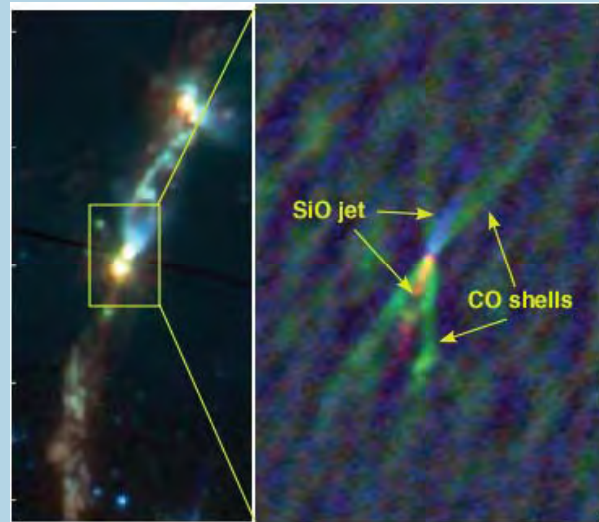


Figure -- (Left) Mid infrared image (observed with the Spitzer satellite) of the bipolar outflow driven by the protostar named L1448C. (Right) Close-up view of the central region of the outflow. CO outflow shells and SiO jet observed with the Submillimeter Array (SMA).

Research Interests

"How stars like our sun are formed?" -- this is one of the most fundamental problems in astronomy. Since stars are formed deeply inside of the interstellar molecular clouds, we need to look into the dusty cocoons that are obscuring the light from newly-born stars. Radio eyes such as "Submillimeter Array" on top of Mauna Kea help us to study what is going on inside of the cocoons. Using the radio eyes, I am studying the structure and physical condition in the close vicinity of the newly-born stars. I am especially interested in the energetic outflow phenomena that are frequently associated with the potostars in the earliest evolutionally stage.

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Education and Positions

- D. Sci., M.S., and B.S., University of Tokyo
- Fellow/Scholar at National Astronomical Observatory of Japan, California Institute of Technology, and Harvard-Smithsonian Center for Astrophysics
- Associate Research Fellow, ASIAA, 2008-present

Selected Publications

- Sakamoto, K., Scoville, N. Z., Yun, M. S., Crosas, M., Genzel, R., & Tacconi, L. J. "Counterrotating Nuclear Disks in Arp 220", *ApJ* (1999) 514, 86.
- Sakamoto, K., Okumura, S. K., Ishizuki, S., & Scoville, N. Z. "Bar-driven Transport of Molecular Gas to Galactic Centers and Its Consequences", *ApJ* (1999) 525, 691.
- Sakamoto, K., Ho, P. T. P., & Peck, A. B. "Imaging Molecular Gas in the Luminous Merger NGC 3256: Detection of High-Velocity Gas and Twin Gas Peaks in the Double Nucleus", *ApJ* (2006) 644, 862.
- Sakamoto, K., Ho, P. T. P., Mao, R. -Q., Matsushita, S., & Peck, A. B. "Detection of CO Hot Spots Associated with Young Clusters in the Southern Starburst Galaxy NGC 1365", *ApJ* (2007) 654, 782.
- Sakamoto, K. "Gas Dynamics and Structure of Galaxies : ALMA Targets and Capabilities", *ApSS* (2008) 313, 245.
- Sakamoto, K., et al. "Submillimeter Array Imaging of CO(3-2) Line and 860 μ m Continuum of Arp 220 : Tracing the Spatial Distribution of Luminosity", *ApJ* (2008) 684, 957.



Figure -- Submillimeter Array (SMA) at the 4100m summit of Mauna Kea, Hawaii. The radio telescope combines eight 6-meter diameter antennas to carry out observations at submillimeter wavelengths at the highest spatial resolution in the world.

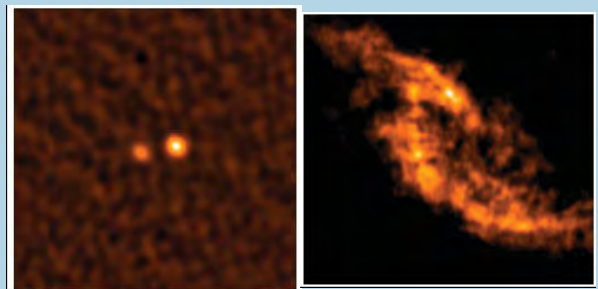


Figure -- SMA observations of gas and dust in the central few kilo-parsecs of two infrared-luminous galaxies, Arp 220 and NGC 1365.

Research Interests

My recent research is in the area of millimeter-submillimeter observations of such galaxies as mergers, barred spirals, and starburst galaxies for the purpose of understanding the structure, dynamics, and evolution of galaxies. The interstellar medium visible at millimeter-submillimeter wavelengths is the raw material for star formation, a tracer of galactic dynamics, and a driver of galaxy evolution through its motion within galaxies. Millimeter-submillimeter interferometry techniques are also in my research interests. My current projects include a Submillimeter Array (SMA) survey of southern starburst galaxies and scientific preparation for the Atacama Large Millimeter-submillimeter Array (ALMA).

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Education and Positions

- B.S., Physics, National Taiwan University, 1991
- M.A., Biophysics, UC Berkeley, 1994
- Ph.D., Astronomy, UC Berkeley, 1998
- Postdoctoral Researcher, UC Berkeley, 1998-1999
- Postdoctoral Fellow, Harvard-Smithsonian Center for Astrophysics, 1999-2000
- Visiting Scientist, Harvard-Smithsonian Center for Astrophysics, 2000-2003
- Assistant Research Fellow, ASIAA, 2000-2007
- TIARA Project Manager, ASIAA, 2005-present
- Associate Research Fellow, ASIAA, 2007-present

Honors

- Berkeley-Illinois-Maryland Association (BIMA) scholarship, ASIAA, 1994-1998

Selected Publications

- Shu, F. H., Shang, H., & Lee, T. "Toward an Astrophysical Theory of Chondrites", *Science* (1996) 271, 1545.
- Shu, F. H., Shang, H., Glassgold, A. E., & Lee, T. "X-Rays and Fluctuating X-Winds from Protostars", *Science* (1997) 277, 1475.
- Shang, H., Shu, F. H., & Glassgold, A. E. "Synthetic Images and Long-Slit Spectra of Protostellar Jets", *ApJ* (1998) 493, L91.
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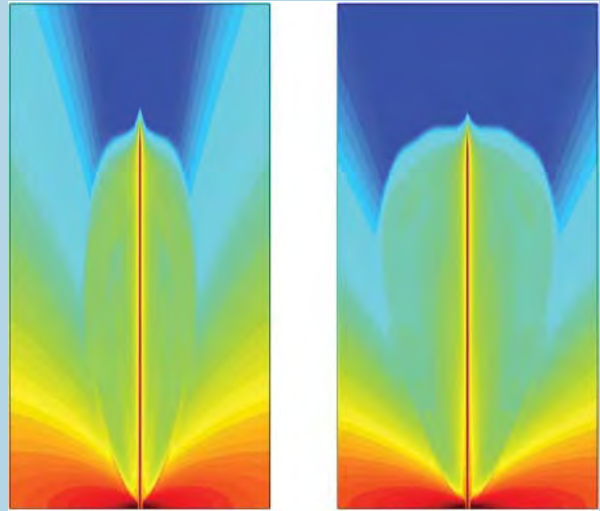


Figure -- Simulations of a X-wind model that produce both the jet and outflow phenomena in the star-forming regions.

Research Interests

My research interests are broad, from theoretical Astrophysics and Magnetohydrodynamics, to chemistry, emission modeling and synthetic observations of the jet and outflow phenomena, cores, and disks, in star and planet formation. I have worked closely on the connection of the early star formation processes to the formation of planetary materials, meteorites, and the origins of Solar system. These are ultimately linked to the Astrobiology of the Universe and the Origins of Life.

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Education and Positions

- B.S., Physics, National Taiwan University, 1994
- Ph.D., Electronic Engineering, National Chiao Tung University, 1999
- Postdoctoral Fellow, Institute of Atomic and Molecular, Academia Sinica 1999-2000
- Postdoctoral Fellow, ASIAA, 2000-2000
- Assistant Research Fellow, ASIAA, 2001-2007
- Associate Research Fellow, ASIAA, 2007-present

Honors

- Phi Tau Phi Scholastic Honor Society of the Republic of China, 1999

Selected Publications

- Wang, S.Y., & Lee, C. P. "Non-uniform Quantum Well Infrared Photodetectors", J. Appl. Phys. (2000) 87, 522.
- Wang, S. Y. Lin, S. D., Wu, H. W., & Lee, C. P. "Low Dark Current Quantum Dot Infrared Photodetectors with AlGaAs Current Blocking Layer" Appl. Phys. Lett. (2001) 78, 1023.
- Wang, S. Y., Chen, S. C., Lin, S. D., Lin, C. J., & Lee, C. P. "InAs/GaAs quantum dot infrared photodetectors with different growth temperatures" Infrared Phys. Techn. (2003) 44, 527.
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Figure -- WIRCam in the prime focus cage of CFHT.

Research Interests

My research interests are mainly in the optical and infrared astronomical instrumentation. I have been working on the wide field infrared camera (WIRCam) for CFHT and now working on the Hyper SuprimeCam for the Subaru telescope. I am also interested in the development of the quantum structure infrared detectors, especially the quantum dot infrared detectors. Currently, I am the project manager of the Taiwan-America-Occultation Survey (TAOS) project and also working on the next generation development of TAOS. Meanwhile, I collaborate with local company and research institute for the infrared technology and the infrared focal plane array development.

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Education and Positions

- B.S., Physics, California Institute of Technology, 1997
- Ph. D., Physics, University of California, Berkeley, 2002
- Postdoctoral Research Fellow, National Tsing-Hua University, Taiwan, 2002-2003
- Distinguished Postdoctoral Fellow, ASIAA, 2003-2004
- Assistant Professor, Department of Physics, National Tsing-Hua University, 2004-present
- Assistant Research Fellow, ASIAA, 2005-present

Selected Publications

- Cai, M. J., & Shu, F. H. "Self-Similar Collapse of Singular Isothermal Spheres and Black Hole Formation", ApJ (2005) 618, 438.
- Shu, F. H., Galli, D., Lizano, S., & Cai, M. J. "Gravitational Collapse of Magnetized Clouds II. The Role of Ohmic Dissipation", ApJ (2006) 647, 382.
- Huang, L., Cai, M. J., Shen, Z.-Q., & Yuan, F. "Black hole shadow image and visibility analysis of Sagittarius A*", MNRAS (2007) 379, 833.
- Cai, M. J., Shang, H., Lin, H.-H., Shu, F. H. "X-winds in Action", ApJ (2008) 672, 489.
- Huang, L., Liu, S., Shen, Z.-Q., Cai, M. J., Li, H., & Fryer, C. "Linearly and Circularly Polarized Emission in Sagittarius A*", ApJ (2008) 676, 119.
- Shu, F. H., Lizano, S., Galli, D., Cai, M. J., Mohanty, S. "The Challenge of Sub-Keplerian Rotation for Disk Winds", ApJ (2008) 682, L121.

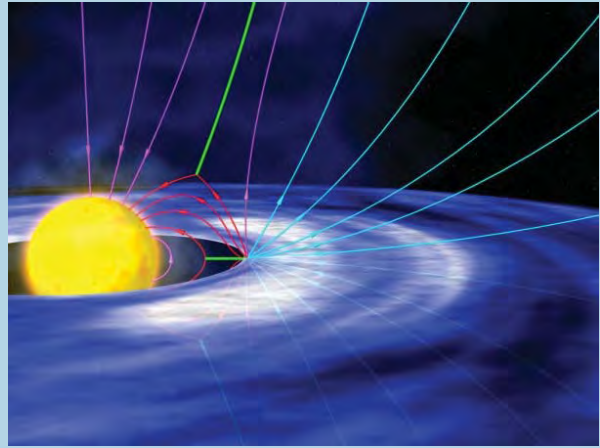


Figure -- A schematic drawing of the X-wind model in the close proximity of the protostar.

Research Interests

My research interests include star and black hole formation, and related phenomena. My recent work on star formation focuses on the generation of jets from young stellar objects. If magnetic diffusivity is relatively low compared to viscosity, the interaction between the stellar magnetosphere and an accretion disk would naturally trap a certain amount of flux near the corotation radius and truncate the disk there. The resulting magnetic geometry would give rise to funnel flows onto the star and bipolar outflows which we call the "X-winds". We have also extended several classical scenarios of star formation to the realm of relativistic gravity, hoping to understand how massive black holes are formed.

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Education and Positions

- M.S., Astronomy, Queen Mary, University of London, UK 1995
- Ph.D., Astronomy, Queen Mary, University of London, UK 2001
- Postdoctoral Research Fellow, Theoretical Astrophysics Center, Denmark 2001-2004
- Research Fellow, Niels Bohr Institute, Denmark 2004-2007
- Assistant Research Fellow, ASIAA, 2007-present

Honors

- Planck Scientist, European Space Agency 2004

Selected Publications

- Chiang, L.-Y., Naselsky, P.D., Verkhodanov, O.V., & Way, M.J. "Non-Gaussianity of the Derived Maps from the First-Year WMAP Data", *ApJ* (2003) 590, L65.
- Chiang, L.-Y., Naselsky, P.D., & Coles, P. "The Robustness of Phase Mapping as a Non-Gaussianity Test", *ApJ* (2004) 602, L1.
- Chiang, L.-Y. "Spawning and Merging of Fourier Modes and Phase Coupling in Cosmological Density Bispectrum", *MNRAS* (2004) 350, 1310.
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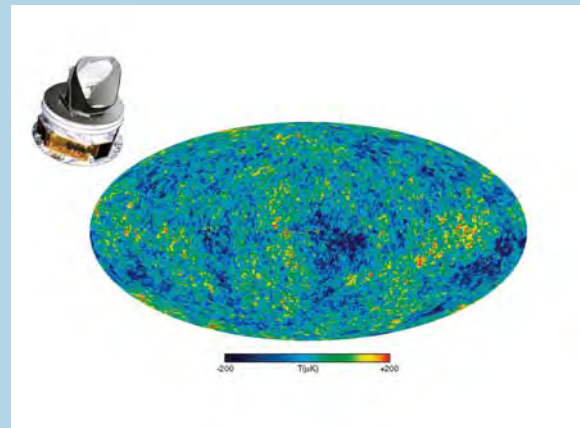


Figure -- ESA Planck Surveyor will be observing the tiny fluctuations in the CMB background radiation.

Research Interests

My main research interest is in cosmology, particularly the cosmic microwave background (CMB) radiation. The CMB is relic radiation emitted 400,000 years after the Big Bang that bears evidence from earlier, hotter, and denser period of the Universe. The tiny variations of one part in 100,000 in temperature shed light on properties of our Universe such as its origin, geometry and contents. Apart from theoretical studies of the CMB, currently I am also involved in ESA Planck Surveyor, scheduled to launch in early 2009. Planck Surveyor is designed to measure the CMB temperature fluctuations with unprecedented resolution (5 arcmin), sensitivity (within 2 μ K) and frequency coverage (30-857 GHz) and it will also measure polarization. Detailed study of these measurements will allow us to determine not only some of the most fundamental cosmological parameters, but also the initial conditions for structure evolution, the origin of primordial fluctuations, and the nature and amount of dark matter.

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Education and Positions

- B.S., Physics, Faculty of Physics, Hanoi National University, Vietnam, 1994
- DEA, Astrophysics and Applications in Space Sciences, University of Paris VI, 1996
- Ph.D., Astrophysics, University Paris VI, 1998
- Institute of Physics, Vietnamese Academy of Science and Technology, 1998-1999
- Postdoctoral Fellow, ASIAA, 1999-2003
- Assistant Research Fellow, ASIAA, 2003-present

Selected Publications

- Muller, S., Dinh-V-Trung, Lim, J., et al. "The molecular envelope around the red supergiant VY CMa", *ApJ* (2007) 656, 1109.
- Lim, J., Ao, Y.P., & Dinh-V-Trung "Radial inflowing molecular gas in NGC 1275 deposited by an X-ray cooling flow in the Persus Cluster", *ApJ* (2008) 672, 252.
- He, J.H., Dinh-V-Trung, Kwok, S., et al. "A spectral line survey in the 2 and 1.3 mm windows toward the carbon rich envelope of IRC+10216", *ApJS* (2008) 177, 275.
- Dinh-V-Trung, Bujarrabal, V., Castro-Carrizo, A., Lim, J., & Kwok, S. "Massive expanding torus and bipolar outflow in planetary nebula NGC 6302", *ApJ* (2008) 673, 934.
- Muller, S., Dinh-V-Trung, He, J.H., & Lim, J. "Distribution and kinematics of HCN 3-2 emission down to the inner most region of the envelope around O-rich star W Hydrae", *ApJ* (2008) 684, L33.
- Dinh-V-Trung, & Lim, J. "Molecular Shells in IRC+10216: Evidence for non-Isotropic and Episodic Mass Loss Enhancement", *ApJ* (2008) 678, 303.
- Dinh-V-Trung "The Peculiar Molecular Envelope around the Post-AGB Star IRAS 08544-4431", *ApJ* (2009) 691, 126.

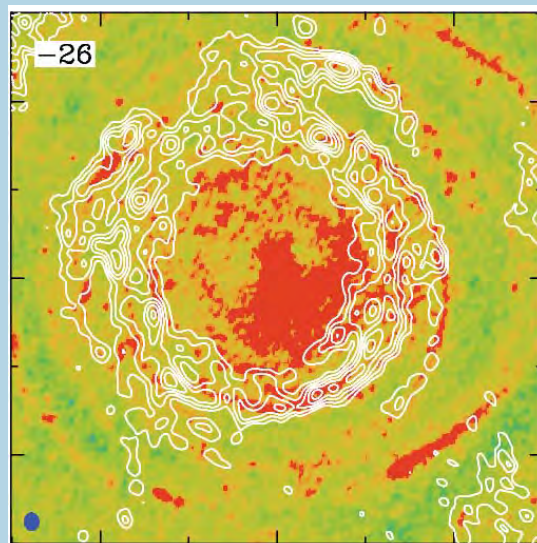


Figure -- The individual incomplete shells represent distinct episodes of mass loss in the envelope of carbon star CW Leo traced by the emission of cyanoacetylene molecule HC₃N. For comparison, the dust scattered galactic background light image in color also shows the incomplete shells.

Research Interests

My research focuses on the physics and chemistry of the circumstellar envelopes around evolved stars as well as the starburst activities in the central region of nearby galaxies and luminous infrared galaxies. My research make use of the emission lines emitted by different molecules which are present in these environments. The analysis of these lines allow a very detailed reconstruction of the conditions in these environments. The circumstellar envelope created by the heavy mass loss during the late phase of the stellar evolution can be studied by the molecular emission lines to determine the mass loss history of the star and the amount of material that the star returns to the interstellar medium through mass loss. That information is vital for our complete understanding of the stellar evolution and also for the recycling process of the interstellar material.

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Education and Positions

- Ph.D., Physics, University of Texas at Austin, 2000
- Postdoctoral Fellow, ASIAA, 2000-2005
- Assistant Research Fellow, ASIAA, 2005-present

Selected Publications

- Gu, Pin-Gao, Lin, D. N. C., & Bodenheimer, P. H. "The Effect of Tidal Inflation Instability on the Mass and Dynamical Evolution of Extrasolar Planets with Ultrashort Periods", *ApJ* (2003) 588, 509.
- Gu, Pin-Gao, Lin, D. N. C., & Vishniac, E. T. "Drag Instability", *ApSS* (2004) 292, 261.
- Gu, P.-G., Bodenheimer, P. H., & Lin, D. N. C. "The Internal Structural Adjustment Due to Tidal Heating of Short-Period Inflated Giant Planets", *ApJ* (2004) 608, 1076.
- Shkolnik, E., Walker, G. A.H., Bohlender, D. A., Gu, P.-G., & Kurster, M. "Hot Jupiters and Hot Spots: The Short- and Long-Term Chromospheric Activity on Stars with Giant Planets", *ApJ* (2005) 622, 1075.
- Gu, P.-G., Shkolnik, E., Li, S.-L., & Liu, X.-W. "Interactions between hot Jupiters and their host stars", *Astronomische Nachrichten* (2005) 326, 909.
- Gu, P.-G., & Ogilvie, G. I. "Diurnal Thermal Tides in a Non-synchronized Hot Jupiter", *MNRAS* (2009) in press.

Research Interests

My current research interests focus primarily on modeling various interactions between hot Jupiters and their parent stars. Hot Jupiters are the Jupiter-mass planets located within ~ 0.1 AU from their parent stars. As a result, these exotic giant planets are intensely illuminated, and magnetically as well as tidally interact with their parent stars. I have been studying thermal tides that drive atmospheric circulation on hot Jupiters. I am also modeling stellar atmospheres to investigate the possibility of planet-induced emissions. In addition, I have been engaging in the calculation that the star-planet interactions can destruct a young hot Jupiter in a proto-planetary disk, therefore explaining the mass distribution of hot Jupiters observed today.

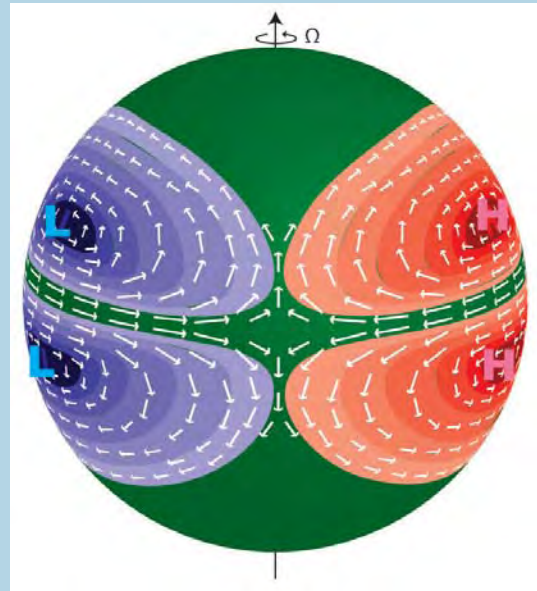


Figure -- Schematic representation of baroclinic Rossby waves at some altitude in the atmosphere of a hot Jupiter driven by the diurnal Fourier harmonic of the stellar irradiation. The equi-pressure contours are marked by colors: H denotes "high pressure" (red) and L denotes "low pressure" (blue). The arrows show the flow directions. In this illustration of wave patterns, the periods of the stellar irradiation roughly corresponds to 50 - 100 days, which are much longer than the spin period of the planet (\sim a few days). As a result, the Rossby waves are confined near the equatorial region. Being excited at the top of the atmosphere, these waves propagate westwards and downwards and eventually dissipate due to radiative loss at deeper layers. The dissipation generates a vertical shear in the planetary atmosphere.

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Education and Positions

- B.S., Electrical Engineering, National Taiwan University, 1991
- MS., Electrical Engineering, National Taiwan University, 1993
- Ph.D., Communication Engineering, National Taiwan University, 2005
- Research Assistant, ASIAA, 1995-2005
- Assistant Research Fellow, ASIAA, 2005-present

Honors

- 2001 Chip Implementation Center (CIC) Multi-Project Chip Service award for chip design entitled "W-Band Subharmonically-Pumped HEMT diode Mixer"
- 2001 CIC Multi-Project Chip Service award for chip design entitled "2-12 GHz Wideband Feedback Amplifier"

Selected Publications

- Hwang, Y.-J., Lien, C.-H., Wang, H., Gough, R. G., Sinclair, M. W., & Chu, T.-H. "A 78-114 GHz monolithic subharmonically pumped GaAs-based HEMT diode mixer", IEEE Microwave Wireless Comp. Lett., (2002) 12, 6, 209.
- Hwang, Y.-J., Wang, H., & Chu, T.-H. "A W-band Subharmonically Pumped Monolithic GaAs-Based HEMT Gate Mixer", IEEE Microwave Wireless Comp. Lett., (2004) 14, 7, 313.
- Hwang, Y.-J., Chen, M.-T., Jiang, H., Chu, T.-H., Hsieh, S.-N., Han, C. C., Patt, F., & Wilson, W. "W-band dual-polarization receiver for Array of Microwave Background Anisotropy (AMiBA)", SPIE (2004) 5498.
- Hwang, Y.-J., Rao, R., Christensen, R., Chen, M.-T., & Chu, T.-H. "Submillimeter-wave phasor beam-pattern measurement based on two-stage heterodyne mixing with unitary harmonic difference", IEEE Trans. Microwave Theory Tech., (2007) 55, 6, 1200.

- Lu, J.-Y., Kuo, C.-C., Chiu, C.-M., Chen, H.-W., Chen, Hwang, Y.-J., Pan, C.-L., & Sun, C.-K. "THz interferometric imaging using subwavelength plastic fiber based THz endoscopes", Optics Express, (2008) 16, 4, 2494.
- Lu, J.-Y., Chiu, C.-M., Kuo, C.-C., Kuo, Lai, C.-H. chang, H.-C., Hwang, Y.-J., Pan, C.-L. Pan, & Sun, C.-K. "Terahertz scanning imaging with a subwavelength plastic fiber", Applied Physics Lett., (2008) 92, 084102.
- Chen, M.-T., Li, C.-T., Hwang, Y.-J., Jiang, H. Jiang, et al. "AMiBA: Broadband Heterodyne CMB Interferometry", (2009) ApJ, 694.

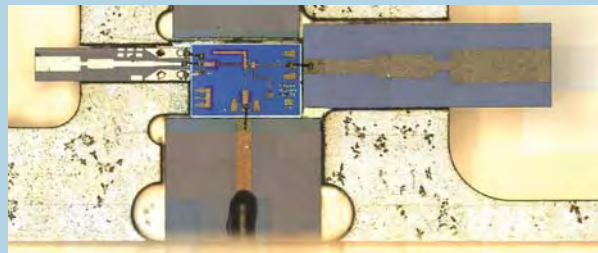


Figure -- An example of the MMIC modules, designed for W-band SHP mixer in the AMiBA receiver.

Research Interests

My research interests are mainly in microwave, millimeter-wave and submillimeter-wave circuit, components and systems for astronomical instrumentations. The technical areas involved are (1) the microwave monolithic integrated circuit (MMIC) design, cryogenic testing and the packaged module, (2) quasi-optics measurement, (3) frequency synthesis, (4) receiver system design, integration and performance measurement, and (5) Submillimeter-wave and THz applications.

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Education and Positions

- M.S., Astronomy, University of Maryland, 1997
- Ph.D., Astronomy, University of Maryland, 2001
- Postdoctoral Research Associateship, Jet Propulsion Lab/National Research Council, 2001-2003
- Postdoctoral Fellow, Harvard-Smithsonian Center for Astrophysics – Submillimeter Array Project, 2003-2006
- Assistant Research Fellow, ASIAA, 2006-present
- Adjunct Assistant Professor, National Taiwan Normal University, 2008-present

Honors

- Phi Tau Phi Scholastic Honor Society of the Republic of China, 1994
- Berkeley-Illinois-Maryland Association (BIMA) scholarship, Institute of Astronomy and Astrophysics, Academia Sinica, Taiwan, 1995-1997
- Phi Kappa Phi Honor Society, University of Maryland, 2001

Selected Publications

- Lee, C.-F., Mundy, L.G., Reipurth, B., Ostriker, E.C., & Stone, J.M. "CO Outflows from Young Stars: Confronting the Jet and Wind Models", *ApJ* (2000) 542, 925.
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- Lee, C.-F., & Ho, P.T.P. "Outflow Interaction in the Late Stages of Star Formation", *ApJ* (2005) 624, 841.

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- Arce, H.G., Shepherd, D., Gueth, F., Lee, C.-F., Bachiller, R., Rosen, A., & Beuther, H., "Molecular outflows in low- and high-mass star forming regions", *Protostars and Planets V* (2007) 245.
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- Lee, C.-F., Ho, P.T.P., Bourke, T.L., Hirano, N., Shang, H., & Zhang, Q. "SiO shocks of the protostellar jet HH 212: A search for jet rotation", *ApJ* (2008) 685, 1032.

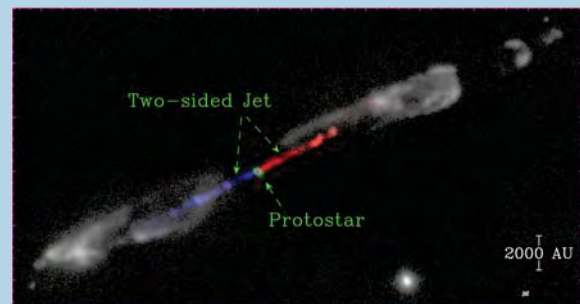


Figure -- Highly supersonic jet and outflow powered by an extremely young protostar in Perseus.

Research Interests

I am interested mainly in the formation and evolution of sunlike stars. With radio observations and magneto-hydrodynamical simulations, I aim to achieve a better understanding of their physical processes. In star formation, I study the gravitational collapse of circumstellar material around protostars (baby stars), and jet and outflow interactions with the surrounding material. In stellar evolution, I study the formation mechanism of proto-planetary and planetary nebulae in order to determine the mass-loss mechanism as sunlike stars die. Hydrogen chemistry and radiative cooling have been added into our numerical codes in order to simulate jet and outflow interactions more realistically.

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Education and Positions

- Ph.D., Astronomy, University of Illinois at Urbana-Champaign, 2000
- Postdoctoral Research Fellowship, California Institute of Technology, 1999-2002
- Postdoctoral Fellow, ASIAA, 2002-2004
- Assistant Research Fellow, ASIAA, 2004-present

Honors

- Academia Sinica Distinguished Postdoctoral Research Fellowship, 2002-2004

Selected Publications

- Liu, S.-Y., Mehringer, D.M., & Snyder, L.E. "Observations of Formic Acid in Hot Molecular Cores", *ApJ* (2001) 552, 654.
- Liu, S.-Y., Girart, J.M., Remijan, A., & Snyder, L.E. "Formic Acid in Orion KL from 1 Millimeter Observations with the Berkeley-Illinois-Maryland Association Array", *ApJ* (2002) 576, 225.
- Su, Y.-N., Liu, S.-Y., Lim, J., Ohashi, N., Beuther, H., Zhang, Q., Sollins, P., Hunter, T., Sridharan, T.K., Zhao, J.-H., & Ho, P.T.P. "Search for Calibrators for the Submillimeter Array. I. High-Mass Star-forming Regions", *ApJ* (2004) 616, L39.
- Hirano, N., Liu, S.-Y., Shang, H., Ho, P.T.P., Huang, H.-C., Kuan, Y.-J., McCaughrean, M.J., & Zhang, Q. "SiO J = 5-4 in the HH 211 Protostellar Jet Imaged with the Submillimeter Array", *ApJ* (2006), 636, L141.
- Su, Y.-N., Liu, S.-Y., Chen, H.-R., Zhang, Q., & Cesaroni, R. "The Outflow from the Luminous Young Stellar Object IRAS 20126+4104: from 4000 AU to 0.4 pc", *ApJ* (2007) 671, 571.

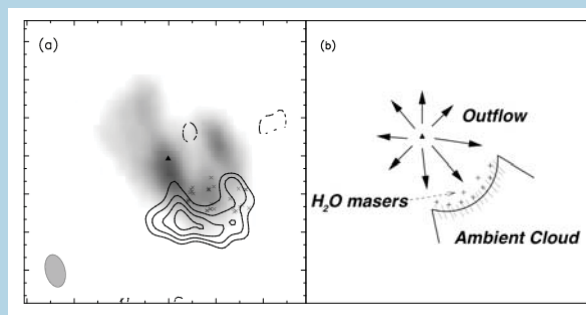


Figure -- The left and right panels show the observed and conceptual cloud configuration respectively at the heart of Orion KL. The molecular outflow originating from source I (filled triangle) impacts the quiescent ambient cloud in compact ridge, results in shocked gas which exhibits water masers (x's) and SO emission (in grey scale), and induces dust grain mantle evaporation that leads to HCOOH emission (in contours).

Research Interests

How stars like our Sun are formed? How life comes about? These are the questions continuously being asked by every one of us but not fully solved yet. My research is related to the understanding of the formation of stars, namely the condition and early evolution during their formation, particularly for stars much more massive than our sun. I am also interested in the chemical environments which massive stars are formed from and which they consequently shape. The large amount of dense and hot molecular gas in massive star forming regions provides us an access to probe the interstellar chemistry in warm conditions, especially for those minor but interesting organic trace species. In order to facilitate and achieve these research goals, I am involved in developing software tools for millimeter and submillimeter interferometric observations as well as for molecular line radiative transfer.

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Education and Positions

- M.S., Astronomy, Tohoku University, 1997
- Ph.D., Astronomy, Graduate University for Advanced Studies (Japan), 2000
- Postdoctoral Fellow, Harvard-Smithsonian Center for Astrophysics – Submillimeter Array (SMA) Project, 2000-2003
- Postdoctoral Fellow, ASIAA– SMA Project, 2003
- Academia Sinica Fellow, ASIAA – SMA Project, 2003-2005
- Assistant Research Fellow, ASIAA, 2005-present

Honors

- Japan Society for the Promotion of Science (JSPS) Research Fellow, 1997-2000
- JSPS Postdoctoral Fellow for Research Abroad, 2000-2002

Selected Publications

- Matsushita, S., Matsuo, H., Pardo, J.R., & Radford, S.J.E. “FTS measurements of submillimeter-wave atmospheric opacity at Pampa la Bola II : Supra-terahertz windows and model fitting”, PASJ (1999) 51, 603.
- Matsushita, S., Kawabe, R., Matsumoto, H., et al. “Formation of a massive black hole at the center of the superbubble in M82”, ApJ (2000) 545, L107.
- Matsushita, S., & Matsuo, H. “FTS measurements of submillimeter-wave atmospheric opacity at Pampa la Bola: III. Water vapor, liquid water, and 183 GHz water vapor line opacities”, PASJ (2003) 55, 325.
- Matsushita, S., Sakamoto, K., Kuo, C.-Y., et al. “SMA CO(J=3-2) interferometric observations of the central region of M51”, ApJ (2004) 616, L55.

- Matsushita, S., Kawabe, R., Kohno, K., Matsumoto, H., Tsuru, T.G., & Vila-Vilaro, B. “Starburst at the expanding molecular superbubble in M82: Self-induced starburst at the inner edge of the superbubble”, ApJ (2005) 618, 712
- Matsushita, S., Muller, S., & Lim, J. “Jet-disturbed molecular gas near the Seyfert 2 nucleus in M51”, Astron. & Astrophys. (2007) 468, L49.
- Matsushita, S., Iono, D., Petitpas, G.R., et al. “SMA CO(J=6-5) and 435 micron interferometric imaging of the nuclear region of Arp 220”, ApJ (2009) 693, 56.

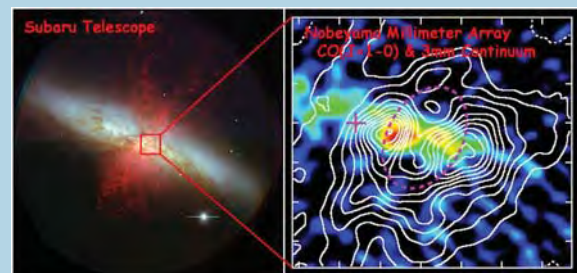


Figure -- (Right) Optical image of the starburst galaxy M82. (Left) Zooming into the center, we can see clearly the starburst (in color scale) at the inner edges of a superbubble (CO contours).

Research Interests

My research interests are mainly molecular gas in and around starburst galaxies and active galactic nuclei (AGNs). For the research of starbursts, I observe molecular bubbles and outflows from starburst regions, and study the termination and triggered starburst mechanisms to understand the evolution of starburst phenomena. For the AGN research, I observe molecular gas around the AGNs, and study the relation between the molecular gas and the AGN activities. I also involved in the site testing for the Atacama Large Millimeter/submillimeter Array (ALMA) project, and our atmospheric transmission measurement results using the Fourier Transform Spectrometer (FTS) played an important role for deciding the ALMA construction site.

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Education and Positions

- M.S., Astronomy, University of Tokyo 1995
- Ph.D., Astronomy, University of Tokyo, 1998
- Postdoctoral Research Fellow, University of Tokyo, 1998
- Postdoctoral Research Assistant, University of Hertfordshire, 1998-2004
- Support Astronomer, Subaru Telescope, 2004-2007
- Assistant Research Fellow, ASIAA, 2007-present

Selected Publications

- Takami, M., Bailey, J., & Chrysostomou, A. "A spectro-astrometric study of southern pre-main sequence stars --- Binaries, outflows and disc structure down to AU scales", A&A (2003) 397, 675.
- Takami, M., Chrysostomou, A., Ray, T.P., Davis, C., Dent, W.R.F., Bailey, J., Tamura, M., & Terada, H. "Detection of a warm molecular wind in DG Tauri", A&A (2004) 416, 213.
- Takami, M., Takakuwa, S., Momose, M., Hayashi, M., Davis, C.J., Pyo, T.-S., Nishikawa, T., & Kohno, K. "Kinematics of SiO J=8-7 Emission towards the HH 212 Jet", PASJ (2006) 58, 563.
- Takami, M., Chrysostomou, A., Ray, T.P., Davis, C.J., Dent, W.R.F., Bailey, J., Tamura, M., Terada, H., & Pyo, T.-S. "Subaru IR Echelle Spectroscopy of Herbig-Haro Driving Sources I. H₂ and [Fe II] Emission", ApJ (2006) 641, 357.
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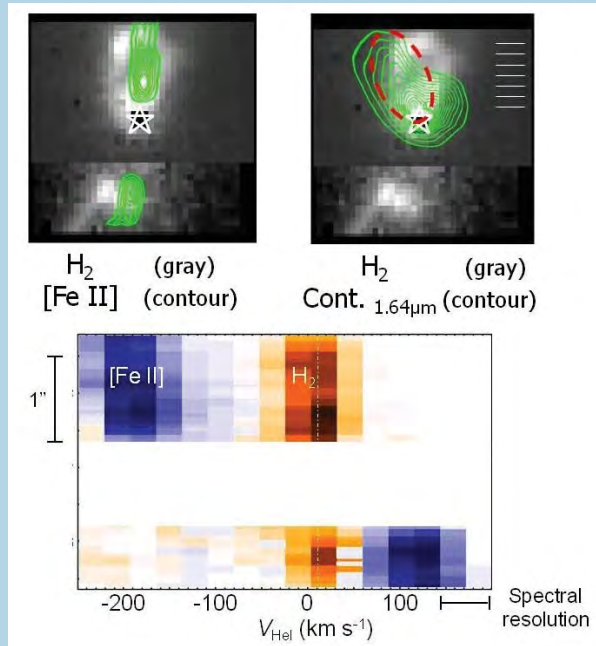


Figure -- (upper) Jet and outflow associated with the young stellar object HL Tau observed in [Fe II] and H₂ emission, and also scattered continuum. The images with unprecedented angular resolution and sensitivity have revealed structures of the neutral collimated jet, warm outflow and outflow cavity, respectively. (lower) Kinematics of [Fe II] and H₂ emission in the same outflow.

Research Interests

My present research interests are focused on star and planet formation. In the last century astronomers have determined how stars are born, but the detailed physical processes are not yet clear. Similarly, a number of exoplanets have been discovered in the last decade, but it is still challenging to understand how these planets are born in protoplanetary disks. I am tackling these issues using the technique of spectroscopy and spectro-imaging at IR and optical wavelengths. Such studies using a variety of telescopes allow the study of the active regions and phenomena, which hold keys to understanding star and planet formation. Also, I have recently started radio observations to complement the understanding.

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Education and Positions

- M.S., Astronomy, University of Tokyo, 1996
- Ph.D., Astronomy, University of Tokyo, 1999
- Postdoctoral Fellow, ASIAA, 1999-2002
- Postdoctoral Fellow, Harvard-Smithsonian Center for Astrophysics – Submillimeter Array Project, 2002-2005
- Postdoctoral Fellow, National Astronomical Observatory of Japan – ALMA Project Office, 2005-2007
- Assistant Research Fellow, ASIAA, 2007-present

Selected Publications

- Takakuwa, S., Mikami, H., & Saito, M. "H¹³CO⁺ and CH₃OH Line Observations of Pre-stellar Dense Cores in the TMC-1C Region", *ApJ* (1998) 501, 723.
- Takakuwa, S., Kawaguchi, K., Mikami, H., & Saito, M. "The Ortho-to-Para Ratio and the Chemical Properties of C₃H₂ in Dark Cloud Cores", *PASJ* (2001) 53, 251.
- Takakuwa, S., Kamazaki, T., Saito, M., & Hirano, N. "H¹³CO⁺ and CH₃OH Line Observations of Pre-stellar Dense Cores in the TMC-1C Region II. Internal Structure", *ApJ* (2003) 584, 818.
- Takakuwa, S., Ohashi, N., Ho, P. T. P., et al. "Submillimeter Array Observations of L1551 IRS5 in CS (J=7-6)", *ApJ* (2004) 616, L15.
- Takakuwa, S., Kamazaki, T., et al. "ASTE Observations of Warm Gas in Low-mass Proto-stellar Envelopes", *PASJ* (2007) 59, 1.
- Takakuwa, S., Ohashi, N., Bourke, T. L., et al. "Arcsecond-Resolution Submillimeter HCN Imaging of the Binary Protostar IRAS 16293-2422", *ApJ* (2007) 662, 431.

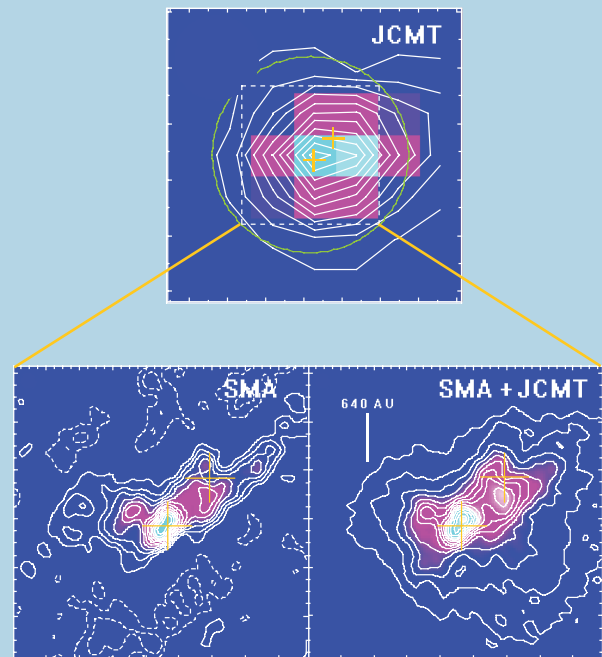


Figure -- HCN images of a star-forming region IRAS 16293-2422. Crosses mark the positions of the forming stars

Research Interests

I have been working on Radio Astronomy, studying how solar-type stars form in the clouds of molecular gas and dust in the inter-stellar space. I am observing radio emission from various molecules in the clouds. I have two strategies. One is observing chemistry in molecular clouds at different evolutionary stages because chemical evolution of molecular clouds can be linked to the physical evolution of the star formation. The other strategy is observing submillimeter molecular lines, with new submillimeter telescopes such as SMA, JCMT and ASTE. Submillimeter molecular lines trace warmer molecular gas, allowing us to study the close vicinity of the forming star.

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Education and Positions

- B.S., Physics, Tohoku University, 1996
- M.S., Astrophysics, Tohoku University, 1998
- Ph.D., Astrophysics, Tohoku University, 2001
- Postdoctoral Research Fellow, ASIAA, 2001-2005
- Research Scientist, ASIAA, 2005-2006
- Assistant Research Fellow, ASIAA, 2006-present
- Adjunct Assistant Fellow, LeCosPA, 2008-present

Selected Publications

- Umetsu, K., & Futamase, T. "Detection of Dark Matter Concentrations in the Field of Cl 1604+4304 from Weak Lensing Analysis", ApJ (2000) 539, L5.
- Broadhurst, T., Takada, M., Umetsu, K. et al. "The Surprisingly Steep Mass Profile of Abell 1689, from a Lensing Analysis of Subaru Images", ApJ (2005) 619, L143.
- Umetsu, K. et al., "Discovery of a Strongly Lensed Galaxy at $z=3.9$ behind a $z=0.83$ Galaxy Cluster", PASJ (2005) 57, 6, 877.
- Okura, Y., Umetsu, K., & Futamase, T., "A Method for Weak Lensing Analysis by the HOLICs Moment Approach", ApJ (2008) 680, 1.
- Okabe, N., & Umetsu, K., "Subaru Weak Lensing Study of Seven Merging Clusters of Galaxies", PASJ (2008) 60, 345.
- Umetsu, K., & Broadhurst, T. "Combining Lens Distortion and Depletion to Map the Mass Distribution of A1689", ApJ (2008) 684, 177.

- Umetsu, K. et al. "Mass and Hot Baryons in Massive Galaxy Clusters from Subaru Weak Lensing and AMiBA SZE Observations", ApJ (2009) in press.

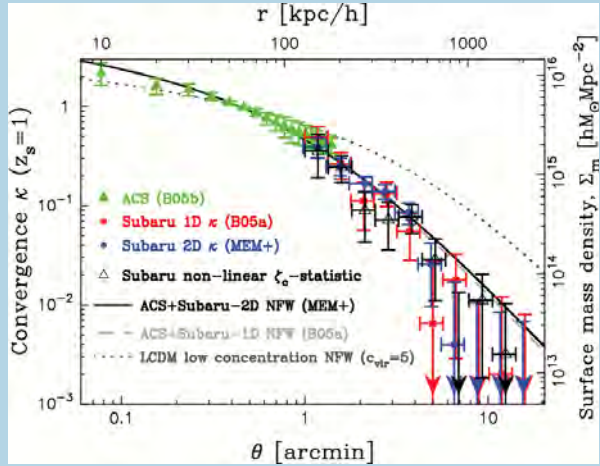


Figure -- Projected mass density profile of the massive galaxy cluster A1689 as derived from high quality strong and weak gravitational lensing data of background galaxy images. The lensing mass profile continuously steepens with radius, consistent with the Navarro-Frenk-White profile expected for equilibrium-state halos of collisionless, non-relativistic cold dark matter (Umetsu & Broadhurst 2008).

Research Interests

My present research is focused on the study of galaxy clusters, which serve as astrophysical laboratories as well as cosmological probes. I have been working on the AMiBA (Array for Microwave Background Anisotropy) project. AMiBA targets the distribution of clusters of galaxies via the Sunyaev-Zel'dovich effect (SZE) on the cosmic microwave background (CMB). It will also measure the CMB temperature anisotropies on scales which are sensitive to structure formation scenarios of the Universe. Meanwhile, I have also been working on weak and strong gravitational lensing by clusters and large-scale structure in the Universe, and involved with on-going/future lensing projects, (e.g., the Subaru Hyper Suprime-Cam project).

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Education and Positions

- B.S., Physics, National Taiwan University, 1996
- M.S., Astronomy, National Central University, 1998
- Ph.D., Astronomy, University of Hawaii, 2006
- Jansky Fellow, National Radio Astronomy Observatory, 2006-2009
- Assistant Research Fellow, ASIAA, 2009-present

Honors

- Jansky Fellow, National Radio Astronomy Observatory

Selected Publications

- Barger, A. J., Cowie, L. L., Mushotzky, R. F., Yang, Y., Wang, W.-H., Steffen, A. T., & Capak, P. "The Cosmic Evolution of Hard X-Ray Selected Active Nuclei", *AJ* (2004) 129, 578.
- Wang, W.-H., Cowie, L. L., & Barger, A. J. "An 850 Micron SCUBA Survey of the Hubble Deep Field-North GOODS Region", *ApJ* (2004) 613, 655.
- Wang, W.-H., Cowie, L. L., & Barger, A. J. "A Near-Infrared Analysis of the Submillimeter Background and the Cosmic Star-Formation History", *ApJ* (2006) 647, 74.
- Barger, A. J., Cowie, L. L., & Wang, W.-H. "The MicroJansky Radio Galaxy Population", *ApJ* (2007) 654, 764.
- Wang, W.-H., Cowie, L. L., van Sadlers, J., Barger, A. J., & Williams, J. P. "GOODS 850-5 -- A $z > 4$ Galaxy Discovered in the Submillimeter?" *ApJ* (2007) 670, L89.

- Barger, A. J., Cowie, L. L., & Wang, W.-H. "A Highly Complete Spectroscopic Survey of the GOODS-N Field", *ApJ* (2008) 689, 687.
- Wang, W.-H., Barger, A. J., & Cowie, L. L. "Ultradeep Near-Infrared Observations of GOODS 850-5", *ApJ* (2009) 690, 319.

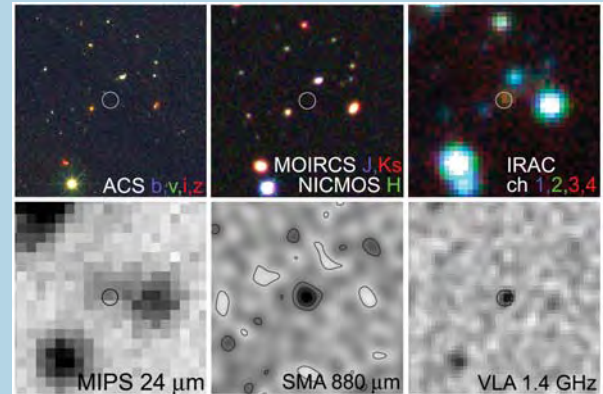


Figure -- A distant submillimeter galaxy recently discovered by our group using observations with the Hubble Space Telescope, Subaru Telescope, Spitzer Space Telescope, and the SMA. This galaxy is extremely luminous in the far-infrared, but it entirely disappears in deep space-telescope images in the optical and near-infrared.

Research Interests

I am interested in multiwavelength observational studies of galaxy formation and evolution at high redshift. Most of my recent effort has been focusing on understanding the submillimeter galaxy population, which emits strongly in the far-infrared and submillimeter wavelengths but is hidden by dust in the optical. Such galaxies are nearly entirely missed by optical observations but they contribute to the cosmic star formation history as much as (if not exceeding) galaxies found by optical telescopes. They will be the major targets of next-generation instruments such as ALMA, James Webb Space Telescope, and the Expanded Very Large Array. I am also interested in finding the most distant galaxies and supermassive black holes in the optical and near-infrared, dense intergalactic medium that absorbs ultraviolet light from distant objects, and developing software for wide-field optical and near-infrared imaging observations.

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Education and Positions

- B.S., Physics, 1989, National Tsing Hua University, Taiwan ROC.
- Package Engineer, Texas Instrument Corp., 1989-1991
- Engineer Section Manager, Taiwan Tech Corp., 1991-1994
- Senior Research Specialist, Highlight Opto-electronic Corp., 1994-1996
- Engineer, Optoelectronics & Systems Laboratory (ITRI), 1996-2002
- Production Manager, Intelligent Epitaxy Technology, 2002-2003
- Specialist, ASIAA, 2003-2007
- Associate Research Engineer, ASIAA, 2007-present

Selected Publications

- Chen, T.-J., et al. "The Fabrication Method of Ridge-type Waveguide Semiconducting Light-emitted Devices".
- Chen, T.-J., et al. "The Transparent Electrode for P-type GaN Based III-V Compound Semiconductor".
- Chen, T.-J. "Indium Tin Oxide Confined GaInP-AlGaInP Quantum-Well Ridge Waveguide Laser", Cross-straight Symposium on Opto-Electrics (88).

Research Interests

My research are mainly related to superconductivity devices. The fabrication of SIS mixers for SMART telescopes and the development of new fabricating process are my major works. I also manage the operation of the clean room at NTHU. We have three sputter systems, DUV mask aligner, and ICP-RIE system in the laboratory.

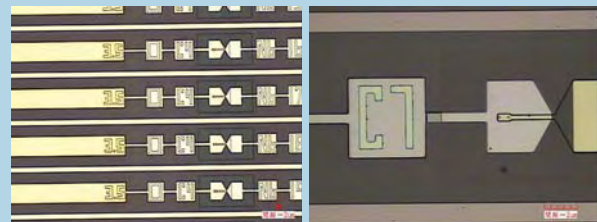
The fabricating process of SIS mixers with quantum noise limit performance for the frequency range 150GHz-600GHz has been developed. The fabrication of SIS junction with AlN barrier for THz frequency is the ongoing plan. Many kinds of processes can be done in our laboratory that could lead to the development of novel devices for Taiwan and world-wide research groups

Important results

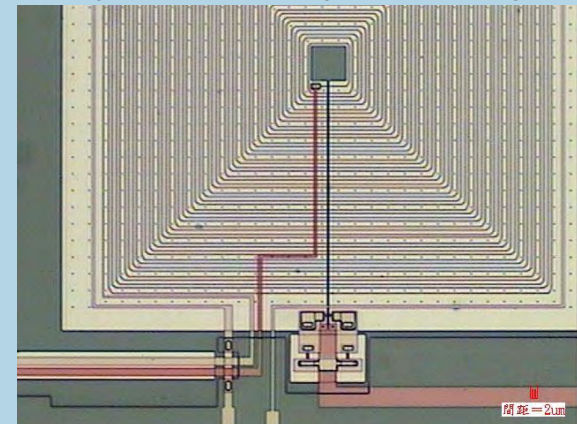
NiO/ITO film improved the light output for LED.
Nb-based superconducting device fabrication.



SIS mixer for sub-millimeter wave.



Scanning SQUID chip and magnetic flux mapping.



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Education and Positions

- M.E., University of Iowa, 1984
- ITRI, Energy Lab., 1985-1989
Control system of Energy conservation.
- Megamedia Corp, 1990-2001
DVD, ZIP, Removable harddisk, floppy
Process Automation, Control system.
DVD Mastering system.
- Specialist, ASIAA, 2001-2005.
- Associate Research Engineer, ASIAA, 2005-present

Selected Publications

- Li, C.-T., Han, C.-C., Chen, M.-T., Huang, Y.-D., Jiang, H., Hwang, Y.-J., Chang, S.-W., Chang, S.-H., Martin-Cocher, P., Chang, C.-H., Chen, C.-C., et al. "Initial Operation of the Array for Microwave Background Anisotropy (AMiBA)" SPIE (2006) 6275, 62751I.
- Raffin, P., Koch, P., Huang, Y.-D., Chang, C.-H. Chen, M.-T., Chen, K.-Y., Ho, Paul T.P., Huang, C.-W., Jiang, H., & Kesteven, M. "Progress of the Array for Microwave Background Anisotropy (AMiBA)", SPIE (2008).
- Lin, K.-Y., & The AMiBA Team "AMiBA 2007: System Performance", SPIE (2008).

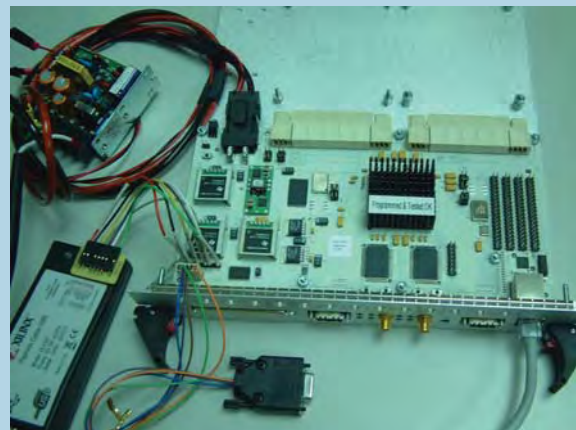
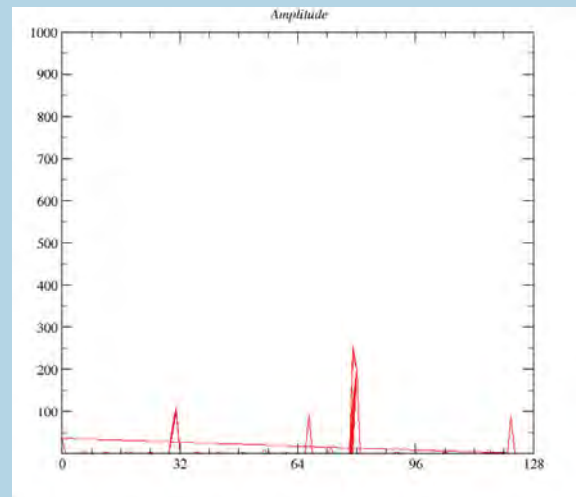


Figure -- (Top) The spectrum of 128 channels by CASPER's iBOB FPGA board. (Bottom) The hardware of CASPER's FPGA board which can be re-programmed to be spectrometer or correlator.

Research Interests

My research interests are mainly in system integration that involves software and hardware. Recently, I have been focusing in the high-speed digital electronics, digital signal processing, and FPGA programming. Some of the applications are digital correlator and digital spectrometer. I have developed a digital spectrometer (as shown above) based on CASPER (Center for Astronomy Signal Processing and Electronics Research, UC Berkeley) technology. I have involved in SMA and AMiBA construction. Receiver automation and monitoring are my major contributions to SMA. Telescope control software, receiver control and monitoring system, computer network on site, and temperature/gain stabilization are the projects I have been working on.

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Education and Positions

- Ph.D., Physics, University of Virginia, 1999
- Postdoctoral Fellow, ASIAA, 2002-2005
- Assistant Research Engineer, ASIAA, 2005-2007
- Associate Research Engineer, ASIAA, 2007-present

Selected Publications

- Lee, M., Li, C.-T., et al. "Non-linear THz Mixing in YBaCuO Thin Film Hot Electron Bolometers", SPIE (1998) 3481.
- Li, C.-T., Kubo, D., et al. "A Wideband Analog Correlator System for AMiBA", SPIE (2004) 5498.
- Li, C.-T., Han, C.-C., Chen, M.-T., et al. "Initial operation of the array for microwave background anisotropy (AMiBA)", SPIE (2006) 6275.
- Lin, K.-Y., Li, C.-T., Wu, J.-H. P., et al. "AMiBA first year observation", SPIE (2008) 7012.
- Li, C.-T., Chang, C. M., Wang, M. J., & Shi, S. C. "Design of SIS Mixers for SMA 400 – 520 GHz Band", Global Symposium on Millimeter Waves (2008).

Research Interests

My research interests are mainly in superconducting devices for radio astronomical applications, as well as backend signal processing. So far I have been involved in superconducting bolometers and superconductor-insulator-superconductor junctions for sub-mm wave mixing. I started working on backend signal processing when I worked on the analog correlator for AMiBA. As instrumentation for radio astronomy is pushing toward THz regime and large arrays, new detecting techniques and high-speed digital signal processing become inevitable. These 2 fields would be my focuses of research and development in the next few years.

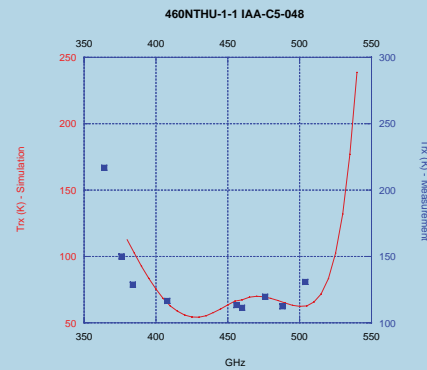
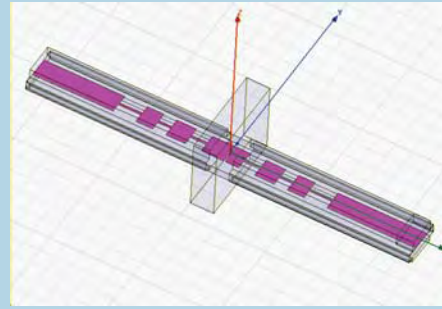


Figure -- SMA 460 GHz SIS Mixer



Figure -- AMiBA backend electronics

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Education and Positions

- B.S., Electrical Engineering, National Taiwan University, 1988
- M.S., Physics, National Taiwan University, 1992
- Ph.D., Physics, National Taiwan University, 1997
- Postdoctoral Fellow, ASIAA, 1997-2004
- Associate Research Engineer, ASIAA, 2004-present

Selected Publications

- Wen, C.-Y., & Hwang, W.-Y. P. "pNN and ω NN Couplings in the External-Field QCD Sum Rule Method", Phys. Rev. C (1997) 56, 3346.
- Hwang, W.-Y. P., & Wen, C.-Y. "Semi-inclusive Λ Production and Generalized Sullivan Processes", Z. Phys. A (1997), 358, 415.
- Wen, C.-Y. "The Taiwanese-American Occultation Survey", Phys. Bimon. J. (1998) 20, 4.
- Alcock, C., et al. "TAOS: The Taiwanese-American Occultation Survey" Earth, Moon, and Planets (2003) 92, 1, 459.
- Lehner, M. J., et al. "TAOS: The Taiwanese-American Occultation Survey" Astronomische Nachrichten (Sept. 2006), 327, 814.
- Hwang, W.-Y. P., & Wen, C.-Y. "Parity-violating Nuclear Force as Derived From QCD Sum Rules", Phys. Rev. C (2008) 78, 025501.

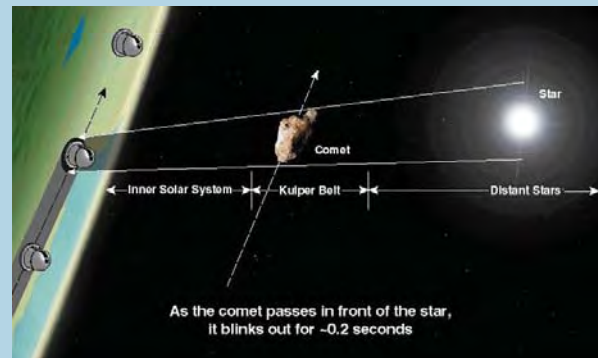


Figure -- Counting Kuiper Belt objects using Occultations.

Research Interests

- High Energy Physics
- Computer programming
- Digital signal processing
- TAOS project software engineer

I joined TAOS project immediately after I got my Ph.D. degree. It has been more than ten years now. For the first few years, I worked on scientific simulation and theoretical prediction for this project, like calculating the diffraction patterns for occultation events and image processing. Also, I learned the programming skill for controlling a robotic telescope system. It took a lot of effort and time to make every things working. Our project started to collect data in 2005 with three 50 cm telescopes. In 2008, we have the fourth telescope running. At current stage my major responsibility is to maintain the daily observation for this project and improve the control software.

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Education and Positions

- B.S., Biomedical, Chung Yuan Christian University, 1999
- M.S., Biomedical, Chung Yuan Christian University, 2001
- Junior Microwave Engineer, ASIAA, 2002-2008
- Assistant Research Engineer, ASIAA, 2008-present

Selected Publications

- Jiang, H., Chang, C.-H., Li, C.-T., Wang, Y.-J., Han, C.-C., et al. "A New Automatic Level Control method to stabilized the System Gain of a Radio Interferometer for Cosmic Microwave Background", IEEE Instrumentation and Measurement Conference (2008).
- Li, C.-T., Han, C.-C., et al. "Initial Operation of the Array of Microwave Background Anisotropy (AMiBA)", SPIE (2006) 6275.
- Li, C.-T., Kubo, D., Han, C.-C., et al. "A Wide-band Analog Correlator System for AMiBA", SPIE (2004) 5498, 455.

Research Interests

I have been working for the AMiBA (Array for Microwave Background Anisotropy) project since I joined ASIAA. With years of training and experience, I have made some achievement on receiver integration assembly and measurement. In these years, I have brought up my interest in MMIC component package and have succeeded on making AMiBA sub-harmonic mixer, and correlator third section power divider. Recently I have been focused on the miniaturization MMIC module development.

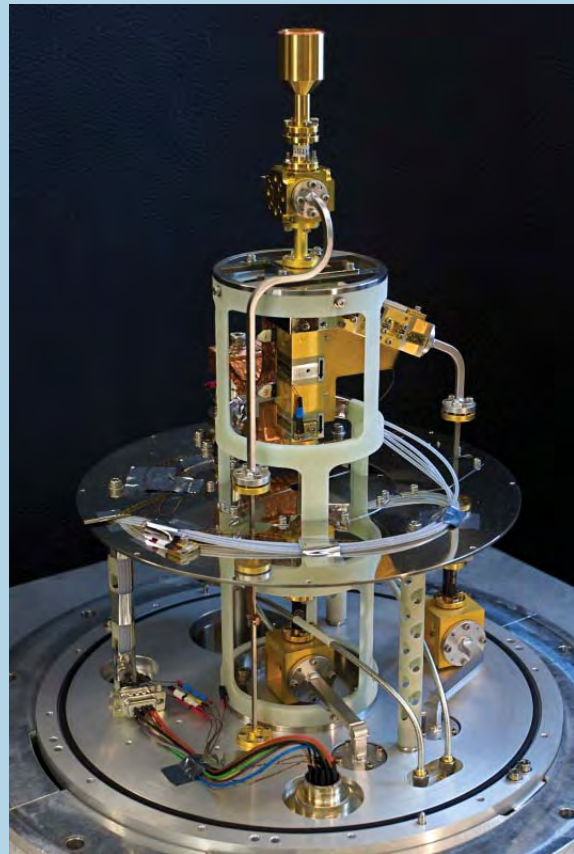
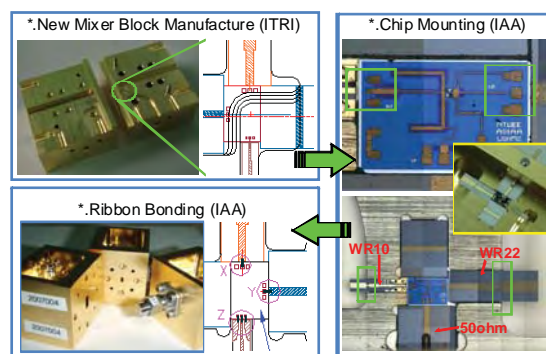


Figure -- AMiBA Receiver Assembly

AMiBA Mixer Production



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Education and Positions

- B.S., National Taiwan University of Science and Technology. 1999
- M.S., National Tsing-hua University, 2001
- Mechanical Engineer, ASIAA, 2001-2006
- Assistant Research Engineer, ASIAA, 2006-present

Honors

- Taipei skill competition, mechatronic systems, bronze medal, 1996

Selected Publications

- Raffin, P., Martin, R.N., Huang, Y.D., Patt, F., Romeo, R.C., Chen, M.T., & Kingsley, J.S. "CFRP Platform and Hexapod Mount for the Array of Microwave Background Anisotropy (AMiBA)", SPIE (2004) 5495, 18.
- Raffin, P., Koch, P., Huang, Y.D., et al. "Progress of the Array for Microwave Background Anisotropy (AMiBA)", SPIE (2006) 6273.
- Huang, Y.-D., Koch, P., Raffin, P., Kesteven, M., Chen, M.-T. "Array for Microwave Background Anisotropy Hexapod Mount", Poster for PKS (2006), Chemnitz, Germany.
- Wang, S., Huang, Y.-D., Jeng, D., Liaw, E. J. Y., Doi, Y., & Miyazaki, S. "The Shutter and Filter Exchanger System of HSC", SPIE (2008) 7014, 153.
- Koch, P., Kesteven, M., Chang, Y.-Y., Huang, Y.-D., Raffin, P., et al. "Platform Deformation Refined Pointing and Phase Correction for the AMiBA Hexapod Telescope" SPIE (2008) 7018, 58.

- Huang, Y. D., Raffin, P., Chen, M.-T., Altamirano, Pablo, & Oshiro, P. "Photogrammetry measurement of the AMiBA 6-meter platform", SPIE (2008) 7012, 89.



Figure -- A view of AMiBA

Research Interests

My research interests are mainly in mechanical design and analysis. I use the Computer Aided Design (CAD) and Finite Element Analysis (FEA) method to design mechanical and electronic components for astronomical research equipments. I am also interested in the Micro-Electromechanical System for components of sub-millimeter-sized parts.

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Education and Positions

- M.S., Space Science, National Central University, 1992
- Ph.D., Astronomy, National Central University, 2000
- Postdoctoral Fellow, Physics department, National Taiwan University (2000~2003)
- Joint assistant professor, National Chiao Tung University (2001/2 ~ 2002/7)
- Joint assistant professor, National Taiwan University of Art (2005/2)
- Assistant Research Scientist, 2003-present

Honors

- The 3rd award of the Kwoh-Ting Li's popular science writing, 2000

Selected Publications

- Chiueh, T.-H., & Tseng, Y.-H. "Nonaxisymmetric Three-Dimensional Instability in Thin Accretion Disks", ApJ (1994) 435, 379.
- Tseng, Y.-H. "Bending Instability in A Rotating Stellar Disk", Chinese J. of Phys. (2000) 38, 111.
- Chiueh, T.-H., Wu, J.-M., & Tseng Y.-H. "Velocity-Anisotropy-Driven Bending Instability in the Galactic Stellar Sisk", Chinese J. of Phys. (2000) 38, 120.
- Chiueh, T.-H., & Tseng, Y.-H. "Rotating Halos and Spirals in the Low-Surface-Brightness Galaxies", ApJ (2000) 544, 204.
- Lin, K.-Y., Woo, T.-P., Tseng, Y.-H., Lin, L., Chiueh, T. -H. "Effects of Preheated Clusters on the CMB Spectrum", ApJ (2004), 608, 1L.

- Umetsu, K., Chiueh, T.-H., Lin, K.-Y., Wu, J.-M., & Tseng, Y.-H. "Simulation of a Combined SZE and Weak Lensing Cluster Survey for AMiBA Experiment", Mod. Phys. Letts. A (2004) 19, 13-16, 1027.
- Lin, K.-Y., Woo, T.-P., Tseng, Y.-H., Lin, L., & Chiueh, T.-H. "Clusters in preheating simulation and its effect on CMB spectrum", Mod. Phys. Letts. A (2004) 19, 13-16, 1035.
- Tseng, Y.-H., & Hsieh, B.-C. "Linux the Great", (2007) ISBN9570390069, Hudson Publishing Company.
- Tseng, Y.-H. "PC Cluster Computation with Linux", (2001), ISBN 957-0390-41-7, Hudson Publishing Company.

Research Interests

My research interests are mainly in galactic dynamics and the large-scale structure of universe. I am also interested in cluster computation to improve the parallel computation efficiency.

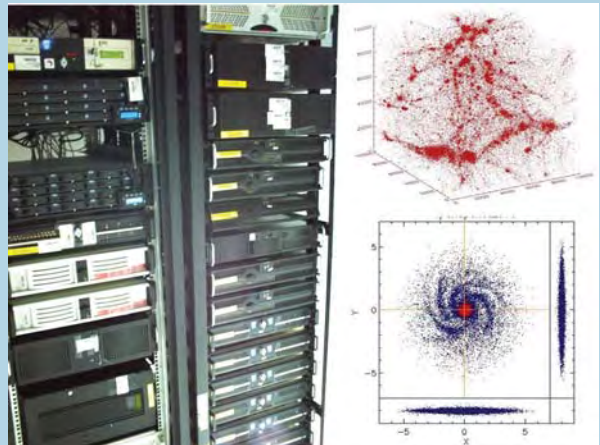


Figure -- (Left) CFD-MHD PC cluster. (Top Right) the LCDM simulation at $Z=0$, 64 million particles within a 10Mpc box. (Bottom Right) The spiral galaxy simulation within a live dark matter halo.

Koch, Patrick
高培邁

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Education and Positions

- B.S., Mechanical Engineering, 1995, ETH Lausanne, Switzerland
- B.S., Physics, 1996, ETH Lausanne, Switzerland
- M.S., Physics, 1999, ETH Zurich, Switzerland
- Ph.D., Physics, 2003, University of Zurich, Switzerland
- Postdoctoral Fellow, ASIAA, 2003-2006
- Research Scientist, ASIAA, 2006-present

Selected Publications

- Koch, P., Jetzer, Ph., & Puy, D. "Cooling Flow Bulk Motion Corrections to Sunyaev-Zeldovich Effect", *New Astronomy* (2002) 7, 587.
- Koch, P., Jetzer, Ph., & Puy, D. "The Influence of Magnetic Fields on the Sunyaev-Zeldovich Effect in Clusters of Galaxies", *New Astronomy* (2003) 8, 1.
- Koch, P. "Possible Merger Signature in SZ Maps", *J. Korean Astron. Soc.* (2004) 37, 471.
- Koch, P., et al. "0.6m Antennae for the AMiBA Interferometry Array", *Proc. of The European Conference on Antennas and Propagation: EuCAP (2006) (ESA SP-626)* p.668.1.
- Koch, P., et al. "Platform Deformation Refined Pointing and Phase Correction for the AMiBA Hexapod Telescope", *SPIE* (2008) 7018.
- Koch, P. "Magnetic Fields and Turbulences in Clusters of Galaxies", *RevMexAA* (2009) in press.

- Tang, Y.-W., Ho, P.T.P, Girart, J.M., Rao, R., Koch, P., Lai, S.-P. "Evolution of Magnetic Fields in High Mass Star Formation: SMA Dust Polarization Image of the UCHII Region G5.89-0.39", *ApJ* (2009) in press.
- Koch, P., et al. "The AMiBA Hexapod Telescope Mount", *ApJ* (2009) in press.

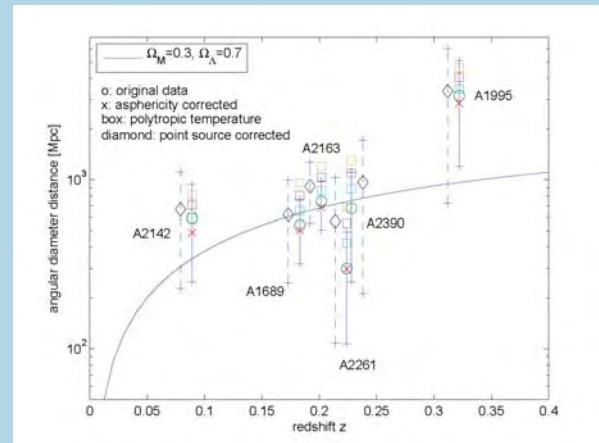


Figure -- Angular diameter distances for 6 clusters of galaxies from AMiBA SZE observations and published X-ray data. Different models are tested in order to derive the Hubble constant.

Research Interests

- Clusters of Galaxies:
Magnetic Fields, Cluster Mergers, Turbulences, Plasma Physics Processes, SZ and X-Ray Observations
- Cosmic Microwave Background, SZ effect, and Structure Formation
- Magnetic Fields and Turbulences in Star Formation
- Observational Techniques, Interferometry in Radio Astronomy
- Telescope Commissioning

Lehner, Matthew J.
連馬修

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Education and Positions

- B.A., Physics, Washington University, St. Louis, MO. 1988
- Ph.D., Physics and Astronomy, University of California San Diego, 1996
- Postdoctoral Research Associate, University of California San Diego, 1996 - 1997
- Postdoctoral Research Associate, University of Sheffield, 1997 - 2000
- Postdoctoral Research Associate, University of Pennsylvania, 2000 - 2001
- Research Associate, University of Pennsylvania, 2001 - 2004
- Research Associate, Harvard College Observatory, 2004 - 2007
- TAOS II Chief Scientist, ASIAA, 2008-present

Selected Publications

- Wang, J.H., et al. "Early Optical Brightening in GRB 071010B", *ApJ* (2008) 679, L5.
- Nihei, T.C., et al. "Detectability of Occultations of Stars by Objects in the Kuiper Belt and Oort Cloud", *Astron. J.* (2007) 134, 1596.
- Lehner, M.J., et al. "TAOS - The Taiwanese-American Occultation Survey", *Astronomische Nachrichten* (2006) 327, 814.
- Alcock, C., et al. "The MACHO Project: Microlensing Results from 5.7 Years of Large Magellanic Cloud Observations", *ApJ* (2000) 542, 281.
- Alcock, C., et al. "EROS and MACHO Combined Limits on Planetary-Mass Dark Matter in the Galactic Halo", *ApJ* (1998) 499, L9.
- Alcock, C., et al. "The MACHO Project: Limits on Planetary Mass Dark Matter in the Galactic Halo from Gravitational Microlensing", *ApJ* (1996) 471, 774.



Figure -- Two of the TAOS telescopes installed at Lu-Lin Observatory.

Research Interests

My primary research interest is the outer Solar System. In particular, I am interested in using the blind stellar occultation survey technique to detect small (~ 1 km), distant objects in the Kuiper Belt and beyond. The size distribution and dynamical characteristics of these objects provide important clues to the formation history of the Solar System. The occultation technique is also uniquely suited to probe the region of 100 to 1000 AU from the Sun, where the discovery of Sedna implies that there may be many more objects that currently can not be discovered with any other astronomical technique. I am a member of the TAOS project, which has been photometrically monitoring thousands of stars with four small telescopes at Lu-Lin Observatory in central Taiwan, in order to search for such occultation events. I am also leading the development of TAOS II, a next generation occultation survey which will use an array of larger telescopes and be located near the summit of Mauna Loa in Hawaii. The new survey will be a hundred times more powerful than the TAOS I survey, which will allow us to probe even smaller and more distant objects. We plan to start collecting data with the new survey in 2011.

Adjunct Research Fellows



Chu, Tah-Hsiung 瞿大雄

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microwave imaging systems and techniques, microwave circuit and subsystem design, microwave measurement and calibration techniques, electromagnetic theory, and microwave communication.



Lo, Kwok-Yung 魯國鏞

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Research Interest:

The Galactic Center, Starburst and Active Galactic Nuclei, Dwarf Galaxies and Intergalactic HI, Cosmic Background Radiation, High Redshift Galaxies, Mega-Masers and the Hubble Constant.



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Research Interest:

Cosmology, Dark Matter, Dark Energy, Galaxy Formation, Super-massive Black Holes



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Research Interest:

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theoretical aspects of the formation of large-scale structures in the universe and the relativistic hydrodynamics of high-energy sources.



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interstellar chemistry, infrared spectroscopy



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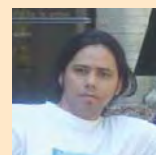
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Very Low Mass Stars

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Research Speciality:

Numerical Simulation

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Optical Robotic Telescope

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Ohashi, Nagayoshi	大橋永芳	Assistant director; Research Fellow	夏威夷辦公室副主管 副主任 ; 研究員
Lim, Jeremy	林仁良	Research Fellow	研究員
Wang, Ming-Jye	王明杰	Research Fellow	研究員
Hasegawa, Tatsuhiko	長谷川 辰彦	Assoc. Research Fellow	副研究員
Hirano, Naomi	平野尚美	Assoc. Research Fellow	副研究員
Sakamoto, Kazushi	坂本和	Assoc. Research Fellow	副研究員
Shang, Hsien	尚賢	Assoc. Research Fellow	副研究員
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Umetsu, Keiichi	梅津敬一	Assist. Research Fellow	助研究員
Wang, Wei-Hao	王為豪	Assist. Research Fellow	助研究員

Research Specialist/Engineer/Scientist

Chang, Shu-Hao	張書豪	Research Technician	技術助理
Chen, Tse-Jun	陳澤潤	Assoc. Research Engineer	研究副技師
Han, Chih-Chiang	韓之強	Assist. Research Engineer	研究助技師
Huang, Yau-De	黃耀德	Assist. Research Engineer	研究助技師
Jiang, Homin	江宏明	Assoc. Research Engineer	研究副技師
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Tseng, Yao-Huan	曾耀寰	Assist. Research Scientist	研究助技師
Wang, Jen-Hung	汪仁鴻	Research Assistant	研究助理
Wei, Ta-Shun	魏大順	Research Technician	技術助理
Wen, Chih-Yi	溫志懿	Assoc. Research Engineer	研究副技師

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Ma, Chung-Pei	馬中珮	Adjunct Associate Fellow	兼任副研究員
Ng, Kin-Wang	吳建宏	Adjunct Research Fellow	合聘研究員
Pen, Ue-Li	彭威禮	Adjunct Associate Fellow	兼任副研究員
Wang, Huei	王暉	Adjunct Research Fellow	合聘研究員
Wu, Jiun-Huei Prot	吳俊輝	Adjunct Associate Fellow	合聘副研究員

Front Office

Hsieh, Winny	謝佳慧	Chief Administrator, Senior Research Specialist	行政室主管； 研究技師
Chang, Guen-Min	張桂敏	Secretary to Director	所長秘書
Chen, Celia	陳俐秀	Purchaser	採購
Chen, Juniper	陳重模	Maintenance Officer	工務
Cheng, Patty	鄭珮君	Personnel / Admin. Assistant	人事/行政助理

Chiang, Michael	江政哲	Librarian	圖書館員
Chiu, Cindy	邱欣怡	Cashier	出納
Chou, Jerry	周益正	Astro-Math Building Project Manager	天文數學館專案經理
Chung, Apple	鍾莉蘋	Administrative Assistant	行政助理
Hwang, Wendy	黃文瑾	Accountant	會計
Chou, Ariel	周旻璇	General Affairs Manager	總務
Liao, Vicky	廖容欣	Personnel Officer	人事
Liu, Fu-Yuan	劉福元	Messenger/Driver	收發/司機
Wang, Jackie	王麗琄	Purchaser	採購

Project Management Office

Shaw, Paul	蕭仰台	Head of PMO, Senior Research Specialist	計劃辦公室主管 ; 研究技師
Huang, Shirley	黃信縈	Administrative Assistant	行政助理
Lin, Esther	林怡君	Administrative Staff	行政人員
Shao, Linda	邵毓琳	Administrative Staff	行政人員
Wang, Eugenia	王貞純	Administrative Staff	行政人員

TIARA NTHU Office

Taam, Ronald E.	譚遠培	Advisory Panel Member	諮詢委員
Zheng, Rebecca	鄭淑錦	TIARA Office Administrative	TIARA 辦公室行政

MIS

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