

# Joseph Incandela, Ph.D. Biography



**Joseph “Joe” Incandela - Class of 1974, - 1956** is an American particle physicist, a Professor of Physics at the University of California, Santa Barbara and currently based at CERN where he spent two years as the spokesperson for the Compact Muon Solenoid experiment at the Large Hadron Collider.

Incandela received his PhD from the University of Chicago in 1986. He worked on the UA2 experiment at CERN to study the recently discovered W and Z bosons before searching for charged Higgs bosons. He then moved back to the US in 1991 to work at FNAL where he led the construction and design of silicon detectors and co-led the search for the top quark using lifetime tagging of quark jets. This channel had the strongest contribution to the top quark discovery in 1995. Since 1997 he has been involved with the Large Hadron Collider at CERN, initially

leading the **construction** of a large part of the tracking system for the Compact Muon Solenoid (CMS) experiment. In 2011 he was elected to be the spokesperson for the CMS experiment.

On July 4, 2012, Incandela announced the discovery of the Higgs Boson.

Members of the CMS collaboration have elected as their new spokesperson Joe Incandela, a physicist at the University of California, Santa Barbara. He is the first scientist from a U.S. institution to be elected spokesperson of an experiment at the LHC.

Incandela’s primary aim as spokesperson will be to help CMS collaboration board chair members create a sustainable mode of working together that allows them to fulfill all of their future goals, he said.

“I want us to have the feeling of a team or a family,” Incandela said. “We’re going to spend the next 20 or 30 years together.”

Incandela, a former member of Fermilab’s CDF experiment, will start his two-year term on Jan. 1, 2012.

“It’s going to be an exciting time,” said US CMS physicist Nick Hadley, who served on the election committee. “We’ll be taking data and publishing. Then the spokesperson will need to carefully choreograph the upgrade, since the CMS detector can only be opened in a particular sequence.”

Incandela will lead scientists from almost 40 countries in his new role. Incandela has served as CMS deputy spokesperson since January 2010, when current spokesperson Guido Tonelli appointed him to the job along with CERN physicist Albert De Roeck.

Incandela earned his Ph.D. from the University of Chicago. He went to Switzerland as a CERN Fellow in 1987 to study W and Z bosons and then on to INFN in Italy to search for charged Higgs bosons. In 1991 he came to Fermilab as a Wilson Fellow and joined the CDF collaboration, where he co-led the experiment’s successful first observation of top quarks with secondary vertex b-tagging. He remained part of the CDF collaboration for 18 years.

In 1998, he took charge of the US CMS tracker group as a member of the UCSB faculty. He returned to CERN in 2007 to serve as deputy physics coordinator for CMS and has been at the laboratory full-time since then.

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Distinguished Professor of Physics, Yzurdiaga Chair in Experimental Science and Interim Vice Chancellor for Research at the University of California Santa Barbara

Education: M.S. and Ph.D., 1986, Univ. of Chicago - B.A. (Physics) and B.S.(Math) 1978-1981, Univ. of Chicago

## **Awards, Fellowships and Honors**

- Elected Fellow, National Academy of Sciences
- Yzurdiaga Chair in Experimental Science, UCSB
- Co-recipient of the 3M\$ Special Breakthrough Prize in Physics
- Elected Fellow, American Association for the Advancement of Science
- Elected Fellow, American Physical Society
- UCSB Research Faculty Lecturer 2016
- PhD Honoris Causis, Lewis University, Chicago
- Phi Beta Kappa, Elected 1981

## **Academic Appointments:**

- 2016 – Interim Vice Chancellor for Research, Univ. of California Santa Barbara
- 2001 -- present: Professor of Physics, University of California Santa Barbara
- 9/91--2/01 Wilson Fellow, Scientist I & II, Fermi National Accelerator Laboratory
- 10/89--9/91 INFN Fellow, Istituto Nazionale di Fisica Nucleare, Milan Italy
- 8/87--10/89 CERN Fellow, Geneva, Switzerland
- 9/86-7/87 Post-doctoral Fellow, MACRO experiment, Boston University Professional Activities and Roles:

- 2015-2019 Elected to the chair line of the Division of Particles and Fields of the American Physical Society
- 2015- Adjunct Professor, Tata Institute for Fundamental Research, Mumbai India
- 2015- Distinguished Visiting Research Chair, Perimeter Inst., Waterloo Canada
- 2014- Member, High Energy Physics Advisory Panel (HEPAP) to DOE and NSF
- 2014- Member, Coordination Group, Future Circular Collider, CERN, Geneva
- 2012- Member, Selection Committee, Breakthrough Prize in Physics
- 2012-13 Spokesperson, Compact Muon Solenoid (CMS) Experiment, CERN
- 2010-11 Deputy Spokesperson, CMS Experiment, CERN, Geneva
- 2010-14 Particle Physics and Astrophysics Advisory Committee, SLAC
- 2007-09 Deputy Physics Coordinator, CMS Experiment, CERN, Geneva
- 1998-2009 Leader of the US tracking detector project for the CMS Experiment
- 2001-09 Member of the Executive Board of the CDF experiment, Fermilab
- 1991-2001 Leader, CDF Experiment detector projects: SVX', ISL, L00
- 1996-2000 Leader, Fermilab Silicon Detector Center
- 2000-2001 Director's Program Advisory Group, Fermilab
- 2004- present: Organizing and/or Scientific Advisory Committee for a wide array of international conferences
- Reviewer for Physical Review Letters and Phys. Rev. D
- Reviewer for particle physics programs for the DOE and NSF
- Reviewer for a variety of national particle physics programs in Europe.

## **Professional Organizations:**

- National Academy of Science
- American Physical Society
- American Association for the Advancement of Science Teaching Experience:
- 2001-2004 Electrodynamics and Mechanics for first year graduate students
- 2004-2007 Quantum Mechanics for first year graduate students

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- 2014-2016 Electrodynamics and Quantum Mechanics for upper division undergraduates
- 2001-present: advisor to 10 PhD students, of which 6 have graduated and 4 are current. Also engaged ~10 undergraduates in research and honor's contracts.

## Grants and Contracts:

- 1991-2001: Supported directly by the DOE as Fermilab Staff
- 2001-present: Co-PI UCSB DOE HEP Group grant
- 2001-2009: PI DOE grant for UCSB CMS Tracker, administered by FNAL
- 2010-2013: PI DOE generic R&D grant for electronics development
- 2014-present: PI DOE grant for UCSB CMS Calorimeter, administered by FNAL University Activities:
- 2014-present: Building & Development committees, Dept. of Physics
- 2005-2007: Chancellor's Advisory Committee on Faculty and Staff Housing
- 2002-2005: UCSB Senate Committee on Planning and Budget

## Most significant publications:

- Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC, CMS collaboration, Published in Phys.Lett. B716 (2012) 30-61, > 6000 citations.
- The CMS experiment at the CERN LHC, [CMS](#) Aug 2008. 361 pp., Published in JINST 3 (2008) S08004, > 3000 citations.
- Observation of top quark production in pbar-p collisions, CDF collaboration, Published in Phys.Rev.Lett. 74 (1995) 2626-2631, >2700 citations.
- A precise determination of the w and z masses at the cern anti-p p collider, UA2 Collaboration, Published in Phys.Lett.B241:150-164,1990
- A flux limit on cosmic ray magnetic monopoles from a large area induction detector. By J. Incandela et al.; Published in Phys.Rev.Lett.53:2067,1984 Link to the full list of > 1100 publications: [Publications list online](#)

## Biosketch

Incandela is an experimental particle physicist known for development of particle detectors and their application to searches for new particles at high-energy particle colliders. Incandela grew up in the Chicago area, attended Elgin High School then University of Colorado and finally transferred to University of Chicago for his bachelor degrees in Physics and Mathematics. He received his PhD from the University of Chicago under Prof. Henry Frisch in 1986 for a search for magnetic monopoles using superconducting coils and quantum interference devices. As a CERN Fellow he joined the UA2 experiment in 1987, performing a measurement of the mass of the Z boson and leading a search for Higgs bosons in tau final states. He joined the CDF experiment as a Fermilab Wilson Fellow in 1991. He led several detector projects and also co-led the search for the top quark that provided the most significant contribution to their discovery in 1995. In 1997 he formed the US Silicon tracker project for the CMS experiment at CERN where he held several leadership roles. As elected Spokesperson (this is the equivalent of the CEO of the experiment), he led the CMS experiment for the observation of the Higgs boson, which he presented on July 4, 2012. He is a co-recipient of the 2012 Breakthrough Prize in Physics. He has been professor of Physics at the University of California, Santa Barbara since 2001 and since March of 2016 he has been the Interim Vice Chancellor for Research.