VITA
Fall 2023

Joel W. Walker
Professor of Physics
Sam Houston State University
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Academic Preparation

Ph.D. in Theoretical Particle Physics, Texas A&M University, 2005

Thesis: "Aspects of Grand Unification and String Phenomenology"
Supervisor: Dimitri V. Nanopoulos, Distinguished Professor of Physics

B.S. in Physics, Harding University, 1997

Professional Experience

2017-Present, Chair of Department of Physics and Astronomy, Sam Houston State University

2019-Present, Professor of Physics, Sam Houston State University

2013-2019, Associate Professor of Physics, Sam Houston State University

2007-2013, Assistant Professor of Physics, Sam Houston State University

2005-2007, Visiting Assistant Professor of Physics, Sam Houston State University

1997-2005, Graduate Assistant, Texas A&M University Department of Physics

Research and Scholarly Activities (Publications are itemized at *http://arxiv.org/a/walker_j_1* **)**

Phenomenology (published in JHEP, NPB, PRD, PLB, EPJC, elsewhere)

Higgs and supersymmetric LHC collider signatures and event reconstruction
Coherent neutrino scattering as a probe of *Z*-prime, sterile ν, ν magnetic moment
Jet Substructure, the SMEFT, Proton decay, dark matter, and rare process constraints

Theory (published in NPB, PRD, PLB, elsewhere)

Grand unified models, including Flipped SU(5)
Models based on no-scale supergravity
String theoretic and D-brane model building

Experiment Service

Tools for real-time monitoring of CMS GRID Computing for the LHC
Guest member of CDF at the Fermilab Tevatron & CMS at the LHC
Consumer Operator in the CDF control room at the Fermilab Tevatron

Computing

High-performance and high-throughput cluster-based computation
Tool development for automated event selection, visualization, and machine learning
Numerical analysis, scripting, batch handling, and inter-process message passing

Teaching

Instructor of 10 unique upper division and 9 unique lower division courses
Supervisor of numerous undergraduate student research experiences

Co-developer of PHYS 1401 “Physics Boot Camp” course

Public Software Development and Distribution

“MInOS”. (2020-2023) Machine Intelligent Optimization of Signficance: Automated Machine Learning for Collider Physics with Boosted Decision Trees. https://github.com/joelwwalker/AEACuS

“RHADAManTHUS”. (2015-2023) Recursively Heuristic Analysis, Display, and Manipulation - The Histogram Utility Suite: Tools for Automated Plotting of Collider Observables. https://github.com/joelwwalker/AEACuS

“AEACuS”. (2012-2023) Algorithmic Event Arbiter and Cut Selector: A Consumer-level tool for implementing generic collider data selection cuts in the search for new physics. https://github.com/joelwwalker/AEACuS

“Brazos”. (2011-2014) Software for the online monitoring of CMS data analysis centers. With students Jacob W. Hill and Michael W. Kowalczyk. github.com/joelwwalker/Brazos

Selected Presentations (titles may vary)

“Cutting, Plotting, and Learning with AEACuS, RHADAManTHUS, and MInOS”, ReInterpretation of LHC Results for New Physics, CERN, 2022, and Computational Tools, IP2I, Lyon, 2021, and PHENO 2021, U. of PIttsburgh

“Jet-SIFTing: A New Scale-Invariant Jet Algorithm for the Substructure Era”, Boost 2022, Universität Hamburg, August 2022, and ML4Jets, Rutgers University, November 2022

“Particle Physics Prospects of Coherent Neutrino Scattering”, Kavli IPMU, Tokyo, 2019, and Magnificent CEVNS CoSMS/TUNL, University of North Carolina, Chapel Hill, 2019, and Magnificent CEVNS, University of Chicago, 2018, and University of California, Irvine, 2018, and Southern Methodist University, 2018, and University of Houston at Clear Lake, 2017, and SUNY Buffalo, 2017, and Texas Tech University, 2017, and University of Louisiana at Lafayette, 2016 and CETUP Workshop, Lead, South Dakota, 2016

External Awards & Funding

2022 KITP Fellow, Kavli Institute for Theoretical Physics, University of California, Santa Barbara

NSF, “SMEFT, Collider, Axion, Neutrino, and Dark Matter Phenomenology” (2021-2024)

NSF, “RUI: Neutrino, Collider, and Dark Matter Phenomenology” (2018-2021)

NSF, “RUI: Supersymmetric Theory, Phenomenology, and Tool Building” (2015-2018)

2013-2015 KITP Scholar, Kavli Institute for Theoretical Physics, University of California, Santa Barbara

Funded participant in the Short-Stay Visitor Program at the LHC Physics Center, Fermilab (2012)

Institutional Awards & Funding

Faculty Research Grant, Sam Houston State University (2013)

Research Enhancement Grant, Sam Houston State University (2011-2012,2014-2015)

Awarded private ten node computing cluster as research startup (2007)

Recent Collaborators

James Dent, William Shepherd, Bhaskar Dutta, Andrew Larkoski, Denis Rathjens, Jason Veatch, Tathagata Ghosh, Ilia Gogoladze, David Toback, Yu Gao, Louis Strigari, Rupak Mahapatra, Nader Mirabolfathi, Dimitri V. Nanopoulos, Jason Kumar, Tianjun Li, Shu Liao, James A. Maxin, Jay Newstead, Pearl Sandick, David Sanford, Qaisar Shafi, Kuver Sinha, Patrick Stengel