



Joe Incandela

Professor, University of California Santa Barbara and CMS Deputy Spokesman

Publications

Brief Biography

- **PhD (1981-1986) University of Chicago (Advisor: Prof. Henry Frisch)**
 - Search for very massive magnetic monopoles using superconducting coils read by Superconducting Quantum Interference Devices (SQUIDS)
 - Derived an analytic expression for the remnant field of magnetic monopole passing through a closed superconducting volume along arbitrary path.
 - Design and construction of two systems with 200 and 1000 times the exposure of the Stanford experiment that had a monopole candidate event in 1983.
 - Presented a first non-confirmation of the Stanford event in 1984.
- **Post-Doc (1986-1988) With Boston University on the MACRO experiment**
 - Designed and prototyped L1 muon trigger boards.
 - Studied the effect of He on photomultipliers and developed quantitative expressions for pmt lifetimes in He environments as function of their geometry, glass types, operating voltages etc.

Involvement in hadron collider experiments (1987 – present)

- **CERN Fellow and INFN (art. 36) on the UA2 experiment at CERN (1987-1991)**
 - Responsible for calorimeter electronics and all HLT code and menus.
 - Made the most precise measurement of mass of Z particle at that time.
 - Measurement of $e - \tau$ universality
 - First search for Charged Higgs particle via the process $t \rightarrow H^+ b$ with $H^+ \rightarrow \tau \nu_\tau$, using hadronic tau decays. Here H^+ is the positively charged Higgs particle (appearing in models such as Supersymmetry), t and b are the top and bottom quarks respectively and τ and ν_τ are the tau and its corresponding neutrino.

- **CDF at FNAL (1991-2009)**
 - Led the construction of the Silicon tracking detector SVX' used in the first observation of the top quark pair production.
 - Co-leader of the group searching for the top quark using tagging of b quarks that provided the most significant contribution to the first observation of tt production. Had some of the initial ideas for and co-led development of “seed vertex” b-tagging algorithm (SECVTX) still used in CDF.
 - Proposed and led construction of two additional silicon detectors (ISL and Layer 00) still in use for the Higgs search at the FNAL Tevatron accelerator. The Layer 00 detector on the beam pipe of CDF was also critical to the observation of Bs mixing.
 - Measured the top pair production cross section in 2004 and 2006.
 - Measurement of top mass using particle tracking only 2003-2009.
- **Compact Muon Solenoid (CMS) experiment at CERN (1997-present)**
 - US Silicon tracker project leader, responsible for a large part of the module production and test for the CMS Tracking system.
 - Led the final stages of the ttH benchmark study for Physics TDR II that was first to show that this channel may not be accessible without new tools and capabilities (later confirmed by an ATLAS analysis).
 - Deputy Physics Coordinator 2007-2009.
 - Played significant role in
 - Trigger based datasets and data distribution planning.
 - Proposal of Physics Validation Team & Wednesday General Meetings
 - Physics organization of the CSA07 exercise
 - Co-organized and led the October Exercise and Proposal of the Physics Operations meetings
 - Co-chair the cross-coordination meeting for planning and solving problems that cross coordination area boundaries.
 - Co-proposed and ensure detailed reporting of XEB meetings
 - Proposed and co-organized LPCC joint CMS-ATLAS-Theory Characterization of New Physics working group.
 - Searching for evidence of Dark Matter production at the LHC with Students and Post-docs from UCSB.
- **Fellowships and Honors**
 - 2011 Elected Fellow to AAAS
 - 2004 Honorary PhD Lewis University
 - Phi Beta Kappa, Elected 1981
- **Selected Reviews and Committees (partial list)**
 - 1995 TEV33 Committee on future of Tevatron
 - 1996 Chairman – CDF Outer Tracker Review
 - 2000 Scientific Advisory Group to Director, Fermilab
 - 2000 KEK BELLE SVD Review, Tsukuba, Japan
 - 2001 GLAST Review, SLAC
 - 2001 Appointed by Fermilab Directorate to run Run2b Silicon Task Force
 - 2010 Particle Physics Astrophysics Advisory Committee, SLAC