

# MARK S. NEUBAUER

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## EDUCATION

<b>Ph.D., Physics</b> , University of Pennsylvania	2001
Dissertation: <i>Evidence for <math>\nu_e</math> Flavor Change through Measurement of the <math>^8B</math> Solar Neutrino Flux at SNO</i>	
Advisor: Dr. Eugene Beier	
<b>B.S., Physics</b> , Kutztown University	1994
Graduated <i>Summa Cum Laude</i>	

## PROFESSIONAL APPOINTMENTS

<i>University of Illinois at Urbana-Champaign, Urbana, IL USA</i>		
<b>Professor</b>	Department of Physics	2018 –
<b>Affiliate Professor</b>	National Center for Supercomputing Applications	2018 –
<b>Affiliate Professor</b>	Department of Electrical and Computer Engineering	2019 –
<b>Affiliate Professor</b>	Discovery Partners Institute	2024 –
<b>Associate Professor</b>	Department of Physics	2013 – 2018
<b>Assistant Professor</b>	Department of Physics	2007 – 2013
<b>Postdoctoral Fellow</b>	<i>University of California at San Diego, La Jolla, CA, USA</i>	2003 – 2007
	<i>Massachusetts Institute of Technology, Cambridge, MA, USA</i>	2001 – 2003

## HONORS AND AWARDS

<b>Breakthrough Prize in Fundamental Physics</b>	2016, 2025
<b>Dean's Award for Excellence in Research</b> (U. Illinois)	2013
<b>Fellow, Center for Advanced Study</b> (U. Illinois)	2012 – 2013
<b>NSF Career Award</b>	2011
<b>Fellow, National Center for Supercomputing Applications</b>	2008 – 2009
<b>Arnold O. Beckman Research Award</b> (U. Illinois)	2007
<b>Member, Sigma Xi</b> (Massachusetts Institute of Technology)	2002
<b>Chairman's Teaching Award</b> (University of Pennsylvania)	1995

## SELECTED FUNDING AWARDS

<b>Co-PI</b>	<a href="#">PREP: Accelerating Research and Education in AI/ML for Science</a>	NSF	2024 –
<b>Co-PI</b>	<a href="#">POSE: Phase II: An Open Source Ecosystem for Collaborative Rapid Design of Edge AI Hardware Accelerators for Integrated Data Analysis and Discovery</a>	NSF	2023 –
<b>Lead PI</b>	U. Illinois Experimental HEP base grant	DOE	2022 –
<b>PI</b>	<a href="#">Democratizing AI Hardware with an Open-Source AI-Chip Design Toolkit</a>	DPI	2022 –
<b>Co-PI</b>	<a href="#">Accelerated AI Algorithms for Data-Driven Discovery Institute</a>	NSF	2021 –
<b>PI</b>	U. Illinois ATLAS Phase-II HL-LHC Upgrade	NSF	2020 –
<b>PI</b>	U. Illinois ATLAS Tier-2 Computing Center Award	NSF	2010 –
<b>PI</b>	<a href="#">FAIR Framework for Physics-Inspired Artificial Intelligence in in HEP</a>	DOE	2020 – 2025
<b>Co-PI</b>	<a href="#">Advancing Science with Accelerated Machine Learning</a>	NSF	2019 – 2024
<b>PI</b>	<a href="#">U. Illinois Institute for Research and Innovation in Software for HEP Award</a>	NSF	2018 – 2024
<b>PI</b>	<a href="#">Scalable Cyberinfrastructure for AI and Likelihood-Free Inference</a>	NSF	2018 – 2022
<b>PI</b>	<a href="#">Conceptualization of a Software Innovation Institute for HEP</a>	NSF	2015 – 2018
<b>Co-PI</b>	<a href="#">Data and Software Preservation for Open Science</a>	NSF	2012 – 2016
<b>Co-PI</b>	<a href="#">MRI: Development of Ultrafast Tracking Electronics</a>	NSF	2011 – 2017
<b>PI</b>	<a href="#">CAREER: Fast Hardware Tracking and Parallel Computing Strategies for Integrated Research, Education, and Outreach in Particle Physics</a>	NSF	2011 – 2017

## SCIENCE COLLABORATIONS AND SELECTED APPOINTMENTS

<b>ATLAS Collaboration</b> , CERN Large Hadron Collider, Geneva, Switzerland:	2007 –
• ATLAS Collaboration Board Institute Representative	2014 –
• ATLAS Trigger/DAQ Institute Board Representative	2014 –
• US ATLAS Institutional Board Representative	2014 –
• ATLAS Phase-II Upgrade Institutional Representative	2017 –
• Co-Convener, ATLAS VBS Polarization Umbrella Group	2024 –
• Member, US ATLAS Summer Workshop Organizing Committee	2025
• Member, ATLAS Event Filter Tracking Task Force	2021
• Member, US ATLAS Resource Allocation Committee (US, ATLAS)	2012 – 2017
• Deputy Manager, US ATLAS Physics Support, Software and Computing	2012 – 2015
• Member, US ATLAS Management Advisory Committee	2012 – 2015
• Chair, US ATLAS Tier-3 Computing Implementation Committee	2015
• Member, US ATLAS Tier-3 Study Group	2013
• ATLAS Representative to the OSG Council	2012 – 2015
• Level-3 Manager, US ATLAS Application Software	2010 – 2012
• Member, US ATLAS Program Management Plan Committee	2009
• Contact Editor for ATLAS Publications: <a href="#">JINST 16 (2021)</a> , <a href="#">JHEP 04 (2019)</a> , <a href="#">PLB 790 (2019)</a> , <a href="#">JHEP 01 (2016)</a> , <a href="#">EPJC 75 (2015)</a> , <a href="#">PLB 718 (2012)</a> , <a href="#">PRL 107 (2011)</a>	
• Member, ATLAS Editorial Board for ATLAS Publications: <a href="#">JHEP 06 (2018)</a> , <a href="#">PLB 761 (2016)</a> , <a href="#">PLB 756 (2016)</a> , <a href="#">PRD 92 (2015)</a> , <a href="#">PLB 737 (2014)</a> , <a href="#">PLB 718 (2013)</a> , <a href="#">PLB 712 (2012)</a>	
<b>CDF Collaboration</b> , Fermilab Tevatron, Batavia, IL USA:	2001 – 2008
• Convener, Diboson Physics Group	2006 – 2007
• Project Leader, Central Analysis Facility	2002 – 2004
<b>SNO Collaboration</b> , SNOlab, Sudbury, ON Canada:	1996 – 2002
• Trigger System and GPS-based Timing System	1996 – 2001

## RESEARCH HIGHLIGHTS

***Multi-boson Production as a Probe of New Physics*** 2007 –

My group has made extensive study of multi-boson (involving  $W$ ,  $Z$ , Higgs boson  $h$ ) production at hadron colliders:

- First observation of electroweak diboson production in semileptonic decay [Submitted to EPJC](#), [Zeng Thesis](#)
- Stringent limits on the production of new particles decaying to multi-boson states and constraints on new physics [EPJC 80 \(2020\)](#), [JHEP 04 \(2019\)](#), [PRD 100 \(2019\)](#), [PLB 790 \(2019\)](#), [PRD 98 \(2018\)](#), [JHEP 03 \(2018\) 009](#), [JHEP 03 \(2018\) 042](#), [PLB 765 \(2017\)](#), [EPJC 77 \(2017\)](#), [JHEP 09 \(2016\)](#), [PLB 755 \(2016\)](#), [JHEP 01 \(2016\)](#), [EPJC 76 \(2016\)](#), [EPJC 75 \(2015\)](#), [JHEP 01 \(2015\)](#), [PLB 737 \(2014\)](#), [PLB 718 \(2012\)](#), [PRL 107 \(2011\) 231801](#), [PRL 107 \(2011\) 041802](#), [EPJC 71 \(2011\)](#)
- First measurement of  $ZZ$  production at a hadron collider [PRL 100 \(2008\)](#)
- First observation of  $WZ$  production [PRL 98 \(2007\)](#)
- Authored two review articles on electroweak and diboson physics [RMP 84 \(2012\)](#), [ARNPS 61 \(2011\)](#)
- Served as Chapter Editor for a review article on Di-Higgs Production [Rev. Phys. 5 \(2020\)](#)

***Higgs Boson Discovery and Measurement*** 2012, 2015

My group contributed to the Higgs boson discovery [PLB 716 \(2012\)](#), which led to the 2013 Nobel Prize in Physics for its theoretical prediction, through analysis of the  $\ell\nu\ell\nu$  channel and the observation of  $h \rightarrow WW^{(*)}$  [PRD 92 \(2015\)](#).

***Resolution of a  $b$ -baryon Lifetime Puzzle*** 2007

I led an analysis measuring the  $\Lambda_b^0$  lifetime  $\tau(\Lambda_b^0)$  in the exclusive decay  $\Lambda_b^0 \rightarrow J/\psi\Lambda^0$ . At the time of publication [PRL 98 \(2007\)](#), this was the most precise  $\tau(\Lambda_b^0)$  measurement and higher than the previous world average by  $3.2\sigma$ . This measurement resolved the long-standing " $\Lambda_b^0$  Lifetime Puzzle" in favor of the early theory calculations of  $\tau(\Lambda_b^0)$ .

***Resolution of the Solar Neutrino Problem*** 2001

My analysis of  $^8\text{B}$  solar neutrino data from the Sudbury Neutrino Observatory (SNO) collaboration provided the first direct evidence for  $\nu_e$  flavor change and resolved the decades-long "Solar Neutrino Problem". The first SNO paper [PRL 87 \(2001\)](#) result was based on [my thesis](#) work and led to the [2016 Breakthrough Prize in Fundamental Physics](#) and [2015 Nobel Prize in Physics](#) (A. McDonald, T. Kajita) for the observation of  $\nu_e$  flavor change.

## SELECTED PUBLICATIONS

Please find a list of my selected publications below. A full list of my publications can be found [here](#).

## Journal Articles

- [1] A. Khot, X. Wang, A. Roy, V. Kindratenko, **M. S. Neubauer**, “Evidential deep learning for uncertainty quantification and out-of-distribution detection in jet identification using deep neural networks”, *Mach. Learn. Sci. Tech.* **6**, 035003 (2025).
- [2] K.M. Black *et al.* “Muon Collider Forum Report”, *Journal of Instrumentation* **19**, T02015 (2024).
- [3] J. Yoo, J. Dickinson, M. Swartz, G. Di Guglielmo, A. Bean, D. Berry, M. B. Valentin, K. DiPetrillo, F. Fahim, L. Gray, J. Hirschauer, S. R. Kulkarni, R. Lipton, P. Maksimovic, C. Mills, **M. S. Neubauer**, B. Parpillon, G. Pradhan, C. Syal, N. Tran, D. Wen, A. Young, “Smart pixel sensors: towards on-sensor filtering of pixel clusters with deep learning”, *Mach. Learn. Sci. Tech.* **5**, 035047 (2024).
- [4] W. Bhimji, D. Carder, E. Dart, J. Duarte, I. Fisk, R. Gardner, C. Guok, B. Jayatilaka, T. Lehman, M. Lin, C. Maltzahn, S. McKee, **M. S. Neubauer**, O. Rind, O. Shadura, N. Tran, P. Gemmeren, G. Watts, B. A. Weaver, F. Würthwein, “Computational Frontier Topical Group Report Storage and Processing Resource Access”, *Comput. Softw. Big Sci.* **7**, 5 (2023).
- [5] J. Duarte, H. Li, A. Roy, R. Zhu, E. A. Huerta, D. Diaz, P. Harris, R. Kansal, D. S. Katz, I. H. Kavoori, V. Kindratenko, F. Mokhtar, **M. S. Neubauer**, S. E. Park, M. Quinnan, R. Rusack, Z. Zhao, “FAIR AI Models in High Energy Physics”, *Mach. Learn. Sci. Tech.* **4**, 045062 (2023).
- [6] E. A. Huerta, B. Blaiszik, L. C. Brinson, K. E. Bouchard, D. Diaz, C. Doglioni, J. M. Duarte, M. Emani, I. Foster, G. Fox, P. Harris, L. Heinrich, S. Jha, D. S. Katz, V. Kindratenko, C. R. Kirkpatrick, K. Lassila-Perini, R. K. Madduri, **M. S. Neubauer**, F. E. Psomopoulos, A. Roy, O. Rübel, Z. Zhao, R. Zhu, “FAIR for AI: An interdisciplinary and international community building perspective”, *Scientific Data* **10** (2023).
- [7] A. Khot, **M. S. Neubauer**, A. Roy, “A detailed study of interpretability of deep neural network based top taggers”, *Mach. Learn. Sci. Tech.* **4**, 035003 (2023).
- [8] **M. S. Neubauer**, A. Roy, Z. Wang, “Making digital objects FAIR in high energy physics: An implementation for Universal FeynRules Output models”, *SciPost Phys. Codebases*, 13 (2023).
- [9] A. Deiana, *et al.* “Applications and Techniques for Fast Machine Learning in Science”, *Front. Big Data* **5**, 787421 (2022).
- [10] A. Elabd, *et al.* “Graph Neural Networks for Charged Particle Tracking on FPGAs”, *Front. Big Data* **5**, 828666 (2022).
- [11] B. Nachman, *et al.* “Jets and Jet Substructure at Future Colliders”, *Front. in Phys.* **10**, 897719 (2022).
- [12] K. Cranmer, *et al.* “Publishing statistical models: Getting the most out of particle physics experiments”, *SciPost Phys.* **12**, 037 (2022).
- [13] Y. Chen, *et al.* “A FAIR and AI-ready Higgs boson decay dataset”, *Sci. Data* **9** (2022).
- [14] G. DeZoort, S. Thais, J. Duarte, V. Razavimaleki, M. Atkinson, I. Ojalvo, **M. S. Neubauer**, P. Elmer, “Charged Particle Tracking via Edge-Classifying Interaction Networks”, *Comput. Softw. Big Sci.* **5**, 26 (2021).
- [15] G. Aad, *et al.* [ATLAS Collaboration] (ATLAS), “The ATLAS Fast TracKer system”, *JINST* **16**, P07006 (2021).
- [16] X. Ju, *et al.* “Performance of a geometric deep learning pipeline for HL-LHC particle tracking”, *Eur. Phys. J. C* **81**, 876 (2021).
- [17] J. Alison *et al.* “Higgs boson potential at colliders: Status and perspectives”, *Rev. Phys.* **5**, 100045 (2020).
- [18] E. A. Huerta *et al.* “Enabling Real-time Multi-messenger Astrophysics Discoveries with Deep Learning”, *Nature Rev. Phys.* **1**, 600–608 (2019).
- [19] G. Aad *et al.* [ATLAS Collaboration] (ATLAS), “Search for the electroweak diboson production in association with a high-mass dijet system in semileptonic final states in  $pp$  collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector”, *Phys. Rev.* **D100**, 032007 (2019).
- [20] E. A. Huerta, R. Haas, J. Jha, **M. S. Neubauer**, D. S. Katz, “Supporting High-Performance and High-Throughput Computing for Experimental Science”, *Comput. Softw. Big Sci.* **3**, 5 (2019).
- [21] J. Albrecht, *et al.* [HEP Software Foundation], “A Roadmap for HEP Software and Computing R&D for the 2020s”, *Journal of Computing and Software for Big Science* **3**, 7 (2019).

- [22] M. Aaboud *et al.* [ATLAS Collaboration] (ATLAS), “Search for Higgs boson decays into a pair of light bosons in the  $b\bar{b}\mu\mu$  final state in  $pp$  collision at  $\sqrt{s}=13$  TeV”, *Phys. Lett.* **B790**, 1–21 (2019).
- [23] M. Aaboud *et al.* [ATLAS Collaboration] (ATLAS), “Search for Higgs boson pair production in the  $b\bar{b}WW^*$  decay mode at  $\sqrt{s}=13$  TeV with the ATLAS detector”, *JHEP* **04**, 092 (2019).
- [24] M. Belkin, R. Haas, G. W. Arnold, H. W. Leong, E. A. Huerta, D. Lesny, **M. S. Neubauer**, “Container solutions for HPC systems: A case study of using shifter on blue waters”, *CoRR* **abs/1808.00556** (2018).
- [25] L. Bauerdick *et al.* (HEP Software Foundation), “HEP Software Foundation Community White Paper Working Group - Data Analysis and Interpretation”, edited by M. S. Neubauer (2018).
- [26] M. Aaboud *et al.* [ATLAS Collaboration] (ATLAS), “Combination of searches for heavy resonances decaying into bosonic and leptonic final states using 36 fb<sup>-1</sup> of proton-proton collision data at  $\sqrt{s}=13$  TeV with the ATLAS detector”, *Phys. Rev.* **D98**, 052008 (2018).
- [27] M. Aaboud *et al.* [ATLAS Collaboration], “Searches for heavy  $ZZ$  and  $ZW$  resonances in  $\ell\ell qq$  and  $\nu\nu qq$  final states in  $pp$  collisions at  $\sqrt{s}=13$  TeV with the ATLAS detector”, *JHEP* **03**, 009 (2018).
- [28] M. Aaboud, *et al.* [ATLAS Collaboration], “Search for  $WW/WZ$  resonance production in  $\ell\nu qq$  final states in  $pp$  collisions at  $\sqrt{s}=13$  TeV with the ATLAS detector”, *JHEP* **03**, 042 (2018).
- [29] P. Elmer, **M. S. Neubauer**, M. D. Sokoloff, “Strategic Plan for a Scientific Software Innovation Institute (S2I2) for High Energy Physics”, (2017).
- [30] M. Aaboud *et al.* [ATLAS Collaboration], “Search for new resonances decaying to a  $W$  or  $Z$  boson and a Higgs boson in the  $\ell^+\ell^-b\bar{b}$ ,  $\ell\nu b\bar{b}$ , and  $\nu\bar{\nu}b\bar{b}$  channels with  $pp$  collisions at  $\sqrt{s}=13$  TeV with the ATLAS detector”, *Phys. Lett.* **B765**, 32–52 (2017).
- [31] M. Aaboud *et al.* [ATLAS Collaboration], “Searches for heavy diboson resonances in  $pp$  collisions at  $\sqrt{s}=13$  TeV with the ATLAS detector”, *JHEP* **09**, 173 (2016).
- [32] G. Aad *et al.* [ATLAS Collaboration], “Observation and measurement of Higgs boson decays to  $WW^*$  with the ATLAS detector”, *Phys. Rev.* **D92**, 012006 (2015).
- [33] G. Aad *et al.* [ATLAS Collaboration], “Search for charged Higgs bosons through the violation of lepton universality in  $t\bar{t}$  events using  $pp$  collision data at  $\sqrt{s}=7$  TeV”, *JHEP* **03**, 076 (2013).
- [34] G. Aad *et al.* [ATLAS Collaboration], “Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC”, *Phys. Lett.* **B716**, 1–29 (2012).
- [35] G. Aad *et al.* [ATLAS Collaboration], “Search for charged Higgs bosons decaying via  $H^+ \rightarrow \tau\nu$  in top quark pair events using  $pp$  collision data at  $\sqrt{s}=7$  TeV with the ATLAS detector”, *JHEP* **06**, 039 (2012).
- [36] J. D. Hobbs, **M. S. Neubauer**, S. Willenbrock, “Tests of the Standard Electroweak Model at the Energy Frontier”, *Rev. Mod. Phys.* **84**, 1477 (2012).
- [37] **M. S. Neubauer**, “Diboson production at colliders”, *Ann. Rev. Nucl. Part. Sci.* **61**, 223–250 (2011).
- [38] T. Aaltonen *et al.* [CDF Collaboration], “First Measurement of  $ZZ$  Production in  $p\bar{p}$  Collisions at  $\sqrt{s}=1.96$  TeV”, *Phys. Rev. Lett.* **100**, 201801 (2008).
- [39] A. Abulencia *et al.* [CDF Collaboration], “Measurement of the  $\Lambda_b^0$  Lifetime in  $\Lambda_b^0 \rightarrow J/\psi\Lambda^0$  in  $p\bar{p}$  Collisions at  $\sqrt{s}=1.96$ -TeV”, *Phys. Rev. Lett.* **98**, 122001 (2007).
- [40] A. Abulencia *et al.* [CDF Collaboration], “Observation of  $WZ$  Production”, *Phys. Rev. Lett.* **98**, 161801 (2007).
- [41] Q. R., Ahmad *et al.* [SNO Collaboration], “Measurement of the rate of  $\nu_e + d \rightarrow p + p + e^-$  interactions produced by  $^8B$  solar neutrinos at the Sudbury Neutrino Observatory”, *Phys. Rev. Lett.* **87**, 071301 (2001).

## Conference Proceedings

- [42] D. Naik, N. Darabi, S. Tayebati, D. Jayasuriya, S. Nasrin, D. Shekar, C. Mills, B. Parpillon, F. Fahim, **M. S. Neubauer**, A. R. Trivedi, “From signals to features to insights: multi-level novelty detection for fast scientific discovery”, *2025 IEEE 43rd VLSI Test Symposium (VTS)* (2025), pp. 1–4.
- [43] A. H. *et al.* “Accelerated Charged Particle Tracking with Graph Neural Networks on FPGAs”, *34th Conference on Neural Information Processing Systems (NeurIPS)* 2020 (Nov. 2020).
- [44] G. Allen *et al.* “Deep Learning for Multi-Messenger Astrophysics: A Gateway for Discovery in the Big Data Era”, White paper based on the “Deep Learning for Multi-Messenger Astrophysics: Real-time Discovery at Scale” workshop, hosted at NCSA, October 17-19, 2018 (2019).

## PROFESSIONAL SERVICE AND LEADERSHIP

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Member, <a href="#">Discovery Partners Institute</a>	2020 –
Core Member, <a href="#">Illinois Center for Advanced Studies of the Universe</a>	2020 –
Founding Member, <a href="#">Center for Artificial Intelligence Innovation</a>	2019 –
Member of the Executive Committee for:	
• <a href="#">Discovery Partners Institute</a>	2025 –
• <a href="#">American Physical Society Group on Data Science</a>	2025 –
• <a href="#">Accelerated AI Algorithms for Data-Driven Discovery Institute</a>	2021 –
• <a href="#">Fast Machine Learning Laboratory</a>	2019 –
• <a href="#">HEP Software Foundation</a>	2016 –
• <a href="#">Open Science Grid</a>	2015 –
Member, American Physical Society	2007 –
Member, American Association of Artificial Intelligence	2024 –
Guest Associate Editor, Machine Learning and Artificial Intelligence, <i>Frontiers in Artificial Intelligence</i>	2021 –
Review Editor, Cloud Computing, <i>Frontiers in High-Performance Computing</i>	2022 –
Member, Equity & Career Committee, Accelerated AI Algorithms for Data-Driven Discovery Institute	2021 –
Community Engagement Coordinator, Accelerated AI Algorithms for Data-Driven Discovery Institute	2021 –
Member, Scientific Organizing Committee, Fast Machine Learning for Science Conference	2020, 2022 – 2025
Member, US Muon Collider Accelerator School Organizing Committee	2025
Member, Annual US Muon Collider Meeting Organizing Committee	2025
Member, AAAI Machine Learning Challenge Organizing Committee	2024
Co-Editor, <i>AI to Accelerate Science and Engineering Discovery</i> NSF Workshop Report	2024
Blueprint Coordinator, Institute for Research and Innovation in Software for HEP	2018 – 2023
Co-Lead, Snowmass CompF4 Analysis Facilities Topical Group	2022
Member, IceCube Software and Computing Advisory Panel	2021, 2025
Open Science Grid Resources Manager	2015 – 2017
Co-Editor, HEP Software Foundation Community White Paper	2017
Member, Fermilab Operational Readiness Review Committee	2017
Reviewer, Practice & Experience in Advanced Research Computing (PEARC) Workshop	2017
Member, OSG Campus Infrastructures Community Committee	2016
Member, DOE LBNF (DUNE) Software and Computing Review Panel	2014
Chair, Mitsuyoshi Tanaka Dissertation Award Committee (DPF)	2012

## SELECTED TALKS

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- *Online Track Reconstruction with Graph Neural Networks for ATLAS*, Lepton Photon, Madison, WI (2025)
- *Vector Boson Scattering and Triboson Results from ATLAS*, Phenomenology Conference, Pittsburgh, PA (2025)
- *Making the Most of AI & Data Deluge for Science*, Keynote talk, AI Ready Data Workshop, Drexel (2024)
- *Energy Frontier Exploration using Particle Physics and AI*, Invited talk, APS March Meeting, Minneapolis (2024)
- *Uncertainty Quantification and Anomaly Detection with Evidential Deep Learning*, ML4Jets, LPHNE, Paris (2024)
- *Uncertainty Quantification and Anomaly Detection with Evidential Deep Learning*, AISSI, SCAI, Paris (2023)
- *Explainable AI for the Interpretability of Deep Neural Networks*, AISSI, SCAI, Paris (2023)
- *Deep Learning for the Matrix Element Method*, International Conference on Computing for HEP, Norfolk, VA (2023)
- *Sustainable Cyberinfrastructure for Matrix Element Analyses with Deep Learning*, ICHEP, Bologna, Italy (2022)
- *Data Analysis and Machine Learning Education*, APS GDS, Community of Practice Workshop, U. Maryland (2022)
- *Machine Learning in High Energy Physics*, AI For Nuclear Physics Workshop, JLab (2020)
- *Low Mass Higgs Boson Searches from ATLAS and CMS*, Higgs Couplings, Tokyo, Japan (2018)
- *Deep Learning for the Higgs Boson and LHC New Physics Searches*, Blue Waters Symposium, Sunriver, OR (2019)
- *Measurement of the Higgs Boson Properties*, Conference on New Physics Interpretations, ANL (2017)
- *Community White Paper and a HEP Software Institute*, APS DPF Meeting, Fermilab (2017)
- *Enabling Discoveries at the LHC through Advanced Computation*, Blue Waters Symposium, Sunriver, OR (2019)
- *Higgs Boson Prospects for Run-II and the HL-LHC*, SM@LHC 2016 Conference, Pittsburgh (2016)
- *Recent Discoveries in Particle Physics*, Keynote talk at the Prairie Section of the AAPT Conference, UIUC (2016)
- *High-mass Higgs Boson Searches at ATLAS*, ICHEP 2014, Valencia, Spain (2014)
- *Higgs Boson Properties & Prospects*, Plenary talk at APS Prairie Section Meeting, U. Missouri, Columbia (2013)
- *Supersymmetry and BSM Higgs Searches at ATLAS*, ASPEN Winter Conference, Aspen Center for Physics (2012)

## SELECTED PUBLIC LECTURES

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- *The Higgs Boson and Beyond: The Big Questions in Particle Physics*, Public Lecture at the APS Prairie Section Meeting, University of Missouri, Columbia, MO (2013)
- *Mind over Matter: Higgs Boson Discovery and What it Means*, World of Science Lecture, William M. Staerckel Planetarium, Parkland College (2012)
- *Higgs Boson Discovery: A Success Story of Big Science with Big Data*, Petascale Day Celebration, National Center for Supercomputing Applications (2012)
- *Unlocking the Dark Secrets of our Universe: How Studying the Smallest Things with the Biggest Project Ever Gets to the Heart of the Matter*, Saturday Honors Physics Public Lecture, UIUC (2010)
- *How the Biggest Science Project Ever Looks at the Smallest Things*, World of Science Lecture, William M. Staerckel Planetarium, Parkland College (2010)

## SERVICE ON UNIVERSITY COMMITTEES

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Member, NCSA Research & Education Review Committee	2023 –
Member, NCSA Faculty Fellows Selection Committee	2022 –
Member, NCSA Resource Allocation Committee	2020 –
Member, Campus Research Network Architecture Committee	2018 –
Chair, Illinois Campus Cluster Executive Steering Committee	2014 – 2016
Chair, Illinois Campus Cluster Investor Forum	2014 – 2016
Senator, University Campus Senate	2009 – 2011, 2025

## SERVICE ON COLLEGE COMMITTEES

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Member, Executive Committee	2025 –
Member, IT Governance Board on Research	2024 –
Member, Small Equipment Grants Committee	2024
Member, College Awards Committee	2022 – 2023
Member, Course and Curriculum Committee	2022 – 2023
Member, Distinguished Postdoctoral Fellowship Review Committee	2022 –
Member, Engineering Open House Advisory Committee	2008 – 2018
Member, Research Information Technology Working Group	2014
Member, NSF Major Research Instrumentation Proposal Selection Committee	2010

## SERVICE ON DEPARTMENT COMMITTEES

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Member, Electrical Engineer Search Committee	2025 –
Member, Master of Engineering in Instrumental Physics Admissions Committee	2023 –
Member, Steering Board on New Courses	2022 –
Undergraduate Academic Advisor/Mentor	2018 –
Faculty Advisor, Society of Physics Students (U. Illinois Chapter)	2008 – 2019
Member, Ph.D. Qualifying Exam Committee	2012, 2018, 2025
Chair/Member, Preliminary Exam and Dissertation Committees	2008–9, 2011–12, 2016–17, 2021, 2023–5
Chair, Department Colloquium	2013
Member, Faculty Search Committee (High Energy Physics)	2013, 2024
Member, Faculty Search Committee (Nuclear Physics)	2013
Member, Communications Coordinator Search Committee	2012
Co-Chair, High-Energy Physics Seminar	2009, 2012, 2022, 2025
Faculty Leader, Entrepreneurial Leadership in STEM Teaching & Learning	2008 – 2011