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**Date of Birth** October 20, 1951  
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**Degree** PhD. In Physics, Universidad Nacional de La Plata, Argentina, 1982.  
M.S. in Physics, Universidad Nacional de La Plata, Argentina, 1977.

**Teaching** 5 years “General Physics” courses at the Universidad Nacional de La Plata, Argentina, and Universidad Nacional de Tandil, Argentina.

### **Research positions**

October 2001 to date: Scientist II, Fermilab.  
October 1994 – September 2001: Applied Scientist I, Fermilab.  
December 1988 – October 1994: Associate Scientist, Fermilab.  
April 1985 – December 1988: Research Associate, Fermilab.  
July 1983 – March 1985: Guest Scientist, Fermilab.  
April 1982 – April 1983: Associate Professor, Physics Department,  
Universidad Nacional Autonoma de Mexico, Mexico,  
March 1978 – March 1982: Scholarship from the Comision de  
Investigaciones Cientificas, Buenos Aires, Argentina.

### **Awards**

2009 recipient of the American Physical Society Edward Bouchet award.  
2005 Employee recognition award for mayor contributions to D0 both in  
detector support and physics analysis.

### **Fermilab assignments**

January 2006 to date: co-leader of the “Physics Support Group” of  
Fermilab’s D0 Department.

September 2005 – September 2006: co-convener of the D0 top physics group.

March 2003 – September 2005: worked on the D0 central muon group

February 2001 – March 2003: leader of the D0 detector offline alignment group.

January 1997 – July 2000: Worked in the D0 Central Fiber Tracker group (in charged of the Fiber Tracker mechanical construction).

June 1996 – December 1996: Associate Head of the RD/Operations Department and Group Leader of the Beams Group.

October 1992 – June 1996: Assistant Head of the RD/Operations Department and Group Leader of the Beams Group.

December 1988 – October 1992: NE beam line physicist.

### **Current research project**

I am currently working in the Dark Energy Survey project in the group that is building the Dark Energy Camera that will be installed in the Cerro Tololo Blanco telescope.

I am working on measuring the top mass and the top-antitop mass difference using the data collected with the D0 detector. This work is being done in collaboration with Dr. Mike Wang from Rochester University.

### **Recent research projects**

Recently measured the top mass with the worlds best resolution. This work was done in collaboration with Carlos Garcia from Rochester University and Dr. Mike Wang from Fermilab.

Researched a new and accurate way of measuring the top mass. This work was done in collaboration with Dr. Juan Estrada and Dr. Florencia Canelli of Rochester University using the Run I D0 data. This work led to Dr. Juan Estrada's thesis and was published in Nature.

W helicity measurements in ttbar events. This work was done in collaboration with Dr. Florencia Canelli of Rochester University. This work led to Dr. Florencia Canelli's thesis and it was published in PLB.

Search for non qqbar mesons in the final states  $pp \rightarrow p(\phi\phi)p$ ,  $pp \rightarrow p(K_S K_S \pi)p$  and  $pp \rightarrow p(K_S K_S)p$  using the data collected by Fermilab experiment E690. This work was done in

collaboration with Dr. Marco Reyes and Dr. Modesto Sosa of the Universidad de Guanajuato, Mexico.

### **Direction of Ph.D. thesis**

Advisor of Dr. Modesto Sosa. Dr. Sosa received his Ph.D. degree in Physics from the Universidad de Guanajuato, Mexico, in January of 1996. Dr. Sosa's Ph.D. Thesis was published in: "Spin Parity Analysis of the Centrally Produced  $K_S^0 K^\pm \pi^\mp$  System at 800 GeV/c" Phys.Rev.Lett. 83, 913 (1999).

Advisor of Dr. Marco Reyes. Dr. Reyes received his Ph.D. degree in Physics from the Instituto Politecnico Nacional, Mexico, in 1998. Dr. Reyes' Ph.D. Thesis was published in: "Partial Wave Analysis of the Centrally Produced  $K_S K_S$  System at 800 GeV/c" Phys.Rev.Lett. 81, 4079 (1998).

## **Work in Fermilab's Particle Physics Division / D0 Department**

### **Top group co-convener**

From September 2005 to September 2006 I served as a co-convener of D0's Top Physics Group. This group is charged with directing and coordinating all the top quark physics at D0.

### **Work in the central muon system**

From March 2003 to September 2005 I worked in the D0 central muon system mostly in relation to the PDT (Proportional Drift Tubes) system. Some of my contributions to the system include: a) reconfiguring the "Layer A" electronics to reduce the electronic noise in the system, b) carefully studying and understanding efficiencies, drift velocities, signal formation, HV stability, radiation effects, the charge division vernier and beam effects during p and p-bar injection into the Tevatron, and c) adding small amounts of water to the PDT gas in order to reduce Malter's effect in the PDT system.

### **D0 Fiber Tracker group**

Developed the carbon support cylinders for the Central Fiber Tracker (CFT) detector. These carbon cylinders were very low mass and very accurate structures made with high module carbon fibers.

Directed the mechanical construction of the CFT detector. This detector is one of the key parts of the D0 upgrade for Run II. The detector was completed and installed in July 2000.

### **Institutional Board representative**

From May 2003 to July 2006 I was one of the two D0 Fermilab group representatives to the D0 Institutional Board (IB). The IB is the governing body of the D0 experiment.

### **Top quark mass EB**

From November 2003 to September 2006 I was a member of D0's Top quark mass Editorial Board (EB). This EB was charged with reviewing all top quark mass measurements and giving final approval before the measurements could be shown in Conferences or submitted for publication.

### **D0 luminosity review**

From February 2005 to April 2005 I was asked (together with two other people) to review the D0 luminosity system. Our findings and recommendations led to modifications in the detector and eventually to D0 changing the luminosity measurement by about 10%.

### **Tracking Task Force**

From October 2001 to August 2002 I was asked to lead a Task Force at D0 to tackle the track reconstruction issues that surface soon after D0 started taking data during Run II of the Tevatron.

## **Other work in Fermilab's Particle Physics Division**

### **FCSA Committee**

From October 2007 to date I have been a member of the Fermilab Committee for Scientific Appointments. This Committee is responsible for making recommendations to the Fermilab Director about the hiring and promotion of Fermilab's Scientific personnel.

### **RA Committee**

From December 2004 to October 2008 I have been a member of Fermilab's Research Associate Committee. This Committee is responsible for hiring all Fermilab Research Associates that work in the Tevatron physics program.

### **CPA Committee**

From January 2007 to June 2008 I was a member of Fermilab's Center for Particle Astrophysics Committee. This Committee is responsible for hiring Fermilab Research Associates to work on Fermilab's Particle Astrophysics program.

### **URA Thesis Committee**

I served in the University Research Association Thesis Committee from February 2004 to June 2006. This Committee is charged with selecting every year the best research thesis for work performed at Fermilab's Tevatron. The best thesis is then recommended for receiving the "URA Thesis Award".

## **Work in Fermilab's Research Division**

### **Epicure review committee**

Chaired the Epicure Review Committee. The Committee was charged with the study of the data acquisition hardware needed to run the 1996-1998 Fixed Target program. The conclusions and recommendations can be found in the final report: "The Epicure Control System Review. Into the Next Century".

### **E815 beam line**

Led the group that designed the E815 beam line and the D0 test beam. Helped to develop a new way of producing an electron beam for the D0 test beam, which allowed a

substantial simplification of the beam line. The design can be found in the reports: “NuTeV (E815) Beam Design Report (Including D0’s Test Beam Design)”, and “Technical Memorandum Sign-Selected Quadrupole Train”.

### **KTeV beam line**

Designed the KTeV primary beam line. This beam line had very stringent requirements on the beam position and slope stability. Other beams were studied during the design process, like the emittance studies done in the MC beam line. The design can be found in the report: “KTeV Beam Systems Design Report” (FERMILAB-TM-2023, Sept. 1997. 270pp) and “Performance of the Ktev High Energy Neutral Kaon Beam at Fermilab” (FERMILAB-TM-2046, June 1998. 52pp.)

### **Management**

Led the efforts of the Beams Group. The Beams Group under my supervision designed, supervised the construction/commissioning and established operating conditions for all the beam lines during the 1996-1998 Fixed Target run.

Participated in the activities of the Operations Department in my position as Assistant Head.

### **Beam line automation**

Wrote a large fraction of the software, established the main concepts and supervised the automation of the Fixed Target beam lines during the 1996-1998 run. This software was crucial in maintaining the KTeV beam position stability to 50 micrometers over periods of many months.

### **NE beam line**

Redesign the NE beam line to deliver 800 GeV protons to Lab G. After the modifications the beam line was successfully operated during the 1991 fixed target run.

Studies performed in the NE beam line: a) magnet’s stability (to 50 E-6), b) behavior of BPMs in a high halo environment, c) RF structure studies, d) primary beam emittance studies.

Software written for the NE beam line: a) T-type collimator alignment, b) septa alignment, c) septa conditioning, d) quadrupole tuning by constraints, e) autotuning of the NE beam line.

The autotuning programs originally written for the NE beam line were successfully adapted to all the other neutrino beams.

### **Shielding work**

Active participation during the 1990 Lab wide shielding assessment. Dose calculations for the NE/NT secondary beam lines. Started a program to include all the beam enclosures in a three dimensional software package. As part of this program all the neutrino primary beam enclosures were included in VANGO.

### **Fermilab experiment E690**

#### **Beam spectrometer**

Design of the beam spectrometer. The beam spectrometer was designed to measure the momentum of particles from about 600 GeV/c to 800 GeV/c with a resolution of 400 MeV/c. The studies performed for the design were: a) effect of multiple scattering, b) needed stability of all the elements in the spectrometer, c) magnetic field stability and uniformity, d) number of position measurements needed to achieve the desired accuracy.

Supervised the measurements of the magnetic fields and the installation of the magnets. Performed studies on the magnetic field stability, specially the 720 Hz ripple produced by the power supplies.

#### **Phototube/counter system**

Designed and assembly of a phototube testing stand. All the photomultipliers were tested for single photoelectron response, time resolution and gain. Those with good single photoelectron resolution were used in the Cherenkov counter, the others were used in the time of flight and veto systems. All scintillator counters were also tested.

Study the time resolution of the time of flight counters.

#### **Data analysis**

Search for non qqbar mesons in the final states: a)  $p (K_s K^\pm \pi^+) p$ , b)  $p (\phi\phi) p$ , and c)  $p (KKbar) p$ . Developed the Partial Wave Analysis techniques necessary to perform the previous analysis.

### **Other contributions**

Calibration of the beam spectrometer system. Position resolution studies of the high pressure drift chambers used in the beam spectrometer. Transferred a large fraction of the code to the SGI machines. Provided the experiment with a clean beam of 800 GeV/c protons with the required intensity and beam shape.

### **Brookhaven experiment BNL 766**

#### **Cherenkov Counter**

Study of the efficiencies in terms of number of photoelectrons for different types of mirrors. Wrote software programs for alignment of the two mirror planes. Wrote a good fraction of the programs used in the Cherenkov particle identification package.

#### **Time of flight**

Studies of the efficiencies of the 72 counters rear hodoscopes. Wrote software for alignment of the counters. Study corrections to the timing due to pulse height, distance along the counter, and start time. Wrote most of the programs used in the time of flight particle identification package.

#### **High pressure drift chambers**

Studies for the design specifications, like anode to cathode tolerances and wire tensions. Electric field calculations with the purpose of checking that the electron's drift velocity was saturated over most of the drift space. Montecarlo the improvement in position resolution with high pressure.

Construction and debugging of several thousand channels of preamplifiers, discriminators and TDCs for the high pressure drift chambers. Construction and debugging of the Nevis Transport system and its interface to a PDP-11 to read out the TDCs. Calibration of the TDCs. The high pressure drift chambers were tested in the wide band electron beam before they were shipped to BNL.

**Exclusives final state identification**

Wrote a software program to identify more than one hundred different exclusive final states. The program known as the E-P1 code uses energy, momentum, charge, strangeness and baryon number conservation to identify all possible exclusive final states. When available direct particle identification is also used. Finding the position of the LH2 target and making energy loss corrections to the charged particles was part of the package.

**Processor work**

Wrote the drivers to handle the communication between the processor, a Data General Eclipse computer and four AVIV 6250 bpi tape drives. Wrote the software to send data from the tape drives, to the Eclipse computer and from the Eclipse to the processor to be analyzed. Once analyzed the data was sent back from the processor to the Eclipse and from the Eclipse to the tape drives. The track reconstruction of all the data stored in several thousand tapes was done this way.

**Other contributions**

Worked in the installation of the Cherenkov counter. Worked in installation of the high pressure drift chambers used for the momentum measurement of the proton beam. Played a very active role in the debugging of the vertex finding programs. Played an active role in the studies to modify the BNL B5 beam line to run protons, and later to fine tune the beam delivered to the experiment.