

Nhat-Minh Nguyen, Ph.D.

Cosmologist, Kavli IPMU Fellow

Kavli Institute for Physics and Mathematics of the Universe, University of Tokyo

[LinkedIn](#) | [GitHub](#) | [ORCID](#)

RESEARCH PROFILE

Cosmologist working on growth of large-scale structure, new physics from galaxy surveys, and statistical methods for extracting information from cosmological data. Current research connects field-level inference, effective-field-theory likelihoods, multi-tracer analyses, and machine-learning methods for spectroscopic surveys. Publication record: 21 papers, including 15 outside large-collaboration author lists; h-index 17 on the current CV.

SELECTED HONORS

Buchalter Cosmology Prize, with American Astronomical Society award announcement 2024

GRANTS

JSPS KAKENHI Grant-in-Aid for Research Activity Start-up, PI, JPY 2,000,000 2025

Japan Foundation for Promotion of Astronomy Research Support Grant, PI, approx. JPY 320,000 2025

SCIENTIFIC LEADERSHIP

Beyond-2-Point Statistics Meet Survey Systematics 2025
Organizing Committee Chair

Cosmology 2025 2025
Scientific Program Committee member

COSMO'24 2024
Large-scale Structure Session Convener

Future of Artificial Intelligence for Science in Japan 2024
Cosmology/Astrophysics Unconference Facilitator

Michigan Cosmology Summer School 2023
Local Organizing Committee member

MENTORING AND TEACHING

- Co-mentored Carter Matties at the University of Michigan; now Physics Graduate Student at Syracuse.
- Co-mentored Andrija Kostić at the Max Planck Institute for Astrophysics; now Research Scientist at DeepL.
- Advised research projects for Baptiste Barthe-Gold, Eleni Tsaprazi, Andrew Hope, Kyle Lee, Disha Saxena, and Kasey Thai.
- Course instructor, Michigan Math and Science Scholars, “Climbing the Distance Ladder to the Big Bang: How astronomers survey the Universe,” Summer 2024.
- Guest lecturer, Michigan Math and Science Scholars, Summer 2023.

POSITIONS

Kavli IPMU Fellow Oct. 2024 – present
Kavli Institute for Physics and Mathematics of the Universe, University of Tokyo

Leinweber Fellow Jan. 2022 – Jul. 2024
Leinweber Center for Theoretical Physics and Physics Department, University of Michigan

Research Associate Jul. 2020 – Dec. 2021
Physical Cosmology Group, Max Planck Institute for Astrophysics

EDUCATION

- Ph.D., Astrophysics, Magna Cum Laude** *2016 – 2020*
International Max Planck Research School on Astrophysics; Ludwig Maximilians University of Munich; Max Planck Institute for Astrophysics
- M.Sc., Astronomy and Astrophysics** *2014 – 2016*
Erasmus Joint Master Degree in Astronomy & Astrophysics, with full-tuition scholarship and stipend
- B.Sc., Physics and Theoretical Physics** *2008 – 2013*
Ho Chi Minh University of Science, with honors and scholarships

SURVEY COLLABORATIONS

- Current** Prime Focus Spectrograph (PFS)
- Former** Dark Energy Spectroscopic Instrument (DESI)

RESEARCH THEMES RELEVANT TO JPL

- Field-level and forward modeling for galaxy clustering, intrinsic alignment, and initial-condition inference.
- Effective-field-theory likelihoods for large-scale structure and consistency tests of physical data models.
- Multi-tracer and multi-survey calibration with PFS–DESI overlap.
- Growth-of-structure tests, modified-gravity parameterizations, and dark-sector phenomenology.
- Beyond-two-point galaxy clustering statistics, mock-data challenges, and survey-analysis validation.
- Machine-learning and statistical reconstruction of the local density field.

SELECTED PUBLICATIONS

1. **Nguyen**. “Multi-tracers, multi-surveys: a joint Fisher analysis of DESI+PFS.” [arXiv preprint](#). Submitted to JCAP, 2026.
2. **Nguyen**, Akitsu, Taruya. “Galaxy sizes as complementary (zero-)bias tracers of local primordial non-Gaussianity.” [arXiv preprint](#). Submitted to PRD, 2026.
3. Barthe-Gold, **Nguyen**, Thiele. “Reconstructing the local density field with combined convolutional and point cloud architecture.” [arXiv preprint](#). Accepted for NeurIPS 2025 Workshop ML4PS.
4. Beyond-2point Collaboration. “A parameter-masked mock data challenge for beyond-2pt galaxy clustering statistics.” *ApJ* 990, 99, 2025.
5. **Nguyen**, Schmidt, Tucci, Reinecke, Kostić. “How much information can be extracted from galaxy clustering at the field level?” *Phys. Rev. Lett.* 133, 221006, 2024.
6. Wen, **Nguyen**, Huterer. “Sweeping through Horndeski Canvas: a New Growth-Rate Parameterization for Modified-Gravity Theories.” *JCAP* 09, 028, 2023.
7. **Nguyen**, Huterer, Wen. “Evidence for suppression of structure growth in the concordance cosmological model.” *Phys. Rev. Lett.* 131, 111001, 2023. Editor’s Suggestion.
8. Kostić, **Nguyen**, Schmidt, Reinecke. “Consistency tests of field level inference with the EFT likelihood.” *JCAP* 07, 063, 2023.
9. Tsaprazi, **Nguyen**, et al. “Field-level inference of galaxy intrinsic alignment from the SDSS-III BOSS survey.” *JCAP* 08, 003, 2022.
10. **Nguyen** et al. “Impacts of the physical data model on the forward inference of initial conditions from biased tracers.” *JCAP* 03, 058, 2021.
11. **Nguyen** et al. “Taking measurements of the kinematic Sunyaev-Zel’dovich effect forward: including uncertainties from velocity reconstruction with forward modeling.” *JCAP* 12, 011, 2020.
12. DESI Collaboration. “DESI 2024 VII: Cosmological Constraints from the Full-Shape Modeling of Clustering

Measurements.” JCAP 07, 028, 2025.

13. DESI Collaboration. “DESI 2024 VI: Cosmological Constraints from the Measurements of Baryon Acoustic Oscillations.” JCAP 02, 021, 2025.
14. Schmidt et al. “A rigorous EFT-based forward model for large-scale structure.” JCAP 01, 042, 2019.

SELECTED TALKS

Conference and workshop talks only; ordinary seminar talks are intentionally omitted.

2025	Particles, Gravitation and the Universe: from Quantum Mechanics to Quantum Gravity, IOP, VAST, Ha Noi, Viet Nam.
2024	“Theory and Data Analysis Challenges for Cosmological Large-Scale Structure Observations,” YITP, Kyoto, Japan.
2024	COSMO’24, Kyoto, Japan.
2024	PASCOS 2024, Plenary Session, ICISE Quy Nhon, Viet Nam.
2024	Cosmology from Home, online conference.
2024	DESI Research Forum.
2024	Aspen workshop, “Fundamental Physics in the Era of Big Data and Machine Learning.”
2024	“Fundamental Physics from Future Spectroscopic Surveys,” LBNL, Berkeley.
2024	CCA Cosmology Meeting, Flatiron Institute.
2023	Cosmology from Home, online conference.
2023	Future Science with CMB x LSS workshop, YITP, Kyoto.
2022	Aspen workshop, “Large-Scale Structure Cosmology beyond 2-Point Statistics.”

POPULAR SCIENCE AND MEDIA

2024	Vietnamese-language article on DESI and dark energy, Tia Sang Magazine.
2023	“Growing in molasses: Cosmic large-scale structure caught growing slower than expected,” Science X Dialog, Phys.org.
2023	Vietnamese-language article on searching for new signals from the Universe, Tia Sang Magazine.
Media	Coverage in Scientific American, New Scientist, VICE, Space.com, Quanta Magazine, University of Michigan News, and Max Planck Institute for Astrophysics Research Highlights.

PROFESSIONAL SERVICE

Referee	Physical Review Letters, Astrophysical Journal Letters, Physical Review D, Journal of Cosmology and Astroparticle Physics, Astronomy & Astrophysics.
Community	Founder or main organizer of VLLT Joint Astronomy & Physics Seminar Series, Cosmology Journal Club, Cosmology & Astrophysics Seminar at the University of Michigan, Kavli IPMU Astro Journal Club, and institute social coffee activities.
Outreach	Panelist for r/askscience and YouTube AMA, Cosmology from Home 2023; scientist participant in Skype a Scientist, APS Physicists To-Go, and University of Michigan Science Communication Fellows.

REFERENCES

Dr. Fabian Schmidt

Ph.D. advisor

Max Planck Institute for Astrophysics University of Michigan

fabians@MPA-Garching.MPG.DE

Prof. Dragan Huterer

Postdoctoral advisor

University of Michigan

huterer@umich.edu

Prof. Elisabeth Krause

External collaborator and mentor

University of Arizona

krausee@arizona.edu