

SUNAO SUGIYAMA

List of publications, talks, and press releases, Compiled on October 13, 2025

PUBLICATIONS

The up-to-date list of publication available at [ADS](#).

* = Author list alphabetized

First-author papers or co-authored papers with significant contributions

1. **Sugiyama, Sunao** and M. Park. Data Compression with Noise Suppression for Inference under Noisy Covariance. *arXiv e-prints*, arXiv:2508.14021, [August 2025:arXiv:2508.14021](#)
2. **Sugiyama, Sunao**, R. C. H. Gomes, and B. Jain. Cosmology from a joint analysis of second and third order shear statistics with Subaru Hyper Suprime-Cam Year 3 data. *arXiv e-prints*, arXiv:2508.14019, [August 2025:arXiv:2508.14019](#)
3. R. C. H. Gomes, **Sugiyama, S.**, B. Jain, et al. Dark Energy Survey Year 3 Results: Cosmological constraints from second and third-order shear statistics. *arXiv e-prints*, arXiv:2508.14018, [August 2025:arXiv:2508.14018](#)
4. R. C. H. Gomes, **Sugiyama, S.**, B. Jain, et al. Cosmology with second and third-order shear statistics for the Dark Energy Survey: Methods and simulated analysis. *arXiv e-prints*, arXiv:2503.03964, [March 2025:arXiv:2503.03964](#)
5. **Sugiyama, Sunao**, R. C. H. Gomes, and M. Jarvis. Fast modeling of the shear three-point correlation function. *arXiv e-prints*, arXiv:2407.01798, [July 2024:arXiv:2407.01798](#)
6. X. Li, T. Zhang, **Sugiyama, Sunao**, et al. Hyper Suprime-Cam Year 3 results: Cosmology from cosmic shear two-point correlation functions. *Phys. Rev. D*, 108(12):123518, [December 2023:123518](#)
7. H. Miyatake, **Sugiyama, Sunao**, M. Takada, et al. Hyper Suprime-Cam Year 3 results: Cosmology from galaxy clustering and weak lensing with HSC and SDSS using the emulator based halo model. *Phys. Rev. D*, 108(12):123517, [December 2023:123517](#)
8. S. More, **Sugiyama, Sunao**, H. Miyatake, et al. Hyper Suprime-Cam Year 3 results: Measurements of clustering of SDSS-BOSS galaxies, galaxy-galaxy lensing, and cosmic shear. *Phys. Rev. D*, 108(12):123520, [December 2023:123520](#)
9. R. Dalal, X. Li, A. Nicola, et al. Hyper Suprime-Cam Year 3 results: Cosmology from cosmic shear power spectra. *Phys. Rev. D*, 108(12):123519, [December 2023:123519](#)
10. **Sugiyama, Sunao**, H. Miyatake, S. More, et al. Hyper Suprime-Cam Year 3 results: Cosmology from galaxy clustering and weak lensing with HSC and SDSS using the minimal bias model. *Phys. Rev. D*, 108(12):123521, [December 2023:123521](#)
11. **Sugiyama, Sunao**, M. Takada, and A. Kusenko. Possible evidence of axion stars in HSC and OGLE microlensing events. *Physics Letters B*, 840:137891, [May 2023:137891](#)
12. H. Miyatake, **Sugiyama, Sunao**, M. Takada, et al. Cosmological inference from an emulator based halo model. II. Joint analysis of galaxy-galaxy weak lensing and galaxy clustering from HSC-Y1 and SDSS. *Phys. Rev. D*, 106(8):083520, [October 2022:083520](#)
13. H. Miyatake, Y. Kobayashi, M. Takada, et al. Cosmological inference from an emulator based halo model. I. Validation tests with HSC and SDSS mock catalogs. *Phys. Rev. D*, 106(8):083519, [October 2022:083519](#)

14. **Sugiyama, Sunao.** Fast Fourier Transformation Based Evaluation of Microlensing Magnification with Extended Source. *ApJ*, 937(2):63, **October 2022:63**
15. **Sugiyama, Sunao**, M. Takada, H. Miyatake, et al. HSC Year 1 cosmology results with the minimal bias method: HSC \times BOSS galaxy-galaxy weak lensing and BOSS galaxy clustering. *Phys. Rev. D*, 105(12):123537, **June 2022:123537**
16. **Sugiyama, Sunao**, V. Takhistov, E. Vitagliano, et al. Testing stochastic gravitational wave signals from primordial black holes with optical telescopes. *Physics Letters B*, 814:136097, **March 2021:136097**
17. *A. Kusenko, M. Sasaki, **Sugiyama, Sunao**, et al. Exploring Primordial Black Holes from the Multiverse with Optical Telescopes. *Phys. Rev. Lett.*, 125(18):181304, **October 2020:181304**
18. **Sugiyama, Sunao**, M. Takada, Y. Kobayashi, et al. Validating a minimal galaxy bias method for cosmological parameter inference using HSC-SDSS mock catalogs. *Phys. Rev. D*, 102(8):083520, **October 2020:083520**
19. **Sugiyama, Sunao**, T. Kurita, and M. Takada. On the wave optics effect on primordial black hole constraints from optical microlensing search. *MNRAS*, 493(3):3632–3641, **April 2020:3632–3641**
20. H. Niikura, M. Takada, N. Yasuda, et al. Microlensing constraints on primordial black holes with Subaru/HSC Andromeda observations. *Nature Astronomy*, 3:524–534, **April 2019:524–534**

co-authored papers

21. T. Zhang, X. Li, **Sugiyama, Sunao**, et al. Cosmology and Source Redshift Constraints from Galaxy Clustering and Tomographic Weak Lensing with HSC Y3 and SDSS using the Point-Mass Correction Model. *arXiv e-prints*, arXiv:2507.01386, **July 2025:arXiv:2507.01386**
22. T. Zhang, **Sugiyama, Sunao**, S. More, et al. Modelling Galaxy Clustering and Tomographic Galaxy-Galaxy Lensing with HSC Y3 and SDSS using the Point-Mass Correction Model and Redshift Self-Calibration. *arXiv e-prints*, arXiv:2507.01377, **July 2025:arXiv:2507.01377**
23. R. Terasawa, M. Takada, T. Kurita, and **Sugiyama, Sunao**. Late-time suppression of structure growth as a solution for the S_8 tension. *arXiv e-prints*, arXiv:2505.09176, **May 2025:arXiv:2505.09176**
24. R. Terasawa, X. Li, M. Takada, et al. Exploring the baryonic effect signature in the Hyper Suprime-Cam Year 3 cosmic shear two-point correlations on small scales: The S_8 tension remains present. *Phys. Rev. D*, 111(6):063509, **March 2025:063509**
25. R. Terasawa, M. Takada, **Sugiyama, Sunao**, and T. Kurita. Testing small-scale modifications in the primordial power spectrum with Subaru HSC cosmic shear, primary CMB and CMB lensing. *arXiv e-prints*, arXiv:2503.20396, **March 2025:arXiv:2503.20396**
26. K.-F. Chen, I. N. Chiu, M. Oguri, et al. Weak-Lensing Shear-Selected Galaxy Clusters from the Hyper Suprime-Cam Subaru Strategic Program: I. Cluster Catalog, Selection Function and Mass–Observable Relation. *The Open Journal of Astrophysics*, 8:2, **January 2025:2**
27. T. Sunayama, H. Miyatake, **Sugiyama, Sunao**, et al. Optical cluster cosmology with SDSS redMaPPer clusters and HSC-Y3 lensing measurements. *Phys. Rev. D*, 110(8):083511, **October 2024:083511**
28. I. N. Chiu, K.-F. Chen, M. Oguri, et al. Weak-Lensing Shear-Selected Galaxy Clusters from the Hyper Suprime-Cam Subaru Strategic Program: II. Cosmological Constraints from the Cluster Abundance. *The Open Journal of Astrophysics*, 7:90, **October 2024:90**
29. J. Shi, T. Sunayama, T. Kurita, et al. The intrinsic alignment of galaxy clusters and impact of projection effects. *MNRAS*, 528(2):1487–1499, **February 2024:1487–1499**
30. T. Zhang, X. Li, R. Dalal, et al. A general framework for removing point-spread function additive systematics in cosmological weak lensing analysis. *MNRAS*, 525(2):2441–2471, **October**

31. Y. Park, T. Sunayama, M. Takada, et al. Cluster cosmology with anisotropic boosts: validation of a novel forward modelling analysis and application on SDSS redMaPPer clusters. *MNRAS*, 518(4):5171–5189, [February 2023:5171–5189](#)

Other Articles

1. S. Sugiyama, M. Takada, and H. Miyatake. Weak lensing cosmology with subaru hsc data. *ASJ EUREKA*, 117(1):304–314, [May 2024:304–314](#)

TALKS

2025

44. **Cosmology from a joint analysis of second and third order shear statistics**, KICP seminar, 2025, Oct., *Oral*
43. **Cosmology with third-order shear statistics Applications to HSC and DES**, [Beyond-two-point Statistics Meet Survey Systematics](#), 2025, Sep., *Oral (Invited Talk)*
42. **Probing Physics Beyond LambdaCDM: Precision Cosmology with Gaussian and Non-Gaussian Information from Subaru Data**, [Earth and Space Science Seminar](#), 2025, Jul., *Oral*

2024

41. **Exploring Primordial Black Hole with Microlensing Data: Updates on Analysis Pipeline**, UPenn CfPC workshop, 2024, Nov., *Oral*
40. **Exploring Primordial Black Hole with Microlensing Data: Updates on Analysis Pipeline**, [Focus week on primordial black holes 2024](#), 2024, Nov., *Oral (Invited Talk)*
39. **Cosmology with third-order shear statistics**, Roman F2F meeting, 2024, Oct., *Oral*
38. **Exploring Primordial Black Hole with Microlensing Data**, [Pacific conference](#), 2024, Aug., *Oral (Invited Talk)*
37. **Cosmology from Subaru HSC weak lensing Year 3 data**, [MIIfA colloquium](#), 2024, May., *Oral (Invited Talk)*
36. **Cosmology from weak lensing three-point correlation function**, astro/cosmo seminar at CMU, 2024, Feb., *Oral*
35. **Cosmology from Subaru HSC weak lensing Year 3 data**, [Subaru Users Meeting FY2023](#), 2024, Jan., *Oral*

2023

34. **HSC Y3 weak lensing cosmology results**, [CosmoPalooza](#), 2023, Oct., *Oral*
33. **Hyper Suprime-Cam Year 3 Results: Cosmology from Weak Lensing with HSC, Windows on the Universe**, 2023, Aug., *Oral (Invited Talk)*
32. **HSC Year 3 Weak Lensing Cosmology Results**, DESI seminar telecon, 2023, Jun., *Oral*
31. **HSC Year 3 Weak Lensing Cosmology Results**, DESC WL telecon, 2023, May., *Oral*
30. **HSC Year 3 Weak Lensing Cosmology Results**, DESC overall telecon, 2023, May., *Oral*
29. **HSC Year 3 Weak Lensing Cosmology Results**, [HSC webinar](#), 2023, Apr., *Oral*
28. **HSC Y3 cosmology results**, [CMB x LSS](#), 2023, Apr., *Oral (Invited Talk)*
27. **HSC Year 3 Weak Lensing Cosmology Results**, Euclid WLSWG Telecon, 2023, Apr., *Oral*
26. **Collaborative coding: git and github**, [CD3 Opening Symposium](#), 2023, Apr., *Oral*

25. Cosmology analysis with Subaru HSC Y3 data and SDSS data: cosmological parameter inference in Λ CDM model, 2023 Spring Annual Meeting of ASJ, 2023, Mar., *Oral*
24. Cosmology with Subaru HSC weak lensing data, 2023 GOPIRA Ph.D. thesis, 2023, Mar., *Oral*

2022

23. Cosmology analysis with Subaru HSC Y3 data and SDSS data: a joint analysis of cosmic shear + galaxy-galaxy lensing + galaxy clustering, 2022 Autumn Annual Meeting of ASJ, 2022, Sep., *Oral*
22. Revealing the nature of dark matter with gravitational lensing: weak and microlensing, Colloquium at Osaka theoretical astrophysics group, 2022, Jul., *Oral* (Invited Talk)
21. HSC cosmology: Joint analysis of galaxy-galaxy lensing and clustering from Subaru HSC and SDSS data, 77th Annual Meeting of JPS, 2022, Mar., *Oral*
20. Exploring Primordial black hole with microlensing observation of Andromeda galaxy, Subaru Users Meeting 2021, 2022, Jan., *Oral*

2021

19. Joint analysis of galaxy-galaxy lensing and clustering at large scales from Subaru HSC and SDSS data, 34th astro-theory Symposium, 2021, Dec., *Oral*
18. Joint analysis of galaxy-galaxy lensing and clustering at large scales from Subaru HSC and SDSS data, 10th workshop on observational cosmology, 2021, Nov., *Oral*
17. Joint analysis of galaxy-galaxy lensing and clustering at large scales from Subaru HSC and SDSS data, 2021 Autumn Annual Meeting of ASJ, 2021, Sep., *Oral*
16. Exploring Dark Matter Candidates with Microlensing, KEK theory seminar, 2021, Apr., *Oral*

2020

15. Constraining PBH with HSC microlensing, IPMU phenomenology lunch journal club, 2020, Dec., *Oral*
14. Testing stochastic gravitational wave signals by PBH microlensing, 4th KEK-PH + KEK-Cosmo Joint Lectures and Workshop on “Gravitational Wave”, 2020, Nov., *Oral* (Invited Talk)
13. Observational constraint on PBH scenarios with HSC microlensing, 9th workshop on observational cosmology, 2020, Nov., *Oral*
12. Developing a method of cosmological parameter inference from galaxy survey data by Subaru/HSC, Summer school for young researchers in astronomy/astrophysics, 2020, Aug., *Oral*
11. Validating a minimal galaxy bias method for cosmological parameter inference using HSC-SDSS mock catalog, Seminar at Daniel Eisenstein group@CfA, 2020, Aug., *Oral*
10. Validation of PT-based method and cosmological parameter constraint with HSC-Y1 data, 2020 Spring Annual Meeting of ASJ, 2020, Mar.
9. Constraints on Primordial Black Holes with Microlensing, Informal seminar at Takahashi and Asada Labs, 2020, Feb., *Oral*
8. Validation of PT-based method for cosmology analysis with wide field galaxy survey data, Seminar at astro group of Hirosaki University, 2020, Feb., *Oral*

7. Constraints on Primordial Black Holes with Microlensing: Wave & Finite Source Effects / PBH from Multiverse, Berkeley Week at Kavli IPMU, 2020, Jan., *Oral*

2019

6. Validation of PT-based method for cosmology analysis of wide field galaxy survey data, 2019 Autumn Annual Meeting of ASJ, 2019, Sep., *Oral*
5. Test and validation of PT-based cosmology : g-g lensing and clustering, PT chat, 2019, Apr., *Poster*
4. On the wave effect of PBH microlensing in the observation of the M31 stars, 2019 Spring Annual Meeting of ASJ, 2019, Mar., *Oral*
3. Wave Effect on PBH Microlensing, Accelerating universe in the dark, 2019, Mar., *Poster*

2018

2. Wave effect on PBH micro-lensing and constraintWave effect on PBH micro-lensing and constraint, 7th workshop on observational cosmology, 2018, Dec., *Oral*
1. Review of new BAO reconstruction method, Summer school for young researchers in astronomy/astrophysics, 2018, Aug., *Oral*

PRESS RELEASES

Primordial black holes and the search for dark matter from the multiverse, IPMU, 2020 Dec

How to see the invisible: Using dark matter distribution to test our cosmological model, IPMU, 2024 Apr