Seth Koren, PhD

Michelson Center for Physics
933 East 56th Street
sethk@uchicago.edu
Chicago IL 60637

EDUCATION AND ACADEMIC APPOINTMENTS

University of Chicago Oehme Postdoctoral Fellow, Enrico Fermi Institute 2020-Present

UC 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

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

Montgomery County Community College 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 aimed covering 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.

At UCSB, research mentor to undergraduates Aidan Herderschee (→ UMichigan grad), Samuel Alipourfard (→ MIT grad), and Umut Can Öktem (→ UCDavis grad)
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.

LEADERSHIP EXPERIENCE

UCSB High Energy Grad Group

Organizer — Sept 2017 – Sept 2019

In addition to organizing our seminar series, this position rendered me the spiritual leader of the high energy theory grads. In that role I worked hard to create a welcoming and supportive environment, to foster a collaborative community, and to advocate for a more equitably focused theory group.

Penn Secular Society, *Founder*

President — Jan 2012 – May 2014

I created PSS to fill a void in the dialogue on campus surrounding philosophy, science and theology, and to provide community for a then-unrepresented population of students. The group became well-known at Penn for its efforts to encourage people to think critically about their beliefs, and fully succeeded in influencing and improving campus dialogue.

Penn For Liberty, *Co-founder*

Vice-, then Co-President — Jan 2012 – Jan 2014

PFL focused its activism on protecting free speech and civil liberties, opposing police overreach and our military interventions abroad, keeping the government out of people's bedrooms and their bodies, and advocating for drug policy reform, all of which I remain proud of. I write at some length on my website why I have amended my views on classical liberalism as concerns economic policy.

TALKS AND SEMINARS

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

Putting Generalized Symmetries to use in 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

Naturalness In Your Face

Aspen Center for Physics Prospecting for New Physics, March 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

Publications

Available at Inspire HEP or NASA ADS or Google Scholar.