

ANDREY KORYTOV

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October 30, 2016

EMPLOYMENT

2006-present Professor, University of Florida
2001-2006 Associate Professor, University of Florida
1996-2001 Assistant Professor, University of Florida
1993-1996 Research Scientist, M.I.T.
1992-1993 Research Associate, M.I.T.
1986-1991 Research Scientist, Joint Institute for Nuclear Research, Dubna, Russia

VISITING AND GUEST APPOINTMENTS

1994-present Visiting Scientist, European Center for Nuclear Research (CERN), Geneva, Switzerland
1992-present Visiting Scientist, Fermilab, Chicago, US
1990-1991 Visiting Scientist, Superconducting Supercollider Laboratory, Dallas, US

EDUCATION

1991 Ph.D. in Physics, Joint Institute for Nuclear Research, Dubna, Russia
1986 M.S. in Physics, Moscow Institute of Physics and Technology, *SUMMA CUM LAUDE Diploma*

AWARDS AND HONORS

2014-2016 University of Florida Research Foundation Professorship
awarded in recognition of "... a distinguished record of research and scholarship that is expected to lead to continuing distinction in the field. You are commended for your key role in the University's research enterprise and our growing emphasis on graduate education."

2012 American Physical Society Fellow
Citation: "For major contributions to the Higgs searches at LHC, and to the design and construction of high rate high precision muon detectors for the CMS experiment"

2009-2010 Colonel Allan R. and Margaret G. Crow Professorship
1993-1994 Superconducting Super Collider Fellowship
1990 Outstanding Young Research Scientist Award, JINR

RESEARCH INTERESTS

Experimental High Energy Physics

MAIN CONTRIBUTIONS IN THE FIELD

Discovery of a Higgs boson and studies of its properties at CMS

- 2011-2012: Led combination of all CMS Higgs boson searches:
 - Discovery of a Higgs boson candidate with a mass near 125 GeV in 2012
 - Exclusion of the SM Higgs boson in the mass range 127-600 GeV in 2011
- 2004-present: Higgs boson search/measurements using the $H \rightarrow ZZ \rightarrow 4l$ decay channel:
 - Observation of a Higgs boson candidate in the standalone $H \rightarrow ZZ \rightarrow 4l$ decay channel
 - Mass measurements of the newly discovered boson
 - Establishing spin-parity quantum numbers of the newly discovered boson
 - Observation of $Z \rightarrow 4l$ decays in pp collisions, a “standard candle” for the $H \rightarrow ZZ \rightarrow 4l$ search
 - Development of the $H \rightarrow ZZ \rightarrow 4l$ search/measurement strategy
- 2009-2010: Convener of the CMS Higgs Physics Group. Coordinated preparations for all Higgs boson searches in CMS and the very first Higgs boson searches carried out with the 2010 LHC data.

Search for supersymmetry (SUSY) at CMS

- 2011-present: Search for SUSY particles, produced in electroweak interactions, in events with tri-leptons and missing energy.
- 2010-present: Search for SUSY particles, produced in strong interactions, in events with same-sign dileptons, jets, and missing energy.

QCD physics at CDF

- 1996-2008: Established and led a broad program of jet fragmentation studies at CDF. The research advanced understanding of the relative roles of perturbative and non-perturbative domains of Quantum Chromo-Dynamics in forming the main characteristics of quark and gluon jets.

CMS Muon Endcap detectors

- 2006-2009: Deputy Project manager for the CMS Endcap Muon System maintenance and operations. The project involved 15 institutions with a budget of about \$2M per year.
- 1994-2005: Led the CMS Endcap muon detector project (\$18M, 9 research institutions) from the early R&D stages through the end of construction.

MEMBER OF THE FOLLOWING EXPERIMENTS

CMS Experiment (international collaboration of ~3000 physicists) operates since 2009 at the Large Hadron Collider (LHC) situated at CERN near Geneva.

CDF Experiment (international collaboration of ~800 physicists) was operational in 1985-2011 at the Tevatron proton-antiproton collider situated at Fermi National Laboratory near Chicago.

DELPHI Experiment (international collaboration of ~600 physicists) was operational in 1989-2000 at the Large Electron-Positron collider (LEP) situated at CERN near Geneva.

RECENT SELECT PUBLICATIONS

As of October 30, 2016, I am the author or co-author of 1,164 publications. The full list can be retrieved via the High Energy Physics publication database web page: <http://inspirehep.net/> (find author korytov).

Books

- “*Higgs boson observation and measurements of its properties in the $H \rightarrow ZZ \rightarrow 4l$ decay mode*”, A. Korytov and K. Nikolopoulos, in “*Discovery of the Higgs boson*”, World Scientific Publishing Co., 2016 (ISBN-10: 9814425443)

Higgs boson search, discovery, and studies of its properties

- “*Measurement of differential and integrated fiducial cross sections for Higgs boson production in the four-lepton decay channel in pp collisions at $\sqrt{s} = 7$ and 8 TeV*”, CMS Collaboration, *JHEP* **04** (2016) 005 (17 citations)
- “*Precise determination of the mass of the Higgs boson and tests of compatibility of its couplings with the standard model predictions using proton collisions at 7 and 8 TeV*”, CMS Collaboration, *EPJ C* **75** (2015) 212 (457 citations)
- “*Constraints on the spin-parity and anomalous HVV couplings of the Higgs boson in proton collisions at 7 and 8 TeV*”, CMS Collaboration, *Phys. Rev. D* **91** (2015) (153 citations)
- “*Measurement of the properties of a Higgs boson in the four-lepton final state*”, CMS Collaboration, *Phys. Rev. D* **89** (2014) 092007 (429 citations)
- “*Study of the mass and spin-parity of the Higgs boson candidate via its decays to Z boson pairs*”, CMS Collaboration, *Phys. Rev. Lett.* **110** (2013) 081803 (335 citations)
- “*Precision studies of the Higgs boson decay channel $H \rightarrow ZZ \rightarrow 4l$ with MEKD*”, P. Avery et al., *Phys. Rev. D* **97** (2013) 055006 (53 citations)
- “*Search for Higgs bosons in pp collisions at $\sqrt{s} = 7$ TeV and 8 TeV in the context of four-generation and fermiophobic models*”, CMS Collaboration, *Phys. Lett. B* **725** (2013) 36 (29 citations)
- “*Observation of a new boson with mass near 125 GeV in pp collisions at $\sqrt{s} = 7$ and 8 TeV*”, CMS Collaboration, *JHEP* **06** (2013) 081 (458 citations)
- “*Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC*”, CMS Collaboration, *Phys. Lett. B* **716** (2012) 30-61 (6,437 citations)
- “*Combined results of searches for the standard model Higgs boson in pp collisions at $\sqrt{s} = 7$ TeV*”, CMS Collaboration, *Phys. Lett. B* **710** (2012) 26-48 (795 citations)
- “*Observation of Z decays to four leptons with the CMS detector at the LHC*”, CMS Collaboration, *JHEP* **12** (2012) 034 (42 citations)

SUSY search

- “*Search for electroweak production of charginos and neutralinos using leptonic final states in pp collisions at $\sqrt{s} = 7$ TeV*”, CMS Collaboration, *JHEP* **1211** (2012) 147 (73 citations)
- “*Search for new physics with same-sign isolated dilepton events with jets and missing transverse energy at the LHC*”, CMS Collaboration, *JHEP* **06** (2011) 077 (96 citations)

QCD Physics

- “*Measurements of charged particle multiplicities in gluon and quark jets in proton-antiproton collisions at $\sqrt{s} = 1.8$ TeV*”, CDF Collaboration, *Phys. Rev. Lett.* **94** (2005) 171802 (24 citations)
- “*Momentum distribution of charged particles in jets in dijet events in proton-antiproton collisions at $\sqrt{s} = 1.8$ TeV and Comparisons to Perturbative QCD Predictions*”, CDF Collaboration, *Phys. Rev. D* **68** (2003) 012003 (56 citations)

Instrumentation

- “*Cathode strip chambers*”, in “*The CMS experiment at the CERN LHC*”, CMS Collaboration, 2008 *JINST* **3** S08004 (3,834 citations)
- “*Large CMS cathode strip chambers: design and performance*”, Acosta et al., *Nucl. Instr. and Meth. A* **453** (2000) 182 (10 citations)

RECENT CONFERENCES, COLLOQUIA, AND SEMINARS

- [LHC Physics in the post Higgs discovery era](#)
Physics colloquium, University of North Florida, October 21, 2016, Jacksonville FL, USA
- [Is \$h\(125\)\$ the standard model Higgs boson?](#)
High energy physics seminar, Texas A&M University, 5 May 2016, College Station TX, USA
- [Spin-parity properties of the \$h\(125\)\$ boson](#)
Workshop “Higgs Days at Santander”, September 17, 2015, Santander, Spain
- [Higgs results from ATLAS and CMS](#)
Lake Louise Winter Institute 2015, February 16, 2015, Lake Louise, Canada
- [SM Higgs boson results](#)
Miami topical conference on elementary particles, astrophysics, and cosmology, Dec 20, 2014, Fort Lauderdale FL, USA
- [Discovery of the Higgs boson and what we have learned since then](#)
Physics colloquium, Los Alamos National Lab, December 4, 2014, LANL, Los Alamos NM, USA
- [Experimental results: Higgs boson](#)
CTEQ School, Peking University, July 17, 2014, Beijing, China
- [Experimental methods at LHC \(3 lectures\)](#)
TASI School, University of Colorado, June 4-6, 2014, Boulder CO, USA
- [H125 Higgs boson studies with the CMS Detector](#)
HEP seminar, Brookhaven National Lab, May 22, 2014, Brookhaven NY, USA
- [Status of Higgs boson studies with the CMS Detector](#)
Mitchell Workshop on Collider and Dark Matter Physics, Texas A&M University, May 12, 2014, College Station TX, USA
- [Higgs boson discovery](#)
Physics colloquium, University of Florida, October 24, 2013, Gainesville FL, USA
- [Higgs boson searches at the LHC](#)
Workshop “LoopFest XII”, Florida State University, May 13, 2013, Tallahassee FL, USA
- [CMS Higgs 126 GeV results](#)
International workshop “The LHC Higgs Signal: Characterization, Interpretation and BSM Implications”, April 22, 2013, University of California Davis, Davis CA, USA
- [Discovery of a new boson with a mass near 125 GeV](#)
Physics colloquium, University of Delaware, February 6, 2013, Newark DE, USA
- [Higgs combination and properties at CMS](#)
Chicago 2012 Workshop on LHC Physics, University of Chicago, November 14, 2012, Chicago IL, USA
- [Observation of a new boson with a mass near 125 GeV](#)
Physics colloquium, University of Florida, August 30, 2012, Gainesville FL, USA
- [Tracking Detectors \(three lectures\)](#)
CERN-Fermilab HEP summer school, Fermilab, August 6-8, 2012, Batavia IL, USA
- [Standard Model Higgs boson search at LHC](#)
Physics colloquium, Jefferson Lab, June 8, 2012, Newport News VA, USA
- [Higgs boson: on the verge of discovery](#)
Colloquium, University of Maryland, March 6, 2012, College Park MD, USA
- [Standard Model Higgs search at CMS](#)
PITT PACC workshop “Light Higgs boson implications”, January 13-15, 2012, Pittsburgh PA, USA
- [Where is the Higgs boson?](#)
HEP seminar, University of Florida, January 10, 2012, Gainesville FL, USA
- [Standard Model Higgs search at CMS](#)
Fermilab Wine & Cheese seminar, Fermilab, December 16, 2011, Batavia IL, USA
- [Standard Model Higgs search at LHC](#)
RDMS seminar, CERN, December 7, 2011, Geneva, Switzerland
- [Standard Model Higgs boson search at CMS](#)
International workshop “Interpreting LHC Discoveries”, Galileo Galilei Institute, Nov 7-11, 2011, Florence, Italy
- [Standard Model Higgs boson searches at CMS](#)
International workshop “Higgs Days at Santander 2011”, September 19-23, 2011, Santander, Spain
- [Standard Model Higgs search results from LHC](#)
HEP seminar, University of Florida, September 6, 2011, Gainesville, USA
- [Combined results of SM Higgs boson search with the CMS Detector](#)
International Europhysics Conference on High Energy Physics (EPS’11), July 21-27, 2011, Grenoble, France

GRADUATE STUDENT SUPERVISION

Name	Graduation date	Thesis	Current position
H. Mei	expected in 2018	<i>LHC, Higgs boson properties</i>	
A. Rinkevicius	PhD Dec 2014	<i>Observation of a Higgs boson in the $H \rightarrow ZZ \rightarrow 4l$ decay channel and studies of its spin-parity properties...</i>	Research Associate, Cornell University
M. Snowball	PhD May 2014	<i>Observation of a Higgs boson in the $H \rightarrow ZZ \rightarrow 4l$ decay channel and using $Z \rightarrow 4l$ decays as a calibration tool...</i>	Staff Scientist, Los Alamos National Lab
T. Cheng	PhD May 2014	<i>Observation of a Higgs boson in the $H \rightarrow ZZ \rightarrow 4l$ decay channel and measurements of its mass...</i>	Postdoctoral Fellow, IHEP, Chinese Academy of Science
N. Skhirtladze	PhD Dec 2013	<i>Search for Supersymmetry with tri-leptons and missing transverse energy using the CMS experiment at LHC</i>	Research Associate, Kansas State University
Yu. Pakhotin	PhD Aug 2010	<i>Compact Muon Solenoid Experiment Discovery Potential for Supersymmetry in Same-Charge Di-lepton Events</i>	Research Associate, Texas A&M University
Yu. Oksuzian	PhD Aug 2009	<i>Search for resonant production of top antitop pairs decaying into multi-jets at the collider detector at Fermilab</i>	Research Associate, University of Virginia
L. Pinera	PhD Aug 2008	<i>Measurement of Event Shapes in Proton-Antiproton Collisions at a Center-of-Mass Energy 1.96 TeV</i>	Software engineer, Raytheon, Boston MA
S. Jindariani	PhD Nov 2007	<i>Fragmentation of Jets Produced in Proton-Antiproton Collisions at a Center-of-Mass Energy 1.96 TeV</i>	Wilson Fellow, Fermi National Lab
A. Drozdetskiy	PhD Aug 2007	<i>The Standard Model Higgs Boson Discovery Potential in the Decay Channel $H \rightarrow ZZ \rightarrow 4\mu$ with the CMS Detector</i>	Data Scientist, Altius, London, UK
A. Pranko	PhD May 2005	<i>Fragmentation of Quark and Gluon Jets in Proton-Antiproton Collisions at Center-of-Mass Energy 1.8 TeV</i>	LBNL Physics Division Fellow, Berkley National Lab
A. Safonov	PhD May 2001	<i>Jet Fragmentation at CDF and Comparison to the Modified Leading Logarithm Approximation</i>	Professor, University of Texas A&M

Member on 21 Ph. D. Committees for the following students:

M,Tran, D. Debnath, S. Mallick, A.Sbergaeva, L. Muniz (2014), M. Fisher (2014), N.Kypreos (2013), G.Sarangi (2012), J.Escobar (2011), M.Park (2011), D.Hyatt (2010), K.Kotov (2010), M.Burns (2009), S.S.Kim (2008), J.Angle (2008), Yu.Turygin (2007), R.Patel (2007), K.C.Kong (2006), C.Group (2006), H.Pi (2005), A.Rubiera (2000)

POSTDOCTORAL SUPERVISION

Name	Period	Research area	Current position
J. Wang	2015–present	<i>Search for $\tau \rightarrow 3\mu$ decays; CMS Muon System operation</i>	
D. Sperka	2014–present	<i>Studies of Higgs boson properties</i>	
P. Milenovic	2011–2016	<i>Search for and discovery of the Higgs boson; first studies of its properties</i>	CERN Fellow CERN, Geneva, Switzerland
M. Chen	2009–2013	<i>Search for and discovery of the Higgs boson; first studies of its properties</i>	Associate Professor IHEP, Beijing, China
A. Drozdetskiy	2007–2013	<i>Search for and discovery of the Higgs boson; CMS Muon System operation</i>	Data Scientist, Altius, London, UK
P. Bartalini	2004–2007	<i>Developing strategies for the Higgs boson search CMS Muon System operation</i>	Professor Central China Normal University

AWARDED RESEARCH FUNDING

- 2016-present \$1.3M (co-PI)
- 2011-2015 \$7.0M (co-PI)
- 2006-2010 \$7.5M (co-PI)
- 2001-2005 \$12.0M (\$479K—PI; \$11,558K—co-PI)
- 1996-2000 \$3.3M (\$591K—PI; \$2,669K—co-PI)

PROFESSIONAL ACTIVITIES AND SERVICE

- Co-organizer, “Implications of Higgs-like LHC signals”, workshop, Aspen CO, August 11-29, 2013
- Co-organizer, “Physics at TeV Colliders”, Les Houches workshop, Les Houches, France, June 3-21, 2013
- Co-organizer, CMS four-lepton workshop, Paris, France, July 1-3, 2009
- Co-organizer, International Symposium on Multiparticle Dynamics, Sonoma CA, July 26-31, 2004
- Co-organizer, “Higgs and Supersymmetry: Search and Discovery”, International conference, Gainesville FL, March 8-11, 1999
- Peer reviewer of high energy physics proposals in US (DOE), Netherlands (NWO)
- Member of the American Physical Society, APS South East Division, and Division of Particles and Fields

DEPARTMENTAL SERVICE

- Department Advisory Committee (2007-2009)
- Department Salary Committee (2007-2010, 2014-2015)
- Graduate Recruiting and Admissions Committee (chair 2005-2008; member 1997-2001)
- Graduate Student Advisory Committee (1997-2001)
- Technical Operations Committee (1997-2003, 2008-present)
- New Physics Building Space Committee (2003-present)
- Preliminary/Qualifying Examination Committee (approx. every other semester)
- Teaching Peer Review Committee (approx. every other year)
- PHY2048/PHY2049 Textbook Committee (2000)
- New Faculty Search Committee (Fall 2000)
- Colloquium Committee (1998)

COURSES TAUGHT

- Introduction to Particle Physics (PHZ5354, PHZ6355-PHZ7357), lectures (10-20 graduate students)
- Introduction to Particle Physics (PHZ4390), lectures (~15 undergraduate students)
- Physics I with calculus (PHY2048), lectures (~700 students)
- Physics II with calculus (PHY2049), lectures (~600 students)
- Physics II with calculus (PHY2049), discussion sections (~100 students)
- Physics II (PHY2064), lectures (~400 students)
- Physics II Labs (~50 students)

OUTREACH

- 5 lectures “Elementary particles, fundamental forces and what is missing” for physics class students at Buchholz High School, Gainesville, Florida (Fall 2003)