

University of Toronto & TRIUMF

Outline



- Department of Physics
- UofT – TRIUMF Connection
- High Energy Physics Group
- Scientific Interests
- Recent, Present, and Future Projects
- Facilities & Infrastructure
- TRIUMF 5 – Year Plan



Department of Physics

- 45 Faculty
- 142 Graduate Students
- 325 “Physics” Undergrads 1st year - 165; 4th year - 30
- Planetary Physics
- Quantum Optics & Condensed Matter
- Subatomic Physics
- Astrophysics
- CITA, Photonics Ontario, Isotrace, Aerospace, IPP



TRIUMF - UofT

- Nuclear Astrophysics:

Strong historical connection through Azuma & King.
Both are now retired.

- High Energy Physics:

When TRIUMF became National Particle Physics Laboratory, Toronto became Associate Member.

Very strong scientific connection through ATLAS

Toronto-TRIUMF Joint Position – Pierre Savard

High Energy Group - Faculty

Experiment

- D. Bailey – ATLAS
- P. Krieger – ATLAS (UofT/IPP)
- J. Martin – ZEUS (UofT/IPP)
- R. Orr – ATLAS, CDF
- P. Savard – CDF (UofT/TRIUMF)
- P. Sinervo – CDF, ATLAS
- W. Trischuk – CDF, ATLAS

Theory

- B. Holdom – Strong Gravity
- K. Hori – Strings (Maths/Physics)
- M. Luke – Effective Field Theory
- P. O'Donnell – Quark Model
- A. Peet - Strings
- E. Poppitz – SUSY & Beyond

High Energy Group – PostDocs & Students

Experiment

- K. Kordas – CDF
- G. Levmann – ZEUS
- A. Mirea – ZEUS
- R. Tafirou – CDF
- “K.K. Joo” – ATLAS

Theory

- A. Alakbha – O’Donnel
- J. Giedt – Poppitz
- T. Hirayama – Holdom
- K. Hosomichi - Hori
- M. Kruczenski – Peet
- D. Page – Peet

Experiment

- J-F. Arguin – CDF
- S. Lai – CDF
- D. McQueen – CDF
- S. Pashapour – CDF
- S. Sabik – CDF
- B. Selzer – CDF
- O. Selzer – CDF
- I. Volrath – CDF
- K. Martens – ATLAS
- J. Kim – ATLAS
- T. Koop - ZEUS

Theory

- C. Burrell – Luke
- A. Williamson - Luke
- M. Trott – Luke
- H. Rukin – Luke
- Y.C. Chai – Luke
- G. Potvin – Peet
- O. Sareni – Peet
- J. Sheldon – Poppitz

Scientific Interests of Experimental Group

- The 1980's

The foundation of the group was laid by successful experiments in Europe (ARGUS) and USA (FNAL 531)

Tradition of both **Detector Development & Physics**, with strong focus on computing.

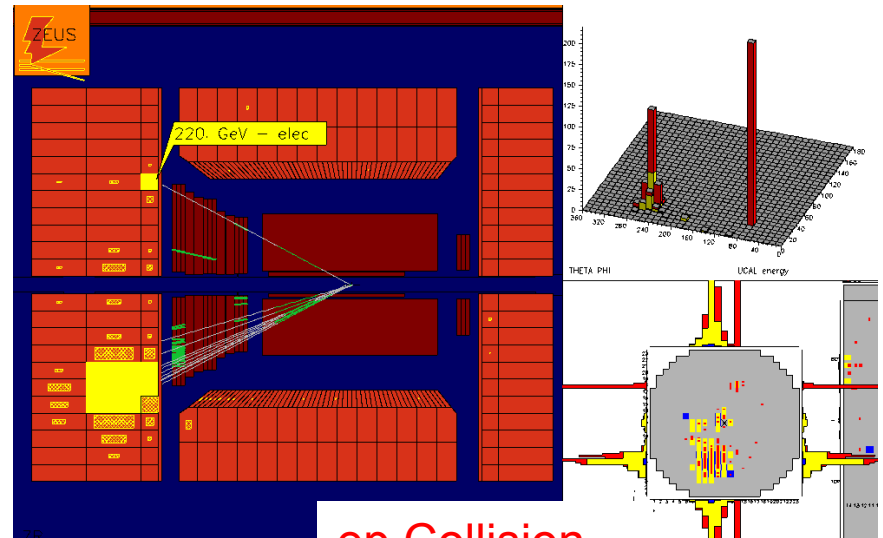
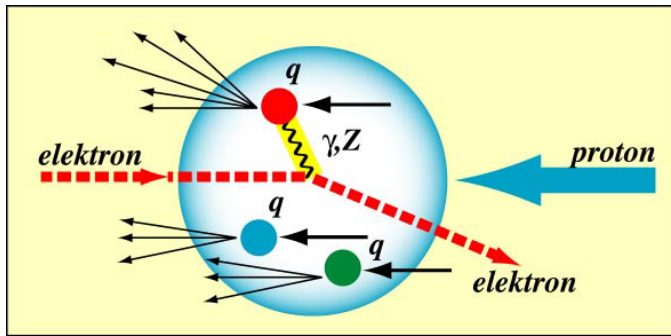
- Present Program

-  Uranium Calorimeter, Third Level Trigger.

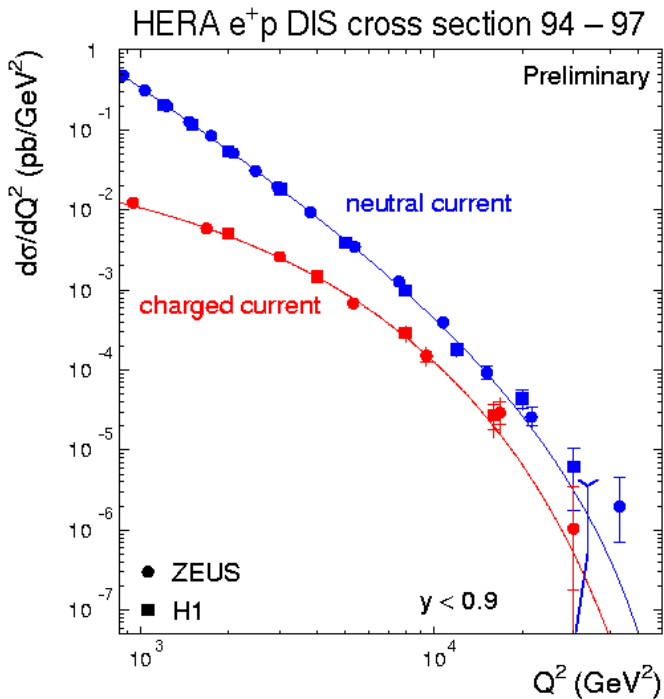
-  SVX Alignment, Calorimeter Software

-  FCAL Design & Construction, Pixels, Software

ZEUS ep Collisions - Proton Structure



ep Collision
seen in ZEUS



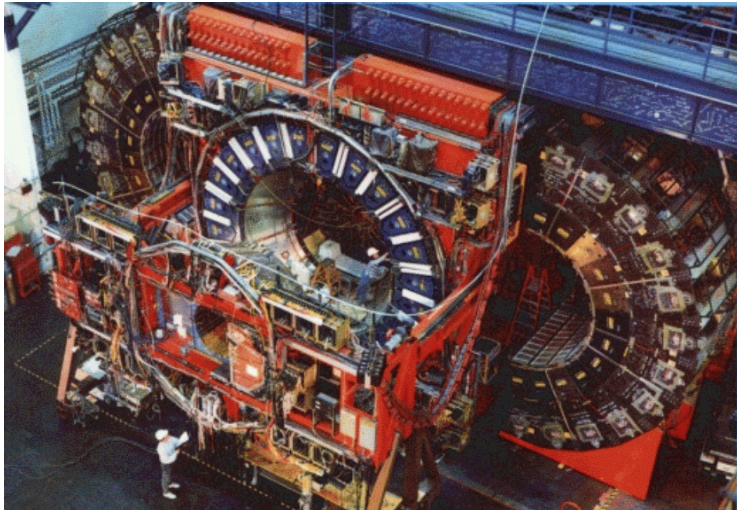
Experimental confirmation
of equal strength of weak and
electromagnetic forces at high
energy

Electroweak Unification

10/11/2002

Robert S. Orr
University of Toronto

Collider Detector @ Fermilab



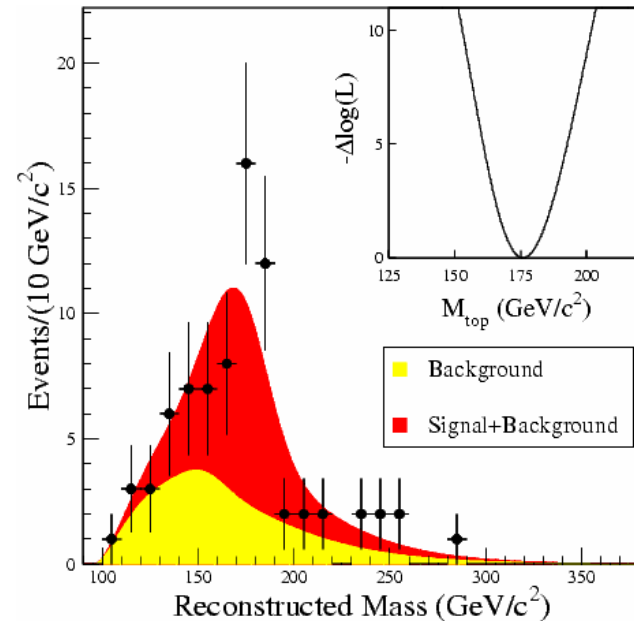
Upgrade:

UofT developed alignment system for silicon vertex Detector.

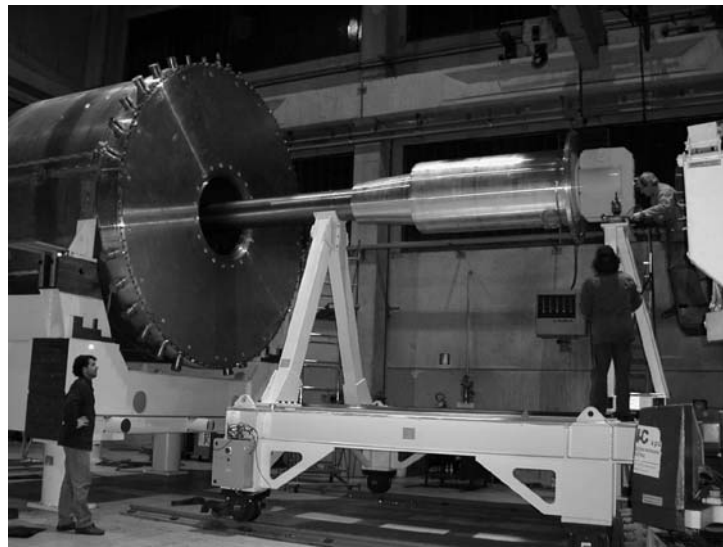
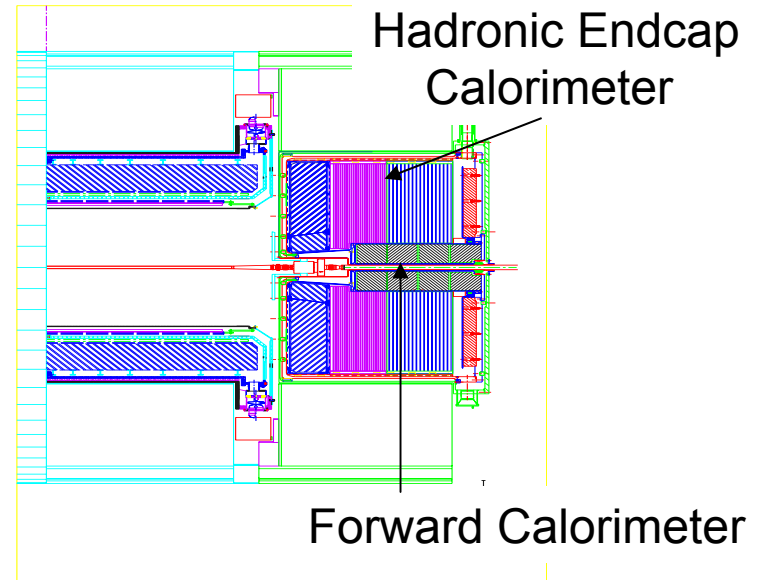
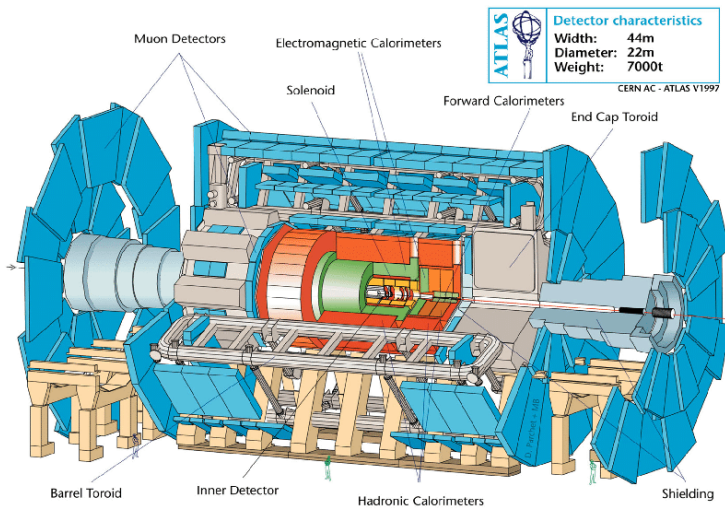
Highlight of Run I

Discovered the sixth quark

Top - completes quark generations



ATLAS Forward Calorimeter



10/11/2002

Robert S. Orr
University of Toronto

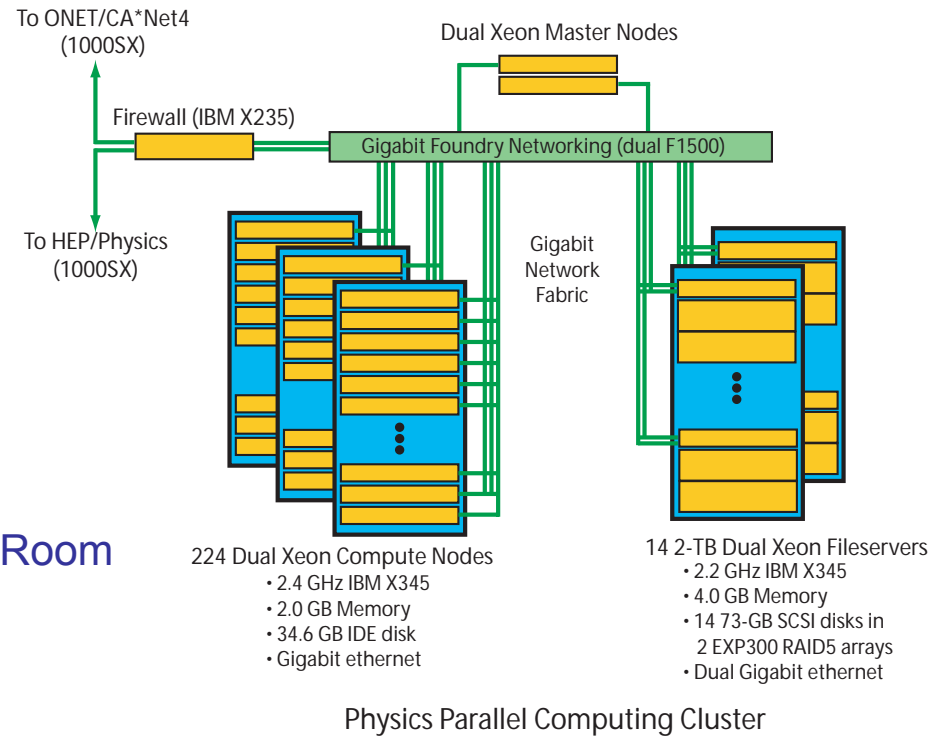
Facilities & Infrastructure

Personnel

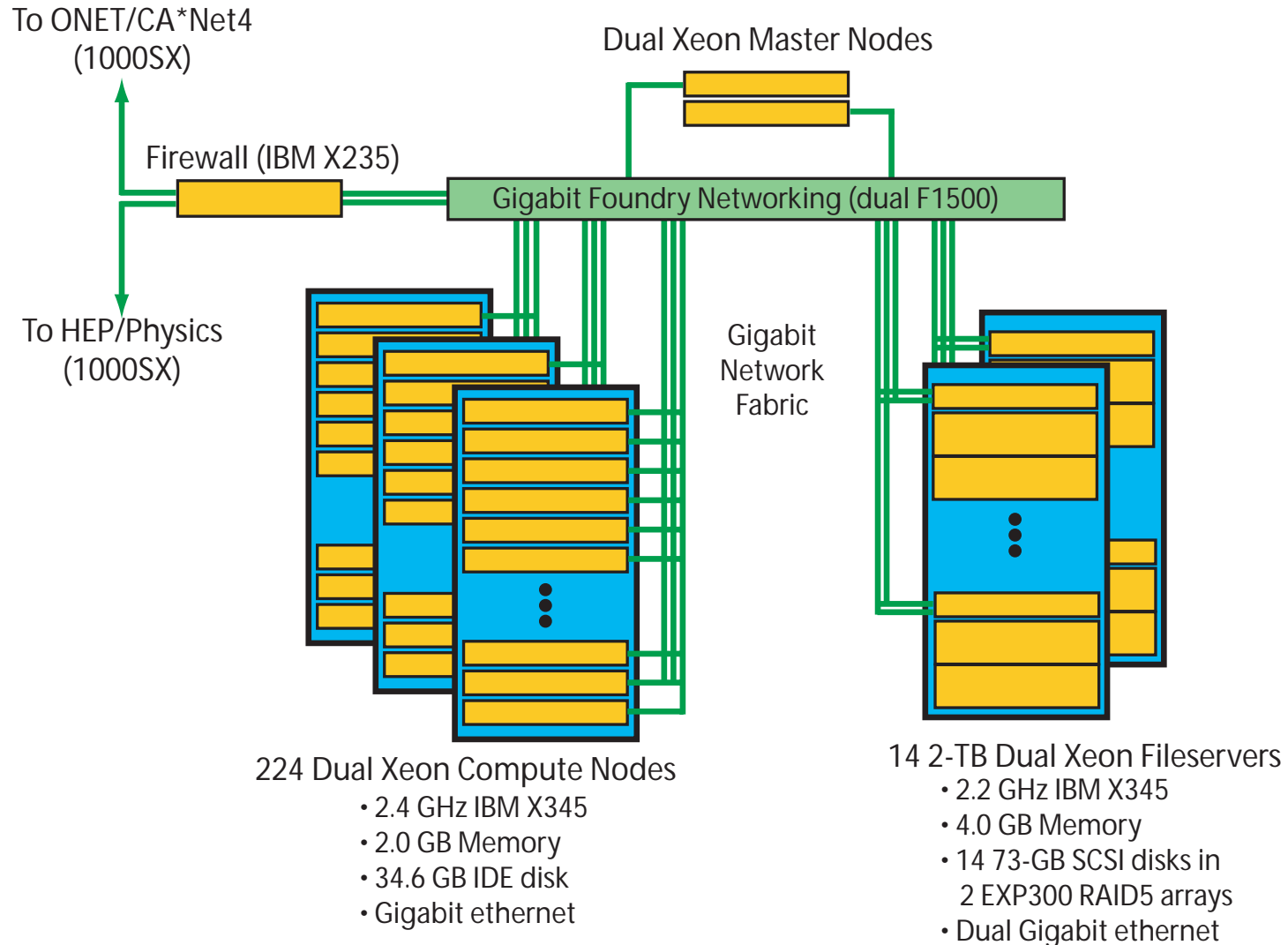
- M. Cadabeschi – Engineer (MFA)
- K. Vincent – Instrumentation Technologist (MFA)
- K. Coley – Designer (ATLAS MIG)



- FCAL Assembly space + Class 10,000 Clean Room
- Physics Mechanical Shop
- Physics Electronic Shop



LINUX Cluster



Physics Parallel Computing Cluster

10/11/2002

Robert S. Orr
University of Toronto

TRIUMF 5 Year Plan

- **Toronto Future**

- ATLAS Analysis
- Linear Collider, perhaps Neutrino Physics

- **Role of TRIUMF**

- **Maintain CERN Commitment**
 - ATLAS
 - LHC Construction
- **ATLAS Physics**
 - National Computing Facility
 - Physics Group
- **Future**
 - Maintain Machine Physics Expertise
 - Engineering & Construction Infrastructure