ADARSH PYARELAL

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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

Jan 2019 - present **Research Scientist**
School of Information, University of Arizona

Oct 2017 - Dec 2018 **Postdoctoral Research Associate**
School of Information, University of Arizona

PUBLICATIONS

2018 **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 in Type-II 2HDMs at the LHC and Future 100 TeV Hadron Colliders*, [arXiv:1812.01633] (submitted to JHEP)

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 Research Associate**, 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.

ASKE - Automated Scientific Knowledge Extraction

As a co-PI on the UA effort for DARPA's ASKE program, I am responsible for developing algorithms to translate crop models written in Fortran into dynamic Bayes networks that are semantically enriched with provenance from the scientific literature related to the models.

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 examined 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 LaTeX
Languages: English (native), Hindi, Malayalam

PROFESSIONAL AFFILIATIONS

American Physical Society