

David Wilkins Miller

The Enrico Fermi Institute
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EDUCATION

2006 - 2011	Stanford University	Stanford, CA
<i>Doctor of Philosophy, Physics</i>		
2001 - 2005	University of Chicago	Chicago, IL
<i>B.A. with honors, Physics, Specialization in Astrophysics</i>		

PROFESSIONAL EXPERIENCE

University of Chicago	2013-present	Neubauer Family Assistant Professor
Enrico Fermi Institute	2011-2013	McCormick Fellow (ATLAS experiment)
SLAC, Stanford University	2006-2011	Graduate research assistant (ATLAS experiment)
University of Chicago	2005-2006	Research technician (ATLAS experiment)
University of Chicago	2003-2005	Undergrad research assistant (CAST experiment)

HONORS

Neubauer Family Assistant Professor Award, University of Chicago, 2013
ATLAS Thesis Award for outstanding contributions to ATLAS, 2011
IEEE Real-Time Conference Outstanding Paper Award, 2010
Stanford University Paul H. Kirkpatrick Graduate Teaching Award, 2007
National Science Foundation Graduate Research Fellowship, 2005-2008
American Physical Society LeRoy Apker Undergraduate Physics Achievement Award, 2005
University of Chicago Fire Department Scholar, 2001-2005

RESEARCH EXPERIENCE

2013 - Present	Physics Department, University of Chicago
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Neubauer Family Assistant Professor

- Electronics for global feature extraction (gFEX) Run III Level-1 boosted object trigger
- ATLAS Deputy Jet Trigger Signature coordinator
- Co-Director of the 2014 Enrico Fermi Institute Summer Interns Program

2011 - 2013 **Enrico Fermi Institute, The University of Chicago**
McCormick Fellow, Postdoctoral Scholar (ATLAS experiment)

- Co-convener of the R -Parity Violating (RPV) Signatures Group within the Supersymmetry (SUSY) Physics Working Group.
- Co-convener of the Jet Substructure and Tagging Performance group.
- Contact physicist for the search for boosted supersymmetric (SUSY) gluino decays.
- Co-coordinator of the Tile Hadronic Calorimeter Calibrations group.
- Responsible for deployment of new jet algorithms in ATLAS and the evaluation of systematic uncertainties used in measurements of and searches for highly boosted W bosons, top quarks, and di-boson resonances.

2006 - 2011

SLAC National Accelerator Laboratory, Stanford University

Graduate student research assistant (ATLAS experiment: Pixel detector group, Jet/ E_T^{miss} performance group, Trigger-DAQ group, Standard Model physics group)

- **Ph.D. thesis:** *Measurement of Hadronic Event Shapes and Jet Substructure in pp Collisions at $\sqrt{s} = 7$ TeV Center-of-Mass Energy with the ATLAS Detector at the Large Hadron Collider.*
- Development and commissioning of advanced jet calibration techniques and jet-vertex association algorithms for high luminosity jet identification and corrections.
- Co-contributor to the track-jet analysis for the publication of the first observation of jet quenching in heavy ion collisions.
- Co-editor of first conference publications on jet properties at $\sqrt{s} = 900$ GeV and 7 TeV.
- Online measurement and characterization of the LHC beam with the ATLAS high-level trigger system.
- Testing, integration, and operation of the silicon pixel detector test stand at CERN.

2005 - 2006

Enrico Fermi Institute, The University of Chicago

Research technician (ATLAS experiment: TileCal calorimeter detector group)

- ATLAS Tile Calorimeter front-end electronics connections team leader.
- *In situ* stability tests of front-end power supplies and on-detector electronics.
- Commissioning and tests of front-end electronics read-out chain integrity.

2003 - 2005

Kavli Institute for Cosmological Physics, University of Chicago

Undergraduate research assistant (CAST experiment: γ -ray calorimeter detector group)

- Design, construction, and installation of the CAST gamma-ray calorimeter at CERN
- Monitoring, DAQ, and analysis coordinator for calorimeter first run data
- Editor and corresponding author for publication of first calorimeter results
- Responsible for testing and selection of inorganic scintillating crystals
- Development of pulse shape discrimination and particle identification algorithms

SELECTED PUBLICATIONS

ATLAS Collaboration, “Search for new phenomena in final states with large jet multiplicities and missing transverse momentum at $\sqrt{s} = 8$ TeV proton-proton collisions using the ATLAS experiment”, *JHEP* **10(2013)130** ([arXiv:1308.1841](#)) (2013)

ATLAS Collaboration (corresponding author), “Performance of jet substructure techniques for large- R jets in proton-proton collisions at $\sqrt{s} = 7$ TeV using the ATLAS detector”, *JHEP* **09(2013)076** ([arXiv:1306.4945](#)) (2013)

ATLAS Collaboration (corresponding author), “Search for pair production of massive particles decaying into three quarks with the ATLAS detector in $\sqrt{s} = 7$ TeV pp collisions at the LHC”, *JHEP* **1205(2012)128** ([arXiv:1210.4813](#)) (2012)

ATLAS Collaboration (corresponding author), “Measurement of Hadronic Event Shapes at High Q^2 with the ATLAS Detector at the LHC”, *Eur. Phys. J. C* **(2012) 72: 2211** ([arXiv:1206.2135](#)) (2012)

ATLAS Collaboration, “Measurement of Jet Mass and Substructure for Inclusive Jets in $\sqrt{s} = 7$ TeV pp Collisions with the ATLAS Experiment”, *JHEP* **1205(2012)128** ([arXiv:1203.4606](#)) (2012)

Altheimer, A. et al., “Jet Substructure at the Tevatron and LHC: New results, new tools, new benchmarks”, *J. Phys. G* **39 (2012) 063001** ([arXiv:1201.0008](#)) (2011)

ATLAS Collaboration, “Jet energy measurement with the ATLAS detector in proton-proton collisions at $\sqrt{s} = 7$ TeV in 2010”, accepted by EPJC ([arXiv:1112.6426](#)) (2011)

ATLAS Collaboration, “Luminosity Determination in pp Collisions at $\sqrt{s} = 7$ TeV Using the ATLAS Detector at the LHC”, *Eur. Phys. J. C* **71** ([arXiv:1101.2185](#)) (2011)

ATLAS Collaboration, “Observation of a Centrality-Dependent Dijet Asymmetry in Lead-Lead Collisions at $\sqrt{s_{NN}} = 2.76$ TeV with the ATLAS Detector at the LHC”, *Phys. Rev. Lett.* **105, 252303** ([arXiv:1011.6182](#)) (2010)

ATLAS Collaboration, “Performance of the ATLAS Detector using First Collision Data”, *JHEP* **09(2010)056** ([arXiv:1005.5254](#)) (2010)

ATLAS Collaboration, “The ATLAS Inner Detector commissioning and calibration”, *Eur. Phys. J. C* **70** ([arXiv:1004.5293](#)) (2010)

CAST Collaboration (corresponding author), “Search for solar axion emission from ^7Li and $\text{D}(p,\gamma)^3\text{He}$ nuclear decays with the CAST γ -ray calorimeter”, *JCAP* **1003 032**, ([arXiv:hep-ex/0904.2103](#)) (2010)

CAST Collaboration, “Search for 14.4 keV solar axions emitted in the M1-transition of ^{57}Fe nuclei with CAST”, *JCAP* **0912 002**, ([arXiv:0906.4488](#)) (2009)

CAST Collaboration, “Probing eV-scale axions with CAST”, *JCAP* **0902 008**, ([arXiv:0810.4482](#)) (2008)

CAST Collaboration, “An improved limit on the axion-photon coupling from the CAST experiment”, *JCAP* **0704 010**, ([arXiv:hep-ex/0702006](#)) (2007)

CAST Collaboration, “First Results from the CERN Axion Solar Telescope (CAST)”, *Phys. Rev. Lett.* **94, 121301**, ([arXiv:hep-ex/0411033](#)) (2005)

CONFERENCE PROCEEDINGS

Miller, D. W. “Studies of the internal properties of jets and jet substructure with the ATLAS Detector” Proceedings of the 2011 Europhysics Conference On High Energy Physics, EPS-HEP (2011)

Miller, D. W. “Jet substructure in ATLAS” Proceedings of the Division of Particles and Fields of the American Physical Society, DPF (2011)

Miller, D. W. “Online Measurement of LHC Beam Parameters with the ATLAS High Level Trigger” Proceedings of the 17th IEEE Real-Time Conference (2010)

Miller, D. W. “First measurement of jets and missing transverse energy with the ATLAS calorimeter at $\sqrt{s} = 900$ GeV and $\sqrt{s} = 7$ TeV” Proceedings of the 14th International Conference on Calorimetry in High Energy Physics, CALOR (2010)

SELECTED PUBLIC ATLAS ANALYSIS NOTES

ATLAS Collaboration “Performance of pile-up subtraction for jet shapes in pp collisions at $\sqrt{s} = 8$ TeV”, [ATLAS-CONF-2013-085](#), 2013

ATLAS Collaboration “Performance of boosted top quark identification in 2012 ATLAS data”, [ATLAS-CONF-2013-084](#), 2013

ATLAS Collaboration (editor) “Studies of the impact and mitigation of pile-up on large- R and groomed jets in ATLAS at $\sqrt{s} = 7$ TeV”, [ATLAS-CONF-2012-066](#), 2012

ATLAS Collaboration (co-editor) “Performance of large- R jets and jet substructure reconstruction with the ATLAS detector”, [ATLAS-CONF-2012-065](#), 2012

ATLAS Collaboration “Jet energy scale and its systematic uncertainty in proton-proton collisions at $\sqrt{s} = 7$ TeV in ATLAS 2010 data”, [ATLAS-CONF-2011-032](#), 2011

ATLAS Collaboration (co-editor) “In-situ jet energy scale and jet shape corrections for multiple interactions in the first ATLAS data at the LHC”, [ATLAS-CONF-2011-030](#), 2011

ATLAS Collaboration (co-editor) “Properties of Jets and Inputs to Jet Reconstruction and Calibration with the ATLAS Detector Using Proton-Proton Collisions at $\sqrt{s} = 7$ TeV”, [ATLAS-CONF-2010-053](#), 2010

ATLAS Collaboration “Characterization of Interaction-Point Beam Parameters Using the pp Event-Vertex Distribution Reconstructed in the ATLAS Detector at the LHC”, [ATLAS-CONF-2010-027](#), 2010

ATLAS Collaboration (co-editor) “Properties and internal structure of jets produced in proton-proton collisions at $\sqrt{s} = 900$ GeV”, [ATLAS-CONF-2010-018](#), 2010

ATLAS Collaboration “Inputs to Jet Reconstruction and Calibration with the ATLAS Detector Using Proton-Proton Collisions at $\sqrt{s} = 900$ GeV”, [ATLAS-CONF-2010-016](#), 2010

ATLAS Collaboration “Performance of the ATLAS Inner Detector Trigger algorithms in p - p collisions at $\sqrt{s} = 900$ GeV”, [ATLAS-CONF-2010-014](#), 2010