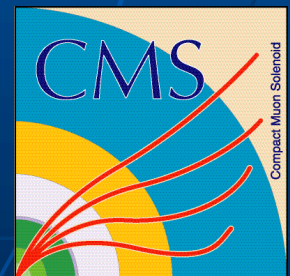
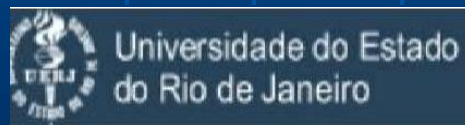




# An Inter-Regional **C**enter for **H**igh **E**nergy **P**hysics **R**esearch and **E**ducational **O**utreach (CHEPREO) at Florida International University

*Laird Kramer, Associate Professor of Physics  
Florida International University*





# CHEPREO

US



CMS

The Compact Muon Solenoid

## FIU will join the CMS experiment

- Add two positions in CMS physics
- Interest in Drell-Yan and Diffractive studies
- Contribute to **D**etector **C**ontrol **S**ystems

## Headquarter education and outreach efforts in the PLC

- Create Community of Scholars
- Partner with Local High Schools
- Modeling Introductory University Physics
- QuarkNet Center

## Leverage Networking

- AMPATH
- Join iVDGL
- Develop Global Grid Laboratory
- CMS Analysis, CAIGEE, etc.

## Partnerships

- Florida, Florida State, Caltech
- Brazil



# Systemic Physics Education Reform

- Integrate Physics Research and Education
- Science for All Students
- Secondary Through Graduate Students
- High School Teachers / University Faculty
- Education Research
- Centered in Diverse South Florida
- Become Science Center for South Florida

➡ Education Reform

➡ Dissemination of HEP Results

# South Florida: K-12

- 4<sup>th</sup> Largest: Miami-Dade

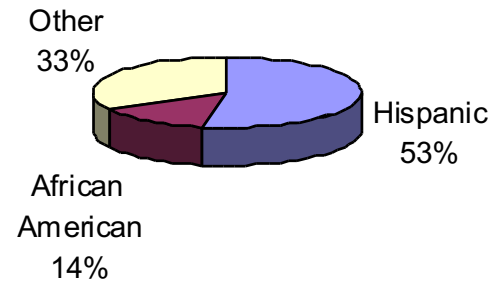
- 380,000 students
- 333 schools
- 3,000 teachers needed

- 5<sup>th</sup> Largest: Broward

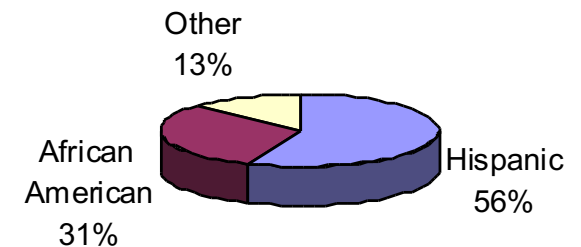
- 261k students (68k HS)
- 238 schools (25 HS)

- Large Diverse Urban Pool

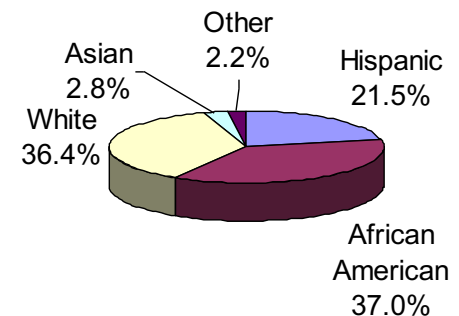
FIU Student Population



M-DCPS Student Population

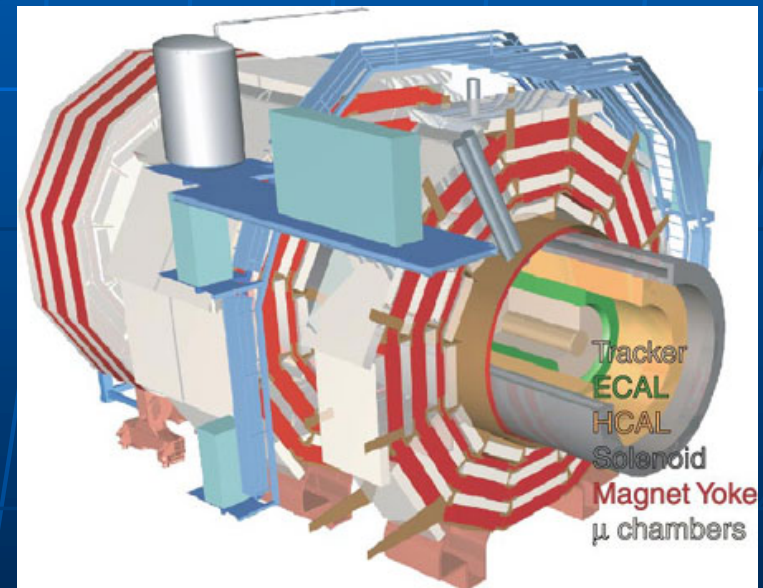


Broward Schools Population



# E/O Structure

- Implement Established Methods
  - QuarkNet
  - Physics Modeling Method
    - Teacher Workshops
    - Introductory University Physics
- Form Community
  - Students, Teachers, Faculty, Parents...
- Support System
  - Fellowships, Tutoring, Mentoring
- Based at Physics Learning Center
  - Classrooms, Workshops, Tutoring
- Education Research
  - Test-Bed Schools
- Seed Changes



**FIU Physics**  
 -Science  
 -Education Reform



**Teachers**  
 -Educators  
 -Researchers

**FIU College of Education**  
 -Education Researchers  
 -Modeling  
 -Contacts

**University**  
 -Curricula  
 -Resources



**Students**  
 -HS / Undergrad / Grad  
 -Future Scientists & Teachers



**Schools**  
 -Test-Bed Research

# Partnership

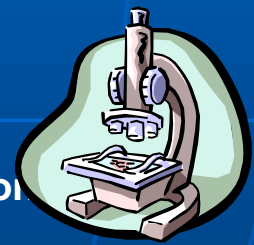


**Existing Programs**  
 -Modeling (Hestenes / COMAP)  
 -Education Research



**Partner Institutes**  
 -FSU / UF / CIT  
 -Brazil

**CMS**  
 -Physics Goal  
 -Context for Education  
 -i.e. kinematics



**Support System**  
 -Parents  
 -Guidance Counselors  
 -School Administration

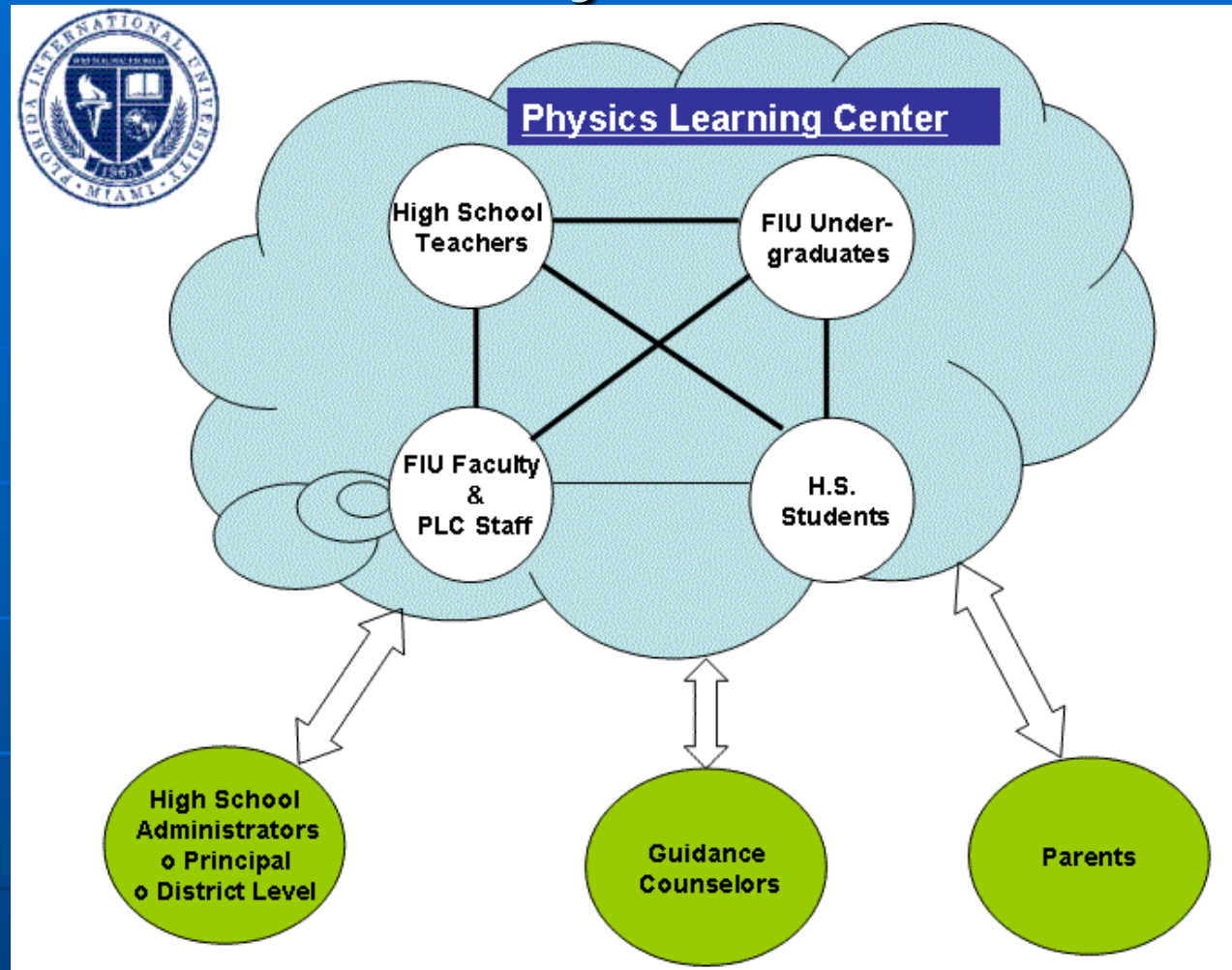


**QuarkNet**

**Professional Associations**  
 -AAPT, APS, FAST...



# Community of Scholars



➡ Form partnership for common goal



# Networking Activities

- FIU, UFL, FSU form State of Florida Research Grid
- Int'l starting point is FIU's AMPATH initiative
- Extend iVDGL to South America
- Serve as pathway for research and education networking
- UERJ collaboration - form LAGRID

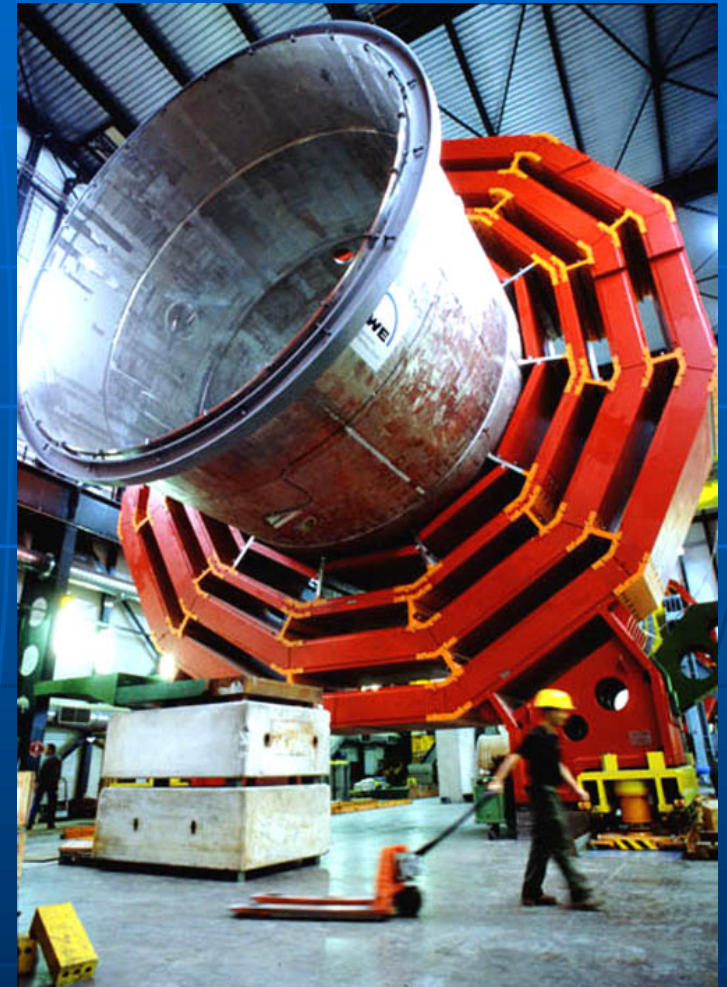






# Focus Groups

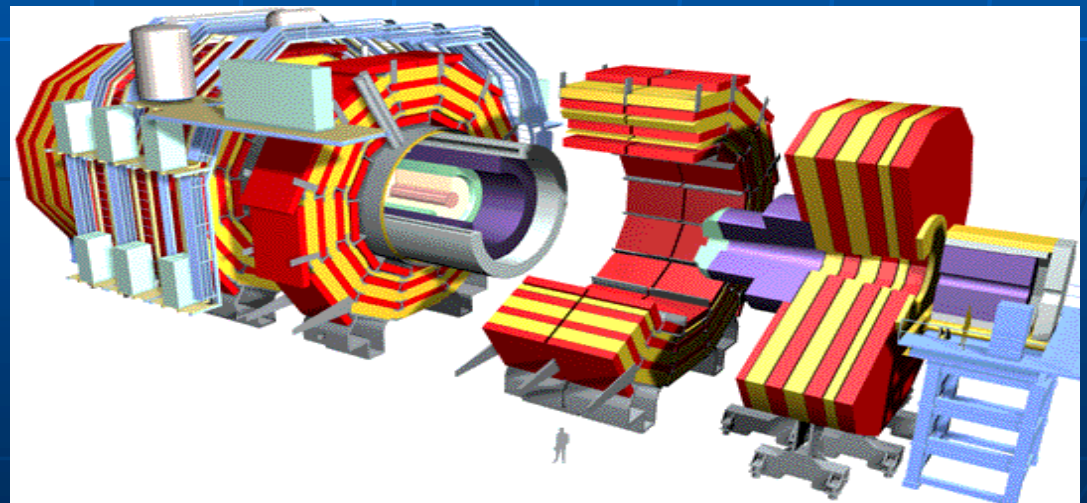
- High School Teachers
- Undergraduate Students
- High School Students
- Graduate Students
- Faculty
- Support System
  - Parents
  - Guidance Counselors
  - School Administrators



# Student/Teacher Opportunities

- CMS research experience for undergraduates and graduate students
- Pre-service experiences for FIU's education students
- QuarkNet research opportunities for teachers
- Networking internships, experience at Terremark's NAP of the America's
- International exchanges, workshops, summer schools
- Participation and support from area high schools
- Science Education Fellowships
- Test-bed schools
- Web-based resources

**Virtual Meetings**  
**Real-time Data Analysis**



# Project Components

**Summer Modeling Workshops**  
-Teachers  
-(Faculty & Students)  
-Content / Pedagogy

**Peer Tutoring**  
-Undergraduates  
-Supported by Fellows

**QuarkNet**  
-Just Awarded!!  
-Teachers / Faculty  
-Content / Pedagogy

**Science Fellowships**  
-Undergraduates  
-Teaching / Research

**Community**

**Science Clubs**  
-High School Students

**Modeling Introductory Physics**  
-All Undergraduates

**Outreach**

**Test-Bed Schools**  
-Teachers/Students/Faculty  
-Intensive Education Research

# Future

- Expand Through Physics
- Expand Through Sciences
- Expand Across Florida
- National Model

