

## **JAY HAUSER**

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### **EDUCATION AND TRAINING:**

University of Michigan, Ann Arbor, MI  
California Institute of Technology, Pasadena, CA  
University of Chicago, Chicago, IL

B.S. in Physics, 1978  
Ph.D. in Physics, 1985  
Enrico Fermi Fellowship, postdoc, 1985-89

### **RESEARCH AND PROFESSIONAL EXPERIENCE:**

University of California, Los Angeles (UCLA)  
University of California, Los Angeles (UCLA)  
University of California, Los Angeles (UCLA)  
Fermilab

Professor of Physics, 7/98 - present  
Associate Professor of Physics, 7/94-6/98  
Assistant Professor of Physics, 7/90-6/94  
R.R. Wilson Fellowship, 1989-90

### **AWARDS AND HONORS:**

Elected Fellow of the American Physical Society, 2014  
SSC Junior Faculty Fellow, Texas National Research Laboratory, 1992-93  
National Science Foundation Graduate Fellowship, 1979-82

### **BIOGRAPHICAL SKETCH:**

I worked on the Mark III experiment at SLAC and analyzed decays of D mesons using  $\psi(3770)$  data, under the guidance of David Hitlin, graduating in 1985. I then worked with Henry Frisch, Mel Shochet, and Myron Campbell as a Fermi Fellow and postdoc at U. of Chicago, building the Level 2 trigger of the CDF (Collider Detector at Fermilab) experiment. Then, as a Wilson Fellow at Fermilab, I worked on motivation and design of a replacement endcap calorimeter for CDF.

I founded the CDF group at UCLA with Thomas Muller in 1990, built a shower maximum detector for a new endcap calorimeter, and searched for Supersymmetry in multi-jet modes (thesis of F. Keyvan) and multi-lepton modes. I lead the first Exotica data analysis group in CDF, and made the first W asymmetry measurement at a hadron collider. Later, I conducted a multi-lepton search for R parity-violating SUSY (thesis of A. Attal) and used a matrix element likelihood method to make a precise top mass measurement (thesis of B. Mohr).

I joined the CMS (Compact Muon Solenoid) experiment in 1994, designed, prototyped, and tested the Level 1 muon trigger using Cathode Strip Chambers (CSC) during the late 1990's, built 1500 large circuit boards of several types in the early 2000's and led the commissioning the CSC system in preparation for first LHC beams, especially the trigger and the time synchronization.

I was Project Manager for the CSC muon detector system of CMS during LHC Run 1 (2010-2012), "Long Shutdown 1" (2013-2014) in which the system was extensively improved, and the start of LHC Run 2 (2015+). This is an international sub-collaboration of some 150 physicists and engineers. I was also involved in searches for heavy stable charged particles (2011-2013). I then led planning for the "Phase 2" upgrades for the CMS muon detector collaboration and was editor of the muon chapter of the CMS Technical Proposal, released in mid-2015.

From September 2015 to August 2017, I was the first System Manager for a newly unified CMS muon system with 65 institutions from 23 countries, and four detector technologies. During this time, I created necessary muon system organizational structures and practices. I also successfully championed the "Phase 2" upgrades of the muon system necessary for operation during the future time of the High Luminosity LHC, leading to the Phase 2 Muon Technical Design Report. Recently I was elected as Chair of the CMS muon Institution Board for a two-year term Sept. 2018-Aug. 2020.

I have worked on two CMS data analyses, the first of which greatly improved timing resolution of the CSC muon detector and applied it to a search for “slow” heavy stable charged particles in LHC Run 1 data (thesis of Chris Farrell). The second analysis searches for spectacular signals from sphaleron-induced or sphaleron-like transitions in LHC Run 2 data; these are similar to signals from short-lived black holes, but the analysis required a new event generator for sphaleron-like transitions due to a lack of existing tools (thesis topic of C. Bravo).

I have been an internal reviewer for 16 CMS data analyses – nine as Chair plus seven as a committee member, yielding three PRL, two PLB, seven JHEP, one PRD and one JINST article. I have been a frequent reviewer of DOE and NSF proposals, and a referee for JHEP.

### **TEN SELECTED PUBLICATIONS IN HIGH ENERGY PHYSICS:**

*N.B.: Unless noted, all publications list authors in alphabetical order, by surname and/or institution.*

- 1) C. Bravo, J. Hauser, “BaryoGEN, a Monte Carlo Generator for Sphaleron-Induced Transitions in Proton-Proton Collisions,” JHEP **11** 41 (2018). DOI: [10.1007/JHEP11\(2018\)041](https://doi.org/10.1007/JHEP11(2018)041)
- 2) CMS Collaboration, “Search for black holes and sphalerons in high-multiplicity final states in proton-proton collisions at  $\sqrt{s} = 13$  TeV,” JHEP **11** 42 (2018). DOI: [10.1007/JHEP11\(2018\)042](https://doi.org/10.1007/JHEP11(2018)042)
- 3) CMS Collaboration, “Search for heavy long-lived charged particles in pp collisions at  $\sqrt{s}=7$  and 8 TeV,” JHEP **1307**, 122 (2013). DOI: [10.1007/JHEP07\(2013\)122](https://doi.org/10.1007/JHEP07(2013)122)
- 4) CMS Collaboration, “Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC,” Phys. Lett. B **716**, 30 (2012). DOI: [10.1016/j.physletb.2012.08.021](https://doi.org/10.1016/j.physletb.2012.08.021)
- 5) CDF Collaboration, “Precise measurement of the top-quark mass in the lepton+jets topology at CDF II”, Phys. Rev. Lett. **99**, 182002 (2007). DOI: [10.1103/PhysRevLett.99.182002](https://doi.org/10.1103/PhysRevLett.99.182002)
- 6) CDF Collaboration, “Search for Anomalous Production of Multilepton Events in p-pbar Collisions at  $\sqrt{s}=1.96$  TeV,” Phys. Rev. Lett. **98**, 131804 (2007). DOI: [10.1103/PhysRevLett.98.131804](https://doi.org/10.1103/PhysRevLett.98.131804)
- 7) CMS Collaboration, "CMS – The Trigger and Data Acquisition project, Volume 1: The Level 1 Trigger," CERN /LHCC 2000-038. <http://inspirehep.net/record/541210>
- 8) CDF Collaboration, "Search for Gluinos and Squarks at the Fermilab Tevatron Collider," Phys. Rev. D **56**, 1357 (1997). DOI: [10.1103/PhysRevD.56.R1357](https://doi.org/10.1103/PhysRevD.56.R1357)
- 9) CDF Collaboration, “Observation of Top Quark Production in pbar-p Collisions with the Collider Detector at Fermilab,” Phys. Rev. Lett. **74**, 2626 (1995). DOI: [10.1103/PhysRevLett.74.2626](https://doi.org/10.1103/PhysRevLett.74.2626)
- 10) CDF Collaboration, "Lepton Asymmetry in W-boson Decays from pbar-p Collisions at  $\sqrt{s}=1.8$  TeV," Phys. Rev. Lett. **68**, 1458 (1992). DOI: [10.1103/PhysRevLett.68.1458](https://doi.org/10.1103/PhysRevLett.68.1458)

### **SYNERGISTIC ACTIVITIES:**

- 1) Presentations about particle physics, the LHC, and CMS: recently to the Bhaumik Institute at UCLA, Guenakhfest (U. Florida), Korean-American Scientists and Engineers Association (KSEA), the CMS Induction School at CERN.
- 2) Represented CMS as official member of CERN team to the 2015 AAAS Annual Meeting.
- 3) Created and ran the local Quarknet outreach program at UCLA 2004-06.
- 4) Member of the Fermilab Users’ Executive Committee (UEC) 1995-97.