

## Contact Information

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## Academic Positions and Appointments

Steering Committee Member, ESA's XMM-Newton Heritage Program: CHEX-MATE (11/2023 – present)

Executive Board Member, Hyper Suprime-Cam Subaru Strategic Program (HSC-SSP) (11/2023 – present)

Research Fellow [equivalent to *Full Professor*], ASIAA (01/2014 – present)

Kavli Visiting Scholar, Kavli Institute for Astronomy and Astrophysics, Peking University (2016)

Associate Research Fellow [*tenured*], ASIAA (01/2010 – 12/2013)

Adjunct Research Fellow, LeCosPA Center, National Taiwan University (NTU) (01/2008 – 12/2012)

Tenure-track Assistant Research Fellow, ASIAA (06/2006 – 12/2009)

Faculty Staff Scientist [*Assistant Project Scientist for AMiBA*], ASIAA (07/2005 – 05/2006)

Postdoctoral Fellow, ASIAA (06/2001 – 06/2005)

## Education

Ph.D. in Astronomy, Tohoku University, Japan (04/1998 – 03/2001)

M.Sc. in Astronomy, Tohoku University, Japan (04/1996 – 03/1998)

B.Sc. in Physics, Tohoku University, Japan (04/1992 – 03/1996)

## Summary of Publications (source: NASA Astrophysics Data System)

- **Total Publications:** 201 papers in peer-reviewed scientific journals, with an *h*-index of 62
- **First/Corresponding Author Publications:** 22 papers with > 1750 citations, including 8 papers each cited > 100 times (Umetsu 2020; Umetsu et al. 2008, 2009, 2011a, 2011b, 2012, 2014, 2016)
- **First/Second Author Publications:** 46 papers with > 2700 citations, including 10 each cited > 100 times
- **Major Contribution Publications:** 76 papers where I am among the first three authors or where my mentee serves as the first author, including 18 papers each cited > 100 times

## Honors and Awards

Academia Sinica Presidential Scholars Program<sup>(1)</sup> [中央研究院特優學術研究獎金] (2023 – 2026)

Academia Sinica Investigator Award<sup>(2)</sup> [中央研究院深耕計畫獲獎] (2023 – 2027)

Invited Review Article in *The Astronomy and Astrophysics Review*, Springer Nature<sup>(3)</sup> (2020)

Outstanding Research Award<sup>(4)</sup>, Ministry of Science and Technology [台灣科技部傑出研究獎] (2018)

Academia Sinica Investigator Award<sup>(2)</sup> [中央研究院深耕計畫獲獎] (2018 – 2022)

Academia Sinica Significant Research Achievements<sup>(5)</sup> [中央研究院重要研究成果專刊] (2015)

Academia Sinica Significant Research Achievements<sup>(5)</sup> [中央研究院重要研究成果專刊] (2013)

PASJ Excellent Paper Award<sup>(6)</sup>, Astronomical Society of Japan (2012)

Academia Sinica Significant Research Achievements<sup>(5)</sup> [中央研究院重要研究成果專刊] (2011)

Academia Sinica Award for Junior Research Investigators<sup>(4)</sup> [中央研究院年輕學者研究著作獎] (2011)

Founding Member, 524-orbit Hubble Multi-Cycle Treasury Program “CLASH”, USA<sup>(7)</sup> (2010 – 2013)

Academia Sinica Career Development Award<sup>(2)</sup> [中央研究院前瞻計畫獲獎] (2009 – 2013)

Invited Lecturer, International School of Physics “Enrico Fermi”, Course CLXXII, Italy (2008)

(1) Awarded a 50% increase in total salary for a three-year period

(2) Five-year research grants awarded to outstanding faculty researchers at Academia Sinica

(3) K. Umetsu, “Cluster–Galaxy Weak Lensing”, *Astron. Astrophys. Rev.*, 28(1), 7 (December 2020) [100 citations]

(4) National academic prizes for Taiwan-based professors with exceptional research achievements

(5) First-author papers selected as representative publications of Academia Sinica

(6) Annual award for the authors of the most outstanding paper published in the *Publ. Astron. Soc. Japan* (PASJ): [N.](#)

[Okabe](#), [M. Takada](#), [K. Umetsu](#), [T. Futamase](#), & [G. P. Smith](#), **PASJ**, 62, 811 (June 2010) [287 citations]  
(7) One of NASA's three premier Multi-Cycle Treasury programs with the Hubble Space Telescope (HST)

## Research Interests and Expertise

- Physical Cosmology: Cosmic Structure Formation; Dark Matter; Gravitational Lensing
- Galaxy Clusters: Sunyaev–Zel'dovich Effects; X-ray Astronomy; Multi-probe Analysis; Radio Interferometry
- Theoretical Astrophysics: Dynamics of Collisionless Systems; Plasma Physics; Hydrodynamics
- Statistical Methods: Bayesian and Frequentist Approaches; Backward and Forward Modeling

## Professional Activities

- Referee for: *Astronomy & Astrophysics* (A&A), EDP Sciences, France
- Referee for: *Journal of Cosmology and Astroparticle Physics* (JCAP), Italy
- Referee for: *Monthly Notices of the Royal Astronomical Society* (MNRAS), UK
- Referee for: *The Astrophysical Journal* (ApJ), American Astronomical Society, USA
- Referee for: *The Astrophysical Journal Letters* (ApJL), American Astronomical Society, USA
- Referee for: *Physical Review D* (PRD), American Physical Society, USA
- Referee for: *LSST Dark Energy Science Collaboration Notes*, Rubin Observatory, USA
- Research proposal reviewer for: *French National Research Agency* (ANR), France
- Research proposal reviewer for: *Netherlands Organisation for Scientific Research* (NWO), Netherlands
- Research proposal reviewer for: *Swiss National Science Foundation* (SNSF), Switzerland
- Research proposal reviewer for: *National Science and Technology Council* (NSTC), Taiwan — formerly known as *Ministry of Science and Technology* (MOST) and *National Science Council* (NSC)
- Observing proposal reviewer for: *Canada–France–Hawaii Telescope* (CFHT)
- Observing proposal reviewer for: *Magellan Telescopes*
- Observing proposal reviewer for: *Subaru Telescope*
- Observing proposal reviewer for: *XRISM X-ray Satellite*
- External reviewer for: Promotion to Assistant Research Professor, *California Institute of Technology*, USA
- External reviewer for: Promotion to Research Professor (tenured), *California Institute of Technology*, USA
- External examiner for: PhD candidates at universities in Taiwan, Hong Kong, India, and Italy
- On-site commissioning and science verification of the AMiBA interferometer in Hawaii (2002 – 2007), leading to key publications including: [K. Umetsu et al.](#), “*Mass and Hot Baryons in Massive Galaxy Clusters from Subaru Weak-Lensing and AMiBA Sunyaev-Zel’Dovich Effect Observations*”, **ApJ**, 694(2), 1643 (April 2009) [102 citations]

## Research Grants Awarded as Principal Investigator

Summary — Received a total of  $\approx$  2.7 million USD as Principal Investigator (PI), all converted at 30 NTD to 1 USD.

PI, NSTC 112-2112-M-001-027-MY3	NSTC	132K USD	(08/2023 – 07/2026)
PI, AS-IA-112-M04 <sup>(1)</sup>	Academia Sinica	817K USD	(01/2023 – 12/2027)
PI, MOST 109-2112-M-001-018-MY3	MOST (NSTC)	128K USD	(08/2020 – 03/2024)
PI, AS-IA-107-M01 <sup>(1)</sup>	Academia Sinica	800K USD	(01/2018 – 12/2022)
PI, MOST 106-2628-M-001-003-MY3 <sup>(2)</sup>	MOST (NSTC)	186K USD	(08/2017 – 07/2021)
PI, MOST 103-2112-M-001-003-MY3	MOST (NSTC)	11K USD	(01/2016 – 07/2016)
PI, MOST 103-2112-M-001-030-MY3	MOST (NSTC)	90K USD	(08/2014 – 10/2017)
PI, NSC 100-2112-M-001-008-MY3	NSC (NSTC)	55K USD	(08/2011 – 07/2014)
PI, AS-98-CDA-M05 <sup>(3)</sup>	Academia Sinica	370K USD	(01/2009 – 12/2013)
PI, NSC 95-2112-M-001-020-MY3	NSC (NSTC)	62K USD	(08/2008 – 01/2012)
PI, NSC 95-2112-M-001-074-MY2	NSC (NSTC)	63K USD	(10/2006 – 07/2008)

(1) Academia Sinica Investigator Award [中央研究院深耕計畫獲獎]

(2) Research grant for Excellent Junior Research Investigators, MOST [科技部優秀年輕學者研究計畫獲獎]

(3) Academia Sinica Career Development Award [中央研究院前瞻計畫獲獎]

## Teaching Experience

- Guest lecturer for General Astronomy, Yuan-Zhe University, Taiwan, November 21, 2019 **[invited]**: Delivered a 1.5-hour lecture titled “*My Journey through Taiwan: from Gravitational Lensing to Dark Matter*”
- Lecturer for ASIAA Summer Student Program, ASIAA, August 4, 2011: Presented on “*Cosmology*”
- Lecturer for ASIAA Summer Student Program, ASIAA, July 27, 2010: Presented on “*Gravitational Lensing and Observational Cosmology*”
- Lecturer for TIARA Winter School on Galaxies and Stellar Clusters, NTHU, Taiwan, January 25–29, 2010 **[invited]**: Presented on “*Lensing and AMiBA Studies of Galaxy Clusters*”
- Lecturer for Joint LeCosPA-FGCPA Summer School on Cosmology, NTU, Taiwan, June 20–23, 2009 **[invited]**: Delivered two 80-minute lectures on
  - “*The Large-Scale Structure in the Universe (I)*”
  - “*The Large-Scale Structure in the Universe (II)*”
- Lecturer for International School of Physics “Enrico Fermi”, Course CLXXII: Astrophysics of Galaxy Clusters, Varenna, Italy, July 15–25, 2008 **[invited]**: Delivered two 60-minute lectures on
  - “*Cluster Weak Gravitational Lensing*”
  - “*CMB Interferometer*”
- Guest lecturer for Department of Physics, NTU, Taiwan, May 12–14, 2008 **[invited]**: Taught a series of lectures (3 hours) on “*Cosmology and Gravitational Lensing*”
- Lecturer for ASIAA Summer Student Program, ASIAA, July 17, 2007: Presented on “*The AMiBA Project*”
- Lecturer for ASIAA Summer Student Program, ASIAA, August 3, 2006: Presented on “*Introduction to Gravitational Lensing*”
- Guest lecturer for Astronomical Institute, Tohoku University, June 28–July 2, 2004 **[invited]**: Taught a series of lectures (6 hours) on “*Weak Gravitational Lensing: Theory, Methods, and Applications*”

## Major International Collaborations (listed in chronological order)

Member,	Yuan-Tseh Lee Array for Microwave Background Anisotropy (AMiBA)	(2001 – 2016)
<u>Science Lead,</u>	7-element AMiBA Experiment	(2005 – 2010)
Member,	Local Cluster Substructure Survey (LoCuSS)	(2005 – 2016)
Member,	Hyper Suprime-Cam Subaru Strategic Program (HSC-SSP)	(2007 – present)
Member,	Cluster Lensing and Supernova Survey with Hubble (CLASH)	(2009 – 2017)
Principal Investigator,	CLASH Subaru Telescope Suprime-Cam Program	(2009 – 2014)
<u>Principal Investigator,</u>	CLASH Caltech Submm Observatory (CSO) Bolocam Program	(2011 – 2013)
Member,	CLASH-VLT Survey	(2011 – present)
Member,	XMM Ultimate Extragalactic Survey (XXL)	(2011 – present)
Member,	J-PAS Survey	(2013 – present)
Member,	Subaru Prime Focus Spectrograph (PFS) Collaboration	(2014 – present)
Member,	Reionization Lensing Cluster Survey (RELICS)	(2015 – present)
Member,	Joint HSC-XXL Working Group, HSC-XXL Collaboration	(2016 – present)
Member,	Galaxy Clusters at Vircam (GCAV, VISTA Public Survey)	(2016 – present)
Member,	Beyond Ultra-deep Frontier Fields and Legacy Observations (BUFFALO)	(2017 – present)
Member,	Cluster Heritage Project with XMM-Newton (CHEX-MATE)	(2018 – present)
Member,	ALMA Lensing Cluster Survey (ALCS)	(2018 – present)
Member,	Local Volume Complete Cluster Survey (LoVoCCS)	(2018 – present)
Member,	SkyPy Collaboration	(2020 – present)
<u>Co-Chair,</u>	XMM-Newton Heritage Program: CHEX-MATE, Lensing Working Group	(2020 – present)
Key Project Coordinator,	XMM-Newton Heritage Program: CHEX-MATE, KP3 & KP4	(2021 – present)
<u>Executive Board Member</u>	HSC-SSP	(2023 – present)
<u>Steering Committee Member</u>	XMM-Newton Heritage Program: CHEX-MATE	(2023 – present)

## Institutional Leadership and Management Experience (as Chair only)

Highlights — Led faculty searches as Chair at ASIAA (2017, 2018, 2019, 2021).

Chair,	Faculty Search Committee, ASIAA	(12/2016 – 03/2021)
Chair,	Taiwanese Time Allocation Committee for CFHT	(2018A, 2018B, 2019A, 2019B)
Coordinator,	ASIAA–NTU Joint Colloquium Series	(12/2015 – 01/2018)
Chair,	Research Manpower Committee, ASIAA	(01/2011 – 09/2012)
Chair,	Postdoctoral Search and Liaison Committee, ASIAA	(04/2009 – 09/2012)

## Organization of Scientific Meetings

### • Scientific Organizing Committee (SOC) Member

- “The 11th KIAS Workshop on Cosmology and Structure Formation”, Seoul, Korea (10/2024)
- “The 10th KIAS Workshop on Cosmology and Structure Formation”, Seoul, Korea (10/2022)
- “The 9th KIAS Workshop on Cosmology and Structure Formation”, Seoul, Korea (11/2020)
- “Panchromatic Panoramic Studies of Galaxy Clusters”, ASIAA (03/2019)
- “The 8th KIAS Workshop on Cosmology and Structure Formation”, Seoul, Korea (11/2020)
- “TIARA Summer School on Astrostatistics and Big Data”, ASIAA (09/2017)
- “Subaru HSC Sciences on Variable and Transients”, NCU, Taiwan (12/2009)
- “AMiBA Workshop”, Hilo, Hawaii, USA (09/2005)

### • Organizer / Co-organizer

- Organizer, “Subaru HSC Survey Collaboration Meeting”, ASIAA (01/2016)
- Co-organizer, “Photometric Redshifts for Large Scale Surveys”, ASIAA (09/2013)
- Co-organizer, “DENET Subaru HSC Workshop”, ASIAA (03/2011)
- Co-organizer, “Taiwan-Japan Subaru HSC Science Mini Workshop”, ASIAA (12/2008)
- Co-organizer, “Subaru-ASIAA Mini Workshop”, ASIAA (03/2008)

## Observing Awards (as PI only)

PI,	2020A	”Homogeneous Weak Lensing Masses of the Reference XMM-Heritage Cluster Sample (II)”	(CFHT)
PI,	2019B	”Homogeneous Weak Lensing Masses of the Reference XMM-Heritage Cluster Sample”	(CFHT)
PI,	2010A	”Constraining the Galaxy Population Evolution in Clusters of Galaxies”	(CFHT)
PI,	2007B	”Testing the Cold Dark Matter Paradigm with Cluster Gravitational Lensing”	(CFHT)
PI,	2007A	”Testing the Cold Dark Matter Paradigm with Cluster Gravitational Lensing”	(CFHT)
PI,	2013B	”A Unique Cluster Mass Profile Dataset from an HST-Subaru Survey Program IV”	(Subaru)
PI,	2013A	”A Unique Cluster Mass Profile Dataset from an HST-Subaru Survey Program III”	(Subaru)
PI,	2012A	”A Unique Cluster Mass Profile Dataset from an HST-Subaru Survey Program II”	(Subaru)
PI,	2010B	”A Unique Cluster Mass Profile Dataset from an HST-Subaru Survey Program”	(Subaru)
PI,	2008A	”Subaru Weak Lensing Study of Merging Galaxy Clusters IIb”	(Subaru)
PI,	2007B	”Subaru Weak Lensing Study of Merging Galaxy Clusters II”	(Subaru)
PI,	2000	”Weak Lensing Survey in a High Redshift Supercluster Field”	(Subaru)
PI,	2011B	”Dark Matter and Baryons in Hubble Treasury Clusters (III)”	(CSO)
PI,	2011A	”Dark Matter and Baryons in Hubble Treasury Clusters (II)”	(CSO)
PI,	2010B	”Dark Matter and Baryons in Hubble Treasury Clusters”	(CSO)

## Public Education and Outreach

- Public lecture [in Chinese] for Prospect Lecture Series: 100 Years of Spacetime Distortion [2019 展望系列科學普及演講], NTU, Taiwan, May 31, 2019: “*Looking at Dark Matter through Gravitational Lenses*”
- Interviewed [in Chinese] at the MOST Outstanding Research Award Ceremony by Unique Satellite TV (USTV), Taiwan, May 24, 2019
- Public lecture [in Chinese] for ASIAA Outreach Activity, NTU Azalea Festival 2017, Taiwan, March 11, 2017: “*Gravitational Lensing in the Universe*”
- Interviewed [in Chinese] by Central News Agency, Taiwan, December 2013

- Public lecture [in Chinese] for Special Open House for NTU undergraduate students, ASIAA, April 11, 2010: “Cosmology and Extragalactic Projects at ASIAA”
- Interviewed by Scientific American Taiwan Edition, October 3, 2008
- Public lecture [in Chinese] for Special Open House for NTU undergraduate students, ASIAA, March 23, 2008: “Introduction to Cosmology”
- Public lecture [in Chinese] for NCKU/NTNU Students Visit, ASIAA, 2006: “The AMiBA Project: Introduction to Observational Cosmology”

## Languages

Japanese (native), English (fluent), Chinese (proficient in spoken)

## Visiting Scholars Hosted

Toshifumi Futamase,	Professor Emeritus, Tohoku University, Japan	(06/2023 – present)
Shutaro Ueda,	Research Scholar, NSTC, Taiwan	(08/2022 – present)
Sandor M. Molnar,	Visiting Scholar, Konkoly Observatory, Hungary	(09/2020 – present)
Adam Amara,	Professor and Head, Math/Physics, University of Surrey, UK	(01/2019 – 07/2024)
Chieh-An Lin,	Ph.D. student, CEA Saclay, France	(02/2016 – 03/2016)
Chieh-An Lin,	Ph.D. student, CEA Saclay, France	(11/2014 – 01/2015)
Hiroyuki Ikeda,	JSPS Postdoctoral Fellow, Japan	(04/2014 – 03/2015)
Tom Broadhurst,	Ikerbasque Professor, University of the Basque Country, Spain	(01/2009 – 07/2024)

## Independent Researchers and Staff Scientists Mentored (as PI only)

Chayan Mondal,	Distinguished Postdoctoral Fellow, ASIAA	(06/2024 – present)
Shouvik Roy Choudhury,	Distinguished Postdoctoral Fellow, ASIAA	(07/2023 – present)
Bau-Ching Hsieh,	Project Research Manager, ASIAA	(05/2019 – present)
Sandor M. Molnar,	Visiting Associate Professor, ASIAA	(01/2016 – 08/2020)
Bau-Ching Hsieh,	Support Scientist, ASIAA	(01/2013 – 04/2019)

## Postdoctoral Researchers Supervised (as PI only)

Sut-leng Tam,	ASIAA	(09/2020 – 07/2024) → Assistant Professor (tenure track), NYCU, Taiwan
Shutaro Ueda,	ASIAA	(04/2018 – 03/2022) → Independent Research Scholar, NSTC, Taiwan
I-Non Chiu,	ASIAA	(06/2016 – 12/2020) → Assistant Professor (tenure track), NCKU, Taiwan
Luis A. Díaz Garcia,	ASIAA	(08/2018 – 06/2020) → Severo Ochoa Fellow, IAA-CSIC, Spain
Yuichi Higuchi,	ASIAA	(05/2016 – 01/2019) → Data Scientist, Accenture, Japan
Nicole Czakon,	ASIAA	(07/2013 – 08/2016) → Data Scientist, Slack, USA
Jean Coupon,	ASIAA	(01/2012 – 09/2013) → Data Scientist, Expedia, Switzerland
Nobuhiro Okabe,	ASIAA	(06/2009 – 08/2013) → Associate Professor (tenured), Hiroshima Univ., Japan

## Graduate Students Supervised (as PI only)

Hsin Fan,	PhD, NTU/Astrophys	(11/2023 – present)	co-advised by Prof. Hsi-Yu Schive
Sut-leng Tam,	Master, NTU/Physics	(10/2014 – 08/2016)	
Li-Yen Hsu	Master, NTU/Physics	(01/2009 – 07/2010)	
Chia-Jung Shih,	Master, NTU/Astrophys	(07/2007 – 07/2009)	
James Hung-Shu Chan,	Research Assistant, ASIAA	(09/2009 – 12/2010)	
Yi-Jung Yang,	Research Assistant, ASIAA	(07/2007 – 10/2007)	

## Undergraduate Students Supervised (as PI only)

Fang-Chia Lee,	Research Assistant, ASIAA	(10/2006 – 07/2007)
Chia-Jung Shih,	ASIAA Summer Student, ASIAA	(06/2006 – 08/2006)
Yang-Ting Chien,	ASIAA Summer Student, ASIAA	(06/2002 – 08/2002)

## Talks at International Conferences

1. The 3rd CHEX-MATE Workshop, January 30–February 1, 2024 (online conferencing): “Uniform Weak-Lensing Analysis of 42 CHEX-MATE Galaxy Clusters using Amalgam2 Data”

2. CHEX-MATE ISSI Meeting, International Space Science Institute (ISSI), Switzerland, November 6 – 10, 2023 (hybrid in-person/online conferencing): *“Simulation-based Bayesian Inference for Cluster Abundance Cosmology: Updates on Pipeline Development”*
3. CHEX-MATE ISSI Meeting, International Space Science Institute (ISSI), Switzerland, November 6 – 10, 2023 (hybrid in-person/online conferencing): *“Uniform Weak-Lensing Analysis of 39 CHEX-MATE Galaxy Clusters using Amalgam2 Data”*
4. Mini Workshop on AGN and Galaxy Evolution, Yuan-Zhe University, Taiwan, August 10–11, 2023 **[invited]**: *“Testing Models of Cosmic Structure Formation with Combined Weak and Strong Gravitational Lensing in Galaxy Clusters”*
5. Lensing at Different Scales: Strong, Weak, and Synergies between the Two, Kavli Institute for Cosmological Physics (KICP) of the University of Chicago, USA, July 31–August 4, 2023 **[invited]**: *“Testing Models of Structure Formation with Combined Strong and Weak Gravitational Lensing in Galaxy Clusters”*
6. Dissecting Cluster Cosmology: toward a Roadmap for Forthcoming Cluster Surveys, Trieste (Institute for the Fundamental Physics of the Universe), Italy, July 3–7, 2023 **[invited]**: *“Cosmological Mass Calibration of Galaxy Clusters with Weak Lensing: Gaussian-Likelihood and Likelihood-Free Approaches”*
7. CHEX-MATE ISSI Meeting, International Space Science Institute (ISSI), Switzerland, November 28 – December 2, 2022 (hybrid in-person/online conferencing): *“Simulation-based Bayesian Inference”*
8. The 2022 NSTC International Researcher Workshop, Department of Natural Sciences and Sustainable Development, National Science and Technology Council (NSTC), Taiwan, November 16, 2022 **[invited]**: *“My Research with International Collaboration in Taiwan”*
9. The 2nd CHEX-MATE Workshop, November 14–16, 2022 (online conferencing): *“Preliminary Results from a Sub-sample Weak-lensing Analysis and Triaxial Mass Modeling with 2D Shear Data”*
10. 2022 Spring Symposium – Galaxy Clusters: Challenging Our Cosmological Perspectives, Space Telescope Science Institute (STScI), USA, April 25–29, 2022 (arranged as a fully virtual conference due to the COVID-19 pandemic) **[invited]**: *“Probing Dark Matter Structure with Strong and Weak Lensing from Space”*
11. A Multi-Wavelength View of Galaxy Clusters: Deriving Masses in the Era of Wide-Field Surveys, Madrid (ESA/ESAC), Spain, September 8–10, 2020 → postponed to a virtual conference on September 6–9, 2021 due to the COVID-19 pandemic **[invited review]**: *“Weak Lensing Mass Measurements and Mass Scaling Relations on Cluster–Group Scales”*
12. The 1st CHEX-MATE Workshop, February 8–10, 2021 (online conferencing due to the COVID-19 pandemic): *“Presentation of Lensing Projects”*
13. The 9th KIAS Workshop on Cosmology and Structure Formation, Seoul (Korea Institute for Advanced Study), Korea, November 2–8, 2020 (hybrid online/in-person conferencing due to the COVID-19 pandemic) **[SOC, invited]**: *“A Short Final Remark”*
14. The 9th KIAS Workshop on Cosmology and Structure Formation, Seoul (Korea Institute for Advanced Study), Korea, November 2–8, 2020 (hybrid online/in-person conferencing due to the COVID-19 pandemic) **[SOC]**: *“HSC-XXL: Weak-lensing Mass Measurements and Scaling Relations on Cluster-Group Scales”*
15. Joint XXL-HSC Collaboration Meeting, July 7–8, 2020 (online conferencing due to the COVID-19 pandemic): *“HSC-XXL: Weak Lensing Mass Measurements and Scaling Relations on Cluster-Group Scales”*
16. SkyPy Project Meeting, Manchester, UK (→ changed to an online meeting due to the COVID-19 pandemic), April 15–17, 2020 **[invited]**: *“Galaxy Cluster Modeling”*
17. The First Shanghai Assembly on Cosmology and Galaxy Formation, Shanghai (Shanghai Jiao Tong University), China, November 4–8, 2019 **[invited]**: *“Unveiling Cosmic Structure Formation by Cluster Lensing”*
18. MATERA OSCURA: Cosmology and Dark Matter within Galaxies and Clusters, Matera, Italy, September 2–6, 2019 **[invited review]**: *“Unveiling the Mass Structure of Galaxy Clusters from Lensing and Multiwavelength Observations”*
19. Sesto 2019: Tracing Cosmic Evolution with Clusters of Galaxies, Sesto, Italy, July 8–12, 2019 **[invited]**: *“Unveiling Cosmic Structure Formation with Cluster Lensing”*
20. Joint XXL-HSC Collaboration Meeting, Ovronnaz, Switzerland, July 4–5, 2019 **[invited]**: *“The Fundamental Plane of Galaxy Clusters”*
21. Joint XXL-HSC Collaboration Meeting, Ovronnaz, Switzerland, July 4–5, 2019: *“HSC Weak-lensing Analysis of XXL Clusters: the  $c$ – $M$  Relation and the  $T$ – $M$  Relation”*
22. Splashback Workshop [limited to 20 external participants], Stanford (Stanford University and SLAC), USA, April 29 – May 4, 2019: *“Possible Connection between the Halo Fundamental Plane and the Splashback Radius through Secondary Infall and Accretion”*
23. Panchromatic Panoramic Studies of Galaxy Clusters: from HSC to PFS and ULTIMATE, Taipei (ASIAA), Taiwan, March 11–13, 2019 **[SOC]**: *“HSC Weak-lensing Analysis of XXL-selected Galaxy Clusters”*

24. The 8th KIAS Workshop on Cosmology and Structure Formation, Seoul (Korea Institute for Advanced Study), Korea, November 4–9, 2018 **[SOC]**: “*Discovery of a New Fundamental Plane Dictating Galaxy Cluster Evolution from Gravitational Lensing*”
25. Cosmology Frontier in Particle Physics: Astroparticle Physics and Early Universe, Taipei (NTU), Taiwan, September 27–29, 2018 **[invited]**: “*Testing CDM Predictions with Galaxy Cluster Gravitational Lensing*”
26. The 5th Korea-Japan Workshop on Dark Energy, Daejeon (Korea Astronomy and Space Science Institute), Korea, August 6–10, 2018 **[invited]**: “*Discovery of a New Fundamental Plane Dictating Galaxy Cluster Evolution from Gravitational Lensing*”
27. Hiroshima HSC-XXL Collaboration Meeting, Hiroshima (Hiroshima University), July 16–19, 2018: “*Update on the HSC Weak-lensing Analysis of XXL Galaxy Clusters*”
28. SnowCluster 2018: The Physics of Galaxy Clusters, Snowbird, Utah, USA, March 18–23, 2018 **[invited]**: “*Discovery of a New Fundamental Plane Dictating Galaxy Cluster Evolution from Gravitational Lensing*”
29. 2018 Annual Meeting of the Physical Society of Taiwan, Taipei (NTU), Taiwan, January 24–26, 2018 **[invited]** (one of 4 invited speakers in Astrophysics/Gravity & Cosmology): “*Formation and Growth of Cosmic Giants: Lensing View of Galaxy Cluster Halos*”
30. First of a three-part conference series (Asia/Australia, America, Europe) organized by UCLA: Shedding Light on the Dark Universe with Extremely Large Telescopes, Lanzhou, China, August 30–September 2, 2017 **[invited]**: “*Testing LCDM Predictions with Cluster Lensing in the ELT Era*”
31. Exploring Dark Matter and Dark Ages with Lensing Clusters, Sesto, Italy, July 24–28, 2017 **[invited]**: “*Characterizing Galaxy Clusters with Gravitational Lensing: Halo Shape and Splashback Radius*”
32. ESAC Joint HSC-XXL Workshop, Madrid (European Space Astronomy Centre), Spain, May 9–12, 2017: “*HSC Weak-lensing Analysis of XXL Galaxy Clusters*”
33. Subaru International Partnership Science and Instrumentation Workshop, Tokyo (NAOJ), Japan, March 22–24, 2017 **[invited]**: “*Cluster Gravitational Lensing with Subaru*”
34. The 10th East Asian Meeting on Astronomy (EAMA10), Seoul (Seoul National University), Korea, September, 27–30, 2016 **[invited]**: “*Ensemble Mass Distribution of Galaxy Clusters from the CLASH Survey*”
35. European Week of Astronomy and Space Science 2016 (Session 6: Exploring the Outskirts of Galaxy Clusters), Athens, Greece, July 4–8, 2016: “*Ensemble Mass Distribution of Galaxy Clusters from the CLASH Survey: Splashback Radius*”
36. RELICS Collaboration Meeting, Tuscon (Steward Observatory), USA, March 2–4, 2016: “*Cluster Weak Gravitational Lensing: CLASH to RELICS*”
37. Clusters with Nick Kaiser Day, Hong Kong (IAS/HKUST), February 17, 2016 **[invited]**: “*Recent Progress in Cluster Weak Lensing*”
38. CLASH-VLT Collaboration Meeting 2015, Florence, Italy, September 23–25, 2015: “*Mass Distribution of CLASH Galaxy Clusters from Full Lensing Analysis*”
39. The 6th KIAS Workshop on Cosmology and Structure Formation, Seoul (Korea Institute for Advanced Study), Korea, November 3–6, 2014 **[invited]**: “*Subaru Shear-and-Magnification Weak-Lensing Analysis of CLASH Galaxy Clusters*”
40. Synergy of HSC and Hiroshima CORE-U Projects, Hiroshima (Hiroshima University), Japan, August 27, 2014 **[invited]**: “*Subaru Weak-Lensing Shear and Magnification Analysis of CLASH Galaxy Clusters*”
41. Clusters Paris 2014: Future Directions in Galaxy Cluster Surveys, Paris, France, June 23–27, 2014 **[invited]**: “*CLASH: Subaru Weak-Lensing Results*”
42. PASCOS 2013: 19th International Symposium on Particles, Strings and Cosmology, Taipei, Taiwan, November 20–26, 2013 **[invited]**: “*Mass Distribution in and around Galaxy Clusters from Gravitational Lensing*”
43. CLASH Collaboration Meeting 2013, London (Royal Astronomical Society), UK, September 16–18, 2013: “*CLASH Weak-Lensing Shear+Magnification Analysis*”
44. Copenhagen-Asia-America Network for Dark cosmology (CAANDY) kick-off meeting, Copenhagen (DARK Cosmology Centre), Denmark, August 12–17, 2013 **[invited]**: “*Cosmology and Cluster Astrophysics Programs at AS/AA*”
45. Sesto 2013: Tracing Cosmic Evolution with Clusters of Galaxies, Sesto, Italy, July 1–5, 2013 **[invited review]**: “*Cluster Mass Distribution from Weak-Lensing Shear and Magnification*”
46. CLASH Collaboration Meeting 2012, Bilbao, Spain, October 16–19, 2012: “*CLASH Stacked Lensing Analysis*”
47. CLASH Collaboration Meeting 2011, Heidelberg, Germany, October 17–19, 2011: “*CLASH Subaru Weak-Lensing and Sunyaev-Zel'dovich Effect Analysis*”
48. SZX HUNTSVILLE 2011: Cosmology with X-ray and Sunyaev-Zeldovich Effect Observations of Galaxy Clusters,

- Huntsville, USA, September 19–22, 2011 **[invited]**: “*Mass and Hot Baryons from Cluster Lensing and SZE Observations*”
49. XXL Consortium Meeting, Corsica, France, May 2–6, 2011 **[invited]**: “*Cluster Weak Gravitational Lensing With Subaru Observations*”
  50. DENET 2011 Subaru HSC Workshop, Taipei (ASIAA), Taiwan, March 7–8, 2011 **[SOC]**: “*Cluster Weak Lensing*”
  51. APCTP Topical Research Program 2010: Recent Progress in Dark Universe and Astrophysics, Seoul, Korea, December 16–17, 2010 **[invited]**: “*Galaxy Cluster Gravitational Lensing as a Cosmological Probe*”
  52. Horiba International Conference: COSMO/CosPA 2010, Tokyo (University of Tokyo), Japan, September 26 – October 1, 2010 **[invited]**: “*Probing the Distribution of Mass in Clusters of Galaxies using Weak + Strong Gravitational Lensing*”
  53. CLASH Collaboration Meeting 2010, Granada (IAA-CSIC), Spain, September 20-21, 2010: “*CLASH Sunyaev-Zel’dovich Effect Observations*”
  54. CMB Workshop, Tokyo (NAOJ), Japan, June 7–9, 2010 **[invited]**: “*The AMiBA Project and the Cluster Cosmology Program in Taiwan*”
  55. Science Opportunities with Wide-Field Imaging and Spectroscopy of the Distant Universe, Princeton, USA, November 9–11, 2009: “*Cluster Lensing Science with HSC: Distortion, Depletion, and Dilution*”
  56. Japan-Princeton Subaru HSC Science/Survey Workshop, Tokyo (NAOJ), Japan, January 17–20, 2009 **[invited]**: “*Cluster Multiwavelength Studies*”
  57. Taiwan-Japan Subaru-HSC Science/Survey Mini Workshop, Taipei (ASIAA), Taiwan, December 22, 2008 **[SOC]**: “*HSC Weak Lensing and AMiBA SZE Observations of Galaxy Clusters*”
  58. Subaru-ASIAA Mini Workshop on Galaxies and Clusters of Galaxies, Taipei (ASIAA), Taiwan, March 5–6, 2008 **[SOC]**: “*Weak Gravitational Lensing by Galaxy Clusters and Cluster Subhalos*”
  59. Subaru Users Meeting 2007: New Strategy of Subaru (II), Tokyo (NAOJ), Japan, January 29–31, 2008 **[invited]**: “*ASIAA Research Highlights and Prospects with HSC*”
  60. CosPA 2007: International Symposium on Cosmology and Particle Astrophysics, Taipei (NTU), Taiwan, November 13–15, 2007 **[invited]**: “*A Moment Method for Measuring the Higher-Order Weak Lensing Effects*”
  61. Asia Science Forum, Sendai (Sendai International Center), Japan, September 10–11, 2007 **[invited]**: “*Progress of the AMiBA Project*”
  62. The 21st Century Center-of-Excellence Program “Exploring New Science by Bridging Particle-Matter Hierarchy”, Sendai (Tohoku University), Japan, February 14–16, 2007 **[invited]**: “*Status of the AMiBA Project*”
  63. CosPA 2006: International Symposium on Cosmology and Particle Astrophysics, Taipei (NTU), Taiwan, November 15–17, 2006 **[invited]**: “*Probing the Distribution of Mass in Galaxy Clusters using Subaru Weak Lensing Observations*”
  64. Zao Cluster Workshop, Zao, Japan, October 24–26, 2006 **[invited]**: “*Weak Lensing Analysis of Galaxy Clusters*”
  65. AMiBA/WIRCam Project Review Meeting, Hilo (SMA Hilo Office), Hawaii, USA, March 9–10, 2006: “*SZE Science with AMiBA*”
  66. Inaugural Japan-Taiwan ALMA Science Workshop, Taipei, Taiwan, December 15–16, 2005 **[invited]**: “*SZ Science with AMiBA and ALMA*”
  67. AMiBA Workshop, Hilo (SMA Hilo Office), Hawaii, USA, September 24–25, 2005 **[SOC]**: “*Cluster Science with AMiBA*”
  68. East Asian Young Astronomers Meeting 2003, Taipei (Tienlai Spring Resort), Taiwan, November 9–12, 2003: “*Simulation of a Combined SZE and Weak Lensing Cluster Survey for the AMiBA Experiment*”
  69. AMiBA 2001: High-z Clusters, Missing Baryons, and CMB Polarization, June 11-15, 2001, Taipei and Taroko National Park, Taiwan: “*Weak Lensing Analysis of the High Redshift Cluster MS1054-03*”

## Selected Colloquia and Seminars

1. Colloquium, Physics Department, National Cheng Kung University, Taiwan, March 17, 2023 **[invited]**: “*Testing the Collisionless Nature of Dark Matter using Gravitational Lensing in Galaxy Clusters*”
2. Colloquium, South-Western Institute for Astronomy Research (SWIFAR), Yunnan University, China (online conferencing due to the COVID-19 pandemic), September 3, 2020 **[invited]**: “*Unveiling Cosmic Structure Formation by Cluster Weak Lensing*”
3. HSC Online Seminar Series, Subaru HSC Collaboration (Japan, Taiwan, USA+), June 16, 2020 **[invited]**: “*HSC-XXL: Weak-lensing Mass Measurements and Scaling Relations on Cluster-Group Scales*”
4. Student Seminar [organized by NTU/Physics undergrad students], ASIAA, May 28, 2019 **[invited]**: “*Gravitational Lensing by Galaxy Clusters*”



5. Seminar, Leung Center for Cosmology and Particle Astrophysics (LeCosPA), NTU, Taiwan, October 22, 2018 **[invited]**: *“Testing Cold Dark Matter Models with Galaxy Cluster Gravitational Lensing”*
6. Astronomy Colloquium, Department of Physics and Institute of Astronomy, National Tsing-Hua University, Taiwan, October 5, 2018 **[invited]**: *“Testing CDM Predictions with Galaxy Cluster Gravitational Lensing”*
7. Seminar, High-Energy Theory Group, Institute of Physics, Academia Sinica, Taiwan, September 19, 2018 **[invited]**: *“Testing CDM Predictions with Galaxy Cluster Gravitational Lensing”*
8. Student Seminar [organized by NTU/Physics undergrad students], ASIAA, May 4, 2017 **[invited]**: *“Galaxy Clusters as Cosmic Lenses”*
9. Colloquium, Institute of Astronomy, National Central University, Taiwan, December 2, 2016 **[invited]**: *“Lensing Constraints on the Mass Profile Shape and Splashback Radius of Galaxy Clusters”*
10. Seminar, National Astronomical Observatories of China, Chinese Academy of Sciences, China, May 20, 2016 **[invited]**: *“Ensemble Mass Distribution of Galaxy Clusters from the CLASH Survey: Concentration–Mass Relation, Stacked Mass Profile, and Splashback Radius”*
11. Colloquium, Department of Astronomy, Shanghai Jiaotong University, China, May 16, 2016 **[invited]**: *“Ensemble Mass Distribution of Galaxy Clusters from the CLASH Survey: Concentration-Mass Relation, Stacked Mass Profile, and Splashback Radius”*
12. Seminar, Key Lab for Astrophysics, Shanghai Normal University, China, May 13, 2016 **[invited]**: *“Ensemble Mass Distribution of Galaxy Clusters from the CLASH Survey: Concentration–Mass Relation, Stacked Mass Profile, and Splashback Radius”*
13. KIAA-PKU Colloquium, Kavli Institute for Astronomy & Astrophysics, Peking University, China, May 11, 2016 **[invited]**: *“Ensemble Mass Distribution of Galaxy Clusters from the CLASH Survey: Concentration–Mass Relation, Stacked Mass Profile, and Splashback Radius”*
14. Student Seminar [organized by NTU/Physics undergrad students], ASIAA, November 19, 2015 **[invited]**: *“Gravitational Lensing by Galaxy Clusters”*
15. Colloquium, Astronomical Institute, Tohoku University, Japan, June 30, 2015 **[invited]**: *“The Full Strength of Cluster Gravitational Lensing: Mass Distribution in and around Cosmic Giants from the CLASH Survey”*
16. Seminar, Department of Physics, University of Hong Kong, Hong Kong, December 4, 2014 **[invited]**: *“The Full Strength of Cluster Gravitational Lensing: Distribution of Matter in and around Cosmic Giants from the CLASH Survey”*
17. HEP Seminar, National Center for Theoretical Sciences, National Tsing-Hua University, Taiwan, September 18, 2014 **[invited]**: *“Weak Gravitational Lensing Effects by Galaxy Clusters”*
18. Astrophysics Colloquium, NASA Jet Propulsion Laboratory (JPL), USA, April 24, 2014 **[invited]**: *“CLASH: Weak-Lensing Shear and Magnification Analysis of 20 Galaxy Clusters”*
19. Colloquium, Institute of Astronomy, National Tsing-Hua University, Taiwan, April 20, 2012 **[invited]**: *“Clusters of Galaxies as Cosmic Lenses”*
20. Colloquium, Institute of Physics, Academia Sinica, Taiwan, June 21, 2011 **[invited]**: *“Galaxy Cluster Gravitational Lensing as Cosmological Probes”*
21. Colloquium, Department of Physics, Hokkaido University, Japan, June 11, 2010 **[invited]**: *“Galaxy Cluster Gravitational Lensing as a Cosmological Probe”*
22. Colloquium, Institute of Astronomy, National Central University, Taiwan, April 9, 2010 **[invited]**: *“Probing the Dark Matter Density Profile by Galaxy Cluster Gravitational Lensing”*
23. Astrophysics Seminar in Fall Semester, Department of Physics, NTU, Taiwan, November 6, 2008 **[invited]**: *“Cluster Weak Lensing and Sunyaev-Zel’dovich Effects in AMiBA Galaxy Clusters”*
24. Astrophysics Seminar in Spring Semester, Department of Physics, NTU, Taiwan, May 29, 2008 **[invited]**: *“Testing LCDM with Cluster Gravitational Lensing”*
25. Colloquium, Institute of Astronomy, National Central University, Taiwan, April 20, 2007 **[invited]**: *“Gravitational Lensing in Galaxy Clusters”*
26. Seminar, National Center for Theoretical Sciences, NTU, Taiwan, November 30, 2006 **[invited]**: *“Probing Dark Energy and Dark Matter with Gravitational Lensing”*

# Selected Key Publications of Keiichi Umetsu

I am an astrophysicist best known for my observational work on galaxy clusters and dark matter using gravitational lensing and complementary astrophysical data sets. In addition to my independent research, I have played key leadership roles in several international collaboration projects, including the Taiwan-led AMiBA project (2001–2010), NASA's Multi-Cycle Treasury program with the Hubble Space Telescope: CLASH (2009 – 2017), ESA's XMM-Newton XXL survey (2011 – present), and ESA's XMM-Newton Heritage program: CHEX-MATE (2018 – present). Leading weak gravitational lensing studies in these international collaborations has been crucial to my research success.

In terms of publication impact, I have 7 first-author publications each cited over 100 times and another close to this mark (source: NASA Astrophysics Data System), all published after becoming a faculty member at ASIAA (2006–present). My contributions to weak gravitational lensing by galaxy clusters have been recognized by **The Astronomy and Astrophysics Review**, Springer Nature (2023 5-year Impact Factor: 29.1), which invited me to write a peer-reviewed review article on the theory and applications of this critical subject (Umetsu 2020). Since its publication in December 2020, the article has already been cited over 90 times.

- An asterisk (\*) indicates the corresponding author of each article.
- Double underlined authors are students or postdoctoral researchers who contributed to the publication while working under my supervision.
- Publications are listed in descending chronological order.
- Citation counts are based on the NASA Astrophysics Data System (ADS).

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1. Keiichi Umetsu\*, Shutaro Ueda, Bau-Ching Hsieh, Mario Nonino, I-Non Chiu, Masamune Oguri, Sandor M. Molnar, Anton M. Koekemoer, & Sut-leng Tam, “Line-of-sight Elongation and Hydrostatic Mass Bias of the Frontier Fields Galaxy Cluster Abell 370”, **The Astrophysical Journal**, 934(2), 169 (August 2022) [6 citations]  
→ Conducted a combined weak gravitational lensing and X-ray analysis on one of the most massive cosmic lenses on the sky targeted by the Hubble Frontier Fields and BUFFALO programs
  2. Sut-leng Tam, Keiichi Umetsu\*, & Adam Amara, “Likelihood-free Forward Modeling for Cluster Weak Lensing and Cosmology”, **The Astrophysical Journal**, 925(2), 145 (February 2022) [6 citations]  
→ First to develop a likelihood-free forward-modeling framework for Bayesian cosmological inference using the abundance of galaxy clusters combined with weak-lensing mass calibration
  3. Keiichi Umetsu\*, “Cluster–Galaxy Weak Lensing”, **The Astronomy and Astrophysics Review**, 28(1), 7 (December 2020) [100 citations]  
→ Invited to write a peer-reviewed review article on cluster weak gravitational lensing for *The Astronomy and Astrophysics Review*, Springer Nature (2023 5-year Impact Factor: 29.1)  
→ Cited at least 100 times
  4. Keiichi Umetsu\*, Mauro Sereno, Maggie Lieu, Hironao Miyatake, Elinor Medezinski, Atsushi J. Nishizawa, Paul Giles, Fabio Gastaldello, Ian G. McCarthy, Martin Kilbinger, Mark Birkinshaw, Stefano Ettori, Nobuhiro Okabe, I-Non Chiu, Jean Coupon, Dominique Eckert, Yutaka Fujita, Yuichi Higuchi, Elias Koulouridis, Ben Maughan, Satoshi Miyazaki, Masamune Oguri, Florian Pacaud, Marguerite Pierre, David Rapetti, & Graham P. Smith, “Weak-lensing Analysis of X-Ray-selected XXL Galaxy Groups and Clusters with Subaru HSC Data”, **The Astrophysical Journal**, 890(2), 148 (February 2020) [60 citations]  
→ Led the HSC weak-lensing mass calibration of the XXL X-ray-selected sample of galaxy groups and clusters  
→ Cited at least 50 times
  5. Keiichi Umetsu\*, Mauro Sereno, Sut-leng Tam, I-Non Chiu, Zuhui Fan, Stefano Ettori, Daniel Gruen, Teppei Okumura, Elinor Medezinski, Megan Donahue, Massimo Meneghetti, Brenda Frye, Anton Koekemoer, Tom Broadhurst, Adi Zitrin, Italo Balestra, Narciso Benitez, Yuichi Higuchi, Peter Melchior, Amata Mercurio, Julian Merten, Alberto Molino, Mario Nonino, Marc Postman, Piero Rosati, Jack Sayers, & Stella Seitz, “The Projected Dark and Baryonic Ellipsoidal Structure of 20 CLASH Galaxy Clusters”, **The Astrophysical Journal**, 860(2), 104 (June 2018) [54 citations]  
→ First detection of the close alignment of dark matter and hot gas shapes in galaxy clusters  
→ Cited at least 50 times
  6. Keiichi Umetsu\* & Benedkt Diemer, “Lensing Constraints on the Mass Profile Shape and the Splashback Radius of Galaxy Clusters”, **The Astrophysical Journal**, 836(2), 231 (February 2017) [78 citations]  
→ First direct lensing constraints on the splashback radius of galaxy clusters  
→ Cited at least 50 times

7. Keiichi Umetsu\*, Adi Zitrin, Daniel Gruen, Julian Merten, Megan Donahue, & Marc Postman, “*CLASH: Joint Analysis of Strong-lensing, Weak-lensing Shear, and Magnification Data for 20 Galaxy Clusters*”, **The Astrophysical Journal**, 821(2), 116 (April 2016) [201 citations]  
→ [Won the MOST Outstanding Research Award \(2018\)](#)  
→ [Cited at least 100 times](#)
8. Keiichi Umetsu\*, Mauro Sereno, Elinor Medezinski, Mario Nonino, Tony Mroczkowski, Jose M. Diego, Stefano Ettori, Nobuhiro Okabe, Tom Broadhurst, & Doron Lemze, “*Three-dimensional Multi-probe Analysis of the Galaxy Cluster A1689*”, **The Astrophysical Journal**, 806(2), 207 (June 2015) [63 citations]  
→ [Selected into Academia Sinica Publications of Significant Research Achievements \(2015\)](#)  
→ [Cited at least 50 times](#)
9. Keiichi Umetsu\*, Elinor Medezinski, Mario Nonino, Julian Merten, Marc Postman, Massimo Meneghetti, Megan Donahue, Nicole Czakon, Alberto Molino, Stella Seitz, Daniel Gruen, Doron Lemze, Italo Balestra, Narciso Benitez, Andrea Biviano, Tom Broadhurst, Holland Ford, Claudio Grillo, Anton Koekemoer, Peter Melchior, Amata Mercurio, John Moustakas, Piero Rosati, & Adi Zitrin, “*CLASH: Weak-Lensing Shear-and-Magnification Analysis of 20 Galaxy Clusters*”, **The Astrophysical Journal**, 795(2), 163 (November 2014) [259 citations]  
→ [Won the MOST Outstanding Research Award \(2018\)](#)  
→ [Cited at least 200 times](#)
10. Keiichi Umetsu\*, “*Model-Free Multi-Probe Lensing Reconstruction of Cluster Mass Profiles*”, **The Astrophysical Journal**, 769(1), 13 (May 2013) [28 citations]  
→ [Selected into Academia Sinica Publications of Significant Research Achievements \(2013\)](#)
11. Keiichi Umetsu\*, Elinor Medezinski, Mario Nonino, Julian Merten, Adi Zitrin, Alberto Molino, Claudio Grillo, Mauricio Carrasco, Megan Donahue, Andisheh Mahdavi, Dan Coe, Marc Postman, Anton Koekemoer, Nicole Czakon, Jack Sayers, Tony Mroczkowski, Sunil Golwala, Patrick M. Koch, Kai-Yang Lin, Sandor M. Molnar, Piero Rosati, Italo Balestra, Amata Mercurio, Marco Scodreggio, Andrea Biviano, Timo Anguita, Leopoldo Infante, Gregor Seidel, Irene Sendra, Stephanie Jouvel, Ole Host, Doron Lemze, Tom Broadhurst, Massimo Meneghetti, Leonidas Moustakas, Matthias Bartelmann, Narciso Benitez, Rychard Bouwens, Larry Bradley, Holland Ford, Yolanda Jimenez-Teja, Daniel Kelson, Ofer Lahav, Peter Melchior, John Moustakas, Sara Ogaz, Stella Seitz, & Wei Zheng, “*CLASH: Mass Distribution in and around the Galaxy Cluster MACS J1206.2-0847 from a Full Cluster Lensing Analysis*”, **The Astrophysical Journal**, 755(1), 56 (August 2012) [115 citations]  
→ [Cited at least 100 times](#)
12. Keiichi Umetsu\*, Tom Broadhurst, Adi Zitrin, Elinor Medezinski, Dan Coe, & Marc Postman, “*A Precise Cluster Mass Profile Averaged from the Highest Quality Lensing Data*”, **The Astrophysical Journal**, 738(1), 41 (September 2011b) [114 citations]  
→ [Highlighted in the second edition of the textbook “Extragalactic Astronomy and Cosmology” by Peter Schneider](#)  
→ [Cited at least 100 times](#)
13. Keiichi Umetsu\*, Tom Broadhurst, Adi Zitrin, Elinor Medezinski, & Li-Yen Hsu, “*Cluster Mass Profiles from a Bayesian Analysis of Weak Lensing Distortion and Magnification Measurements: Applications to Subaru Data*”, **The Astrophysical Journal**, 729(2), 127 (March 2011a) [130 citations]  
→ [Selected into Academia Sinica Publications of Significant Research Achievements \(2011\)](#)  
→ [Cited at least 100 times](#)
14. Keiichi Umetsu\*, Elinor Medezinski, Tom Broadhurst, Adi Zitrin, Nobuhiro Okabe, Bau-Ching Hsieh, & Sandor M. Molnar, “*The Mass Structure of the Galaxy Cluster Cl0024+1654 from a Full Lensing Analysis of Subaru and ACS/NIC3 Observations*”, **The Astrophysical Journal**, 714(2), 1479 (May 2010) [83 citations]  
→ [Cited at least 50 times](#)
15. Keiichi Umetsu\*, Mark Birkinshaw, Guo-Chin Liu, Jiun-Huei Protty Wu, Elinor Medezinski, Tom Broadhurst, Doron Lemze, Adi Zitrin, Paul T. P. Ho, Chih-Wei Locutus Huang, Patrick M. Koch, Yu-Wei Liao, Kai-Yang Lin, Sandor M. Molnar, Hiroaki Nishioka, Fu-Cheng Wang, Pablo Altamirano, Chia-Hao Chang, Shu-Hao Chang, Su-Wei Chang, Ming-Tang Chen, Chih-Chiang Han, Yau-De Huang, Yuh-Jing Hwang, Homin Jiang, Michael Kesteven, Derek Y. Kubo, Chao-Te Li, Pierre Martin-Cocher, Peter Oshiro, Philippe Raffin, Tashun Wei, & Warwick Wilson, “*Mass and Hot Baryons in Massive Galaxy Clusters from Subaru Weak Lensing and AMiBA Sunyaev–Zel’dovich Effect Observations*”, **The Astrophysical Journal**, 694(2), 1643 (April 2009) [103 citations]  
→ [Won the Academia Sinica Research Award for Junior Research Investigators \(2011\)](#)  
→ [Cited at least 100 times](#)
16. Keiichi Umetsu\* & Tom Broadhurst, “*Combining Lens Distortion and Depletion to Map the Mass Distribution of A1689*”, **The Astrophysical journal**, 684(1), 1776 (September 2008) [133 citations]  
→ [Cited at least 100 times](#)
17. Yuki Okura, Keiichi Umetsu\*, & Toshifumi Futamase, “*A Method for Weak-Lensing Flexion Analysis by the HOLICs Moment Approach*”, **The Astrophysical Journal**, 680(1), 1 (June 2008) [59 citations]

→ Cited at least 50 times

18. Yuki Okura, Keiichi Umetsu\*, & Toshifumi Futamase, “A New Measure for Weak-Lensing Flexion”, **The Astrophysical Journal**, 660(2), 995 (May 2007) [66 citations]

→ Cited at least 50 times

19. Keiichi Umetsu\* & Toshifumi Futamase, “Detection of Dark Matter Concentrations in the Field of CI 1604+4304 from Weak Lensing Analysis”, **The Astrophysical Journal Letters**, 539(1), L5 (August 2000) [53 citations]

→ Cited at least 50 times

# Complete List of Publications: Keiichi Umetsu

- An asterisk (\*) indicates the corresponding author of each article.
  - Double underlined authors are students or postdoctoral researchers who contributed to the publication while working under my supervision.
  - Publications in each category are listed in descending chronological order.
  - See my research website: <http://www.asiaa.sinica.edu.tw/people/cv.php?i=keiichi>
  - See my NASA/ADS library: <https://ui.adsabs.harvard.edu/public-libraries/YfVHJhW3T6K0z00QW7fi3w>
  - See my Google Scholar profile: <https://scholar.google.com/citations?user=JHAdrVOAAAJ>
  - See my ORCID profile: <https://orcid.org/0000-0002-7196-4822>
  - See my Publons profile: <https://publons.com/researcher/3921484/keiichi-umetsu/>
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## (A) Publications in Peer-reviewed Journals

1. G. Riva, G. W. Pratt, M. Rossetti, I. Bartalucci, S. T. Kay, E. Rasia, R. Gavazzi, K. Umetsu, M. Balboni, A. Bonafede, H. Bourdin, S. De Grandi, F. De Luca, D. Eckert, S. Ettori, M. Gaspari, F. Gastaldello, V. Ghirardini, S. Ghizzardi, M. Gitti11, L. Lovisari, B. J. Maughan20, P. Mazzotta, S. Molendi, E. Pointecouteau, J. Sayers, M. Sereno, & I. Towler, submitted to **A&A**  
“CHEX-MATE: the Intracluster Medium Entropy Distribution in the Gravity-dominated Regime”
2. Christian Garrel, Marguerite Pierre, Keiichi Umetsu, Sunayana Bhargava, Atsushi J. Nishizawa, Federico Marulli, Alfonso Veropalumbo, Alisson Pellissier, Lauro Moscardini, Christophe Adami, Nicolas Cerardi, Lucio Chiappetti, Nicolas Clerc, Dominique Eckert, Stefano Ettori, Arya Farahi, Fabio Gastaldello, Elias Koulouridis, Jean-Paul Le Fevre, Ben J. Maughan, Satoshi Miyazaki, Nobuhiro Okabe, Florian Pacaud, Manolis Plionis, Mauro Sereno, & Patrick Valageas, submitted to **A&A**  
“The XXL Survey LIII: The XXL-HSC Dark Energy Equation of State”
3. Shenming Fu, Ian Dell’Antonio, Zacharias Escalante, Jessica Nelson, Anthony Englert, Søren Helhoski, Rahul Shinde, Julia Brockland, Philip LaDuca, Christelyn Larkin, Lucca Paris, Shane Weiner, William K. Black, Ranga-Ram Chary, Douglas Clowe, M. C. Cooper, Megan Donahue, August Evrard, Mark Lacy, Tod Lauer, Binyang Liu, Jacqueline McCleary, Massimo Meneghetti, Hironao Miyatake, Mireia Montes, Priyamvada Natarajan, Michelle Ntampaka, Elena Pierpaoli, Marc Postman, Jubee Sohn, David Turner, Keiichi Umetsu, Yousuke Utsumi, & Gillian Wilson, **ApJ** in press (arXiv:arXiv:2402.10337)  
“LoVoCCS – II. Weak Lensing Mass Distributions, Red-Sequence Galaxy Distributions, and Their Alignment with the Brightest Cluster Galaxy in 58 Nearby X-ray-Luminous Galaxy Clusters”
4. Seiji Fujimoto, Kotaro Kohno, Masami Ouchi, Masamune Oguri, Vasily Kokorev, Gabriel Brammer, Fengwu Sun, Jorge Gonzalez-Lopez, Franz E. Bauer, Gabriel B. Caminha, Bunyo Hatsukade, Johan Richard, Ian Smail, Akiyoshi Tsujita, Yoshihiro Ueda, Ryosuke Uematsu, Adi Zitrin, Dan Coe, Jean-Paul Kneib, Marc Postman, Keiichi Umetsu, Claudia del P. Lagos, Gergo Popping, Yiping Ao, Larry Bradley, Karina Caputi, Miroslava Dessauges-Zavadsky, Eiichi Egami, Daniel Espada, R. J. Ivison, Mathilde Jauzac, Kirsten K. Knudsen, Anton M. Koekemoer, Georgios E. Magdis, Guillaume Mahler, A. M. Munoz Arancibia, Timothy Rawle, Kazuhiro Shimasaku, Sune Toft, Hideki Umehata, Francesco Valentino, Tao Wang, & Wei-Halo Wang, **ApJS** in press (arXiv:2303.01658)  
“ALMA Lensing Cluster Survey: Deep 1.2 mm Number Counts and Infrared Luminosity Functions at  $z \simeq 1-8$ ”
5. Junhan Kim, Jack Sayers, Mauro Sereno, Iacopo Bartalucci, Loris Chappuis, Sabrina De Grandi, Federico De Luca, Marco De Petris, Megan E. Donahue, Dominique Eckert, Stefano Ettori, Massimo Gaspari, Fabio Gastaldello, Raphael Gavazzi, Adriana Gavidia, Simona Ghizzardi, Asif Iqbal, Scott Kay, Lorenzo Lovisari, Ben J. Maughan, Pasquale Mazzotta, Nobuhiro Okabe, Etienne Pointecouteau, Gabriel W. Pratt, Mariachiara Rossetti, & Keiichi Umetsu, **A&A**, 686, A97 (June 2024)  
“CHEX-MATE: CLUster Multi-Probes in Three Dimensions (CLUMP-3D), I. Gas Analysis Method using X-ray and Sunyaev-Zel’dovich Effect Data”
6. Jose M. Diego, Sung Kei Li, Ashish K. Meena, Anna Niemiec, Ana Acebron, Mathilde Jauzac, Mitchell F. Struble, Alfred Amruth, Tom J. Broadhurst, Catherine Cerny, Harald Ebeling, Alexei V. Filippenko, Eric Jullo, Patrick Kelly, Anton M. Koekemoer, David Lagatutta, Jeremy Lim, Marceau Limousin, Guillaume Mahler, Nancy Patel, Juan Remolina, Johan Richard, Keren Sharon, Charles Steinhardt, Keiichi Umetsu, Liliya Williams, Adi Zitrin,

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#### (F) Dissertations

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2. Keiichi Umetsu\* (March 1998)  
**M.S. thesis:** *"Environmental Effects of Galaxy Clusters on the Mass Function of Dark Matter Halos"*  
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