Yuri Gershtein
Curriculum Vitae

Education

Ph.D., Institute for Theoretical and Experimental Physics, Moscow. Thesis: "A Study of $\bar{B}^0 \to D^{*-}\ell^+\nu$ and $B^0 - \bar{B}^0$ Mixing Using Partial D^{*-} reconstruction", 1996. Advisor: M. Danilov
B.Sc., Moscow Institute for Physics and Technology, 1992

Fellowships and Awards

APS Fellow, 2019
LPC Distinguished Researcher, 2019
Rutgers Society of Physics Students award for Outstanding Teaching, 2019
Rutgers University Trustees Award for Excellence in Research, 2014
LPC Fellow, 2012
NSF CAREER Award, 2010
DOE Outstanding Junior Investigator, 2006
Alikhanov Fellowship, 1998

Positions Held

2021 – current Distinguished Professor of Physics at Rutgers University, Piscataway NJ
2015 – 2021 Professor of Physics at Rutgers University, Piscataway NJ
2010 – 2015 Associate Professor of Physics at Rutgers University, Piscataway NJ
2008 – 2010 Assistant Professor of Physics at Rutgers University, Piscataway NJ
2004 – 2008 Assistant Professor of Physics at Florida State University, Tallahassee, FL
1999 – 2004 Research Associate at Brown University, Providence, RI
1996 - 1999 Research Scientist at Institute for Theoretical and Experimental Physics, Moscow, Russia.
1991 - 1995 Research Assistant at Institute for Theoretical and Experimental Physics, Moscow, Russia.

Experiments

2004 – present CMS Experiment. Searches for / discovery of the Higgs boson; searches for physics beyond the Standard Model; HL-LHC Upgrades, photon reconstruction and identification, calorimeter test beam studies.
1997 – present DØ Experiment. Searches for physics beyond the Standard Model, photon and τ-lepton reconstruction and identification, track triggers, silicon detector assembly, muon scintillation counters design and production.
1994 – 1997 CMS Experiment. Quartz Fiber Čerenkov calorimeter development and beam tests, case studies for Higgs discovery strategy, especially in WW and ττ decay modes

1994	HERA-B Experiment. Rare τ decays
1993	GEM Experiment. Muon system alignment.
1991 – 1999	ARGUS Experiment. Semileptonic B decays, $B^0 - \overline{B}^0$ mixing, D^0 decays.

Leadership positions

2023- 2024	Member of the Particle Physics Project Prioritization Panel (P5)
2018 -	CMS Outer Tracker System Test Group co-convener
2015 -	US CMS co-manager of the Upgrade of Tracker Electronics for HL-LHC
2013 - 2015	Co-convener of CMS SUSY Photon subgroup
2012 - 2014	DPF Executive committee member (elected post)
2012 - 2013	Co-convener of the Snowmass-2013 New Particles subgroup
2009 – 2013	US CMS Physics Liaison (elected post)
2009 – 2010	Coordinator of the "High pT photon" group in CMS Exotica PAG
2008 – 2009	Convener of the Photon+X Signature Group at the Fermilab's LPC
2006 – 2007	Convener of the DØ New Phenomena group
2004 – 2007	Head of the Electron-Photon Group at the LHC Physics Center at FNAL.
2003 – 2004	Convener of the DØ Common Samples Group
2000 – 2003	Convener of the DØ Tau ID group
1999 – 2000	Manager of the Silicon Barrel assembly project for the DØ Upgrade

Invited / Plenary Talks

"A Vision for the Future of Particle Physics", a summary talk of PASCOS-2024 conference, Qui-Nhon, 2024
"Long-lived Particles in Higgs Decays", 9th LCTP Symposium, Ann Arbor, 2024
"BSM Searches Using Unconventional Signatures", 15th Recontres du Vietnam, 2019
"Rare and BSM Higgs decays in CMS", 10th Higgs Hunting workshop, Paris 2019
"Dark Photons at HL-LHC Using L1 Track Trigger", Long-Lived Particles Workshop, CERN, 2019
"CMS Track Trigger", Triggering on New Physics at the HL-LHC, Princeton, 2018
"Long-lived particles and CMS Track Trigger", Trieste, October 2017
"SUSY & Naturalness in Run 2 and beyond", **GGI**, October 2015
"Not-quite mainstream Run 2 Physics", **NPKI**, September 2015
"Overview of recent BSM results from ATLAS and CMS" - **PHENO2014**, May 2014
"Higgs search in di-photons" – LHC@BNL After Discovery workshop, October 2012
"Higgs search in di-photons" – Aspen workshop, 2012
"Higgs search in di-photons" – TeraHiggs workshop, University of Oregon, 2012
"Cool non-standard searches" - LHC New Physics Forum Heidelberg, 2011
"Search for the Higgs at CMS" - Higgs @ Tevatron and LHC, Washington, 2011
"Non-SUSY Searches", Recontres de Blois, 2010
"Early CMS results and techniques", LHC 0.5, Washington, 2010
"Hidden Valley Searches at DZero" –SLAC "Dark Forces" Workshop,September 2009
"Searched for Hidden Valleys with Photons" –SUSY09, May 2009

"Searches for New Physics at CMS and ATLAS" – Invited talk at the APS April Meeting, Denver, CO, May 2009
"Tevatron Searches for Higgs Boson and Supersymmetry" – SLAC Summer Institute, August 2008
"Searches for Gauge-Mediated Supersymmetry" - SUSY07, June 2007
"Searches for Supersymmetry" - SUSY06, June 2006

Colloquia

Lawrence Berkeley National Laboratory (2018), Kansas State (2018), Utah (2017), University of Illinois (2015), Rutgers (2014, 2012), New York University (2010), University of Oklahoma (2010), Rice University (2009), SUNY Buffalo (2009), Washington University of St Luois (2008), University of Virginia (2006)

Recent Seminars

Johns Hopkins (2019), Kansas State (2018), FNAL (2018), Texas A&M (2017), Utah (2017), Cornell (2015), Kansas State (2015), Fermilab (2014), New York U (2013), Yale (2012), University of Maryland (2012), IHEP- Protvino (2012), Boston U (2012), Florida State (2012), Massachusetes Amhurst (2010), Oklahoma (2010), Stony Brook (2009), Caltech (2008), Harvard (2007), Fermilab (2007), Rochester (2007), ITEP Moscow (2007), University of Illinois (2006), Maryland (2006)

Conference & workshop organization

- Co-convener, BSM Session of the 2019 CEPC International Workshop
- Organizer of the Winter Aspen HEP conference (2017)
- Organizer of "Preparing for the High Luminosity Run of the LHC" workshop at Perimeter Institute (2015)
- Advisor of KITP-2013 Summer Conference "Exploring TeV Scale New Physics with LHC Data"
- Org. committee member for SUSY at the LHC, BNL, 2012
- Org. Committee member for Aspen Summer workshop 2012
- Organized the 2008 Aspen Winter Conference on High Energy Physics "Revealing the Nature of the Electroweak Symmetry Breaking"
- Organized the Mini-Workshop "Exploring New Phenomena at the Tevatron" (2006)

Teaching

Physics 227 (Analytical Physics II) Spring 2024
Physics 326 (Computer Based Experimentation) Fall 2023
Physics 324 (Advanced General Physics II) Spring 2021, 2022, 2023
Physics 361 (Intro Quantum) Fall 2020, 2021, 2022
Physics 382 (Mechanics-II) Spring 2017, 2018, 2019
Physics 381 (Mechanics-I) Fall 2016, 2017, 2018

Physics 386 (Electromagnetism-II) - Spring 2014, 2015, 2016
Physics 385 (Electromagnetism-I) - Fall 2013, 2014, 2015, 2024
Physics 418 (Nuclei and Particles) – Spring 2010, 2011
Physics 271 (intro physics, honors) – Fall 2009, 2010, 2011
Physics 204 (intro physics, non-science majors) – Spring 2009
Astronomy 1020 (non-science majors) – Spring 2008, Fall 2007
Physics 2041/2042 (intro physics, science/engineering majors) Spring 2007, Fall 2006, Spring 2006, Fall 2005

Post-docs

Prafulla Saha (2023-)
Andrew Hart (2018-2024)
Kevin Nash (2015-2023)
Vladimir Rekovic (2012-2014)
Oleksiy Atramentov (2006-2011)
Andrew Askew (2005-2009)

PhD Students

David Jaroslawski (expected 2025)
Savvas Kyriacou (2019)
Anthony Barker (2015)
Rishi Patel (2014)
Edgar Carrera (2008)

External Funding

"Experimental Research in Elementary Particle Physics", co-PI (one of five), NSF award #2209460 (2023-2025)

"LPC Distinguished Researcher", PI, DOE/Fermilab, (2019)

"Experimental Research in Elementary Particle Physics", co-PI (one of five), NSF award #1913356 (2019-2022)

"Experimental Research in Elementary Particle Physics", co-PI (one of five), NSF award #1607096 (2017-2019)

URA Visiting Scholar Program at Fermilab, PI, URA (2014)

"Experimental Research in Elementary Particle Physics", co-PI (one of five), NSF award #1306801 (2013-2016)

"LPC Fellowship", PI, DOE/Fermilab, (2012)

"CAREER: Physics with CMS Detector", PI, NSF award number #0952482, (2010-2014)

"Experimental Research in Elementary Particle Physics", co-PI (one of five), NSF award #0969282 (2010-2013)

"Research in Experimental High Energy Physics", PI, NSF award #0855019 (2009)

Outstanding Junior Investigator Award: "Recovering EM energy resolution in CMS", DOE, PI, (2006-2008)

"High Energy Physics at FSU", co-PI (one of seven), DOE (2005-2008)

Papers with significant personal involvement
in approximate inverse chronological order

"Exploring the Quantum Universe: Pathways to Innovation and Discovery in Particle Physics", P5 report https://www.usparticlephysics.org/2023-p5-report/

"Search for a W' boson decaying to a vector-like quark and a top or bottom quark in the all-jets final state at sqrt(s) = 13 TeV", JHEP 09 (2022) 088

"Probing naturally light singlets with a displaced vertex trigger", Y. Gershtein, S. Knappen, and D. Redigolo, Phys.Lett.B 823 (2021) 136758

"A Trigger for Displaced Muon Pairs Following the CMS Phase II Upgrades", Y. Gershtein and S. Knappen, Phys. Rev. D 101, 032003 (2020)

"Search for physics beyond the standard model in events with overlapping photons and jets", [CMS Experiment] Phys. Rev. Lett. 123, 241801 (2019)

"Machine learning-based identification of highly Lorentz-boosted hadronically decaying particles at the CMS experiment", [CMS Experiment] CMS-JME-18-002, *to be submitted to JINST*

"Higgs Physics at the HL-LHC and HE-LHC", M. Cepeda et al, arXiv:1902.00134

"CMS hardware track trigger: New opportunities for long-lived particle searches at the HL-LHC," Y. Gershtein, Phys. Rev. D 96 (Aug, 2017) 035027.

"Search for a W' boson decaying to a vector-like quark and a top or bottom quark in the all-jets final state", [CMS Experiment] arXiv:1811.07010, submitted to JHEP

"Searches for W′ bosons decaying to a top quark and a bottom quark in proton-proton collisions at 13 TeV," [CMS Experiment] JHEP 08 (2017) 029

"Search for W' → tb in proton-proton collisions at 8 TeV" , [CMS Experiment] J. High Energy Phys. 02 (2016) 122

"Search for the production of an excited bottom quark decaying to tW in proton-proton collisions at 8 TeV", [CMS Experiment] J. High Energy Phys. 01 (2016) 166

"Search for stealth supersymmetry in events with jets, either photons or leptons, and low missing transverse momentum in pp collisions at 8 TeV," [CMS Experiment] Phys.Lett. B743 (2015) 503–525, arXiv:1411.7255 [hep-ex]

Searches for electroweak production of charginos, neutralinos, and sleptons decaying to leptons and W, Z, and Higgs bosons in pp collisions at 8 TeV," [CMS Experiment] Eur.Phys.J. C74 no. 9, (2014) 3036, arXiv:1405.7570 [hep-ex]

"Observation of the diphoton decay of the Higgs boson and measurement of its properties" Eur. Phys. J. C74 no. 10, (2014) 3076, CMS-HIG-13-001, arXiv:1407.0558,

"Measurement of the W gamma and Z gamma inclusive cross sections in pp collisions at sqrt(s) = 7 TeV" Phys. Rev. D 89 (2014) 092005

"Search for top squark and higgsino production using diphoton Higgs boson decays," [CMS Experiment] Phys.Rev.Lett. 112 (2014) 161802, arXiv:1312.3310 [hep-ex]

"New Particles Working Group Report of the Snowmass 2013 Community Summer Study", arXiv:1311.0299

"Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC" [CMS experiment] Phys.Lett. B716 (2012) 30-61

"A search using multivariate techniques for a standard model Higgs boson decaying into two photons" [CMS experiment] CMS-HIG-12-001

"Search for supersymmetry in events with photons and missing energy", [CMS experiment] CMS-SUS-12-001, JHEP 1303 (2013) 111

"Search for the fermiophobic model Higgs boson decaying into two photons", [CMS experiment] CMS-HIG-12-002, JHEP 1209 (2012) 111

"Search for new physics with long-lived particles decaying to photons and missing energy" [CMS experiment] CMS-EXO-11-067, JHEP11(2012)172

"Search for the standard model Higgs boson in the decay channel H to two photons in pp collisions at sqrt(s) = 7 TeV" [CMS Experiment] CMS-HIG-11-033, arXiv:1202.1997

"Search for Supersymmetry in events with a lepton, photon and large missing transverse energy" [CMS Experiment] CERN-PH-EP-2011-058, JHEP 1106:093 (2011)

"Search for Supersymmetry in pp Collisions at s = 7 TeV in Events with Two Photons and Missing Transverse Energy" [CMS Experiment] arXiv:1103.0953, Phys. Rev. Lett. 106, 211802 (2011)

"Search for events with leptonic jets and missing transverse energy in p-pbar collisions at √s = 1.96 TeV", [D0 Experiment] Phys. Rev. Lett. 105, 211802 (2010)

"Search for quirks at the Fermilab Tevatron Collider", [D0 Experiment], Phys. Rev. Lett. 105, 211803 (2010)

"Measurement of the Z gamma ---> nu anti-nu gamma cross section and limits on anomalous Z Z gamma and Z gamma gamma couplings in p anti-p collisions at s**(1/2) = 1.96-TeV", V. M. Abazov et al. [D0 Experiment], Phys. Rev. Lett. 102, 201802-1 – 201802-7 (2009).

"The CMS barrel calorimeter response to particle beams from 2-GeV/c to 350-GeV/c", S. Abdullin et al. [USCMS Experiment and ECAL/HCAL Experiment], Eur. Phys. J. C 60, 359-373 (2009).

"Search for Large extra spatial dimensions in the dielectron and diphoton channels in p anti-p collisions at s**(1/2) = 1.96-TeV", V. M. Abazov et al. [D0 Experiment], Phys. Rev. Lett. 102, 051601-1 – 051601-7 (2009).

"Discovering hidden sectors with mono-photon Z-primeo searches", Y. Gershtein, F. Petriello, S. Quackenbush and K. M. Zurek, Phys. Rev. D 78, 095002-1 – 095002-13 (2008).

"Search for scalar leptoquarks and T-odd quarks in the acoplanar jet topology using 2.5 fb**-1 of p anti-p collision data at s**(1/2) = 1.96-TeV", V. M. Abazov et al. [D0 Experiment], Phys. Lett. B 668, 357-363 (2008) .

"Measurement of the electron charge asymmetry in p anti-p ---> W + X ---> e nu + X events at s**(1/2) = 1.96-TeV", V. M. Abazov et al. [D0 Experiment], Phys. Rev. Lett. 101, 211801-1 – 211801-7 (2008).

"Search for long-lived particles decaying into electron or photon pairs with the D0 Detector", V. M. Abazov et al. [D0 Experiment], Phys. Rev. Lett. 101, 111802-1 – 111802-7 (2008).

"First study of the radiation-amplitude zero in W gamma production and limits on anomalous WW gamma couplings at s**(1/2) = 1.96- TeV", V. M. Abazov et al. [D0 Experiment], Phys. Rev. Lett. 100, 241805-1 - 241805-7 (2008)

"Search for decay of a fermiophobic Higgs boson h(f) ---> gamma gamma with the D0 detector at s**(1/2) = 1.96-TeV", V. M. Abazov et al. [D0 Experiment], Phys. Rev. Lett. 101, 051801-1 – 051801-7 (2008).

"Search for large extra dimensions via single photon plus missing energy final states at s**(1/2) = 1.96-TeV", V. M. Abazov et al. [D0 Experiment], Phys. Rev. Lett. 101, 011601-1 – 011601-7 (2008).

"Search for supersymmetry in di-photon final states at s**(1/2) = 1.96-TeV", V. M. Abazov et al. [D0 Experiment], Phys. Lett. B 659, 856-863 (2008).

"First measurement of sigma (p anti-p ---> Z) . Br (Z ---> tau tau) at s**(1/2) = 1.96-TeV", V. M. Abazov et al. [D0 Experiment], Phys. Rev. D 71, 072004-1 - 072004-7 (2005). ibid. D 77, 039901 (2008).

"Search for supersymmetry with gauge-mediated breaking in diphoton events at D0", V. M. Abazov et al. [D0 Experiment], Phys. Rev. Lett. 94, 041801-1 - 041801-7 (2005). [arXiv:hep-ex/0408146].

"The Muon system of the run II D0 detector", V. M. Abazov et al., Nucl. Instrum. Meth. A 552, 372-398 (2005).

"On the differences between high-energy proton and pion showers and their signals in a non-compensating calorimeter", N. Akchurin et al., Nucl. Instrum. Meth. A 408, 380-396 (1998).

"Test beam results of CMS quartz fibre calorimeter prototype and simulation of response to high-energy hadron jets", N. Akchurin et al., Nucl. Instrum. Meth. A 409, 593-597 (1998).

"Beam test results from a fine-sampling quartz fiber calorimeter for electron, photon and hadron detection", N. Akchurin et al., Nucl. Instrum. Meth. A 399, 202-226 (1997).

"Test beam of a quartz-fibre calorimeter prototype with a passive front section", N. Akchurin et al., Nucl. Instrum. Meth. A 400, 267-278 (1997).

"Physics with ARGUS", H. Albrecht et al. [ARGUS Experiment], Phys. Rept. 276, 223-405 (1996).

" Measurement of the semileptonic branching fractions of the D0 meson", H. Albrecht et al. [ARGUS Experiment], Phys. Lett. B 374, 249-255 (1996).

"Measurement of the absolute branching fractions for D0 decays into K- pi+, Ki+pi+ pi-anti-K0 pi+ pi-", H. Albrecht et al. [ARGUS Experiment], Phys. Lett. B 340, 125-128(1996).

"A Study of anti-B0 ---> D*+ lepton- anti-neutrino and B0 anti-B0 mixing using partial D*+ reconstruction", H. Albrecht et al. [ARGUS Experiment], Phys. Lett. B 324, 249-254 (1994).