

## Sunil Somalwar

Professor, Department of Physics and Astronomy  
Rutgers, The State University of New Jersey

### Personal Data

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Citizenship: U.S.A.

### Education

M.Sc.(Physics) Indian Institute of Technology, Bombay (1982)  
Ph.D. (Physics) University of Chicago, Prof. Henry Frisch (1988)  
Postdoctoral Enrico Fermi Inst., University of Chicago, Prof. Bruce Winstein (1988-92)

### Positions

2018- Distinguished Professor, Rutgers University  
1993-98-2005-18 Assistant, Associate, and Full Professor, Rutgers University  
1988-1992 Research Associate, University of Chicago  
1982-1988 Graduate Assistant, University of Chicago

### Experimental Physics Research

Compact Muon Solenoid (CMS) Experiment at the Large Hadron Collider (2004-)  
Collider Detector at Fermilab (CDF) (2000-2010)  
Fermilab KTeV Expt (Neutral Kaon Direct CP Violation  $\epsilon'/\epsilon$  and Rare Decays) (1992-2003)  
Fermilab E731/773/799 (Kaon Direct CP/CPT violation and rare decays (1988-1995)  
Chicago-Fermilab-Michigan Magnetic Monopole Search (1983-1988)

### Honors and Awards

Fellow, American Physical Society (2016-)  
European Physical Society's High Energy and Particle Physics Prize (2013) for Higgs  
Discovery, received as a member of the CMS Experiment  
Faculty Scholar-Teacher Award, Rutgers University (2009)  
National Science Foundation Young Investigator Award (1993-1998)  
Distinguished Contributor to Undergraduate Education, Rutgers University (1996)  
Outstanding Teacher Award, Society of Physics Students, Rutgers University (1995)  
Baxter-Travenol International Fellowship (1986-1987)  
Indian Institute of Technology Medal (Highest Rank in Sciences) (1982)  
Tata Endowment Fellowship (1982)  
I.I.T. Bombay Merit Awards (1979-1981)  
National Merit Scholarship, India (1976-1982)

### Postdoctoral Advisees

Halil Saka (2015-), Richard Gray (2008-2013), John Zhou (2002-2006),  
Peter McNamara (2004-2005), Amit Lath (1994-1999), John Belz (1995-2000), Rui Li (1993-95).

### Thesis Students

Jay Vora (2017-), Maximilian Heindl (2014-),  
Peter Thomassen(2012-2016)(Fellow,Stiftung der Wirtschaft), Patrick Zywicki (2011-2014),  
Emmanuel Contreras (2010-2015), Shruti Panwalkar (2009-2014), Sourabh Dube (2002-2008),  
Julian Glatzer (2007-2009,MS), Jared Yamaoka (2004-2007), Eva Halkiadakis (1995-2001).

### Undergraduate Advisees

S. Ferrante (2017-), D. Hertz-Kintish (2016-), B. Zhou (2016-),

M. Christos (2016-), G. Sica(REU) (2016)(to Davis), K. Feigelis (2015-16)(to Stanford), I. Stewart (2014-2015)(to Columbia), G. Bongiovi (2015), T. Sewell (2013-2015)(to Maryland), V. Velan (2013-2015)(to Berkeley), M. Tader(REU 2014)(to Cornell), K. Chan (2010-2013)(to Caltech), K. Mei (2010-2013)(Goldwater)(to Cambridge/Princeton), S. Randall,REU (2013)(to Berkeley), E. Williams (2010-2013)(to Florida), S. Yeager(2010-2011) (to Texas AM), A. Sood(2007-2010)(to Berkeley), A.Cunha(1998-2000) (to Santa Barbara), D.Medvigy(1997-99)(to Harvard), J.Bricker (1996-98)(to Stanford), T.Koeth (1995-97)(to Rutgers), E.Halkiadakis(1994-95)(to Rutgers), B.Utter(1994-95)(to Cornell), S.Hadley(1993-94).

### **Teaching Experience**

Quantum Mechanics 417(2017-)  
Nuclei and Particles (2016,17-)  
Classical Mechanics I and II 381-382(2013-2016)  
Junior Electricity and Magnetism I and II 385-386(2010-2013)  
Byrne Seminar: Reducing Your Carbon Footprint (2009,10)  
Honors Seminar: Global Warming Without Politics (2008,09)  
Particle and Nuclear Physics 418(2007-09)  
Quantum Mechanics 417(2005-07)  
Honors Seminar: Energy, Society and Climate Change (2002,2005,2006)  
Greenhouse Effect 140(2000-2004)  
Honors Physics I and II 271-272(1997-2000)  
Junior Electricity and Magnetism I and II 385-386(1993-1996)  
Faculty Advisor, Class of 1997 (1994-97)

### **Professional and Administrative Affiliations, Services and Experience**

Co-Principal Investigator of a \$3.1 million NSF elementary particles research grant  
Member, Energy Frontier Panel, Dept. of Energy Energy (2016-)  
Co-P.I., Rutgers Physics and Astronomy NSF REU grant  
Member, Rutgers Energy Institute  
Principal Investigator for several NSF Grants  
Reviewer and Panelist for NSF, Fermilab, IEEE & U.S. Civilian R & D Foundation (CRDF)  
for the Former Soviet Union & DOE Oak Ridge Inst. of Science & Education  
Textbook Reviews for Princeton,Wiley, Norton, Brooks/Cole, Thomson & Science Curriculum  
Fellow, Rutgers College, Rutgers University.  
Rutgers Representative, Faculty for the 21st Century Project Kaleidoscope (1997-)  
Advisor, Rutgers College Honors Program & Project SUPER for Douglas Women Scientists  
Monte Carlo Coordinator, CDF experiment, Fermilab.  
System Manager, Tracking System, KTeV, Fermilab.  
NSF Advisory Panel Member, CAREER Program  
Fermilab Reviewer for Experimental Proposal  
Invited Lecturer, Theoretical Advanced Studies Inst., U.Colorado, Boulder  
Principal Investigator of NSF Young Investigator Grants  
DOE Research Equipment Grants for Fermilab KTeV Experiment  
Recipient of Research Support from the Industrial and Private Sources

## Publications: Sunil Somalwar

1. **Search for evidence of Type-III seesaw mechanism in multilepton final states in  $pp$  collisions at 13 TeV** (CMS Collaboration), Phys. Rev. Lett. 119, 221802 (2017).
2. **Search for Vector-like leptons in  $\tau$  leptonic final states in  $pp$  collisions at 13 TeV** (CMS Collaboration), preliminary result in preparation.
3. **Search for high-mass resonances in  $emu$  final state in  $pp$  collisions at 13 TeV** (CMS Collaboration), in preparation, to be submitted to JHEP.
4. **Searches for R-parity-violating supersymmetry in  $pp$  collisions at 8 TeV in final states with 0-4 leptons** (CMS Collaboration), Physical Review D 94, 112009 (2016)
5. **Search for pair-produced vector-like B quarks in proton-proton collisions at  $\sqrt{s} = 8$  TeV** (CMS Collaboration), Physical Review D 93, 112009 (2016)
6. Search for supersymmetry in electroweak production with photons and large missing transverse energy in  $pp$  collisions at  $\sqrt{s}=8$ TeV (CMS Collaboration), Phys. Lett. B 759 (2016) 479-500.
7. Search for Displaced Supersymmetry in events with an electron and a muon with large impact parameters (CMS Collaboration), Phys. Rev. Lett. 114 (2015) 061801.
8. **Searches for electroweak production of charginos, neutralinos, and sleptons decaying to leptons and W, Z, and Higgs bosons  $pp$  Collisions at 8 TeV** (CMS Collaboration), European Physics Journal C (2014) 74:3036
9. **Measurement of top quark-antiquark pair production in association with a W or Z boson in  $pp$  collisions at  $\sqrt{s} = 8$  TeV** (CMS Collaboration), European Physics Journal C (2014) 74:3060
10. **Search for anomalous production of events with three or more leptons in  $pp$  collisions at  $\sqrt{s} = 8$  TeV** (CMS Collaboration), Physical Review D 90, 032006 (2014)
11. **Searches for electroweak neutralino and chargino production in channels with Higgs, Z, and W bosons in  $pp$  collisions at  $\sqrt{s} = 8$  TeV** (CMS Collaboration), Physical Review D 90, 092007 (2014)
12. **Searches for heavy Higgs bosons in two-Higgs-doublet models and for  $t \rightarrow ch$  decay using multilepton and diphoton final states  $pp$  collisions at  $\sqrt{s} = 8$  TeV** (CMS Collaboration), Physical Review D 90, 112013 (2014)
13. Inclusive search for a vector-like T quark with charge 2/3 in  $pp$  collisions at  $\sqrt{s}=8$  TeV (CMS Collaboration), Phys. Lett. B 729 (2014) 149-171.
14. **Search for Top Squarks in R-Parity-Violating Supersymmetry Using Three or More Leptons and b-Tagged Jets** (CMS Collaboration), Physical Review Letters PRL 111, 221801 (2013)

15. **Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC** (CMS Collaboration) Phys.Lett. B716 (2012) 30-61.
16. **Search for electroweak production of charginos and neutralinos using leptonic final states in  $pp$  Collisions at  $\sqrt{s} = 7 TeV$**  (CMS Collaboration), Journal of High Energy Physics, JHEP11(2012)147.
17. **Search for Anomalous Production of Multilepton Events in  $pp$  Collisions at  $\sqrt{s} = 7 TeV$**  (CMS Collaboration), Journal of High Energy Physics, JHEP06(2012)169.
18. **Search for Physics Beyond the Standard Model Using Multilepton Signatures in  $\sqrt{s} = 7 TeV$   $pp$  Collisions with the CMS Detector at the LHC** (CMS Collaboration), Phys.Lett. B704 (2011) 411-433.
19. **Searching for  $t \rightarrow ch$  with multileptons** N. Craig et al. Phys. Rev. D 86, 075002 (2012).
20. **Multi-Lepton Signals of Multiple Higgs Boson** N. Craig et al. Journal of High Energy Physics, JHEP02(2013)033.
21. **Multi-Lepton Signals of the Higgs Boson** E. Contrera-Campana et al. arXiv:1112.2298 [hep-ph], Journal of High Energy Physics, JHEP04(2012)112
22. **Backgrounds To Higgs Boson Searches from  $W\gamma^* \rightarrow l\nu l(l)$  Asymmetric Internal Conversion** R. C. Gray, C. Kilic, M. Park, S. Somalwar and S. Thomas, arXiv:1110.1368 [hep-ph].
23. **Simplified Models for LHC New Physics Searches**, D. Alves et al. (LHC New Physics Working Group Collaboration) J. Phys. G (Nucl. and Particle Phys.) 39 (2012) 105005.
24. **SUSY Searches at Tevatron** S. Somalwar, Proc. of Science, PoS HCP2009:037,(2009).
25. **Search for Supersymmetry in  $p\bar{p}$  Collisions at  $\sqrt{s} = 1.96 TeV$  Using the Trilepton Signature of Chargino-Neutralino Production.** (CDF Collaboration), Phys. Rev. Lett. 101, 251801 (2008).
26. **Addressing the Multi-Channel Inverse Problem at High Energy Colliders: A Model Independent Approach to the Search for New Physics with Trileptons** S. Dube, J. Glatzer, S. Somalwar, A. Sood, and S. Thomas, arXiv:0808.1605, J. Phys. G: Nuclear and Particle Physics 39,085004 (2012).
27. **First measurement of the fraction of top-quark pair production through gluon-gluon fusion** (CDF Collaboration), Phys. Rev. D Rapid Communications 78, 111101(R) (2008).
28. **Search for Chargino-Neutralino Production in  $p\bar{p}$  Collisions at  $\sqrt{s}=1.96 TeV$**  (CDF Collaboration), Phys. Rev. Lett. 99, 191806 (2007).
29. **A Search for High Mass Resonances Decaying to  $e\mu$  in  $p\bar{p}$  Collisions at  $\sqrt{s}=1.96 TeV$**  (CDF Collaboration), Phys. Rev. Lett. 96, 211802 (2006).

30. Search for Anomalous Kinematics in  $t\bar{t}$  Dilepton Events at CDF II (CDF Collaboration), Phys. Rev. Lett. 95, 022001 (2005).
31. **Radiative widths of neutral kaon excitations.** S. V. Somalwar, Pramana (Indian Journal of Physics) 62,597-600 (2004) and simulataneously in the Proceedings of PAS-COS'03, The IXth International Conference on Particles, Strings and Cosmology, Mumbai, India, 2003 (Indian Academy of Sciences, Bangalore, India, 2004).
32. **Radiative widths of neutral kaon excitations,** S. V. Somalwar, proceedings of the International Conference "Quark Confinement and the Hadron Spectrum V", Gargnano, Brescia, Italy, Sep 2002, N. Brambilla and M. Prosperi ed. (World Scientific, Singapore, 2003), pp. 346-348.
33. **Measurements of Direct CP violation, CPT symmetry, and other parameters in the neutral kaon system.** (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/0208007, Phys.Rev.D 67,012005 (2003).
34. Search for the  $K_L \rightarrow \pi^0\pi^0e^+e^-$  decay in the KTeV experiment. (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/0210056, Phys. Rev. Lett. 89,211801 (2002).
35. **Radiative decay width measurements of neutral kaon excitations using the Primakoff effect** (A. Alavi-Harati et al., KTeV Collaboration with A. Cunha and D. Medvigy, Rutgers University), preprint hep-ex/0110016, Phys. Rev. Lett. 89, 072001 (2002).
36. A measurement of the  $K_L$  charge asymmetry. (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/0202016, Phys. Rev. Lett. 88, 181601 (2002).
37. **Branching ratio measurement of the decay  $K_L \rightarrow e^+e^-\mu^+\mu^-$**  (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/0108037, Phys. Rev. Lett. 87, 111802 (2001).
38. A new measurement of the radiative  $K_{e3}$  branching ratio and photon spectrum (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/0106062. Phys. Rev. D. 64, 112004 (2001).
39. First measurement of form factors of the decay  $\Xi^0 \rightarrow \Sigma^+e^-\bar{\nu}_e$  (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/0105016, Phys. Rev. Lett. 87, 132001 (2001).
40. **Measurements of the rare decay  $K_L \rightarrow e^+e^-e^+e^-$**  (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/0104043, Phys. Rev. Lett. 86, 5425 (2001).
41. Measurement of the branching ratio and form factor of  $K_L \rightarrow \mu^+\mu^-\gamma$  (A. Alavi-Harati et al., KTeV Collaboration), Phys. Rev. Lett. 87, 071801 (2001).
42. A measurement of the branching ratio and asymmetry of the decay  $\Xi^0 \rightarrow \Sigma^0\gamma$  (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/0012031, Phys. Rev. Lett. 86, 3239 (2001).
43. First observation of the decay  $K_L \rightarrow \pi^0e^+e^-\gamma$  (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/0011093, Phys. Rev. Lett. 87, 021801 (2001).

44. A measurement of the branching ratio of  $K_L \rightarrow e^+e^-\gamma\gamma$  (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/0010059, Phys. Rev. D 64, 012003 (2001).
45. Search for the decay  $K_L \rightarrow \pi^0 e^+ e^-$  (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/0009030, Phys. Rev. Lett. 86, 397 (2001).
46. **Study of the  $K_L \rightarrow \pi^+\pi^-\gamma$  direct emission vertex** (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/0008045, Phys. Rev. Lett. 86, 761 (2001).
47. Observation of the decay  $K_L \rightarrow \mu^+\mu^-\gamma\gamma$  (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/0001005, Phys. Rev. D62, 112001 (2000).
48. Search for the decay  $K_L \rightarrow \pi^0\mu^+\mu^-$  (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/0001006, Phys. Rev. Lett. 84, 5279 (2000).
49. **Search for the weak decay of a lightly bound  $H^0$  dibaryon** (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/9910030, Phys. Rev. Lett. 84, 2593 (2000).
50. Observation of CP Violation in  $K_L \rightarrow \pi^+\pi^-e^+e^-$  Decays (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/9908020, Phys. Rev. Lett. 84, 408 (2000).
51. Search for the Decay  $K_L \rightarrow \pi^0\nu\bar{\nu}$  using  $\pi^0 \rightarrow e^+e^-\gamma$ , (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/9907014, Phys. Rev. D61, 072006 (2000).
52. **Observation of Direct CP Violation in  $K_{S,L} \rightarrow \pi^+\pi^-$  Decays**, (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/9905060, Phys. Rev. Lett. 83, 22-25 (1999).
53. **Light Gluino Search for Decays Containing  $\pi^+\pi^-$  or  $\pi^0$  from a Neutral Hadron Beam at Fermilab**, (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/9903048, Phys. Rev. Lett. 83, 2128-2132 (1999).
54. Measurement of the Branching Ratio of  $\pi^0 \rightarrow e^+e^-$  Using  $k_L \rightarrow 3\pi^0$  Decays in Flight, (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/9903007, Phys. Rev. Lett. 83, 922-925 (1999).
55. Measurement of the Decay  $K_L \rightarrow \pi^0\gamma\gamma$ , (A. Alavi-Harati et al., KTeV Collaboration), preprint hep-ex/9902029, Phys. Rev. Lett. 83, 917-921 (1999).
56. Observation of the Decay  $\Xi^0 \rightarrow \Sigma^+e^-\bar{\nu}$ , (A. Affolder et al., KTeV Collaboration), Phys. Rev. Lett. 82, 3751-3754(1999).
57. Search for the Lepton-family Number Violating Decays  $K_L \rightarrow \pi^0\mu^\pm e^\mp$ . (K. Arisaka et al., E799 Collaboration), Phys. Lett. B432, 230-234 (1998).
58. Search for the Decay  $K_L \rightarrow \pi^0\nu\bar{\nu}$ , (J. Adams et al., KTeV Collaboration), preprint hep-ex/9806007, Phys. Lett. B447, 240-245, (1999).
59. **Direct Search for Light Gluinos**, S.V. Somalwar, proceedings of the International Europhysics Conference on High Energy Physics, Jerusalem, Israel, August 1997, D. Lellouch ed. (Springer-Verlag, Berlin Heidelberg,1998) pp. 985-988.

60. **New Results from KTeV**, S.V. Somalwar, proceedings of the International Europhysics Conference on High-Energy Physics, Jerusalem, Israel, August 1997, D. Lellouch ed. (Springer-Verlag, Berlin Heidelberg,1998) pp. 790-791.
61. Measurement of the Branching Fraction of the decay  $K_L \rightarrow \pi^+\pi^-e^+e^-$  (J. Adams et al., KTeV Collaboration), Phys. Rev. Lett. 80, 4123-4126 (1998).
62. **Light Gluino Search in the Neutral Kaon Beam at Fermilab** (KTeV Collaboration and J.D. Bricker,Rutgers), J. Adams *et al.*, Phys. Rev. Lett. 79, 4083(1997).
63. CP and CPT Violation with  $K_S^0$  Mesons. Talk by S.V. Somalwar at the Sixth Conference on Intersections of Particle and Nuclear Physics, Big Sky, Montana, May 1997, T. Alexopoulos *et al.*, T.W. Donnelly ed. (AIP Press, New York 1997) pp. 812-818.
64. **CP and CPT Symmetry Tests from the Two-pion Decays of the Neutral Kaons with the FNAL E731 Detector** (L.K. Gibbons et al., E731 Collaboration), Phys. Rev. D 55, 6625 (1997).
65. **CPT Tests in the Neutral Kaon System** (B. Schwingenheuer et al.,E773 collaboration), Phys. Rev. Lett. 74, 4376-4379(1995).
66. **New Measurement of the CP Violation Parameter  $\eta_{+-\gamma}$** , (J. Matthews et al., E773 collaboration), Phys. Rev. Lett. 75, 2803-2806(1995).
67. A Measurement of the Branching Ratio and Form Factor of  $K_L \rightarrow \mu^+\mu^-\gamma$  (M. Spencer et al., E799-I collaboration),Phys. Rev. Lett. 74, 3323-3326(1995).
68. First Evidence for the Decay  $K_L \rightarrow e^+e^-\mu^+\mu^-$  (P. Gu et al., E799-I collaboration),Phys. Rev. Lett. 76, 4312-4315 (1996).
69. **CP/CPT Experiments with Neutral Kaons** (Invited Lectures at the Theoretical Advanced Studies Institute, University of Colorado at Boulder, May 1994), published in "CP Violation and the Limits of the Standard Model", J.F. Donoghue ed. (World Scientific, Singapore, 1995) pp. 2-12.
70. A Measurement of the Branching Ratio of  $K_L \rightarrow e^+e^-\gamma\gamma$ ,(T. Nakaya et al., E799-I collaboration), Phys. Rev. Lett. 73, 2169-2172(1994).
71. Search for the Decay  $K_L \rightarrow \pi^0\pi^0\gamma$ , (D. Roberts et al., E799-I collaboration), Phys. Rev. D50, 1874-1878(1994).
72. Polarization of  $\Lambda$  and  $\bar{\Lambda}$  Produced by 800-GeV Protons, (E.J. Ramberg et al., E799-I collaboration), Phys. Lett. B338, 403-408(1994).
73. Test of a Diamond-Tungsten Sampling Calorimeter, (R. Stone et al., DIAMAS collaboration), Mat. Res. Soc. Symp. Proc. 339, 121-126(1994).
74. Performance of a diamond-tungsten sampling calorimeter, (R.J. Tesarek et al., DIAMAS collaboration), Nucl. Inst. Meth. A349, 96-105(1994).

75. Limit on the Branching Ratio of  $K_L \rightarrow \pi^0 \nu \bar{\nu}$ , (M. Weaver et al., E799-I collaboration), Phys. Rev. Lett. 72, 3758-3761 (1994).
76. **Measurement of the Branching Ratio and a Study of the CP for the Leptonic Decay  $K_L \rightarrow e^+ e^- e^+ e^-$** , (P. Gu et al., E799-I collaboration), Phys. Rev. Lett. 72, 3000-3003 (1994).
77. A Limit on the Lepton-Family Number Violating Process  $\pi^0 \rightarrow \mu^\pm e^\mp$ , (P. Krolak et al., E799-I collaboration), Phys. Lett. B, 320, 407-410 (1994).
78. A Limit on the Branching Ratio of  $K_L \rightarrow \pi^0 \mu^+ \mu^-$ , (D.A. Harris et al., E799-I collaboration), Phys. Rev. Lett., 71, 3914-3917 (1993).
79. A Limit on the Branching Ratio of  $K_L \rightarrow \pi^0 e^+ e^-$ , (D.A. Harris et al., E799-I collaboration), Phys. Rev. Lett., 71, 3918-3921 (1993).
80. A Measurement of the Branching Ratio of  $\pi^0 \rightarrow e^+ e^-$  Using Decays in Flight of  $K_L \rightarrow \pi^0 \pi^0 \pi^0$ , (K.S. McFarland et al., E799-I collaboration), Phys. Rev. Lett. 71, 31-34 (1993).
81. **A New Measurement of the CP-Violation Parameter  $\text{Re}(\epsilon'/\epsilon)$** , (L.K. Gibbons et al., E731 collaboration), Phys. Rev. Lett. 70, 1203-1206 (1993).
82. **New Measurements of the Neutral Kaon System Parameters  $\Delta m$ ,  $\tau_S$ ,  $\Phi_{00} - \Phi_{+-}$ , and  $\Phi_{+-}$** , (L.K. Gibbons et al., E731 collaboration), Phys. Rev. Lett. 70, 1199-1202 (1993).
83. Study of the decay  $K_L \rightarrow \pi^\pm \pi^0 e^\mp \bar{\nu}(\nu)$ , (G. Makoff et al., E731 collaboration), Phys. Rev. Lett. 70, 1591-1594 (1993).
84. Simultaneous Measurement of  $K_L$  and  $K_S$  Decays into  $\pi^+ \pi^- \gamma$ , (E.J. Ramberg et al., E731 collaboration), Phys. Rev. Lett. 70, 2525-2528 (1993).
85. Measurement of the CP-Violation Parameter  $\eta_{+-\gamma}$  in Neutral Kaon Decays, (E.J. Ramberg et al., E731 collaboration), Phys. Rev. Lett. 70, 2529-2532 (1993).
86. Search for the Decay  $K_L \rightarrow \pi^0 \nu \bar{\nu}$ , (G.E. Graham et al., E731 collaboration), Phys. Lett. B295, 169-173 (1992).
87. **A Measurement of the Quadratic Slope Parameter in the  $K_L \rightarrow 3\pi^0$  Decay Dalitz Plot**, (S.V. Somalwar et al., E731 collaboration), Phys. Rev. Lett. 68, 2580-2583 (1992).
88. **Preliminary Results from Fermilab-E731 on the Direct CP Violation in the Neutral Kaon System** (Invited Talk at the Fourth Conf. on Intersections of Particle and Nuclear Physics, May 1991, Tucson, AZ) Willem T.H. van Oers ed. (American Institute of Physics 1992) pp. 640-643.
89. KTeV Design Report: Physics Goals, Technical Components, and Detector Costs (K. Arisaka et al.), FERMILAB-FN-580, Jan 1992. Fermilab Publication, 276pp.



90. Conceptual Design Report: Kaons at the Main Injector, K. Arisaka et al., 176 pp., Fermilab Publication, FERMILAB-FN-568, June 1991.
91. A Measurement of the Branching Ratio of the Decay  $K_L \rightarrow \pi^0 \gamma \gamma$ , (V. Papadimitriou et al., E731 collaboration), Phys. Rev. D44, 573-576 (1991).
92. Letter Of Intent To Measure The Branching Ratio For The Decay,  $K_S^0 \rightarrow \pi^0 e^+ e^-$ . K. Arisaka et al., FERMILAB-PROPOSAL-0833
93. Proposal For A New Tevatron Search For Direct CP Violation In The  $2\pi$  Decays Of The Neutral Kaon. K. Arisaka et al., FERMILAB-PROPOSAL-0832
94. **A Determination of  $\text{Re}(\epsilon'/\epsilon)$  by the Simultaneous Detection of the Four  $K_{L,S} \rightarrow \pi\pi$  Decay Modes**, (J.R. Patterson et al., E731 collaboration), Phys. Rev. Lett. 64, 1491-1494 (1990).
95. Test of CPT Symmetry Through a Determination of the Difference in the Phases of  $\eta_{00}$  and  $\eta_{+-}$  in  $K \rightarrow 2\pi$  Decays, (M. Karlsson et al., E731 collaboration), Phys. Rev. Lett. 64, 2976-2979 (1990).
96. A New Limit on  $K_L \rightarrow \pi^0 e^+ e^-$ , (A. Barker et al., E731 collaboration), Phys. Rev. D41, 3546-3547 (1990).
97. **Transient Response Induction Detectors for Magnetic Monopoles: First Operation at 78°K**, (S. Somalwar, H. Frisch, and J. Incandela), Phys. Rev. D37, 2403-2418 (1988).
98. **First Results from a 1.1m Diameter Superconducting Monopole Detector**, (J. Incandela, H. Frisch, S. Somalwar, M. Kuchnir, and H. Gustafson), Phys. Rev. D34, 2637-2647 (1986).
99. **First Results from the Chicago-Fermilab-Michigan Cosmic Ray Magnetic Monopole Detector**, (J. Incandela, M. Campbell, H. Frisch, S. Somalwar, M. Kuchnir, and H. Gustafson), Monopole'83, J. Stone ed. (Plenum Press, New York 1984) pp. 461-470.
100. **Series-Parallel Gradiometers for Monopole Detectors**, (S. Somalwar, H. Frisch, J. Incandela, and M. Kuchnir), Nucl. Instr. and Meth. in Phys. Res. 226, 341-343 (1984).
101. **Flux Limit on Cosmic-Ray Magnetic Monopoles from a Large Area Induction Detector**, (J. Incandela, M. Campbell, H. Frisch, S. Somalwar, M. Kuchnir, and H.R. Gustafson), Phys. Rev. Lett. 53, 2067-2070 (1984).

## Selected Invited Talks: Sunil Somalwar

1. **Beyond Standard Model (BSM) Physics at the Large Hadron Collider:** Plenary talk at the American Physical Society April Meeting 2018, 14-17 Apr 2018, Columbus, OH (upcoming).
2. **CMS Status Report:** Plenary talk at the XVI Mexican Workshop on Particles and Fields, Puerto Vallarta, Mexico 22-27 October 2017.
3. **What does the LHC Say about neutrino Mass?:** Colloquium, Dept. of Physics and Astronomy, Rutgers University, 20 September, 2017.
4. **Exotic searches at the Large Hadron Collider:** Plenary talk at the Lepton Photon 2017, XXVIII International Symposium in High Energy Physics, Guangzhou, China, August, 2017.
5. **Supersymmetry Searches with Higgs in the Final State:** Plenary talk at the Mitchell Workshop, Texas A&M University, May 12, 2014.
6. **Topical Supersymmetry Results from CMS:** Plenary talk at “What Next @LHC” conference, Tata Instt. of Fundamental Research, Bombay, India, January 2014.
7. **New Physics Signatures with Higgs - Search with Multileptons:** Workshop on the Implications of LHC Higgs-like Signals, Aspen, CO, 15 August, 2013.
8. **Searches for Exotic Beyond Standard Model Physics:** Plenary talk at Supersymmetry’13, International Center for Theoretical Physics, Trieste, Italy, August, 2013.
9. **Anomalous Decays of the Top Quark:** Supersymmetry’13 conference, International Center for Theoretical Physics, Trieste, Italy, August, 2013.
10. **New Physics with Leptons - Experiment:** Lecture at the “Prospects in Theoretical Physics”, Institute for Advanced Studies, Princeton, NJ, July 2013.
11. **Searches for Supersymmetry:** Plenary talk at the 24th Rencontre de Blois -Particle Physics and Cosmology Conference, Blois, France, May 27 - June 1, 2012.
12. **Recent SUSY Searches with Multileptons at CMS:** Seminar at Research Progress Meeting, Lawrence Berkeley National Laboratory, Berkeley, California, June 2012.
13. **Searches with Multilepton Final States at CMS:** Plenary talk at the Chicago 2012 workshop on LHC physics, Chicago, Illinois, May 2012.
14. **Beyond Standard Model Searches at CMS :** Plenary talk at Aspen’12 - The Hunt for New Particles, from the Alps to the Plains to the Rockies, Aspen, CO, February 2012.
15. **Making Supersymmetry Results Model Independent: CDF to LHC:** Plenary talk at the LHC Workshop, Brookhaven National Laboratory, Upton, NY, Jan. 2011.
16. **Managing Multilepton Topologies: The Tau Trouble:** Plenary talk at the Characterization of New Physics at the LHC, CERN, Geneva, Switzerland, November 2010.

17. **Search for New Physics at the Tevatron:** XVIII International Workshop on Deep Inelastic Scattering, Florence, Italy, 19-23 April 2010, recorded.
18. **Supersymmetry Searches at the Tevatron:** Plenary talk at the 20th Hadron Colliders in Physics Symposium, 2009 (HCP'09), Evian, France, November 2009.
19. **Future of Electricity in Transportation:** Plenary talk at the Rutgers Energy Institute Annual Symposium, May 2009.
20. **Supersymmetry Searches with Leptons at CDF:** 34<sup>th</sup> International Conference on High Energy Physics (ICHEP'08), Philadelphia, PA, USA, 29 July - 5 August, 2008.
21. **Of Symmetries Good and Bad, Seen and Unseen** Colloquium, Department of Physics and Astronomy, Rutgers University, 16 Apr 2008
22. **Global Warming: Policy without Politics?** Colloquium, Department of Physics and Astronomy, Rutgers University, 26 April 2006.
23. **Will Fermilab Discover Higgs Before CERN?** Colloquium, Department of Physics and Astronomy, Rutgers University, 6 October 2004.
24. **Will Supersymmetry Help Fermilab Discover Higgs Before CERN?** Colloquium, Department of Physics, University of Utah, 30 September 2004.
25. **Searches for Standard Model Higgs at the Tevatron:** 5<sup>th</sup> Recontres du Vietnam, Particle Physics and Astrophysics, Hanoi, Vietnam, 5-11 August 2004.
26. **Radiative Widths of Neutral Kaon Excitations**  
IX International Conference on Particles, Strings and Cosmology (PASCOS 2003), Bombay, India, 3-8 January, 2003.
27. **Radiative Width Measurements of Excited Kaons Using the Primakoff Effect**  
5<sup>th</sup> International Conference on Quark Confinement and the Hadron Spectrum, Gargnano, Garda Lake, Italy, 10-14 September 2002.
28. **Making Physics and Society Connection via Teaching**  
A Quarknet Seminar, Rutgers University, July 25, 2002, Sponsored by US DOE and NSF.
29. **New Results in K Physics**  
Invited Lecture, Aspen Center for Physics, 1999 Winter Conference on Particle Physics, Aspen, Colorado, 17-23 January, 1999.
30. **New Frontiers in K Physics**  
Colloquium, Department of Physics, Lehigh University, Bethlehem, PA, Nov. 1997.
31. **Light Gluinos as Dark Matter? Search Results from KTeV**  
Wine and Cheese Seminar, Fermi National Lab., Batavia, IL, Oct. 1997.
32. **New Frontiers in K Physics**  
Colloquium, Department of Physics and Astronomy, Rutgers University, Piscataway, NJ, Sept. 1997.

33. **New Results from KTeV**  
International Europhysics Conf. on High-Energy Physics, Jerusalem, Israel, Aug. 1997.
34. **Limits on Light Gluino Production with 800 GeV Proton Beam**  
International Europhysics Conf. on High-Energy Physics, Jerusalem, Israel, Aug. 1997.
35. **Status of KTeV  $\epsilon'$  Measurement**  
Colloquium, Max Planck Institute, Heidelberg, Germany, 6 August 1997.
36. **CP and CPT Violation with  $K_S^0$  Mesons**  
Sixth Conf. on Intersections of Particle and Nuclear Physics, Big Sky, MT, May 1997.
37. **Status of KTeV  $\epsilon'$  Measurement**  
Main Injector Stationary Target Workshop, Fermi National Accelerator Laboratory, Batavia, Illinois, 1 May 1997.
38. **Where is all the Antimatter? The CP Puzzle**  
Outreach Colloquium, Department of Physics, HMC/Claremont Colleges, Los Angeles, California, 11 March 1997.
39. **The CP Puzzle**  
Colloquium, Department of Physics, Temple University, Philadelphia, Pennsylvania, 17 February 1997.
40. **Where is all the antimatter?**  
Outreach Colloquium, Department of Physics, Bethany College, Bethany, West Virginia, 13 November 1996.
41. **Left-Right, Matter-Antimatter and All That**  
Outreach Lecture for the Society of Physics Students, Rutgers University, Piscataway, New Jersey, 27 November 1995.
42. **KTeV Tracking System**  
Department of Energy Lehman Panel Review of the KTeV Experiment, Fermi National Accelerator Laboratory, Batavia, Illinois, 23 May 1995.
43. **Physics Goals of the Next Fixed Target Run**  
Department of Energy Review of the Fermi National Accelerator Laboratory, Batavia, Illinois, 23 May 1995.
44. **CP/CPT Experiments with Neutral Kaons**  
Guest Lecturer, Theoretical Advanced Studies Institute, University of Colorado at Boulder, Boulder, Colorado, 30 May-24 June 1994.
45. **Kaon Physics at Fermilab, Now and Five Years Later**  
American Physical Society's Drell Panel Meeting at the Harvard University, Boston, Massachusetts, 22 March 1994.
46. **First Announcement of Preliminary Results from Fermilab Experiment E773 on CPT Violation Search in the Neutral Kaon System**  
American Physical Society Meeting, Washington D.C., 18-22 April 1994.

47. **CPT Tests with the  $K^0$  System**

Workshop on the Future Directions in Particle and Nuclear Physics, Brookhaven National Laboratory, Long Island, New York, 4-6 March 1993.