

Seth Koren, PhD

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EDUCATION AND ACADEMIC APPOINTMENTS

University of Notre Dame	Postdoctoral Researcher	2023-Present
University of Chicago	Oehme Postdoctoral Fellow, Enrico Fermi Institute	2020-2023
University of California, Santa Barbara	MA, PhD in Physics Dissertation: NEW APPROACHES TO THE HIERARCHY PROBLEM AND THEIR SIGNATURES FROM MICROSCOPIC TO COSMIC SCALES advised by Prof. Nathaniel Craig	Aug 2020
University of Pennsylvania	BA in Physics (w/ honors, astro concentration) and Math, MS in Physics	May 2015
Montgomery County Community College, PA	gap year after high school due to illness	2010-2011

HONORS AND AWARDS

UChicago EFI 91st Arthur H. Compton Lecturer, 2023

American Physical Society's 2022 Sakurai Dissertation Award

UCSB Graduate Student Association's 2019 Excellence in Teaching Award

UPenn William E. Stephens Memorial Prize for a graduating physics major

UPenn Roy and Diana Vagelos Science Challenge Award, full tuition scholarship

TEACHING AND MENTORSHIP

Particles, the Cosmos, and You: An Origin Story from the Edges of Space and Time is a series of lectures for the general public on fundamental particle physics and cosmology

The Hierarchy Problem: From the Fundamentals to the Frontiers is a pedagogical guide to renormalization and the hierarchy problem

UChicago Introduction to Particle Physics Seminar – Spring 2021

I volunteered to lead an undergraduate reading seminar on introductory particle physics as I was concerned students weren't getting time with professors during the pandemic. I lectured on important concepts, emphasized the role of quantum mechanics, and wrote mastery questions for students to work on to firm their understanding. I also introduced particle simulation software and wrote a final project to reinterpret an ATLAS search and 'discover' the Higgs.

UCSB Worster Fellowship for summer mentorship (awarded 2017 and 2019)

Introduction to Quantum Mechanics 1 – Fall 2016, Fall 2017, Fall 2018

Complex Variables – Winter 2020

With Nathaniel Craig in Fall 2017, I worked to overhaul the Introductory Quantum Mechanics course using active learning methods and placing increased effort on pedagogy and on instructor accessibility. This worked marvelously and students both had better learning outcomes and reported feeling more comfortable in the classroom and with the material. Since then, our model has been implemented throughout the physics classes at UCSB.

Invited Talks († = zoom talk)

UV/IR Mixing and the Hierarchy Problem

Yale Mossman Seminar, November 2019

SoCal Grads Fields and Strings at UC Los Angeles, February 2020

Cornell/UMaryland Particle Phenomenology Seminar, October 2020†

UC Berkeley Particle Seminar, October 2020†

Caltech High Energy Physics Seminar, October 2020†

UMichigan Particle Theory Seminar, November 2020†

The Hydrogen Mixing Portal, Its Origins, and Its Cosmological Effects

UToronto Theoretical High Energy Physics Seminar, November 2020†

Fermilab Theoretical Physics Seminar, November 2020†

Discrete Gauged B-L and the Cosmological Lithium Problem

Stony Brook University Theoretical Physics Seminar, December 2021

UW Madison High Energy/Cosmology Theory Seminar, April 2022

American Physical Society Sakurai Dissertation Award Talk, New York, April 2022

Harvard CMSA Quantum Matter Seminar, May 2022†

UC Irvine Particle Physics Seminar, June 2022†

UNAM Instituto de Fisica Seminario Sandoval Vallarta, June 2022

Brookhaven National Lab High Energy Theory Seminar, August 2022

UI Urbana-Champaign High Energy Phenomenology Seminar, September 2022

Notre Dame Particle Physics Seminar, October 2022

MIT Nuclear and Particle Theory Seminar, October 2022

UMaryland Particle Theory Seminar, December 2022

Naturalness In Your Face

Aspen Center for Physics Prospecting for New Physics, March 2023

Putting Generalized Symmetries to Work for Particle Physics

Cornell Particle Theory Seminar, February 2023

McGill Theory HEP Seminar, February 2023†

UMinnesota HEP Theory Seminar, February 2023

UC Berkeley Particle Seminar, March 2023

UVictoria Theory Seminar, March 2023†

Caltech High Energy Physics Seminar, April 2023

Rutgers NHETC Seminar, May 2023

UOregon IFS Seminar, May 2023

Aspen Center for Physics Pheno to Formal, August 2023

Sydney-CPPC Seminar, August 2023†

Non-Invertible Symmetries, Leptons, Quarks, and Why Multiple Generations

Harvard CMSA Quantum Matter Seminar, October 2023

Boston University High Energy Seminar, October 2023

Pitt High Energy Physics Seminar, November 2023

UToronto High-Energy Physics Seminar, November 2023

UKentucky Theory Seminar, December 2023

KAIST HET Seminar, Daejeon, South Korea, December 2023

SLAC EPP Theory Seminar, March 2024

UC Irvine Informal Seminar, March 2024

Nankai University Special Seminar, March 2024†

Fractionally-Charged Particles, The SM Gauge Group, and One-Form Symmetries

CERN EFT Coffee, June 2024

Glasgow PPT Seminar, August 2024

Generalized Global Symmetries and Nonperturbative Quantum Flavodynamics

Simons Center Symmetric Mass Generation, May 2024

CERN Crossroads Between Theory and Phenomenology, Geneva, June 2024

Durham IPPP Seminar, August 2024

Symmetries 2024 at Oxford, August 2024

Texas A&M High Energy Seminar, August 2024

UMichigan HET Seminar, September 2024

UMinnesota HEP Theory Seminar, September 2024

Brown BCTP IDEA Seminar, October 2024

TRIUMF Theory Seminar, Vancouver, Canada, November 2024
Tata Institute of Fundamental Research Free Meson Seminar, Mumbai, India, December 2024
Institute for Basic Science Seminar, January 2025
University of Oklahoma HEP Seminar, February 2025
Northwestern HEP Seminar, March 2025
IU-Bloomington, May 2025
Model Building in Fundamental Physics: Naturalness, New Symmetries, and the Generation Puzzle
Pitt Colloquium, January 2025
Naturalness and Generalized Symmetries
KITP What is Particle Theory?, Santa Barbara, April 2025
CNRS New Approaches to Naturalness in Lyon, France, May 2025
PLANCK 25 in Padova, Italy, May 2025

Conferences and Workshops (*=contributed talk)

***IHEP** Workshop on the High Energy Circular Electron-Positron Collider, Beijing, November 2018
 ***CERN** Fifth Workshop of the LHC Long-Lived Particle Community, Geneva, May 2019
 ***Galileo Galilei Institute** New Physics From The Sky Workshop, October 2021
 ***Aspen Center for Physics** Frontiers of Particle Physics Workshop, March 2022
 ***Pheno 2022** at University of Pittsburgh, May 2022
 ***Cambridge High Energy Workshop** at Harvard CMSA, August 2022
 ***Aspen Center for Physics** Effective Field Theories Workshop, August 2022
 ***ICTP-SAIFR** New Directions in Particle Physics, São Paulo, Brazil, September 2022
CERN Exotic Approaches to Naturalness, Geneva, January 2023
 ***Simons Center** Lighting New Lampposts for DM and BSM, February 2023
 ***Amherst Center for Fundamental Interactions** Theoretical Tests of the Landscape, April 2023
 ***Pheno 2023** at University of Pittsburgh, May 2023
 ***Mainz Institute for Theoretical Physics** New Proposals for Baryogenesis, June 2023
Chicagoland Pheno at UIUC, October 2023
PIKIMO Fall 2023 at IU Bloomington, November 2023
 ***DCPIHEP** Workshop, University of Colima, Mexico, January 2024
Amherst Center for Fundamental Interactions Surveying the Landscape, April 2024
 ***PIKIMO Spring 2024** at UIUC, May 2024
 ***Pheno 2024** at University of Pittsburgh, May 2024
 ***Mainz Institute for Theoretical Physics** Dark Matter and Flavor Puzzles, Capri, June 2024
 ***Chicagoland Pheno** at UIUC, November 2024
 ***PIKIMO Fall 2024** at UMichigan, November 2024
 ***BCVSPIN 2024** in Kathmandu, Nepal, December 2024
 ***HKUST IAS** Program on Fundamental Physics, Hong Kong, January 2025
 ***KITP** Generalized Symmetries, March 2025
MIAPbP Navigating New Horizons, Munich, Germany, June 2025