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   Aug 2020
   Dissertation: NEW APPROACHES TO THE HIERARCHY PROBLEM AND THEIR SIGNATURES FROM MICROSCOPIC TO COSMIC SCALES advised by Prof. Nathaniel Craig

University of Pennsylvania   May 2015
   BA in Physics (w/ honors, astro concentration) and Math, MS in Physics

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 I wrote as an introduction to my dissertation

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

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

Non-invertible symmetries, leptons, quarks, and why multiple generations
Harvard CMSA Quantum Matter Seminar, October 2023
Boston University High Energy Seminar, October 2023
Pittsburgh High Energy Physics Seminar, November 2023
UToronto High-Energy Physics Seminar, November 2023
UKentucky Theory Seminar, December 2023
KAIST HET Seminar, December 2023

Contributed Talks

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
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
DCPIHEP Workshop, University of Colima, Mexico, January 2024