

Özer Özdal

Contact Information

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Personal Information

- Date of birth
28/05/1990
- Place of birth
Izmir, Turkey

Languages

Native Turkish
Advanced English
French (A2 Level)

Software Skills

Monte Carlo Sampling
Statistical Modeling
Linear regression
Clustering
Quantitative Analysis
Data Visualization

Coursework

- Machine Learning
 - Deep Learning Specialization
- SQL for Data Science
 - Linear Algebra
- Multivariate Calculus
 - Probability Theory
- Computational Physics
 - Classical Mechanics
 - Quantum Mechanics
 - Statistical Mechanics

Tools

PYTHON, C++
SQL, FORTRAN
CERN ROOT, LaTeX
Bash shell scripting
MATHEMATICA, MATLAB

Packages

Scikit-Learn,
NumPy, SciPy,
Pandas, Matplotlib,
Pytorch, TensorFlow

Research interests

Particle Physics Phenomenology, Beyond the Standard Model Phenomenology, Supersymmetry, Dark Matter, LHC Phenomenology/Collider Physics, Computing Tools for High-Energy Physics, Future High-Energy Physics Experiments, Grand Unified Theories (GUT), Electroweak Symmetry Breaking

Education

- 2016–2020 **Ph.D. in Physics** Concordia University
Phenomenology of new physics beyond the Standard Model: signals of dark matter and new gauge bosons at colliders. Lead to five scientific publications.
- 2016–2017 **Inter-University Transfer Student** McGill University
*Took two graduate courses:
Physics 610 Quantum Field Theory I given by Prof. Simon Caron-Huot
Physics 673 Quantum Field Theory II given by Prof. Alexander Maloney*
- 2014–2016 **M.Sc. in Physics** Izmir Institute of Technology
The Higgs boson and right-handed neutrinos in supersymmetric models. Lead to two scientific publications.
- 2009–2014 **B.Sc. in Physics (Ranked 3rd)** Izmir Institute of Technology
Revisiting N-symmetric barrier tunneling in Quantum Mechanics

Experience

- since 2020 **Postdoctoral Researcher (PD)** Concordia University
Mariana Frank Research Group
- 2016–2020 **Research Assistant (RA)** Concordia University
Mariana Frank Research Group
- 2019-2020 **Visiting Ph.D. Student** NExT Institute & University of Southampton
Supported by MITACS Globalink Research Award. Lead to two scientific publications.
- 2016-2020 **Teaching Assistant (TA)** Concordia University
*TAed for 8 physics courses. Graded assignments and wrote solutions, lead office hours and tutorial sessions:
PHYS 273: Energy and Environment (2020 Winter)
PHYS 284: Introduction to Astronomy (2019 Fall)
PHYS 204: Mechanics (Tutor, 2019 Summer, 2020 Summer)
PHYS 367: Modern Physics and Relativity (Tutor, 2019 Winter)
PHYS 245: Classical Mechanics (Tutor, 2018 Fall)
PHYS 224: Introductory Experimental Mechanics (Lab Assistant)
PHYS 252: Optics (2017 Winter, 2018 Winter)
PHYS 236: Numerical Analysis in Physics (2016 Fall, 2017 Fall)*
- 2015–2016 **Research Assistant (RA)** TUBITAK Project No: 114F461
Studied muon anomalous magnetic moment and yukawa quasi-unification in supersymmetric Models. Lead to two scientific publications.
- 2012–2012 **Internship** Koç University, Mechanical Characterization Lab
Created vibration modeling in nanowire resonators with mechanical coupling

Publications

2020	Leptophobic Z' bosons in the secluded UMSSM	Phys. Rev. D. 102, 115025
2020	PhD Thesis: Phenomenology of new physics beyond the Standard Model: signals of dark matter and new gauge bosons at colliders	PhD Dissertation
2020	E6 motivated UMSSM confronts experimental data	J. High Energ. Phys. 2020, 123 (2020)
2019	Natural Dark Matter and light bosons in an alternative left-right symmetric model	J. High Energ. Phys. 2020, 116 (2020)
2019	Relaxing LHC constraints on the W_R mass	Phys. Rev. D 99, 035001
2018	Exploring the supersymmetric $U(1)_{B-L} \times U(1)_R$ model with dark matter, muon $g-2$, and Z' mass limits	Phys. Rev. D 97, 015012
2017	Muon $g-2$ in an alternative quasi-Yukawa unification with a less fine-tuned seesaw mechanism	Phys. Rev. D 97, 055007
2016	The Higgs boson and right-handed neutrinos in supersymmetric models	IZTECH Theses & Dissertations
2016	Mass spectrum and Higgs profile in B-L symmetric SSM	Phys. Rev. D 93, 055024

Activities

2020	Beyond Standard Model: From Theory to Experiment (2021, March)	BSM - 2021
2015	Introduction to Supersymmetry Summer School (2015, September 7-11)	Boğaziçi University
2015	METU HEP Days (2015, February 12-14)	METU
2014	Cosmology and Astroparticle Physics Summer School (2014, September 1-12)	Boğaziçi University
2014	Differential Geometry and Topological Methods in Physics Summer School	Boğaziçi University
2014	Computational Techniques for Physicists and Astronomers Summer School	Boğaziçi University
2014	Winter School on Computer Applications in Accelerator and Particle Physics	Gaziosmanpaşa University
2013	Physics for Astronomers (2013, September 2-6)	Boğaziçi University
2013	Cosmology Summer School (2013, August 19-30)	Boğaziçi University
2010	Istanbul University 27th International Physics Congress	Istanbul University

Presentations

2019	University of Southampton (Oral Presentation) (2019, November 26) Title: Relaxing LHC constraints on the W' mass, and natural Dark Matter	University of Southampton
2019	NExT Meeting at Sussex (Oral Presentation) (2019, November 20) Title: Loopholes in W' searches at the LHC	University of Sussex
2019	Higgs Couplings Workshop, Oxford, UK (Oral Presentation) (September 30 - October 4) Title: Mass spectrum and Higgs profile in B-L symmetric SSM	Higgs Couplings 2019
2019	XIth International Symposium: Quantum Theory and Symmetries (QTS) Title: Relaxing LHC constraints on the W_R mass	QTS 2019
2018	Phenomenology Symposium, Pittsburgh, USA (Oral Presentation) (2018, 7-9 May) Title: Naturalness and dark matter in supersymmetric $U(1)_{B-L} \times U(1)_R$ model	Pheno 2018
2018	Winter Nuclear and Particle Physics Conference (Oral Presentation) (2018, 15-18 February) Title: Exploring the supersymmetric $U(1)_{B-L} \times U(1)_R$ model	WNPPC 2018
2015	First Joint METU-IPM Conference on LHC Physics (Poster) (September 29–October 3) Title: Higgs Anomalies in SUSY B-L Model	ICTP-ECAR
2014	Turkish Physical Society 31th International Physics Congress (Poster) (July 21-24) Title: Revisiting N-symmetric barrier tunneling in Quantum Mechanics	TFD-31
2014	Izmir Solid State Physics Meeting (Poster) (2014, April 11) Title: Revisiting N-symmetric barrier tunneling in Quantum Mechanics	IZTECH

On-going Studies & Future Plans

- 1) **Correlating W' and Z' mass limits in general extensions of the Standard Model**
Collaboration with Prof. Benjamin Fuks, Prof. Stefano Moretti and Prof. Mariana Frank
- 2) **Complete detector analysis for wide W' & Z' searches**
 $W' \rightarrow WZ$, $Z' \rightarrow WW$, possibly also including Higgses ($V' \rightarrow Vh$)
- 3) **Explanation of electron and muon $g - 2$ anomalies in a single framework**
- 4) **Long-lived particles at the LHC**
- 5) **Dark matter characterization at the LHC**

Awards

2019	Mitacs Globalink Research Award	Mitacs
2016	Concordia International Tuition Award of Excellence	Concordia University
2014	B.Sc. in Physics 3rd Ranked Award	Izmir Institute of Technology

References

- 1) **Prof. Mariana Frank**
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- 2) **Prof. Benjamin Fuks**
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- 3) **Prof. Stefano Moretti**
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- 4) **Prof. Poulouse Poulouse**
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- 5) **Assoc. Prof. Cem Salih Ün**
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