

ADARSH PYARELAL

School of Information · University of Arizona · Tucson · Arizona · USA · 85719

✉ adarsh@email.arizona.edu 🌐 adarsh.cc

EDUCATION

- 2017 **Ph. D. in Physics** University of Arizona
Thesis: *Hidden Higgses and Dark Matter at Current and Future Colliders*
- 2011 **B. A. in Physics** Reed College
Thesis: *Contribution of the neutral pion Regge trajectory to the exclusive central production of $\eta(548)$ mesons in high energy proton/proton collisions*

PROFESSIONAL APPOINTMENTS

- 2017 - present **Postdoctoral Research Associate**
School of Information, University of Arizona

PUBLICATIONS

- 2017 **A. Pyarelal** and S. Su, *A Razor Search for Bino Dark Matter at 100 TeV*,
(in preparation)
F. Kling, H. Li, **A. Pyarelal**, H. Song, and S. Su, *Exotic Higgs Decays at 14 and 100 TeV*, (in preparation)
- 2015 F. Kling, **A. Pyarelal**, and S. Su, *Light Charged Higgs Bosons to AW/HW via Top Decay*, *Journal of High Energy Physics*, **11** (2015) 051

HONORS AND AWARDS

- 2016,17 Dept. of Physics Publications/Presentations Award
- 2014,17 Outstanding Graduate Student Colloquium Presentation
- 2016 Galileo Circle Scholarship
- 2015 Graduate and Professional Student Council Travel Award
Professor C. Y. Fan 'FanFare' Travel Award
Graduate College Fellowship in Physics
- 2014-16 APS 4CS Student Travel Grant

GRANTS

2018-20 Co-Investigator, *AutoMATES: Automated Model Assembly from Text, Equations, and Software*, Defense Advanced Research Projects Agency, (\$967,678)

TALKS

2018 *Causal Analysis Graphs from Text*
DARPA World Modelers PI Meeting, Arlington, VA

2016 *Machine Learning and Particle Physics*
Tucson Data Science Meetup, Tucson, AZ

A Razor Search for Dark Matter at a Future 100 TeV Collider
Joint Meeting of the Four Corners and Texas Sections of the American Physical Society, Las Cruces, NM

2015 *Light Charged Higgs Bosons in Single-Top Production*
Phenomenology 2015 Symposium, University of Pittsburgh

Light Charged Higgs Bosons in Two Higgs Doublet Models
Annual Meeting of the APS Four Corners Section, Tempe, AZ

2014 *Light Charged Higgs Bosons in Single-Top Production*
Annual Meeting of the APS Four Corners Section, Orem, UT

Light Charged Higgs Bosons to AW/HW via Top Decay
23rd International Conference on Supersymmetry and Unification of Fundamental Interactions, Lake Tahoe, CA

RESEARCH EXPERIENCE

2017 - present **Postdoctoral Researcher**, University of Arizona

Big Mechanism

As part of DARPA's Big Mechanism program, I am currently developing and implementing algorithms to infer the structure of chemical reaction pathways within cells, using data automatically extracted from biomedical research papers.

World Modelers

For DARPA's World Modelers program, I am designing algorithms to assemble and parameterize quantitative models of food security from machine reading of texts such as agency reports and news articles.

2016-17

Research Assistant, University of Arizona

During the course of my doctoral research, I developed three analyses aimed at discovering or constraining new physics models in high-energy particle collision experiments.

Exotic Higgs Decays at 14 and 100 TeV

This analysis aims to determine the prospects of exotic Higgs decay modes at a 100 TeV collider for all physically viable Two-Higgs Doublet Models, using boosted decision tree classifiers and physics-motivated input features.

A Razor Search for Bino Dark Matter at 100 TeV

I designed an analysis to examine the prospects of finding bino-like dark matter resulting from the decay of pair-produced higgsinos at a 100 TeV collider, using razor variables and boosted decision trees.

Light Charged Higgs Bosons to AW/HW via Top Decay

This analysis is designed to find a charged Higgs produced via the decay of a top quark at the 14 TeV LHC, in the context of a Type-II Two Higgs Doublet Model, using a unique kinematical angle to discriminate between signal and background events.

TEACHING EXPERIENCE

2011-17

Teaching Assistant, University of Arizona

Introduction to Scientific Computing (Spring 2017)

Advanced Lab, (Fall 2013-Fall 2016).

Introductory Physics for non-majors - Lecturer (Fall 2012).

Introductory Electricity and Magnetism (2011-12).

Introductory Physics for non-majors - Lab (Summer 2012 & Summer 2014).

SERVICE

2015 GPSC Travel Grant Judge
2012-13 Member of Physics Grad Council
Member of the Associated Graduate Council for the College of Science
Organized the weekly departmental graduate student seminar series
Arizona Assurance Mentor

SKILLS

Data analysis with C++ and PYTHON.
Software version control with GIT and [Github](#)
Website design with HTML and CSS, static site generation.
Writing and typesetting scientific manuscripts with L^AT_EX
Languages: English (native), Hindi, Malayalam

PROFESSIONAL AFFILIATIONS

American Physical Society