Tomotsugu Goto

Associate Professor,

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Education:

- * University of Tokyo, Ph.D., Physics, 2003 (Adviser: Sadanori Okamura, Maki Sekiguchi)
- * University of Tokyo, M.A., Physics, 2001 (Adviser: Maki Sekiguchi)
- * Kyoto University, B.S., Faculty of Science, 1999
- * Visiting Research Scholar at Carnegie Mellon University, 2001-2003

Positions:

- Associate Professor, Institute of Astronomy, National Tsing Hua University, 2013/12-Present
- Dark Fellow, Dark Cosmology Centre, Niels Bohr Institute, University of Copenhagen, 2012/06-2013/12
- Japan Society of Promotion of Science SPD Research Fellow¹, Institute for Astronomy, University of Hawaii, 2008/04-2012/05
- Aerospace Project Research Associate, ISAS/JAXA (Japan), 2005/04-2008/03
- Associate Research Scientist, ACS Science team, Department of Physics & Astronomy, Johns Hopkins University (US), 2004/09-2005/03
- Assistant Research Scientist, ACS Science team, Department of Physics & Astronomy, Johns Hopkins University (US), 2003/09-2004/08
- Japan Society of Promotion of Science Research Fellow, 2001-2003 (Visiting Research Scholar at Carnegie Mellon University, US)

Awards:

- Japan Society of Promotion of Science Research Fellow (SPD¹), 2008-2010
- A PASJ Excellent Paper Award to "The Environment of Passive Spiral Galaxies in the SDSS", Goto et al. et al. 2003, PASJ², 55, 757
- Japan Society of Promotion of Science Research Fellow (DC1), 2001-2003
- Japan Ikuei-kai Fellowship, 1999-2001

Awarded Grants:

¹Oversubscription rate for the SPD fellow in physics was 761 in the year of 2007.

²PASJ: Publications of the Astronomical Society of Japan

- 2016-2019: Taiwan Ministory of Science and Technology research grant, "Revealing cosmic star formation history with AKARI space infrared telescope", USD 151,000.
- 2014-2016: Taiwan Ministory of Science and Technology research grant, "Revealing cosmic reionization using supermassive black holes at 6 < z < 8", USD 94,100.
- 2011: Co-I of a Herschel observation, "THE HERSCHEL-AKARI NEP DEEP SURVEY: the cosmological history of stellar mass assembly and black hole accretion", 73.5 hours, USD33,000
- 2011: Co-I of a Herschel observation, "A deep PACS survey of AKARI-Deep field south: Revealing the connection between AGN and star formation", 34.5 hours, USD11,000
- 2008-2010: Japan Society for the Promotion of Science, Grant-in-Aid for Scientific Research, USD98,900
- 2006-2007: Japan Society for the Promotion of Science, Grant-in-Aid for Scientific Research, USD20,600
- 2006: Foundation for Promotion of Astronomy, USD6,782
- 2006: Sasagawa Science Fund, USD4,434
- 2005: Hayakawa fund, USD2,000
- 2005: National Astronomical Observatory of Japan, Research Collaboration Fund, USD2,000
- 2001-2003: Japan Society for the Promotion of Science, Grant-in-Aid for Scientific Research, USD30,000

Teaching experience:

At NTHU, I have taught the following classes.

- Galactic Astronomy
- Introduction to Modern Cosmology
- Cosmology
- Literature review in astronomy
- Frontier of Astrophysics Seminars I,II
- Astronomy Colloquium

Projects lead:

I have planned and lead the following science projects. Each project was funded by the research grants mentioned above. During the course of the projects, I have mentored 6 graduate students in total, resulting in 8 refereed publications by the students. Currenly I supervise a group of two graduate students, and three postdocs.

- A search for the highest redshift QSOs (supermassive black holes).
- This project was funded by the JSPS and the MoST. We recently found one of the most distant supermassive black hole at z=6.6, and a student I supervised published a paper (Tang et al. 2017). Previously I found two new QSOs at $z\sim6$. I published 5 papers.

- Revealing cosmic star formation history hidden by the dust. This project is currently funded by the MoST. In collaboration with Japanese colleagues, I have launched infrared space telescope, AKARI. With this telescope, we can reveal dust-hidden cosmic star-formation history previously unnoticed. I have published 6 papers on this project so far.
- Creating the largest galaxy cluster catalog using the SDSS data and revealing cluster galaxy evolution.

This project was funded by the JSPS, and resulted in 8 referred publications by myself, and 2 by students. The resulting galaxy cluster catalog was the largest at the time of publication, and used by researchers all over the world.

• Revealing the physical origin of post-starburst (E+A) galaxies.

This project was funded by the JSPS, and Sasagawa Science Fund. Resulted in 6 publications by myself, 2 by students, and 2 by collaborators all in refereed international journals. Another paper by a student is in the refereeing process. We have created the largest catalog of post-starburst (E+A) galaxies, which have been used around the world.

Referring experience:

I am one of the most active reviewers in the field. I referee in average 5 papers a year for the following journals:

ApJ,AJ,MNRAS,A&A, PASP,PASJ, JKAS³,

Technical expertise:

• I am familiar with the following astronomy software/languages: IRAF, AIPS, IDL, C, FORTRAN, SuperMongo, Perl, JAVA, and Python. I have contributed to the development of the SDSS galaxy deblending algorithm, and the AKARI all sky survey data reduction pipeline. I also have contributed to the operation of the AKARI spacecraft as a manager of a daily link to the satellite.

³Journal of Korean Astronomical Society

List of Publications of Tomotsugu Goto

Summary: I have published 40 first author papers in referred journals since I started astronomy. Total citations to my 40 first author papers are 1720 (7463 for all 164 referred publications), with *h*-index of 43. These are one of the top numbers in the field. I believe these citation records show my publications are of high quality. My paper on unusual passive-spiral galaxies received the PASJ award for excellence. Four of my papers were press-releases in the past. Most recent is on the discovery of 100 distant QSOs at $z\sim6$ by NTHU. My full publication list is presented first from 1st author publications, followed by non-first author publications in counter-cronoligical order. Publications by students I mentored are marked with \Diamond .

(First author refereed publications, listed in counter-chronological order).

- Infrared luminosity functions based on 18 mid-infrared bands: revealing cosmic star formation history with AKARI and Hyper Suprime-Cam Goto, T. et al., 2019, accepted for publication in PASJ AKARI special issue ⁴
- 2. No Ly α emitters detected around a QSO at z=6.4: Suppressed by the QSO? Goto, T. et al., 2017, MNRAS, 470L, 117⁵
- Hyper Suprime-Camera Survey of the Akari NEP Wide Field Goto, T. et al., 2017, PKAS⁶, 32, 225
- 4. CO luminosity line width correlation of sub-millimeter galaxies and a possible cosmological application <u>Goto, T.</u> and Toft. S. 2015, A&A, 579, 17⁷, <u>A short explanation video is at https://youtu.be/scWMFurOJi8</u>
- 5. Evolution of mid-infrared galaxy luminosity functions from the entire AKARI NEP-Deep field with new CFHT photometry <u>Goto, T</u>. et al., 2015, MNRAS,452,1684, A short explanation video is at https://youtu.be/ZFYIIPg28E8
- Cosmic Star Formation History and AGN Evolution Near and Far: AKARI Reveals both Goto, T. et al. 2012c, Publications of The Korean Astronomical Society, 27, 4, 347
- 7. Cross-correlation of WISE Galaxies with the Cosmic Microwave Background Goto, T. et al. 2012b, MNRAS, 422L,77
- 8. Spectroscopy of the spatially-extended Ly α emission around a QSO at z=6.4 Goto, T. et al. 2012a, MNRAS, 421L, 77
- A Gunn-Peterson test with a QSO at z=6.4 Goto, T. et al. 2011c, MNRAS, 415L,1
- Infrared Luminosity Functions of AKARI-SDSS Galaxies Goto, T. et al. 2011b, MNRAS, 414,1903

⁴PASJ: Publications of the Astronomical Society of Japan

⁵MNRAS: Monthly Notices of the Royal Astronomical Society

⁶PKAS: Publications of The Korean Astronomical Society

⁷A&A: Astronomy & Astrophysics

- 11. Luminosity Functions of Local Infrared Galaxies Revisited: Implications to the Cosmic Star Formation History and AGN Evolution
 Goto, T. et al. 2011a, MNRAS, 410, 573
 (A part of this result was a press release by JAXA/ESA⁸, along with the AKARI catalog release.)
- Evolution of Infrared Luminosity functions of Galaxies in the AKARI NEP-Deep field: Revealing the cosmic star formation history hidden by dust Goto, T. et al. 2010, A&A⁹ AKARI special issue, 514A, 6
- 13. Environmental dependence of 8μ m luminosity functions of galaxies at z~0.8: Comparison between RXJ1716.4+6708 and the AKARI NEP deep field Goto, T. et al. 2010, A&A AKARI special issue, 514A, 7
- 14. A QSO host galaxy and its Ly α emission at z=6.43 <u>Goto, T.</u> et al. 2009, MNRAS, 400, 843 (This paper was a press-release by the University of Hawaii¹⁰. See Fig.2)
- 15. Galaxy Clusters at 0.9 < z < 1.7 in the AKARI NEP deep field. Goto, T. et al. 2008, PASJ ,60,531, AKARI special issue
- Spatially-Resolved Medium Resolution Spectroscopy of an Interacting E+A (post-starburst) System with the Subaru telescope Goto, T., Yagi,M., Yamauchi, C., MNRAS, 2008, 391, 700
- 17. Integrated field spectroscopy of E+A (post-starburst) galaxies with the Kyoto3DII Goto, T. et al. 2008,MNRAS, 2008, 386, 1355
- 18. A Catalog of Local E+A(post-starburst) Galaxies selected from the Sloan Digital Sky Survey Data Release 5 <u>Goto, T.</u> 2007,MNRAS, 381,187
- Abundance diagnosis of E+A (post-starburst) galaxies Goto, T. 2007,MNRAS, 377,1222
- 20. Discovery of a new high redshift QSO at z=5.96 with the Subaru telescope <u>Goto, T.</u> 2006,MNRAS, 371,769 (This paper was a press-release by Subaru¹¹.)
- Deep J-band imaging of high redshift QSO candidates with the Himalayan Chandra Telescope Goto, T. 2006, BASI¹², 34,291
- Post-starburst–AGN Connection: Spatially Resolved Spectroscopy of Hdelta-Strong AGNs Goto, T. 2006, MNRAS, 369, 1765
- 23. Optical Properties of 4248 IRAS Galaxies Goto, T. 2005,MNRAS,360,322

 $^{{}^8}See \ http://sci.esa.int/science-e/www/object/index.cfm?fobjectid=46769$

⁹A&A: Astronomy & Astrophysics

¹⁰See http://www.ifa.hawaii.edu/info/press-releases/BlackHole/

¹¹See http://www.subarutelescope.org/Pressrelease/2006/08/29/index.html

¹²BASI: Bulletin of the Astronomical Society of India

- 24. Velocity Dispersion of 335 Galaxy Clusters Selected from the Sloan Digital Sky Survey: Statistical Evidence for Dynamical Interaction, and Against Ram-Pressure Stripping Goto, T. 2005,MNRAS,359,1415
- 25. 266 E+A galaxies selected from the Sloan Digital Sky Survey Data Release 2: the origin of E+A galaxies Goto, T. 2005,MNRAS,357,937
- 26. The Luminosity Functions of the Galaxy Cluster MS1054-0321 at z=0.83 based on ACS Photometry <u>Goto, T.</u> et al. 2005,ApJ¹³,621,188
- 27. Do star formation rates of galaxy clusters depend on mass?: blue/late-type fractions, total star formation rates of 115 galaxy clusters as a function of cluster virial mass Goto, T. 2005,MNRAS,356L,6
- 28. Are E+A galaxies dusty-starbursts?: VLA 20 cm radio continuum observation Goto, T. 2004,A&A,427,125
- 29. Evolution of the Colour-radius and Morphology-radius Relations in SDSS Galaxy Clusters Goto, T. et al. 2004,MNRAS,348,515
- 30. The Morphology-Density Relation in the Sloan Digital Sky Survey Goto, T. et al. 2003,MNRAS,346,601
- 31. H
&-Strong Galaxies in the Sloan Digital Sky Survey I: The Catalog Goto, T. et al. 2003,
PASJ,55,771
- 32. The Environment of Passive Spiral Galaxies in the SDSS <u>Goto, T.</u> et al. 2003,PASJ,55,757. (This paper received the PASJ excellent paper <u>award.</u>)
- The Morphological Butcher-Oemler Effect in the SDSS Cut&Enhance Galaxy Cluster Catalog Goto, T. et al. 2003, PASJ, 55, 739
- 34. Composite Luminosity Functions of the Sloan Digital Sky Survey Cut & Enhance Galaxy Cluster Catalog Goto, T. et al. 2002, PASJ, 54, 515
- 35. The Cut & Enhance method : selecting clusters of galaxies from the SDSS commissioning data Goto, T. et al. 2002,AJ¹⁴,123,1807

Non-first author refereed publications in counter-chronological order Publications by students/postdocs I mentored are marked with \Diamond .

36. Surface density: a new parameter in the fundamental metallicity relation of star-forming galaxies

♦ Hashimoto, T.,..., Goto, T., et al., 2018, MNRAS, 475, 4424

¹³ApJ : The Astrophysical Journal

¹⁴AJ: The Astronomical Journal

- 37. The infrared luminosity function of AKARI 90 μ m galaxies in the local Universe \Diamond Kilerci Eser, E., Goto, T., 2018, MNRAS, 474, 5363
- 38. An extinction-free AGN selection by 18-band SED fitting in mid-infrared in the AKARI NEP deep field
 ♦ Huang, Ting-Chi, Goto, T., et al., 2018, MNRAS, 471, 4239
- The mass-metallicity relation of AKARI-FMOS infrared galaxies at z~0.88 in the AKARI North Ecliptic Pole Deep Survey Field Oi, N.,<u>Goto, T.</u>, et al., 2017,PASJ,69,70
- Far-infrared Properties of Infrared-bright Dust-obscured Galaxies Selected with IRAS and AKARI Far-infrared All-sky Survey Toba, Y.,..., Goto, T., et al., 2017, ApJ,840, 21
- 41. ◊A Quasar Discovered at redshift 6.6 from Pan-STARRS1 Tang, J.-J., <u>Goto, T.</u>, et al., 2017, MNRAS, 466, 4568 (A paper by a student I supervised)
- 42. [Ultra] luminous infrared galaxies selected at 90 m in the AKARI deep field: a study of AGN types contributing to their infrared emission Malek, K.,..., Goto, T., et al., 2017, A&A,598A,1
- 43. Subaru High-z Exploration of Low-luminosity Quasars (SHELLQs). I. Discovery of 15 Quasars and Bright Galaxies at 5.7 < z < 6.9 Matsuoka, Y. ,...,Goto, T., et al. 2016, ApJ, 828, 26
- 44. The Subaru FMOS galaxy redshift survey (FastSound). II. The emission line catalog and properties of emission line galaxies Okada, H. ,...,Goto, T., et al. 2016,PASJ,68,47
- 45. The Subaru FMOS galaxy redshift survey (FastSound). IV. New constraint on gravity theory from redshift space distortions at z~1.4
 Okumura,T., ...,<u>Goto, T.</u>, et al. 2015,PASJ,68,38
 (This paper was a press-release by the Subaru telescope¹⁵).
- 46. The Subaru FMOS Galaxy Redshift Survey (FastSound). III. The mass-metallicity relation and the fundamental metallicity relation at z~1.4, Yabe, K.,...,<u>Goto, T.</u>, et al., 2015, PASJ, 67,102
- 47. Mid-infrared luminosity functionet al. of local star-forming galaxies in the North Ecliptic Pole-Wide survey field of AKARI Kim, S.J.,...,Goto, T., et al. 2015,MNRAS,454,1573
- Hyper-luminous dust-obscured galaxies discovered by the Hyper Suprime-Cam on Subaru and WISE, Toba, Y.,...,Goto, T., et al., 2015, PASJ, 67, 86
- The Subaru FMOS galaxy redshift survey (FastSound). I. Overview of the survey targeting Hα emitters at z ~1.4, Tonegawa, M.,...,Goto, T., et al., 2015, PASJ, 67, 81

¹⁵See http://subarutelescope.org/Pressrelease/2016/05/10/index.html

- 50. Clustering of the AKARI NEP deep field $24\mu \rm m$ selected galaxies, Solarz, A.,...,Goto, T., et al., 2015, A&A, 582, A58
- VLT/X-Shooter spectroscopy of the afterglow of the Swift GRB 130606A. Chemical abundances and reionisation at z~6, Hartoog, O. E.,...,Goto, T., et al., 2015, A&A, 580, A139
- Rest-frame Optical Spectra and Black Hole Masses of 3< z <6 Quasars, Jun, H.,..., Goto, T., et al. 2015, ApJ, 806, 109
- Dust attenuation up to z~2 in the AKARI North Ecliptic Pole Deep Field Buat, V,, Goto, T., et al. 2015,A&A,577,A141,14
- Chandra survey in the AKARI North Ecliptic Pole Deep Field I. X-ray data, point-like source catalogue, sensitivity maps, and number counts Krumpe, M,, Goto, T., et al. 2015,MNRAS,446,911
- Oltraluminous Infrared Galaxies in the AKARI All-sky Survey Kilerci Eser, E, Goto, T., Doi, Y. 2014, ApJ, 797, 54
- 56. The 2-24 $\mu \rm m$ source counts from the AKARI North Ecliptic Pole survey Murata,K.,..., Goto, T., et al. 2014,MNRAS,444,2346
- 57. The first source counts at 18 μ m from the AKARI NEP Survey Pearson, C., .,..., Goto, T., et al. 2014,MNRAS,444,846
- 58. Polycyclic aromatic hydrocarbon feature deficit of starburst galaxies in the AKARI North Ecliptic Pole Deep field Murata, K., .,..., Goto, T., et al. 2014,A&A,566A,136
- 59. Optical near-infrared catalog for the AKARI north ecliptic pole Deep field Oi,N.,..., Goto, T., et al. 2014,A&A,566A,60
- 60. A study of selection methods for Hα-emitting galaxies at z~1.3 for the Subaru/FMOS galaxy redshift survey for cosmology (FastSound) Tonegawa, M.,..., Goto, T., et al. 2014,PASJ,66,43
- A Tale of Two Feedbacks: Star Formation in the Host Galaxies of Radio AGNs Karouzos, M.,..., Goto, T., et al. 2014, ApJ,784,137
- AKARI North Ecliptic Pole Deep Survey. Revision of the catalogue via a new image analysis Murata, K.,..., <u>Goto, T.</u>, et al. 2013, A&A,559,1830
- 63. A deep ATCA 20 cm radio survey of the AKARI Deep Field South near the South Ecliptic Pole White, G.,..., Goto, T., et al. 2012, MNRAS,427,132
- 64. The North Ecliptic Pole Wide survey of AKARI: a near- and mid-infrared source catalog Kim, S.,..., Goto, T., et al. 2012, A&A, 548, 29
- The current star formation rate of K+A galaxies Nielsen, D.,..., Goto, T., et al. 2012, ApJ, 761, 16

- 66. Star Formation and AGN Activity in Galaxies Classified Using the 1.6μm Bump and PAH Features at z=0.4-2 Hanami, H.,..., Goto, T.,et al. 2012, PASJ, 64, 70
- Star-galaxy separation in the AKARI NEP deep field Solarz,..., Goto, T., et al. 2012, A&A, 541, 50
- The AKARI NEP-Deep survey: a mid-infrared source catalogue Takagi, T.,..., Goto, T.,et al. 2012,A&A, 537, 24
- Far-infrared luminosity function of local star-forming galaxies in the AKARI Deep Field-South Sedgwick, C.,..., <u>Goto, T.</u>,et al. 2011,MNRAS, 416, 1862
- 70. Spatially Resolved Spectroscopic Observations of a Possible E+A Progenitor: SDSS J160241.00+521426.9
 Matsubayashi, K.,..., Goto, T., et al. 2011, ApJ, 729, 29
- Merging Galaxy Cluster A2255 in Mid-infrared Shim, H.,..., Goto, T., et al. 2011, ApJ, 727, 14
- 72. ◊ A Large Number of z>6 Galaxies Around a QSO at z = 6.43: Evidence for a Protocluster? Utsumi, Y.,..., <u>Goto, T.</u>,et al. 2010, ApJ, 721.1680
- 73. A deep survey of the AKARI north ecliptic pole field . I. WSRT 20 cm radio survey description, observations and data reduction White, G. J.,..., Goto, T., et al. 2010, A&A, 517A, 54
- 74. Source counts at 15 microns from the AKARI NEP survey Pearson, C.P.,..., Goto, T., et al. 2010, A&A, 514A, 8
- 75. Polycyclic aromatic hydrocarbon (PAH) luminous galaxies at z∼1 Takagi, T.,..., Goto, T., et al. 2010, A&A, 514A, 5
- 76. The Fundamental Planes of E+A galaxies and GALEX UV-excess early-type galaxies: Revealing their intimate connection Choi, Y., Goto, T., Yoon, S.J., MNRAS, 2009, 395, 637
- 77. The Mid-infrared View of Red Sequence Galaxies in Abell 2218 with AKARI Jongwan, K., ... Goto, T., et al. 2009, ApJ, 695, 198
- Photometric redshift accuracy in AKARI deep surveys Negrello, M.,... Goto, T., et al. 2009,MNRAS,394,375
- AKARI/IRC Deep Survey in the North Ecliptic Pole Region Wada, T,... Goto, T., et al. 2008, PASJ, 60, 517
- 80. \diamond E+A and companion galaxies I. A catalogue and statistics Yamauchi,C., Yagi,M., Goto, T., 2008,MNRAS,390,383
- Current star formation in early-type galaxies and the K+A phenomenon Helmboldt, J. F., Walterbos, R. A. M., Goto, T., 2008, MNRAS, 387, 1537

- 82. Timeline analysis and wavelet multiscale analysis of the AKARI All-Sky Survey at 90μ m Lingyu, W. ... Goto, T., et al. 2008, MNRAS, 387, 601
- 83. ♦ Spatially resolved spectroscopy of passive spiral galaxies Ishigaki,M., Goto, T., Matsuhara,H. 2007,MNRAS,382,270
- 84. The Far-Infrared Properties of Spatially Resolved AKARI Observations Jeong, W.S-..., Goto, T., et al. 2007, PASJ, 59S, 429
- The Far-Infrared Surveyor (FIS) for AKARI Kawada,M...., Goto, T., et al. 2007,PASJ,59S,389
- The Infrared Astronomical Mission AKARI Murakami, H...., Goto, T., et al. 2007, PASJ, 59S, 369
- 87. Feedback and Brightest Cluster Galaxy Formation: ACS Observations of the Radio Galaxy TN J1338-1942 at z = 4.1 Zirm, A.W..., Goto, T. et al. 2005,ApJ,630,68
- Interacting E+A System SDSS J161330.18+510335.5. I. Spatially Extended Poststarburst Signatures and Age Gradient Yagi,M., <u>Goto</u>, T., Hattori, T. 2006,ApJ,642,152
- The Spatial Distribution of Poststarburst Signatures in E+A Galaxies Yagi,M., Goto, T. 2006, AJ,131,2050
- 90. Clustering of Star-forming Galaxies Near a Radio Galaxy at z=5.2 Overzier, R. A..., Goto, T. et al. 2006, ApJ, 637, 58
- 91. Hubble Space Telescope ACS Multiband Coronagraphic Imaging of the Debris Disk around β Pictoris Golimowski, D. A... Goto, T. et al. 2006, AJ, 131, 3109
- 92. Evolution of the Color-Magnitude Relation in High-Redshift Clusters: Blue Early-Type Galaxies and Red Pairs in RDCS J0910+5422 Mei,S..., Goto, T. et al. 2006,ApJ,639,81
- An Overdensity of Galaxies near the Most Distant Radio-loud Quasar Zheng, W..., Goto, T. et al. 2006, ApJ, 640, 574
- 94. The C4 Clustering Algorithm: Clusters of Galaxies in the Sloan Digital Sky Survey Miller, C.J..., Goto, T. et al. 2005, AJ, 130, 968
- Total Galaxy Magnitudes and Effective Radii from Petrosian Magnitudes and Radii Graham, A.W..., Goto, T. et al. 2005, AJ, 130, 1535
- 96. ♦ Radial and 2D colour properties of E+A galaxies Yamauchi, C., Goto, T. 2005, MNRAS,359,1557
- 97. A Dynamical Simulation of the Debris Disk around HD 141569A Ardila, D.R..., Goto, T. et al. 2005, ApJ,627,986
- 98. Hubble Space Telescope Advanced Camera for Surveys Coronagraphic Imaging of the AU Microscopii Debris Disk Krist, J.E..., Goto, T. et al. 2005, AJ, 129, 1008

- Near-infrared imaging of 222 nearby Hδ-strong galaxies from the Sloan Digital Sky Survey Balogh,M.L..., Goto, T. et al. 2005,MNRAS,360,587
- 100. Strong-Lensing Analysis of A1689 from Deep Advanced Camera Images Broadhurst, T..., Goto, T. et al. 2005, ApJ.621.53
- 101. The Morphology Density Relation in z ~ 1 Clusters Postman,M,..., Goto, T. et al. 2005, ApJ,623,721
- 102. The Transformation of Cluster Galaxies at Intermediate Redshift Homeier, N.L..., Goto, T. et al. 2004, ApJ,621,651
- 103. The Environmental Dependence of Galaxy Properties in the Local Universe: Dependence on Luminosity, Local Density, and System Richness Tanaka,M..., Goto, T. et al. 2004, AJ, 128, 2677
- 104. The Luminosity Function of Early-Type Galaxies at $z\sim 0.75$ Cross, N.J.G..., Goto, T. et al. 2004, AJ, 128, 1990
- 105. Observations and Theoretical Implications of the Large-Separation Lensed Quasar SDSS J1004+4112
 Oguri, M..., Goto, T., et al. 2004, ApJ, 605, 78O
- 106. Ultracompact Dwarf Galaxies in Abell 1689: A Photometric Study with the Advanced Camera for Surveys Mieske, S..., Goto, T. et al. 2004, AJ, 128, 1529
- 107. The Evolution of Galaxies in and around Clusters at High-Redshift Fujita, Y., Goto, T., 2004, PASJ, 56, 621
- 108. Are Passive Spiral Galaxies Truly "Passive" and "Spiral"? : A Near-Infrared Perspective Yamauchi, C., Goto, T. 2004, MNRAS, 352, 815
- 109. Selection and photometric properties of K+A galaxies Quintero, A.D..., Goto, T. et al. ,2004, ApJ, 602, 190
- 110. Galaxy Star-Formation as a Function of Environment in the Early Data Release of the Sloan Digital Sky Survey Gomez, P... Goto, T. et al. 2003, ApJ. 584, 210
- 111. The Cluster Mass Function from Early SDSS Data: Cosmological Implications Bahcall, N.A..., Goto, T. et al. 2003 ApJ, 585, 182
- 112. A Merged Catalog of Clusters of Galaxies from Early SDSS Data Bahcall , N.A..., Goto, T. et al.,2003, ApJS, 148, 243
- 113. Star formation rate indicators in the Sloan Digital Sky Survey Hopkins, A.M..., Goto, T. et al. 2003 , ApJ, 599, 97

Conference proceedings

- 114. Cosmic star formation history revealed by the AKARI & Spatially-resolved spectroscopy of an E+A (Post-starburst) system,
 <u>Goto, T.</u> et al., 2009, "Hunting for the Dark: The Hidden Side of Galaxy Formation",
 <u>Malta</u>, 19-23 Oct. 2009, eds. V.P. Debattista & C.C. Popescu, AIP Conf. Ser. arXiv:1001.0007
- 115. Environmental Effects on Galaxy Evolution Based on the SDSS Goto, T. et al., 2006, Proc. ESO Workshop, Groups of Galaxies in the Nearby Universe (5-9 Dec 2005), eds. I. Saviane, V. Ivanov & J. Borissova (Springer-Verlag), astro-ph/0605203
- The origin of E+A galaxies Goto, T. 2004, Astronomical Herald, 97, 467
- 117. The Origin of E+A Galaxies Goto, T. et al., 2003, RESCEU International symposium, astro-ph/0411519
- 118. The Environmental Effects on Galaxy Evolution Based on the SDSS Goto, T., 2003, Carnegie Observatories Astrophysics Series, Vol. 3: Clusters of Galaxies: Probes of Cosmological Structure and Galaxy Evolution, ed. J. S. Mulchaey, A. Dressler, and A. Oemler (Cambridge: Cambridge Univ. Press), astro-ph/0312042

Invited talks

• Invited talk at "NCTS Annual Theory Meeting 2016:Particles, Cosmology and String", Hsinchu, Taiwan (2016/12)

"A new distance measure using the correlation between CO luminosity and its line width of sub-millimeter galaxies."

- Invited talk at "NCTS Annual Theory Meeting 2015:Particles, Cosmology and String", Hsinchu, Taiwan (2015/12)
 "Dark Energy: Observational Challenges"
- Invited talk at SPICA science conference, Tokyo, Japan(2013/06) "Cosmic star-formation history and AGN accretion history: from AKARI to SPICA"
- Invited seminar at University of Edinburgh, UK(2012/11) "Cosmic star-formation history and AGN accretion history near and far: AKARI reveals both"
- Invited talk at 2ndAKARI conference, Jeju, Korea(2012/02) "Cosmic star-formation history and AGN accretion history near and far: AKARI reveals both"
- Invited talk at Kyoto University International Center (2007/06) Graduate School in USA

1 Appendix

Our discovery of the 100 QSOs is reported in 14 newspapers in Taiwan (Fig.1).



Figure 1: Taiwan's news paper reporting our discovery of 100 QSOs in March, 2019.

A discovery of the most distant QSO host galaxy (Goto et al. 2009, MNRAS, 400, 843) was a subject of a press-release by the University of Hawaii¹⁶, and appeared in many US and international newspapers. Fig.2 is an article in the Honolulu Advertiser.

Big Isle telescope spots giant galaxy

Scientists using the Subaru telescope on the Big Island report the discovery of a giant galaxy surrounding the most distant supermassive black hole ever found.

The University of Hawai'i's Institute for Astronomy said yesterday that the galaxy 12.8 billion light-years from Earth is as large as our own Milky Way galaxy. The universe itself is thought to be 13.7 billion years old.

UH astronomer Tomotsugu Goto and his colleagues made the discovery. He said it's surprising that such a large galaxy existed when the universe was only one-sixteenth of its present age, and that it hosted a black hole 1 billion times more massive than the sun.

Goto says the galaxy and black hole must have formed very rapidly in the early universe.

Figure 2: Appeared in Honolulu Advertiser, on Sep. 4, 2009.

¹⁶http://www.ifa.hawaii.edu/info/press-releases/BlackHole/