

# CURRICULUM VITAE

*Tepei OKUMURA*

## PERSONAL DETAILS

Nationality: Japanese Phone: +886-2-2366-5401  
Date of birth: June 8th, 1980 E-mail: tokumura@asiaa.sinica.edu.tw  
Place of birth: Osaka, Japan Webpage: <http://idv.sinica.edu.tw/tepei/>  
Present Address: Institute of Astronomy and Astrophysics, Academia Sinica (ASIAA)  
11F of AS/NTU Astronomy-Mathematics Building, No.1, Sec. 4, Roosevelt Rd, Taipei 10617, Taiwan

## ACADEMIC APPOINTMENTS

- 2021.7 - present
- **ASIAA**, Research Fellow [equivalent of Full Professor]
  - **Kavli IPMU, The University of Tokyo**, Senior Visiting Scientist
- 2017.8 - 2021.6
- **Kavli IPMU, The University of Tokyo**, Visiting Scientist
- 2017.1 - 2021.7
- **ASIAA**, Associate Research Fellow [equivalent of Associate Professor]
- 2014.1 - 2016.12
- **Kavli IPMU, The University of Tokyo**, Project Researcher, advised by Masahiro Takada
- 2009.12 - 2013.12
- **IEU, Ewha Womans University, Korea**, Postdoctoral Fellow, advised by Uros Seljak
  - **UC Berkeley and LBNL**, Long-term guest (1 year in total), hosted by Uros Seljak
- 2008.4 - 2009.11
- **Shanghai Astronomical Observatory**, Postdoctoral Fellow, advised by Yipeng Jing
  - **Max Planck Institute for Astrophysics**, Long-term guest (2 months), hosted by Simon White
- 2005.4 - 2008.3
- **Nagoya University, Japan**, Research Assistant

## EDUCATION AND DEGREES

- 2005.4 - 2008.3
- **Nagoya University, Japan**, Ph.D in Physics, supervised by Prof. Takahiko Matsubara.
- 2003.4 - 2005.3
- **Nagoya University, Japan**, M.S. in Physics, supervised by Prof. Satoru Ikeuchi
- 1999.4 - 2003.3
- **Kwansei Gakuin University, Japan**, B.S. in Physics, supervised by Prof. Takashi Okamura

## HONORS AND AWARDS

- 2019 - 2023 Academia Sinica Career Development Award, TAIWAN
- 2018 The PASJ Excellent Paper Award, The Astronomical Society of Japan (Okumura et al. 2016, PASJ, 68, 38)
- 2014 PRD Editor's Suggestion, American Physical Society (Saito et al. 2014, PRD, 90, 123522)
- 2013 Vaidya-Raychaudhuri Postdoctoral Fellowship, Inter-University Centre for Astronomy and Astrophysics (IUCAA), INDIA (declined)

## SCIENTIFIC ACTIVITY SINCE JOINING ASIAA (2017.1 - today)

Number of refereed publications since 2017: **31**

- 7** first-author **TO**, Takada et al ('17), **TO**, Nishimichi, Umetsu et al ('18), **TO**, Taruya et al ('19, '20b), **TO** & Taruya ('20a, '21), **TO**, Hayashi et al ('21)
- 16** second-author Sugiyama, **TO**, Spergel ('17, '18), Tonegawa, **TO** et al ('18), Arroja, **TO** et al ('18), Agrawal, **TO** et al ('19, '20), Taruya & **TO** ('20), Shiraishi, **TO** et al ('20, '21a), Matsumoto, **TO**, Sasaki ('20), Chiu, **TO** et al ('20), Ishikawa, **TO** et al ('21), Tonegawa & **TO** ('22), Chuang, **TO**, Shirasaki ('22), Osato & **TO** ('22), Saga, **TO** et al ('22)
- 5** third-author Shiraishi, Sugiyama, **TO** ('17), Sugiyama, Shiraishi, **TO** ('18), Akitsu, Li, **TO** ('21), Shiraishi, Taruya, **TO**, et al ('21b), Shiraishi, Akitsu, **TO** ('21c)

## OBTAINED RESEARCH FUNDING

2020.8 – 2023.7	Ministry of Science and Technology (MoST), Taiwan, 3,372,000TWD ( $\simeq$ 114,000\$)
2019.1 – 2023.12	Academia Sinica Career Development Award, Taiwan, 10,000,000TWD ( $\simeq$ 350,000\$)
2017.10 – 2020.7	Ministry of Science and Technology (MoST), Taiwan, 3,033,000TWD ( $\simeq$ 100,500\$)
2014.4 – 2016.3	Start-up grant of the Japan Society for the Promotion of Science (JSPS), 2,500,000JPY ( $\simeq$ 25,000\$)
2010.1 – 2010.12	The Research Fellowship for International Young Scientists, National Natural Science Foundation of China, 250,000RMB ( $\simeq$ 37,000 US \$), (declined)
2006.4 – 2007.3	Research Grant for Young Researchers, Nagoya University, 250,000JPY ( $\simeq$ 2,700 US \$)

## GRADUATE STUDENTS SUPERVISED

2022-	Master, NTU	Shing Lau	Project “TBC”
2020-	PhD, NTU	Takuya Inoue	Project “Probing general relativistic effects ”
2020-	Master, NTU	Yao-Tsung Chuang	Project “Intrinsic alignments of galaxies and modified gravity”
2020-2022	Master, NTHU	Ngoc Minh Le	Project “Velocity power spectrum of dark matter halos”
2019-2019	Post-Master R.A., ASIAA	Sheng-Chieh Lin	
2018-2018	Post-Master R.A., ASIAA	Shan-Chang Lin	
2011-2012	Master, Ewha U.	Minji Oh	Project “Redshift-space distortions”

## TEACHING EXPERIENCE

2022	Lecturer for ASIAA Summer Student Program at ASIAA, Taiwan, July 7, 2022: “ <i>Cosmology</i> ”
2022	Invited Lecturer for Student Seminar at ASIAA, Taiwan, March 15, 2022. Lecture title: “ <i>Probing dark energy with large-scale structure of the universe</i> ”
2021	Lecturer for ASIAA Summer Student Program at ASIAA, Taiwan, July 8, 2021: “ <i>Cosmology</i> ”
2019	Supervising of intern student from Vietnam “Finite volume effect of the velocity power spectrum” (3 months)
2019	Invited Lecturer for Student Seminar at ASIAA, Taiwan, November 25, 2019. Lecture title: “ <i>Cosmology with large-scale structure of the Universe</i> ”
2019	Lecturer for ASIAA Summer Student Program at ASIAA, Taiwan, July 30, 2019: “ <i>Cosmology</i> ”
2018	Lecturer for ASIAA Summer Student Program at ASIAA, Taiwan, July 26, 2018: “ <i>Cosmology</i> ”
2018	Invited Lecturer for undergraduate course of cosmology at NTHU, Taiwan (3 hours), May 8, 2018. Lecture title: “ <i>Probing the accelerating expansion of the universe with large-scale structure</i> ”
2017	Lecturer for ASIAA Summer Student Program at ASIAA, Taiwan, July 27, 2017: “ <i>Cosmology</i> ”
2011	Tutoring of one graduate student (spring semester) for the course “Modern Cosmology”, with a project “Sunyaev-Zel’dovich effect” at Ewha Womans University, Korea

## RECOMMENDATION LETTERS FOR JOB APPLICATIONS (alphabetical)

- Faculty position: I-Non Chiu, Ken Osato, Naonori Sugiyama
- Postdoc position: Aniket Agrawal, Kazuyuki Akitsu, I-Non Chiu, Minji Oh
- Graduate school: Takuya Inoue, Ngoc Minh Le

## ACADEMIC SOCIETY AND CONTRIBUTIONS

- Membership
  - Astronomical Society of Japan
  - Rironkon (Theoretical Astronomy and Astrophysics community in Japan)
- Referee
  - Journal referee for: *Nature Astronomy*, Nature Publishing Group, UK
  - Journal referee for: *Journal of Cosmology and Astroparticle Physics (JCAP)*, SISSA, Italy

- Journal referee for: *The Astrophysical Journal (ApJ)*, American Astronomical Society, USA
- Journal referee for: *Monthly Notices of the Royal Astronomical Society (MNRAS)*, UK
- Journal referee for: *Astronomy & Astrophysics*, France
- Journal referee for: *Progress of Theoretical Physics (PTP)*, The Physical Society of Japan, Japan
- Journal referee for: *European Physical Journal C*
- Journal referee for: *Classical and Quantum Gravity*, UK
- Observing proposal referee for: *Subaru Telescope*
- External reviewer for a faculty candidate at National University in Taiwan
- Grant proposal / Award reviewers for : *MoST grant* and *Research Award for Physics Society of Taiwan*
- Thesis defense committee
  - Yu-Han Tseng, National Taiwan University (Master, May 2020, Advisor: Prof. Pisin Chen)
  - Shu-Rong Chen, National Taiwan University (Ph.D., July 2019, Advisor: Prof. Tzi-Hong Chiueh)
  - Chien-Ting Chen, National Taiwan University (Ph.D., July 2019, Advisor: Prof. Pisin Chen)
  - KaHou Leong, National Taiwan University (Master, January 2018, Advisor: Prof. Tzi-Hong Chiueh)
  - James Chan, National Taiwan University (Ph.D., August 2017, Advisor: Prof. Tzi-Hong Chiueh)

## EVENT ORGANIZING AND MANAGEMENT ACTIVITIES

2021.12	SOC	YITP workshop on Galaxy shape statistics and Cosmology at Kyoto University
2020.9 – today	Chair	Computing committee at ASIAA, Taiwan - <b>Supervising 7 computing staff members (2020.9-2021.10)</b>
2019.1 – 2020.12	Coordinator	Joint colloquium committee at ASIAA/NTU/NTNU/LeCosPA, Taiwan
2019.1 – 2020.3	Member	Research manpower (postdoc hiring) committee at ASIAA, Taiwan
2017.9 – 2018.8	Chair	weekly-lunch seminar at ASIAA, Taiwan
2017.1 – today	Member	Colloquium committee at ASIAA, Taiwan
2013.12	Co-organizer	APCTP-IEU Focus program on Cosmology and Fundamental Physics IV at APCTP Postech, Korea
2004.4 – 2007.3	Organizer	weekly seminar in theoretical astrophysics group in Nagoya University
2005.8 – 2006.12	Deputy Head	Summer School in Astronomy & Astrophysics (over 400 participants)

## PRESENTATIONS

### Invited conference and workshop talks

- [1] “Tightening geometric and dynamical constraints on dark energy and gravity with galaxy intrinsic alignment”  
*IA Cosmology Workshop*, YITP, Kyoto University, Japan (November, 2021)
- [2] “Intrinsic alignment of galaxy shapes as new dynamical and geometric probes of cosmology”  
*The 9th KIAS Workshop on Cosmology and Structure Formation*, Korea Institute for Advanced Study, Korea (November, 2020)
- [3] “Intrinsic alignments of halo orientations with density and velocity fields at BAO scales and beyond”  
*The first Shanghai Assembly on Cosmology and Galaxy Formation*, Shanghai Jiao Tong University, China, (November, 2019)
- [4] “Galaxy clustering analysis of the Subaru FastSound survey”  
*Cosmology workshop on galaxy redshift surveys*, NAOJ, Japan (August, 2019)
- [5] “Large-scale intrinsic alignments of halo orientations with velocity field”  
*PTchat@Kyoto*, YITP, Kyoto University, Japan (April, 2019)

- [6] “Cosmology with large-scale structure using Subaru: FMOS FastSound and PFS surveys”  
*EAO Subaru Science Workshop*, KASI, Korea (January, 2019)
- [7] “Probing physical boundaries of dark matter halos from cosmic density and velocity fields”  
*The 8th KIAS Workshop on Cosmology and Structure Formation*, Korea Institute for Advanced Study, Korea (November, 2018)
- [8] “Probing physical boundaries of dark matter halos from cosmic density and velocity fields”  
*Cosmology Frontier in Particle Physics: Astroparticle Physics and Early Universe*, National Taiwan University, Taiwan (September, 2018)
- [9] “Recent progresses on studies of the splashback radius of dark matter halos” **[Review talk]**  
*Workshop on dark matter halos*, NAOJ, Japan (August, 2018)
- [10] “Probing physical boundaries of dark matter halos from cosmic density and velocity fields”  
*5th Korea-Japan workshop on Dark Energy*, KASI, Korea (August, 2018)
- [11] “Probing physical boundaries of dark matter halos from cosmic density and velocity fields”  
*The Nonlinear Universe 2018*, Smartno, Slovenia (July, 2018)
- [12] “Probing physical boundaries of dark matter halos from cosmic density and velocity fields”  
*Sesto 2018 workshop on gal axy clustering*, Sexten Center for Astrophysics, Italy (July 2018)
- [13] “Intrinsic Alignments and Splashback Radius of Dark Matter Halos from Cosmic Density and Velocity Fields”  
*The Nonlinear Universe*, Smartno, Slovenia (July, 2017)
- [14] “Reconstruction of halo power spectrum from redshift-space galaxy distribution”  
*2017 Rencontres du Vietnam on Cosmology conference*, Quy Nhon, Vietnam (July, 2017)
- [15] “Baryon acoustic oscillations and the structure of the Universe at the highest redshifts” **[Review talk]**  
*Astronomical Distance Determination in the Space Age*, International Space Science Institute-Beijing, China (May, 2016)
- [16] “New constraint on gravity theory at  $z$  1.4 from the Subaru FMOS/FastSound galaxy redshift survey”  
*3rd Korean-Japan Workshop on Dark Energy*, Korea Institute for Advanced Study, Korea (April, 2016)
- [17] “Modeling nonlinear power spectrum of galaxies in redshift space”  
*Measuring and Modelling Redshift-Space Distortions in Galaxy Surveys*, Sexten Center for Astrophysics, Sesto, Italy (July, 2014)
- [18] “Galaxy Survey and Redshift-space distortions,” **[Review talk]**  
*2nd Observational Cosmology Workshop*, National Astronomical Observatory of Japan (December, 2013)
- [19] “Distribution function approach to redshift space distortions ”  
*The 5th KIAS Workshop on Cosmology and Structure Formation*, Korea Institute for Advanced Study, Korea (October, 2012)
- [20] “Distribution function approach to redshift space distortions: N-body simulations ”  
*Perturbative approaches to redshift space distortions*, University of Zurich, Switzerland (July, 2012)
- [21] “Distribution function approach to redshift space distortions: N-body simulations ”  
*WKYC 2012 Conference* , Daejeon, Korea (June, 2012)
- [22] “Numerical analysis of redshift-space distortions in galaxy redshift surveys”  
*The KASI-APCTP joint mini-workshop on Science and Technology of BigBOSS* , Jeju, Korea (May, 2012)

- [23] “Dark Energy and Modified Gravity from Large-scale Structure”  
*QGC2010 NIMS-APCTP Joint International Workshop String Theory and Cosmology*, Daejeon, Korea (September, 2010)
- [24] “Systematic effects on determination of dark energy and modified gravity from galaxy surveys”  
*Recent Progresses in Dark-Universe and Astrophysics*, APCTP-Seoul-Branch, Korea (August, 2010)
- [25] “3D Galaxy Clustering (BAO)” [Review talk]  
*National Cosmology Workshop*, Institute for High Energy Physics and National Astronomical Observatory of China, Beijing, China (December, 2008)
- [26] “Large-Scale Anisotropic Correlation Function of the SDSS”  
*Conference for Hyper-Suprime Cam*, Mie, Japan (March, 2008)

### Invited colloquium and seminar talks

- [1] “Tightening geometric and dynamical constraints on dark energy and gravity: galaxy clustering, intrinsic alignment and kinetic Sunyaev-Zel’dovich effect”  
*Colloquium at Department of Astronomy*, Shanghai Jiao Tong University, China (October 2021)
- [2] “Intrinsic alignments of cosmic density and velocity fields as a cosmological probe”  
*NTHU IoA Colloquium*, National Tsing-Hua University, Taiwan (October 2019)
- [3] “Large-scale intrinsic alignments of dark matter halo orientations with velocity field”  
*Cosmology seminar at Stanford*, Stanford University, USA (April 2019)
- [4] “Probing physical boundaries of dark matter halos from cosmic density and velocity fields”  
*LeCosPA Cosmology and Particle Astrophysics Seminar*, National Taiwan University, Taiwan (May, 2018)
- [5] “Probing physical boundaries of dark matter halos from cosmic density and velocity fields”  
*High Energy Theory Group Seminar*, Academia Sinica Institute of Physics, Taiwan (May, 2018)
- [6] “Reconstructing power spectrum of dark matter halos from galaxy distribution”  
*IANCU Colloquium*, National Central University, Taiwan (November, 2017)
- [7] “Precision cosmology with galaxy redshift surveys”  
*LeCosPA Cosmology and Particle Astrophysics Seminar*, National Taiwan University, Taiwan (May, 2017)
- [8] “Theoretical modeling of redshift space distortions for galaxies toward precision cosmology”  
*Cosmology seminar*, Yale University, USA (December, 2016)
- [9] “New constraint on gravity theory at  $z \sim 1.4$  from the Subaru FMOS galaxy redshift survey (FastSound)”  
*Astronomy Colloquium*, The University of Tokyo, Japan (February, 2016)
- [10] “Observational and theoretical studies of large-scale structure of the Universe using galaxy redshift surveys”  
*ASIAA Colloquium*, Academia Sinica Institute of Astronomy and Astrophysics, Taipei, Taiwan (Dec 2, 2015)
- [11] “Probing dark energy and modified gravity from large-scale structure of the Universe”  
*Tsinghua Center for Astrophysics Colloquium*, Tsinghua University, Beijing, China (March, 2015)
- [12] “Modeling nonlinear power spectrum of dark matter halos and galaxies in redshift space”  
*Cosmology seminar*, YITP, Kyoto University, Japan (March 2015)
- [13] “Nonlinear velocity statistics and redshift-space distortions in peculiar velocity surveys”  
*Astronomy-Cosmology-Particle Physics (ACP) Seminar*, Kavli IPMU, U. of Tokyo, Japan (February, 2014)
- [14] “Intrinsic ellipticity correlation of luminous red galaxies on large scales”  
*Berkeley cosmology seminar*, UC Berkeley, USA (December, 2009)

## Selected contributed talks

- [1] “Tightening geometric and dynamical constraints on dark energy and gravity: galaxy clustering, intrinsic alignment and kinetic Sunyaev-Zel’dovich effect”  
*Observational cosmology workshop*, online, Japan (November, 2021)
- [2] “Intrinsic alignments of halo orientations with velocity field and the baryon acoustic oscillation features”  
*Annual Conference in Astronomical Society of Japan*, Kumamoto Univ., Japan (September, 2019)
- [3] “Splashback radius of non-spherical dark matter halos from cosmic density and velocity fields”  
*Annual Conference in Astronomical Society of Japan*, Chiba Univ., Japan (March, 2018)
- [4] “Reconstruction of power spectrum of dark matter halos from galaxy distribution in redshift surveys”  
*Annual Conference in Astronomical Society of Japan*, Ehime Univ., Japan (September, 2016)
- [5] “The Subaru FMOS galaxy redshift survey (FastSound). New constraint on gravity theory from redshift space distortions at  $z \sim 1.4$ ”  
*Subaru Users’ Meeting FY2015*, Atami, Japan (January, 2016)
- [6] “Reconstructing halo power spectrum from redshift-space galaxy distribution”  
*Theoretical and Observational Progress on Large-scale Structure of the Universe: MPA/ESO/MPE/Excellence Cluster Universe Joint Conference 2015*, ESO, Garching, Germany (July, 2015)
- [7] “Peculiar velocities in redshift space: formalism, N-body simulations and perturbation theory”  
*The 10th Sino-German Workshop on Galaxy Formation and Cosmology*, Xi’an, China (May, 2014)
- [8] “Nonlinear velocity statistics and redshift-space distortions in peculiar velocity surveys”  
*CosKASI Conference 2014*, Korea Astronomy and Space Science Institute, Korea (April, 2014)
- [9] “Formulation of velocity statistics in redshift space”  
*Annual Conference in Astronomical Society of Japan*, International Christian Univ., Japan (March, 2014)
- [10] “Peculiar velocity statistics in real and redshift space: N-body simulations and perturbation theory”  
*LSS13 Theoretical Challenges in Large Scale Structure*, Ascona, Switzerland (July, 2013)
- [11] “Peculiar velocity statistics in real and redshift space: N-body simulations and perturbation theory”  
*IEU Cosmology Conference 2013*, IEU Ewha Womans University, Korea (June, 2013)
- [12] “Modeling redshift-space power spectrum using phase space distribution function approach”  
*Annual Conference in Astronomical Society of Japan*, Kagoshima University, Japan (September, 2011)
- [13] “Intrinsic ellipticity correlation of luminous red galaxies”  
*Annual Conference in Astronomical Society of Japan*, Osaka Prefecture University, Japan (March, 2009)
- [14] “Intrinsic Ellipticity Correlation of Luminous Red Galaxies and Misalignment with their Host Dark Matter Halos”  
*The 8th Sino-German workshop on galaxy formation and cosmology*, Kunming, China (February, 2009)
- [15] “Systematic Effects on Determination of the Growth Factor from Redshift-space Distortions”  
*IEU Workshop on Cosmology and Fundamental Physics*, IEU Ewha Womans University, Korea, (May, 2010)
- [16] “Large-Scale Anisotropic Correlation Function of SDSS Luminous Red Galaxies”  
*1st Korea-Japan Workshop on Galaxy Evolution*, Yonsei University, South Korea (February, 2008)
- [17] “Anisotropic Correlation Function of Large-scale Galaxy Distribution from the SDSS LRG Sample”  
*Outstanding Questions for the Standard Cosmological Model*, Imperial College London, UK (March, 2007)

- [18] “Anisotropic Correlation Function in the LRG”  
*SDSS-II Collaboration Meeting*, Seoul National University, Korea (September, 2006)
- [19] “Cosmological Parameters from Anisotropy of SDSS LRG Correlation Function”  
*SDSS-II Collaboration Meeting*, Santa Fe, USA (March, 2006)
- [20] “Cosmological Analysis with Baryonic Acoustic Oscillations in the Correlation Function of SDSS Galaxies and Future Galaxy Redshift Surveys”  
*The 1st China-Japan-Korea Joint Workshop on Cosmology, Large Scale Structure and Galaxy Formation: Numerical Simulations*, Shanghai, China (November, 2005)
- [21] “Cosmological Analysis with Anisotropy of Correlation Function of SDSS Galaxies”  
*Annual Conference in Astronomical Society of Japan*, Sapporo, Hokkaido, Japan (October, 2005)

### Media press release

- [1] “Decoding the gravitational evolution of dark matter halos” on January 13th, 2015
- Place : Kavli Institute for the Physics and Mathematics of the Universe, The University of Tokyo
  - Contents : Shun Saito and I made a press release based on the refereed paper, Saito et al. (2014), published by Physical Review D, editor’s suggestion. After it was released at the website of The University of Tokyo, it was also forecasted by web news in Japan, The USA, Italy Turkey, Spain and China, and also forecasted by YouTube.
- [2] Press release on “New test by deepest galaxy map finds Einstein’s theory stands true”
- Date : May 11th, 2016
  - Place : Kavli Institute for the Physics and Mathematics of the Universe, The University of Tokyo
    - Co-released from the following institutes:
    - Astronomy department, The University of Tokyo;
    - Physics department, Kyoto University;
    - National Astronomical Observatory of Japan;
    - Astronomy department, Tohoku University
  - Contents : I made a press release based on the refereed paper Okumura et al. (2016), published by PASJ (See the publication list in the next page).

# LIST OF PUBLICATIONS

## Refereed Papers

- Number of publications: **52** [**1559** citations] (citations taken from NASA ADS).
- Number of first and second authored publications: **32**.
- 1<sup>st</sup> author paper statistics: **1** paper with > 170 citations, **3** with > 100 citations and **7** with > 50 citations

- [1] S. Saga, **T. Okumura**, A. Taruya & T. Inoue  
“Relativistic distortions in galaxy density-ellipticity correlations: gravitational redshift and peculiar velocity effects”  
Submitted to *MNRAS*, (2022) [arXiv:2207.03454][ADS]
- [2] K. Osato, & **T. Okumura**  
“Clustering of emission line galaxies with IllustrisTNG I: fundamental properties and halo occupation distribution”  
Submitted to *MNRAS*, (2022) [arXiv:2206.08678][ADS]
- [3] **T. Okumura** & A. Taruya  
“Tightening geometric and dynamical constraints on dark energy and gravity: galaxy clustering, intrinsic alignment and kinetic Sunyaev-Zel’dovich effect”  
Submitted to *Phys. Rev. D.*, (2021) [arXiv:2110.11127][ADS]
- [4] Y.-T. Chuang, **T. Okumura** & M. Shirasaki  
“Intrinsic alignments of dark matter halos in  $f(R)$  gravity simulations”  
Accepted to *MNRAS*, (2022) [arXiv:2111.01417][ADS]
- [5] M. Tonegawa, & **T. Okumura**  
“First Evidence of Intrinsic Alignments of Red Galaxies at  $z_{j1}$ : Cross-correlation between CFHTLenS and FastSound Samples”  
*ApJ Letters* **924**, L3 (2021) [arXiv:2109.14297][ADS]
- [6] S. Ishikawa, **T. Okumura**, M. Oguri, & S.-C. Lin  
“Halo-model analysis of the clustering of photometric luminous red galaxies at  $0.10 \leq z \leq 1.05$  from the Subaru Hyper Suprime-Cam Survey”  
*ApJ* **922**, 23 (2021) [arXiv:2103.08628][ADS]
- [7] **T. Okumura**, M. Hayashi, I.-N. Chiu, Y.-T. Lin, K. Osato, B.-C. Hsieh, & S.-C. Lin  
“Angular clustering and host halo properties of [OII] emitters at  $z > 1$  in the Subaru HSC survey”  
*Publication for Astronomical Society of Japan* **73**, 1186-1207 (2021) [arXiv:2012.12224][ADS]
- [8] M. Shiraishi, K. Akitsu, & **T. Okumura**  
“Alcock-Paczynski effects on wide-angle galaxy statistics”  
*Phys. Rev. D.* **103**, 123534 (2021) [arXiv:2103.08126][ADS]
- [9] M. Shiraishi, A. Taruya, **T. Okumura**, & K. Akitsu  
“Wide-angle effects on galaxy ellipticity correlations”  
*MNRAS Letters* **503**, L6-L10 (2021) [arXiv:2012.13290][ADS]
- [10] K. Akitsu, Y. Li, & **T. Okumura**  
“Cosmological simulation in tides: power spectrum and halo shape responses, and shape assembly bias”  
*JCAP* **04**, 041 (2021) [arXiv:2011.06584][ADS]



- [11] M. Shiraishi, **T. Okumura**, & K. Akitsu  
“Minimum variance estimation of statistical anisotropy via galaxy survey”  
*JCAP* **03**, 039 (2021) [arXiv:2009.04355][ADS]
- [12] A. Agrawal, **T. Okumura**, & T. Futamase  
“Standard candles and sirens rescue  $H_0$ ”  
*ApJ* **904**, 169 (2020) [arXiv:2008.00869][ADS]
- [13] I.-N. Chiu, **T. Okumura**, M. Oguri, A. Agrawal, K. Umetsu, & Y.-T. Lin  
“A clustering-based self-calibration of the richness-to-mass relation of CAMIRA galaxy clusters out to  $z \approx 1.1$  in the Hyper Suprime-Cam survey”  
*MNRAS* **498**, 2030 (2020) [arXiv:2005.13564][ADS]
- [14] M. Shiraishi, **T. Okumura**, N. S. Sugiyama, & K. Akitsu  
“Minimum variance estimation of galaxy power spectrum in redshift space”  
*MNRAS Letters* **498**, L77-L81 (2020) [arXiv:2005.03438][ADS]
- [15] J. Matsumoto, **T. Okumura**, & M. Sasaki  
“New measures to test modified gravity cosmologies”  
*JCAP* **07**, 059 (2020) [arXiv:2005.03438][ADS]
- [16] **T. Okumura**, A. Taruya & T. Nishimichi  
“Testing tidal alignment models for anisotropic correlations of halo ellipticities with N-body simulations”  
*MNRAS* **494**, 694-702 (2020) [arXiv:2001.05302][ADS]
- [17] A. Taruya & **T. Okumura**  
“Improving Geometric and Dynamical Constraints on Cosmology with Intrinsic Alignments of Galaxies”  
*ApJ Letters* **891**, L42 (2020) [arXiv:2001.05962][ADS]
- [18] **T. Okumura** & A. Taruya  
“Anisotropies of intrinsic ellipticity correlations in real and redshift space: Angular dependence in linear tidal alignment model”  
*MNRAS Letters* **493**, L124-L128 (2020) [arXiv:1912.04118][ADS]
- [19] **T. Okumura**, A. Taruya & T. Nishimichi  
“Intrinsic alignment statistics of density and velocity fields at large scales: Formulation, modeling and baryon acoustic oscillation features”  
*Phys. Rev. D.* **100**, 103507 (2019) [arXiv:1907.00750][ADS]
- [20] A. Agrawal, **T. Okumura**, & T. Futamase  
“Constraining neutrino mass and dark energy with peculiar velocities and lensing dispersions of Type Ia supernovae”  
*Phys. Rev. D.* **100**, 063534 (2020) [arXiv:1907.02328][ADS]
- [21] S. H. Suyu, T.-C. Chang, F. Courbin, & **T. Okumura**  
“Cosmological distance indicators”  
*Space Science Reviews* **214**, 91 (2018) [arXiv:1801.07262][ADS]
- [22] **T. Okumura**, T. Nishimichi, K. Umetsu & K. Osato  
“Splashback radius of nonspherical dark matter halos from cosmic density and velocity fields”  
*Phys. Rev. D.* **98**, 023523 (2018) [arXiv:1807.02669][ADS]

- [23] K. Umetsu, M. Sereno, S.-I. Tam, I.-N. Chiu, Z. Fan, S. Ettori, D. Gruen, **T. Okumura**, E. Medezinski, M. Donahue, M. Meneghetti, B. Frye, A. Koekemoer, T. Broadhurst, A. Zitrin, I. Balestra, N. Benitez, Y. Higuchi, P. Melchior, A. Mercurio, J. Merten, A. Molino, M. Nonino, M. Postman, P. Rosati, J. Sayers, & S. Seitz  
“The Projected Dark and Baryonic Ellipsoidal Structure of 20 CLASH Galaxy Clusters”  
*ApJ* **860**, 104 (2018) [arXiv:1804.00664][ADS]
- [24] M. Tonegawa, **T. Okumura**, T. Totani, G. Dalton & K. Yabe  
“The Subaru FMOS galaxy redshift survey (FastSound). V. Intrinsic alignments of emission line galaxies at  $z \sim 1.4$ ”  
*Publication for Astronomical Society of Japan* **70**, 41 (2018) [arXiv:1708.02224][ADS]
- [25] K. Osato, T. Nishimichi, M. Oguri, M. Takada & **T. Okumura**  
“Strong orientation dependence of surface mass density profiles of dark haloes at large scales”  
*MNRAS* **477**, 2141-2153 (2018) [arXiv:1712.00094][ADS]
- [26] F. Arroja, **T. Okumura**, N. Bartolo, P. Karmakar & S. Matarrese  
“Large-scale structure in mimetic Horndeski gravity”  
*JCAP* **05**, 050 (2018) [arXiv:1708.01850][ADS]
- [27] N. S. Sugiyama, **T. Okumura**, & D. N. Spergel  
“A direct measure of free electron gas via the Kinematic Sunyaev-Zel’dovich effect in Fourier-space analysis”  
*MNRAS* **475**, 3764-3785 (2018) [arXiv:1705.07449][ADS]
- [28] N. S. Sugiyama, M. Shiraishi, & **T. Okumura**  
“Limits on statistical anisotropy from BOSS DR12 galaxies using bipolar spherical harmonics”  
*MNRAS* **473**, 2737-2752 (2018) [arXiv:1704.02868][ADS]
- [29] **T. Okumura**, M. Takada, S. More, & S. Masaki  
“Reconstruction of halo power spectrum from redshift-space galaxy distribution: cylinder-grouping method and halo exclusion effect”  
*MNRAS* **469**, 459-475 (2017) [arXiv:1611.04165][ADS]
- [30] M. Shiraishi, N. S. Sugiyama, & **T. Okumura**  
“Polypolar spherical harmonic decomposition of galaxy correlators in redshift space: Toward cosmic isotropy and homogeneity tests”  
*Phys. Rev. D* **95**, 063508 (2017) [arXiv:1612.02645][ADS]
- [31] N. S. Sugiyama, **T. Okumura**, & D. N. Spergel  
“Will kinematic Sunyaev-Zel’dovich measurements enhance the science return from galaxy redshift surveys?”  
*JCAP* **01**, 057 (2017) [arXiv:1606.06367][ADS]
- [32] N. S. Sugiyama, **T. Okumura**, & D. N. Spergel  
“Understanding redshift space distortions in density-weighted peculiar velocity”  
*JCAP* **07**, 001 (2016) [arXiv:1509.08232][ADS]
- [33] H. Okada, T. Totani, M. Tonegawa, M. Akiyama, G. Dalton, K. Glazebrook, F. Iwamuro, K. Ohta, N. Takato, N. Tamura, K. Yabe, A. J. Bunker, T. Goto, C. Hikage, T. Ishikawa, **T. Okumura** & I. Shimizu  
“The Subaru FMOS Galaxy Redshift Survey (FastSound). II. The Emission Line Catalog and Properties of Emission Line Galaxies”  
*Publication for Astronomical Society of Japan* **68**, 47 (2016) [arXiv:1504.05592][ADS]

- [34] **T. Okumura**, C. Hikage, T. Totani, M. Tonegawa, H. Okada, K. Glazebrook, C. Blake, P. G. Ferreira, S. More, A. Taruya, S. Tsujikawa, M. Akiyama, G. Dalton, T. Goto, T. Ishikawa, F. Iwamuro, T. Matsubara, T. Nishimichi, K. Ohta, I. Shimizu, R. Takahashi, N. Takato, N. Tamura, K. Yabe, & N. Yoshida  
“The Subaru FMOS galaxy redshift survey (FastSound). IV. New constraint on gravity theory from redshift space distortions at  $z \sim 1.4$ ”  
*Publication for Astronomical Society of Japan* **68**, 42 (2016) [arXiv:1511.08083][ADS]
- [35] **T. Okumura**, N. Hand, U. Seljak, Z. Vlah & V. Desjacques  
“Galaxy power spectrum in redshift space: combining perturbation theory with the halo model”  
*Phys. Rev. D.* **92**, 103516 (2015) [arXiv:1506.05814][ADS]
- [36] M. Tonegawa, T. Totani, H. Okada, M. Akiyama, G. Dalton, K. Glazebrook, F. Iwamuro, T. Maihara, K. Ohta, I. Shimizu, N. Takato, N. Tamura, K. Yabe, A. J. Bunker, J. Coupon, P. G. Ferreira, C. S. Frenk, T. Goto, C. Hikage, T. Ishikawa, T. Matsubara, S. More, **T. Okumura**, W. J. Percival, L. R. Spitzer, & I. Szapudi  
“The Subaru FMOS Galaxy Redshift Survey (FastSound). I. Overview of the Survey Targeting on H $\alpha$  Emitters at  $z \sim 1.4$ ”  
*Publication for Astronomical Society of Japan* **67**, 81 (2015) [arXiv:1502.07900][ADS]
- [37] Y.-S. Song, A. Taruya, E. Linder, K. Koyama, C. G. Sabiu, G.-B. Zhao, F. Bernardeau, T. Nishimichi, & **T. Okumura**  
“Consistent Modified Gravity Analysis of Anisotropic Galaxy Clustering Using BOSS DR11”  
*Phys. Rev. D.* **92**, 043522 (2015) [arXiv:1507.01592][ADS]
- [38] S. Saito, T. Baldauf, Z. Vlah, U. Seljak, **T. Okumura** & P. McDonald  
“Understanding higher-order nonlocal halo bias at large scales by combining the power spectrum with the bispectrum”  
*Phys. Rev. D.* **90**, 123522 (2014) [arXiv:1405.1447][ADS]
- [39] Y.-S. Song, C. G. Sabiu, **T. Okumura**, M. Oh & E. V. Linder  
“Cosmological Tests using Redshift Space Clustering in BOSS DR11”  
*JCAP* **12**, 005 (2014) [arXiv:1407.2257][ADS]
- [40] Y.-S. Song, **T. Okumura** & A. Taruya  
“Broadband Alcock-Paczynski test exploiting redshift distortions”  
*Phys. Rev. D.* **89**, 103541 (2014) [arXiv:1309.1162][ADS]
- [41] **T. Okumura**, U. Seljak, Z. Vlah & V. Desjacques  
“Peculiar velocities in redshift space: formalism, N-body simulations and perturbation theory”  
*JCAP* **05**, 003 (2014) [arXiv:1312.4214][ADS]
- [42] J. Blazek, U. Seljak, Z. Vlah & **T. Okumura**  
“Geometric and dynamic distortions in anisotropic galaxy clustering”  
*JCAP* **04**, 001 (2014) [arXiv:1311.5563][ADS]
- [43] E. V. Linder, M. Oh, **T. Okumura**, C. G. Sabiu & Y.-S. Song  
“Cosmological Constraints from the Anisotropic Clustering Analysis using BOSS DR9”  
*Phys. Rev. D.* **89**, 063525 (2014) [arXiv:1311.5226][ADS]
- [44] Z. Vlah, U. Seljak, **T. Okumura** & V. Desjacques  
“Distribution function approach to redshift space distortions. Part V: perturbation theory applied to dark matter halos”  
*JCAP* **10**, 053 (2013) [arXiv:1308.6294][ADS]

- [45] **T. Okumura**, U. Seljak & V. Desjacques  
 “Distribution function approach to redshift space distortions. Part III: halos and galaxies”  
*JCAP* **11**, 014 (2012) [arXiv:1206.4070][ADS]
- [46] Z. Vlah, U. Seljak, P. McDonald, **T. Okumura** & T. Baldauf  
 “Distribution function approach to redshift space distortions. Part IV: perturbation theory applied to dark matter”  
*JCAP* **11**, 009 (2012) [arXiv:1207.0839][ADS]
- [47] **T. Okumura**, U. Seljak, P. McDonald & V. Desjacques  
 “Distribution function approach to redshift space distortions. Part II: *N*-body simulations”  
*JCAP* **02**, 010 (2012) [arXiv:1109.1609][ADS]
- [48] W. Wang, Y. P. Jing, C. Li, **T. Okumura**, & J. Han  
 “Galaxy Clustering and Projected Density Profiles as Traced by Satellites in Photometric Surveys: Methodology and Luminosity Dependence”  
*ApJ* **734**, 88 (2011) [arXiv:1011.2058][ADS]
- [49] **T. Okumura**, & Y. P. Jing  
 “Systematic Effects on Determination of the Growth Factor from Redshift-space Distortions”  
*ApJ* **726**, 5 (2011) [arXiv:1004.3548][ADS]
- [50] **T. Okumura**, & Y. P. Jing  
 “The Gravitational Shear–Intrinsic Ellipticity Correlation Functions of Luminous Red Galaxies in Observation and in the  $\Lambda$ CDM Model”  
*ApJ Letters* **694**, L83-L86 (2009) [arXiv:0812.2935][ADS]
- [51] **T. Okumura**, Y. P. Jing, & C. Li  
 “Intrinsic Ellipticity Correlation of SDSS Luminous Red Galaxies and Misalignment with their Host Dark Matter Halos”  
*ApJ* **694**, 214-221 (2009) [arXiv:0809.3790][ADS]
- [52] **T. Okumura**, T. Matsubara, D. J. Eisenstein, I. Kayo, C. Hikage, A. S. Szalay, & D. P. Schneider  
 “Large-Scale Anisotropic Correlation Function of SDSS Luminous Red Galaxies”  
*ApJ* **676**, 889-898 (2008) [arXiv:0711.3640][ADS]

## Scientific Articles

- [53] **T. Okumura**, M. Tonegawa, T. Totani, & C. Hikage  
 “New test of Einstein’s general relativity by deepest galaxy survey with Subaru Telescope,”  
*The Astronomical Herald*, The Astronomical Society of Japan, Vol. 110, No.2, p.131-141 (2017)
- [54] **T. Okumura** (interviewed) & Y. Arafune (writer)  
 “General Relativity Stands True at Distant Universe,”  
*Graphic Science Magazine NEWTON*, No.8, p.128-p.128 (2016)
- [55] **T. Okumura**,  
 “An Analysis of SDSS Data Using the Galaxy Anisotropic Correlation Function,”  
*The Astronomical Herald*, The Astronomical Society of Japan, Vol.101, No.10, p.589 - 597 (2008)

## Proceedings and unpublished papers

- [56] **T. Okumura**, T. Nishimichi, K. Umetsu & K. Osato  
“Intrinsic Alignments and Splashback Radius of Dark Matter Halos from Cosmic Density and Velocity Fields”  
arXiv preprint, [arXiv:1706.08860][ADS]
- [57] J. Kim & **T. Okumura**  
“Heavy-Tail Distribution from Correlation of Discrete Stochastic Process”,  
arXiv preprint [arXiv:1203.5581][ADS]
- [58] Y. P. Jing, C. Y. Jiang, **T. Okumura**, A. Faltenbacher, C. Li, W. P. Lin  
“Mergers of Galaxies and Orientation of Giant Elliptical Galaxies”,  
ASP Conf. Ser. 408, The Starburst-AGN Connection, ed. W. Wang, Z. Yang, Z. Luo, and Z. Chen (San Francisco: Astronomical Society of the Pacific), 2009., p.328