SUNAO SUGIYAMA

List of publications, talks, and press releases, Compiled on February 4, 2026

PUBLICATIONS

The up-to-date list of publication availabele 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, M. Jarvis, D. Anbajagane, A. Halder, G. A. Marques, S. Pandey, J. Marshall, A. Alarcon, A. Amon, K. Bechtol, M. Becker, G. Bernstein, A. Campos, R. Cawthon, C. Chang, R. Chen, A. Choi, J. Cordero, C. Davis, J. Derose, S. Dodelson, C. Doux, K. Eckert, F. Elsner, J. Elvin-Poole, S. Everett, A. Ferté, M. Gatti, G. Giannini, D. Gruen, I. Harrison, K. Herner, E. M. Huff, D. Huterer, N. Kuropatkin, P. F. Leget, N. Maccrann, J. Mccullough, J. Muir, J. Myles, A. Navarro Alsina, J. Prat, M. Raveri, R. P. Rollins, A. Roodman, A. J. Ross, E. S. Rykoff, C. Sánchez, L. F. Secco, E. Sheldon, T. Shin, M. Troxel, I. Tutusaus, T. N. Varga, B. Yanny, B. Yin, Y. Zhang, J. Zuntz, M. Aguena, F. Andrade-Oliveira, D. Bacon, J. Blazek, S. Bocquet, D. Brooks, A. Carnero Rosell, J. Carretero, M. Costanzi, L. da Costa, M. E. da Silva Pereira, T. M. Davis, J. De Vicente, H. T. Diehl, B. Flaugher, J. Frieman, G. Gutierrez, S. R. Hinton, D. L. Hollowood, K. Honscheid, D. J. James, N. Jeffrey, S. Lee, J. Mena-Fernández, R. Miquel, R. L. C. Ogando, A. A. Plazas Malagón, A. Porredon, E. Sanchez, D. Sanchez Cid, S. Samuroff, M. Smith, E. Suchyta, M. E. C. Swanson, D. Thomas, V. Vikram, J. Weller, and M. Yamamoto. 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, M. Jarvis, D. Anbajagane, M. Gatti, D. Gebauer, Z. Gong, A. Halder, G. A. Marques, S. Pandey, J. L. Marshall, S. Allam, O. Alves, F. Andrade-Oliveira, D. Bacon, J. Blazek, S. Bocquet, D. Brooks, A. Carnero Rosell, J. Carretero, L. N. da Costa, P. Doel, C. Doux, S. Everett, B. Flaugher, J. Frieman, J. García-Bellido, E. Gaztanaga, D. Gruen, R. A. Gruendl, G. Gutierrez, K. Herner, S. R. Hinton, D. L. Hollowood, K. Honscheid, D. Huterer, D. J. James, N. Jeffrey, J. Mena-Fernández, R. Miquel, J. Muir, R. L. C. Ogando, M. E. S. Pereira, A. Pieres, A. A. Plazas Malagón, S. Samuroff, E. Sanchez, D. Sanchez Cid, B. Santiago, I. Sevilla-Noarbe, M. Smith, E. Suchyta, M. E. C. Swanson, G. Tarle, C. To, V. Vikram, N. Weaverdyck, and J. Weller. 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**, R. Dalal, R. Terasawa, M. M. Rau, R. Mandelbaum, M. Takada, S. More, M. A. Strauss, H. Miyatake, M. Shirasaki, T. Hamana, M. Oguri, W. Luo, A. J. Nishizawa, R. Takahashi, A. Nicola, K. Osato, A. Kannawadi, T. Sunayama, R. Armstrong, J. Bosch, Y. Komiyama, R. H. Lupton, N. B. Lust, L. A. MacArthur, S. Miyazaki, H. Murayama, T. Nishimichi, Y. Okura, P. A. Price, P. J. Tait, M. Tanaka, and S.-Y. Wang. 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, T. Nishimichi, X. Li, M. Shirasaki, S. More, Y. Kobayashi, A. J. Nishizawa, M. M. Rau, T. Zhang, R. Takahashi, R. Dalal, R. Mandelbaum, M. A. Strauss, T. Hamana, M. Oguri, K. Osato, W. Luo, A. Kannawadi, B.-C. Hsieh, R. Armstrong, J. Bosch, Y. Komiyama, R. H. Lupton, N. B. Lust, L. A. MacArthur, S. Miyazaki, H. Murayama, Y. Okura, P. A. Price, T. Sunayama, P. J. Tait, M. Tanaka, and S.-Y. Wang. 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, M. M. Rau, M. Shirasaki, X. Li, A. J. Nishizawa, K. Osato, T. Zhang, M. Takada, T. Hamana, R. Takahashi, R. Dalal, R. Mandelbaum, M. A. Strauss, Y. Kobayashi, T. Nishimichi, M. Oguri, W. Luo, A. Kannawadi, B.-C. Hsieh, R. Armstrong, J. Bosch, Y. Komiyama, R. H. Lupton, N. B. Lust, L. A. MacArthur, S. Miyazaki, H. Murayama, Y. Okura, P. A. Price, P. J. Tait, M. Tanaka, and S.-Y. Wang. 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, J. Zuntz, M. A. Strauss, **Sugiyama, Sunao**, T. Zhang, M. M. Rau, R. Mandelbaum, M. Takada, S. More, H. Miyatake, A. Kannawadi, M. Shirasaki, T. Taniguchi, R. Takahashi, K. Osato, T. Hamana, M. Oguri, A. J. Nishizawa, A. A. P. Malagón, T. Sunayama, D. Alonso, A. Slosar, W. Luo, R. Armstrong, J. Bosch, B.-C. Hsieh, Y. Komiyama, R. H. Lupton, N. B. Lust, L. A. MacArthur, S. Miyazaki, H. Murayama, T. Nishimichi, Y. Okura, P. A. Price, P. J. Tait, M. Tanaka, and S.-Y. Wang. 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, X. Li, M. Shirasaki, M. Takada, Y. Kobayashi, R. Takahashi, T. Nishimichi, A. J. Nishizawa, M. M. Rau, T. Zhang, R. Dalal, R. Mandelbaum, M. A. Strauss, T. Hamana, M. Oguri, K. Osato, A. Kannawadi, B.-C. Hsieh, W. Luo, R. Armstrong, J. Bosch, Y. Komiyama, R. H. Lupton, N. B. Lust, S. Miyazaki, H. Murayama, Y. Okura, P. A. Price, P. J. Tait, M. Tanaka, and S.-Y. Wang. 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, T. Nishimichi, M. Shirasaki, Y. Kobayashi, R. Mandelbaum, S. More, M. Oguri, K. Osato, Y. Park, R. Takahashi, J. Coupon, C. Hikage, B.-C. Hsieh, Y. Komiyama, A. Leauthaud, X. Li, W. Luo, R. H. Lupton, S. Miyazaki, H. Murayama, A. J. Nishizawa, P. A. Price, M. Simet, J. S. Speagle, M. A. Strauss, M. Tanaka, and N. Yoshida. 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, T. Nishimichi, M. Shirasaki, **Sugiyama, Sunao**, R. Takahashi, K. Osato, S. More, and Y. Park. 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, T. Nishimichi, M. Shirasaki, Y. Kobayashi, R. Mandelbaum, S. More, R. Takahashi, K. Osato, M. Oguri, J. Coupon, C. Hikage, B.-C. Hsieh, Y. Komiyama, A. Leauthaud, X. Li, W. Luo, R. H. Lupton, H. Murayama, A. J. Nishizawa, Y. Park, P. A. Price, M. Simet, J. S. Speagle, M. A. Strauss, and M. Tanaka. HSC Year 1 cosmology results with the minimal bias method: HSC ×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, A. Kusenko, M. Sasaki, and M. Takada. 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**, M. Takada, V. Takhistov, and E. Vitagliano. 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, H. Miyatake, M. Shirasaki, T. Nishimichi, and Y. Park. 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, R. H. Lupton, T. Sumi, S. More, T. Kurita, **Sugiyama, Sunao**, A. More, M. Oguri, and M. Chiba. 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**, R. Mandelbaum, S. More, R. Dalal, A. Kannawadi, H. Miyatake, A. J. Nishizawa, T. Nishimichi, M. Oguri, K. Osato, M. M. Rau, M. Shirasaki, T. Sunayama, and M. Takada. 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, R. Mandelbaum, X. Li, R. Dalal, H. Miyatake, A. Kannawadi, A. J. Nishizawa, T. Nishimichi, M. Oguri, K. Osato, M. M. Rau, M. Shirasaki, T. Sunayama, and M. Takada. 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, T. Nishimichi, S. Tanaka, **Sugiyama, Sunao**, T. Kurita, T. Zhang, M. Shirasaki, R. Takahashi, H. Miyatake, S. More, and A. J. Nishizawa. Exploring the baryonic effect signature in the Hyper Suprime-Cam Year 3 cosmic shear two-point correlations on small scales: The S8 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, Y.-T. Lin, H. Miyatake, S. Miyazaki, S. More, T. Hamana, M. M. Rau, T. Sunayama, **Sugiyama, Sunao**, and M. Takada. 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**, S. More, X. Li, R. Dalal, M. M. Rau, J. Shi, I. n. Chiu, M. Shirasaki, T. Zhang, and A. J. Nishizawa. 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, M. M. Rau, T. Hamana, Y.-T. Lin, H. Miyatake, S. Miyazaki, S. More, T. Sunayama, **Sugiyama, Sunao**, and M. Takada. 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, M. Takada, **Sugiyama, Sunao**, R. Mandelbaum, H. Miyatake, S. More, T. Nishimichi, and H. Johnston. 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, R. Mandelbaum, M. A. Strauss, A. Kannawadi, H. Miyatake, A. Nicola, A. A. P. Malagón, M. Shirasaki, **Sugiyama, Sunao**, M. Takada, and S. More. A general framework for removing point-spread function additive systematics in cosmological weak lensing analysis. MNRAS, 525(2):2441–2471, October 2023:2441–2471

31. Y. Park, T. Sunayama, M. Takada, Y. Kobayashi, H. Miyatake, S. More, T. Nishimichi, and **Sugiyama, Sunao**. 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

46. **Observational search of PBH**, Dark matter and black holes, 2025, Dec., *Oral* (**Invited Talk**)

45. **Data Compression with Noise Suppression for Inference under Noisy Covariance**, Roman F2F meeting, 2025, Nov., *Oral*

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**, MIfA 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 ΛCDM 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*

<u>2022</u>

23. **Cosmology analysis with Subaru HSC Y3 data and SDSS data: a joint analysis of cosmic shear + galaxy-galaxt 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**, Colloqium 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*

<u>2021</u>

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*

<u>2020</u>

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