

# Shun Saito

(last updated in Aug 2022)



## Experience

- 2019–now **Department of Physics, Missouri University of Science and Technology** Rolla, MO, USA  
*Assistant Professor*
- 2016–2018 **Max-Planck-Institut für Astrophysik (MPA)** Garching, GERMANY  
*Postdoctoral Fellow*  
Adviser: Prof. Eiichiro Komatsu
- 2013–2016 **Kavli Institute for Physics and Mathematics of the Universe (Kavli IPMU), The University of Tokyo** Kashiwa, Chiba, JAPAN  
*Project Researcher (Postdoctoral Researcher)*  
Adviser: Prof. Alexie Leauthaud
- 2010–2013 **Department of Astronomy, University of California at Berkeley & Physics Division, Lawrence Berkeley National Laboratory (LBNL)** Berkeley, California, USA  
*Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellow*  
Adviser: Prof. Martin White, Prof. Uroš Seljak

## Education

- Mar 2010 **Ph.D., Physics** Department of Physics, Graduate School of Science, The University of Tokyo  
*“Toward a precise measurement of neutrino mass through nonlinear galaxy power spectrum based on perturbation theory”*  
Supervisor: Prof. Yasushi Suto  
Advisors: Prof. Atsushi Taruya & Prof. Masahiro Takada
- Mar 2007 **Master, Physics** Department of Physics, Graduate School of Science, The University of Tokyo  
*“Probing circular polarization of Gravitational Wave Background with Cosmic Microwave Background anisotropy”*  
Supervisor: Prof. Yasushi Suto  
Advisors: Prof. Atsushi Taruya & Dr. Kiyotomo Ichiki
- Mar 2005 **B.Sc., Physics** Department of Physics, School of Science, The University of Tokyo

## Award

- 2022 **CASB Faculty Research Award** Missouri S&T  
for exceptional work with undergraduate students.

## contact

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## about me

🌐  
nationality: Japanese  
♂/♀  
gender: Male (he/him/his)  
🗓️  
date of birth: 29<sup>th</sup> Sep. 1982

## languages

Japanese (mother tongue)  
English (fluency)  
German (basic, A1.2)

## programming

Python, Fortran 90/95/03/08, C++  
HTML5 & CSS3  
Matlab, Mathematica

## Grants and Fellowship

2022-2024	<b>National Science Foundation, Partnerships in Astronomy &amp; Astrophysics Research and Education (PAARE)</b>	Missouri S&T
	PI, USD 135,116, “Collaborative Research: A Partnership in Central Missouri in the Era of Multi-messenger Astrophysics” Award #2219212	
2019	<b>The University of Missouri South African Education Program (UMSAEP)</b>	Missouri S&T
	PI, USD 4,978, “Exploring the Nonlinear Universe with the Galaxy Clustering and the Intensity Mapping”	
2016–2018	<b>Postdoctoral Fellowship</b>	Max-Planck-Institut für Astrophysik, Garching, GERMANY
2013–2015	<b>Grants-in-Aid for Research Activity Start-up</b>	JSPS
	JPY 2,730k $\approx$ USD 24.8k*	
2011–2013	<b>Postdoctoral Fellowship for Research Abroad</b>	JSPS
	JPY 10,560k $\approx$ USD 96k	
2010–2011	<b>Excellent Young Researcher Overseas Visit Program</b>	JSPS
	JPY 1,825k $\approx$ USD 16.6k	
2009–2011	<b>Research Fellowship (DC2, PD)</b>	JSPS
	total research budget of JPY 2,000k $\approx$ USD 18.2k	
	* conversion assumes 1 USD = 110 JPY	

## Publication & Research Interests

- **Publication Summary:**

- **64** publications (1 peer-reviewed proceeding, and 2 non-reviewed proceeding) in leading international peer-reviewed journals.
- $\geq$  **7890** citations.  $h$ -index = **41** (according to google scholar).
- **7** invited talks in international conferences and workshops. More than **20** invited seminars in international leading institutions.

- **Research Interests:**

- **Observational Cosmology, Large-scale structure of the Universe:**  
Neutrino Mass, Cosmic Acceleration (Dark Energy, Modified Gravity)  
Galaxy Clustering & Intensity Mapping (BAO, RSD, Galaxy Bias, Nonlinear Evolution)  
Galaxy Evolution, Galaxy-Halo connection, Subhalo Abundance Matching
- **Cosmic Microwave Background:**  
Lensing, Polarization, Inflation
- **Gravitational Wave:**  
Inflation, Reheating Temperature, Standard Siren
- **Statistical Analysis:**  
Markov chain Monte Carlo methods

## Teaching

Fall 2022	<b>Physics 6101 Graduate-level Classical Mechanics</b>	Missouri S&T
Spring 2022	<b>Physics 2135 (Basic Electromagnetics): Recitation Instructor</b>	Missouri S&T
Fall 2021	<b>Physics 1135 (Basic Dynamics): Recitation Instructor</b>	Missouri S&T
Spring 2021	<b>Physics 4001 (Cosmology and Galaxies)</b>	Missouri S&T
Fall 2020	<b>Physics 2135 (Basic Electromagnetics): Recitation Instructor</b>	Missouri S&T
Spring 2020	<b>Physics 4553 (Astrophysics): Team-teach with Prof. Cavaglia</b>	Missouri S&T
Fall 2019	<b>Physics 2135 (Basic Electromagnetics): Recitation Instructor</b>	Missouri S&T
Spring 2019	<b>Physics 2135 (Basic Electromagnetics): Recitation Instructor</b>	Missouri S&T
2016	<b>Invited Lecturer, Lecture Series on Cosmology</b> Garching, GERMANY	Max-Planck-Institut für Astrophysik,
2005	<b>Teaching Assistant, Basic Physics Exercises</b> The University of Tokyo, JAPAN	Department of Physics, School of Science,
2005	<b>Teaching Assistant, General Relativity</b> The University of Tokyo, JAPAN	Department of Physics, School of Science, The

## Supervision

2021–	<b>Hasti Khoraminezhad, Postdoc, Supervisor</b> “Empirical LAE simulation in HETDEX”	Missouri S&T, Rolla, USA
2021–	<b>Jordan Stevens, Undergraduate, Advisor (OURE program)</b> Dynamical Dark Energy in HETDEX -Won the 3rd prize in Undergraduate Research Conference at S&T in 2022. -Won the 1st prize at the 51th Fuller Prize (Departmental Competition) in 2022.	Missouri S&T, Rolla, USA
2020–	<b>Steven Karst, Undergraduate, Advisor (National Merit Fellow)</b> “Machine Learning in PFS cosmology target selection” -Won the 1st prize in Undergraduate Research Conference at S&T in 2021. -Won the 1st prize at the 50th Fuller Prize (Departmental Competition) in 2021. -Selected as a representative student to present at the Undergraduate Research at the Capitol in 2022.	Missouri S&T, Rolla, USA
2020–2021	<b>Noah Baden, Undergraduate, Advisor (OURE program)</b> “Do BAO and BBN independently confirm the Hubble tension?”	Missouri S&T, Rolla, USA
2019–2020	<b>Siddhartha Gurung-López, Postdoc, Supervisor</b> “Lyman- $\alpha$ radiative transfer modeling” -currently postdoc at Valencia, Spain	Missouri S&T, Rolla, USA
2017–2021	<b>Chris Byrohl, Ph.D. student, Supervisor</b> “Lyman- $\alpha$ radiative transfer simulation”	Max-Planck-Institut für Astrophysik, Garching, GERMANY
before 2019	<b>Aniket Agrawal, Yuichi Harikane, Akira Oka, Toshiya Namikawa</b>	

## Major collaboration

2016–	<b>Hobby-Eberly Dark Energy Experiment (HETDEX), USA</b> - leading role in Lyman- $\alpha$ intensity mapping analysis - the chair of Cosmology Science Working Group (since Jan 2021)	P.I.: Gary Hill
2015–	<b>Subaru Prime Focus Spectrograph (PFS) Survey, JAPAN</b> - leading role in the target selection of OII emitters - internal reviewer of the 1D Data Reduction Pipeline documents	P.I.: Hitoshi Murayama
2010–	<b>The Baryon Oscillation Spectroscopic Survey (BOSS), Sloan Digital Sky Survey III (SDSS-III), USA</b> - involved in BAO & RSD analysis in galaxy clustering working group	P.I.: David Schlegel
2010–	<b>The Hyper Suprime-Cam (HSC) Survey, JAPAN</b> - involved in cross-correlation analysis between cosmic shear & the BOSS galaxies	P.I.: Satoshi Miyazaki

## Professional activities

- Service at Missouri S&T.
  - Physics Qualifying Exam committee (Dec 2021 -).
  - Physics Colloquium Chair (Aug 2020-May 2022).
  - Physics Faculty ad-hoc Search Committee (Mar 2020).
  - Physics The Scheerer Prize Committee (Dec 2019, Dec 2021).
  - Physics Faculty Search Committee (Aug 2019-Apr 2020).

- Physics The Fuller Research Prize Committee (May 2019).
- Physics Thesis Committee for 5 PhD students (Feb 2019-).
- Regular referee for JCAP, MNRAS, PASJ, PTP, EPJC, PRD, APJ, TKDD, Nature Astronomy.
- Review Panel (NSF in 2019).
- Observation Experience in HSC-SSP (1 night).
- Member of American Astronomical Society, Astronomical Society of Japan & Physical Society of Japan.
- Contributed to “The Japanese optical & infrared astronomy in 2020s”.
- One of the main contributors to [www.massivegalaxies.com](http://www.massivegalaxies.com).
- Public Release
  - “[Researchers validate theory that neutrinos shape the universe](#)” at Missouri S&T in Nov 2020.
  - “[Missouri S&T joins dark energy experiment to solve accelerating cosmos mystery](#)” at Missouri S&T in Sep 2019.
  - “[1.2 Million Galaxies in 3D](#)” at MPA in Jul 2016.
  - “[SDSS Opens a New Observational Data to the Public](#)” at IPMU in Feb 2015.
  - “[Decoding the Gravitational Evolution of Dark Matter Halos](#)” at IPMU in Jan 2015.
  - “[One Percent Measure of the Universe](#)” at IPMU in Jan 2014.
- Outreach
  - Prepared “the Scientific Olymppia”, Feb 2020.
  - Attendee of the 6th HOPE Meeting (selected by JSPS), Mar 2014. won the Best Team Presentation Award
  - Attendee of the Lindau Nobel Meeting (selected by JSPS), Jul 2012.
  - Berkeley Lab Open House, October 2012.

## Organization of scientific meetings

2017–2018	<b>LOC, The 3rd German Physics Seminar for Japanese Researchers</b>	MPA, GERMANY
2018	<b>LOC, PhyStat-Nu Workshop on Statistical Issues in Experimental Neutrino Physics</b>	MPA, GERMANY
2016	<b>SOC, PhyStat-Nu Workshop on Statistical Issues in Experimental Neutrino Physics</b>	Kavli IPMU, JAPAN
2013	<b>LOC, Cosmological Information from Small Scales</b>	Kavli IPMU, JAPAN
2012	<b>LOC, BigBOSS collaboration meeting</b>	LBL, USA

## Institutional responsibilities

2022–	<b>Founder of UWC-S&amp;T joint seminar</b>	Missouri S&T, USA
2019–	<b>Founder of Midwest Cosmology Network</b>	Missouri S&T, USA
2017–2018	<b>Postdoc Representative</b>	MPA, GERMANY
2013–2014	<b>Organizer of Astrophysics Journal Club &amp; Cosmology Lunch Seminar</b>	Kavli IPMU, JAPAN
2012–2013	<b>Organizer of INPA Seminar</b>	LBNL, USA
2009-2010	<b>Organizer of Thursday Cosmology Seminar</b>	The University of Tokyo, JAPAN

## Selected list of invited talks and seminars

- The 15th International Conference on Interconnections between Particle Physics and Cosmology, Washington University in St. Louis, Jun 2022.
- HEP seminar, Washington University in St. Louis, Oct 2021.
- Physics, Astronomy, Material Sciences Seminar, Missouri State University, Sep 2021.
- HEPAP/CMA seminar at Penn State, Online, Apr 2021.
- 5th German Physics and Applied Physics Seminar, Online, Nov 2020.
- Friday seminar, University of the Western Cape, South Africa, Feb 2020.
- Mini workshop on Galaxy Clustering, NAOJ, Japan, Jan 2020.
- Physics Colloquium on Nobel Prize Physics 2019, Missouri University of Science and Technology, USA, Nov 2019.
- The first Shanghai Assembly on Cosmology and galaxy Formation, Shanghai, China, Nov 2019.
- Astro/Relativity Seminar, University of Missouri Columbia, USA, Apr 2019.
- Physics Colloquium, Missouri University of Science and Technology, USA, Feb 2018.
- The 4th IMPRS Student Symposium, Max-Planck-Institut für Extraterrestrische Physik, GERMANY, Oct 2017.
- The 2nd German Physics Seminar for Japanese Researchers, Max-Planck-Institut für Festkörperforschung, GERMANY, Feb 2017.
- Cosmology with Neutral Hydrogen, UC Berkeley, USA, Jan 2017.
- Cosmology Lunch, DAMTP, Univ. of Cambridge, UK, Nov 2016.
- PFS SSP collaboration meeting, Princeton Univ., USA, Sep 2016.
- Lecture Series in Cosmology, MPA, GERMANY, June 2016.
- Astrophysics Seminar, Ohio University, USA, Oct 2015.
- The 3rd SKA-JP workshop, Kobe City Center, JAPAN, Sep 2015.
- The 3rd Observational Cosmology Workshop, Nagoya Univ., JAPAN, Nov 2014.
- Theoretical Physics Seminar, KEK theory group, JAPAN, Jan 2014.
- 27th Workshop on Neutrino Physics, ICRR, The Univ. of Tokyo, JAPAN, Jan 2014.

- YITP Seminar, YITP Kyoto University, JAPAN, Dec 2012.
- Cosmology Seminar, Osservatorio Astronomico di Trieste, ITALY, Oct 2012.
- Sante Fe Cosmology Workshop, St. John's College, USA, Jul 2011.
- Cosmology Seminar, UC Davis, USA, Feb 2011.