



Educational Outreach

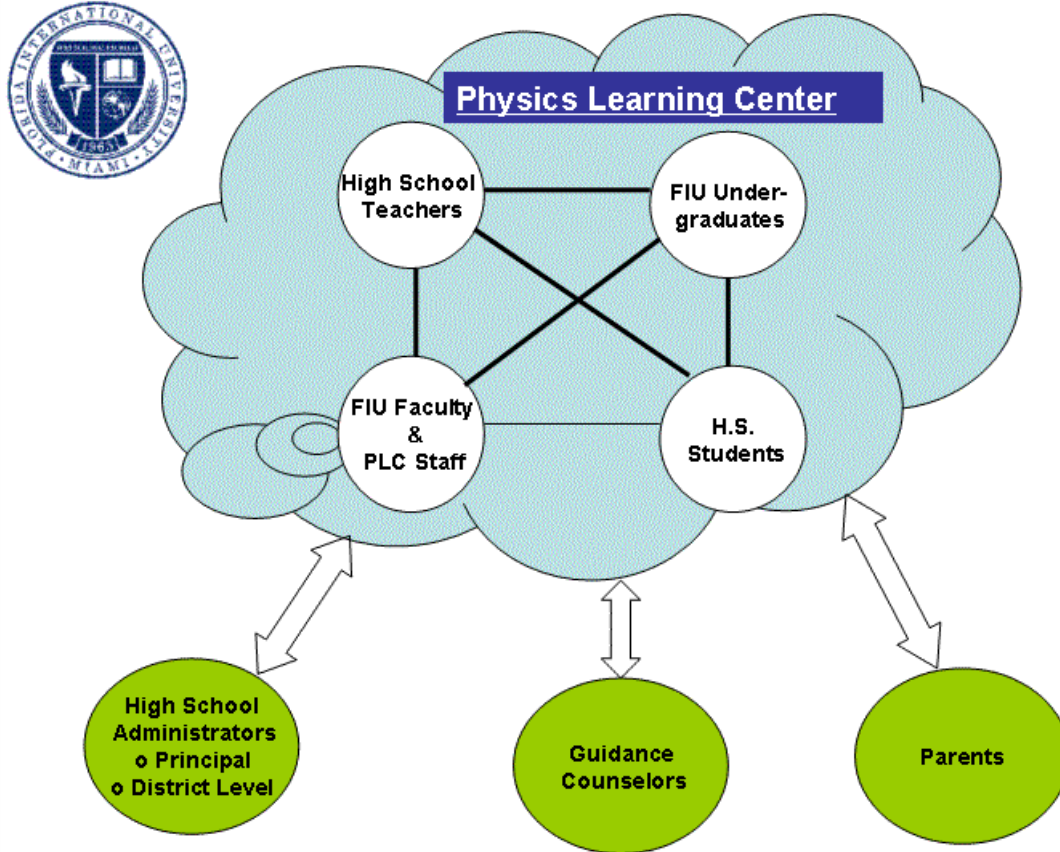
- **Heidi Alvarez, FIU CIARA/AMPATH**
- **Paul Avery, University of Florida Physics**
- *Mario Eraso, FIU, College of Education*
- **Vanessa Gaultney, FIU, Physics**
- **Vasken Hagopian, Florida State University**
- *Julio Ibarra, FIU CIARA/AMPATH*
- *David Jones, Miami Palmetto Senior High School*
- *Laird Kramer, FIU Physics*
- **Pete Markowitz, FIU Physics PI**
- **Harvey Newman, Caltech Physics**
- *Sergio Novaes, UNESP Physics*
- *George O'Brien, FIU College of Education*
- *Alberto Santoro, UERJ Physics*
- *Sanjay Ranka, UF Computer Science*

Today's Presenters:

- Laird Kramer
- George O'Brien
- David Jones
- Mario Eraso
- Vanessa Gaultney
- Sergio Novaes



Community of Scholars



➔ Form partnership for common goal





Highlights

- Modeling @ FIU
 - First UGrad Modeling Classes Complete
 - Treisman Study Groups established
 - 2nd Year of Hestenes Workshops (I & II)
 - 1st Year COMAP Workshops (I & II)
- 5 Partner Schools building into Test-Bed Schools
- QuarkNet Second Year Complete
- International partnership with Brazil
- PLC Space Laid Out / Design Underway
- *Community Building*





Summary

- Community Building
 - Workshops / Visits / Classes
- 2nd Year of Modeling Workshops (I & II)
- QuarkNet Associate Teacher Institute
- PLC Space Design
- Modeling Classes @ FIU
 - Pilot Spring 2004
 - Additional Section/Faculty Fall 2004





Summary II

- Fellows Matriculate Fall 2004
- International Connections Underway
- PER Scientist Search Ongoing
- Research / Assessment Underway
- External Evaluator Selection
- Grid Curriculum Development





Summary III / Related Activities

- M-DCPS Collaboration
- Curricular Enhancements @ FIU
- Collaborating Projects
 - FIU Based
 - Nationally Based



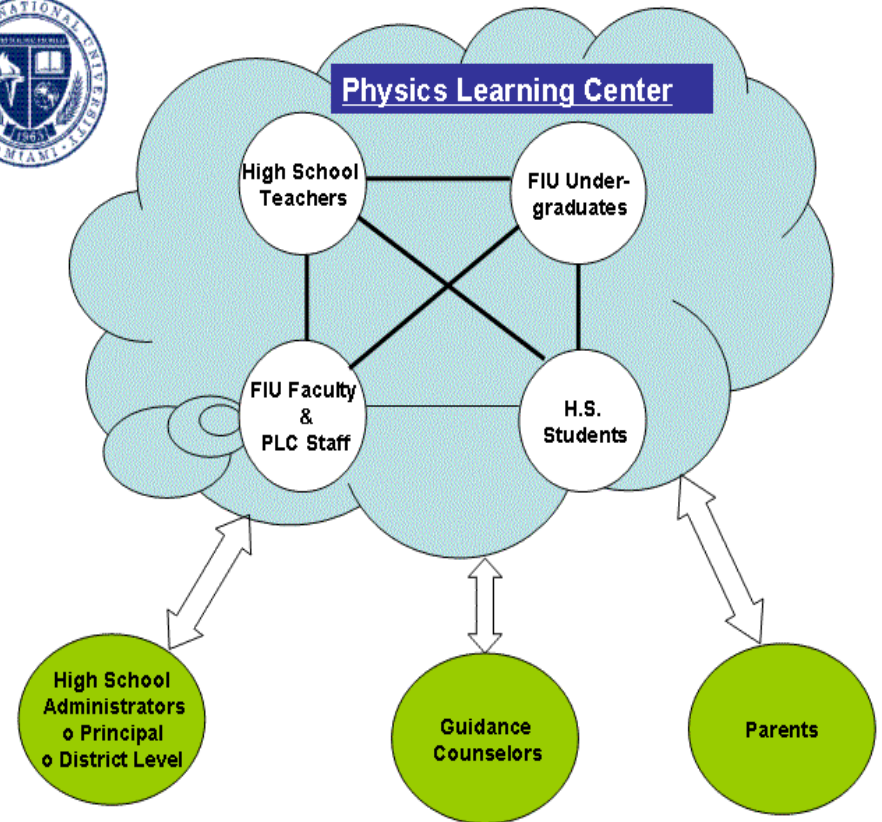


Presenter's Background

Building Community

EDUCATIONAL OUTREACH

- Vanessa Gaultney, FIU Undergraduate Student, Physics Program, Student in Physics Courses with Modeling, Research Projects, QuarkNet Participation
- Hestenes Summer Modeling Workshops, QuarkNet Programs, Physics Research Program



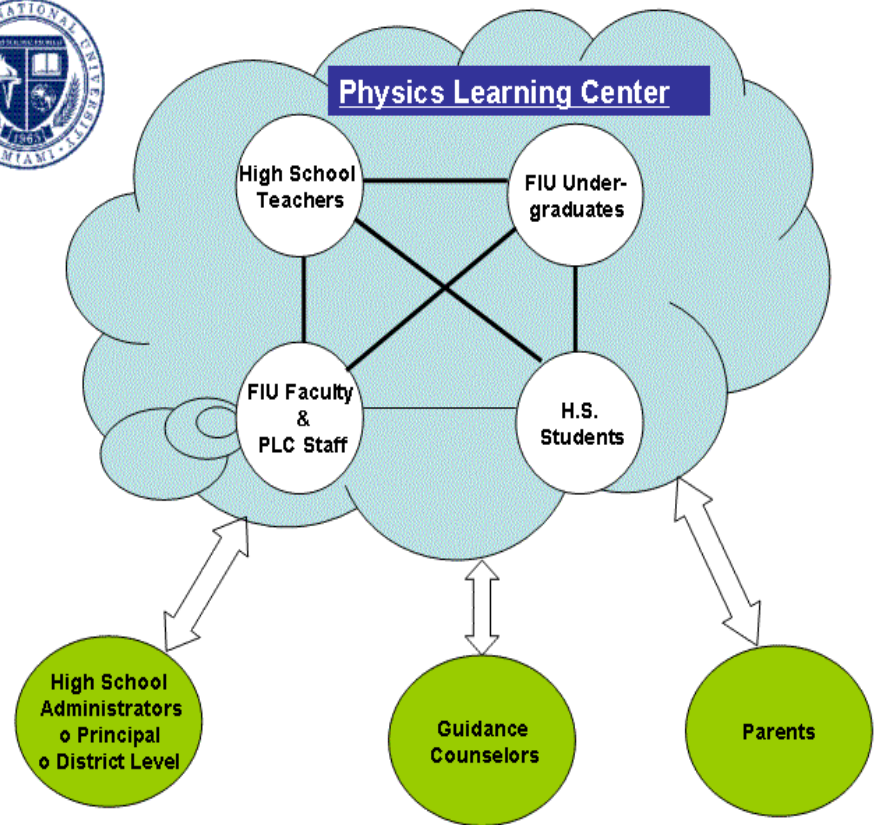


Presenter's Background

Building Community

EDUCATIONAL OUTREACH

- **Mario Eraso**, FIU Doctoral Student, M/S/T Teacher at FIU campus program, Coordinator Undergraduate Treisman Study Groups, Instructor Mathematics Courses
- Hestenes Summer Modeling Workshops, QuarkNet Programs, COMAP Summer Workshops, Treisman Study Groups, Research Development



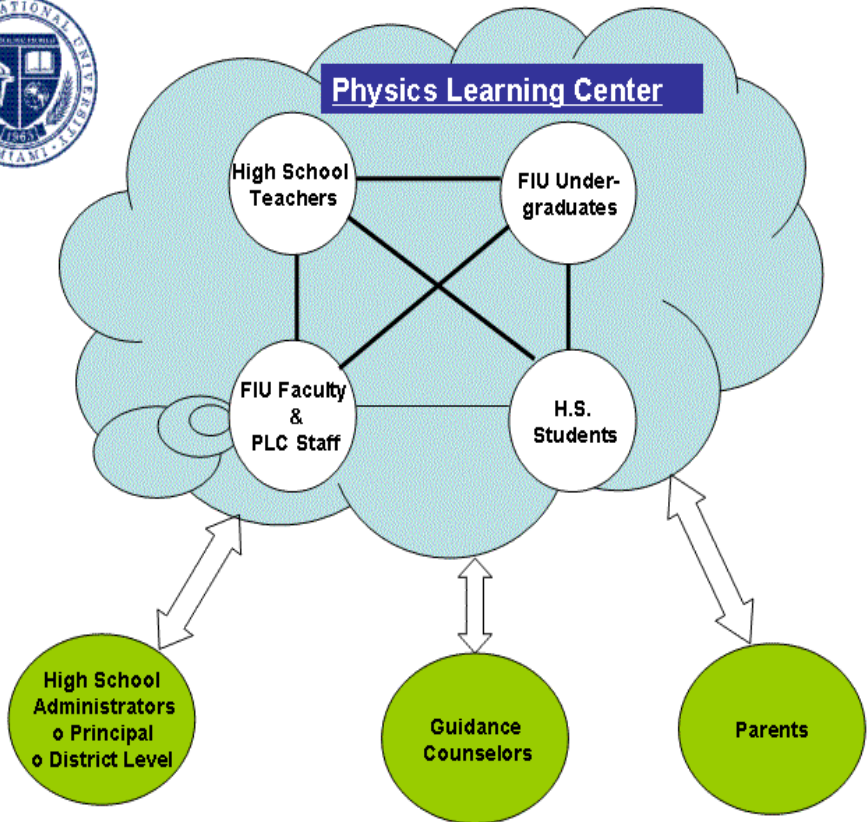


Presenter's Background

Building Community

EDUCATIONAL OUTREACH

- [David Jones](#), Physics Teacher, Palmetto Senior High School, Miami
- Hestenes Summer Modeling Workshops, QuarkNet Programs, Advisory Board, Partner School Development



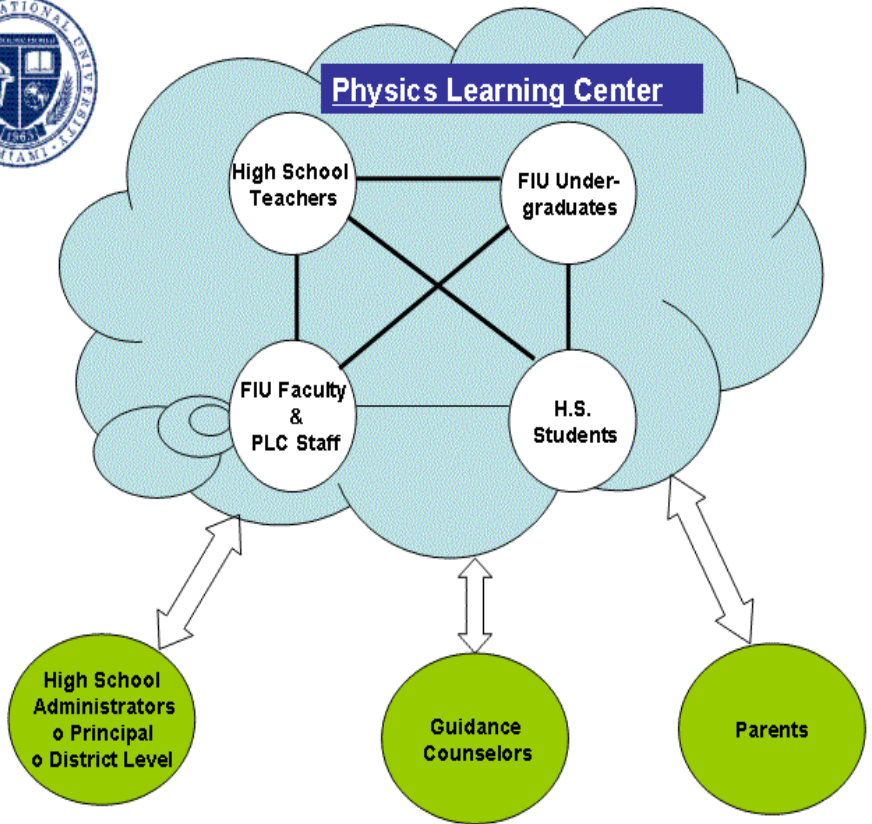


Presenter's Background

Building Community

EDUCATIONAL OUTREACH

- Sergio Novaes, Physics Department faculty, UNESP, Brazil
- International Developments



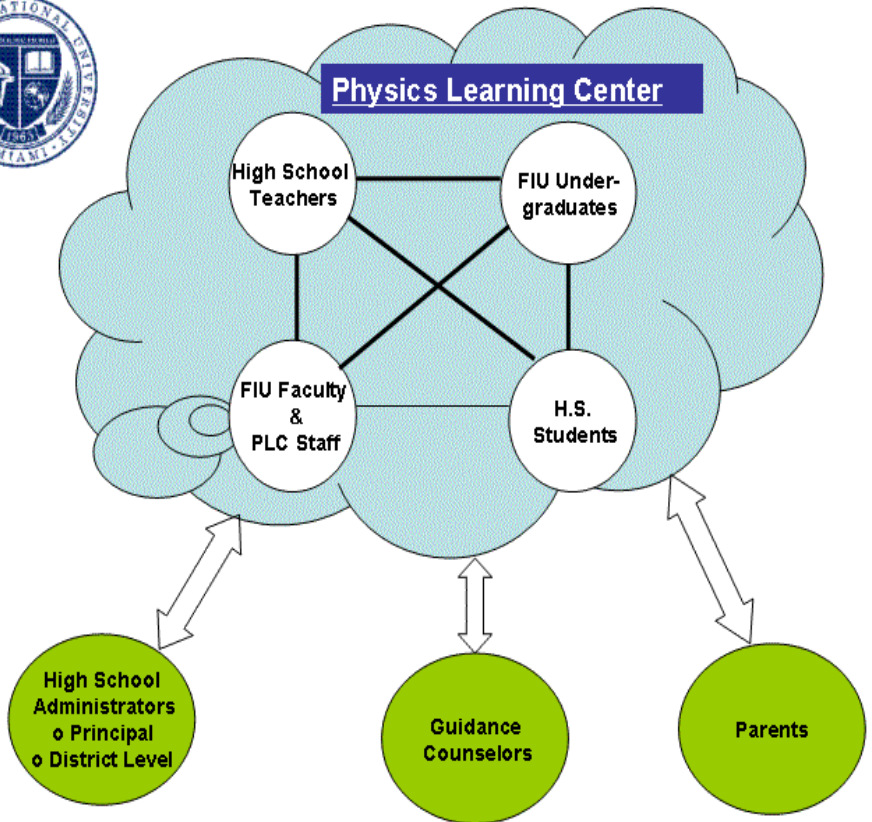


Presenter's Background

Building Community

EDUCATIONAL OUTREACH

- George O'Brien, College of Education faculty, FIU



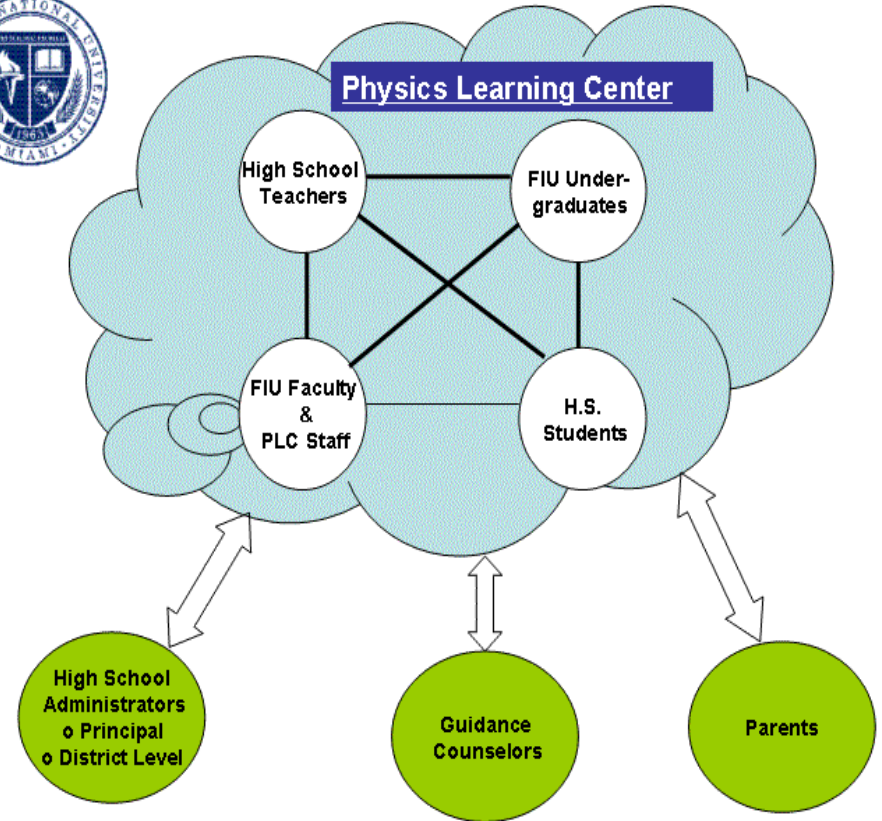


Presenter's Background

Building Community

EDUCATIONAL OUTREACH

- Laird Kramer, Physics Department faculty, FIU





Introductory Modeling @ FIU

- Fall 2003
 - Pilot Supplemental
- Spring 2004
 - Modeling-Based Physics II
 - 25 students
- Fall 2004 / Spring 2005
 - 2 Modeling Sections: Physics I and Physics II
 - Additional Faculty
 - PLC Support
 - Study Group Sessions
 - Student Led Study Groups and Course Assistants



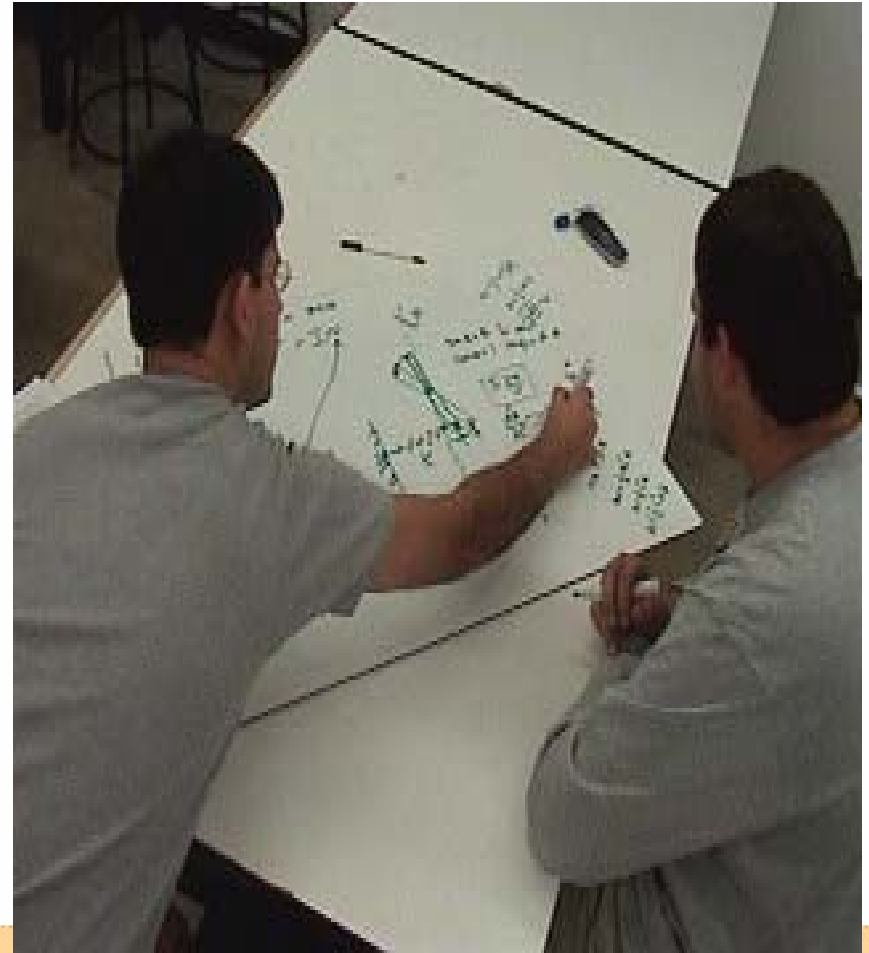


BUILDING A COMMUNITY 2003-2004 (UNDERGRADUATE PROGRAMS)

2003-2004

Undergraduate
Participants (on-going
data collection)

- **Treisman Study Groups**
- **Students improve academic performances in physics I, physics II, Calculus, and other math & science courses.**

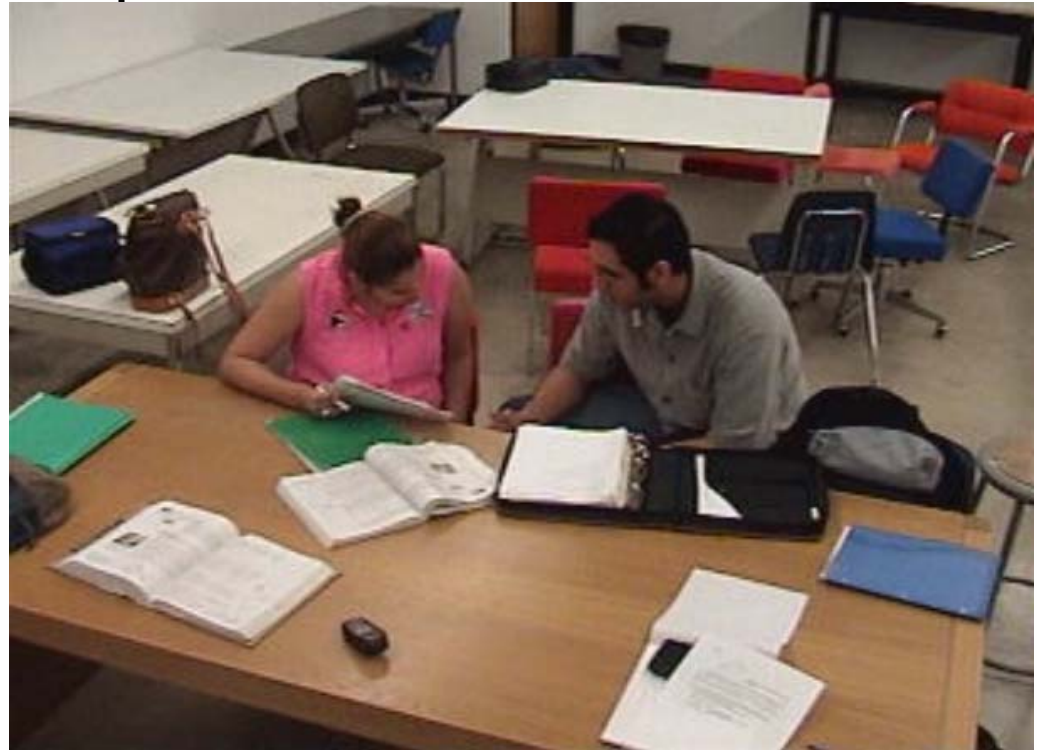




BUILDING A COMMUNITY 2003-2004

(UNDERGRADUATE PROGRAMS)

- Participants work in study groups 6 hours per week for each course enrolled during semester.
- Participants work in groups of 3-5 individuals & receive individual help/guidance as needed.





BUILDING A COMMUNITY 2003-2004 (UNDERGRADUATE PROGRAMS)

- Graduate students who participated in the Summer 2003 Hestenes Modeling Workshops lead Treisman sessions.
- Participants with experiences in modeling and Treisman study group experiences help assist graduate students.





Study Groups

- Fall 2003 / Spring 2004 / AY 2004/5
 - CoE Group Supported / Organized
 - Treisman Study Groups
 - Physics
 - Chemistry
 - Math
 - Undergraduates Modeling Courses
 - Add Modern Physics Support





Undergraduate Physics Fellowships

- 5 Begin Fall 2004
 - 5 Additional From FIU Match
- 5 Additional Each Year
- Provide Tuition & Laptop
- Must Major in Focus Areas
- Students Support Study Groups/Research
- Selection Through Test-Bed Schools





Teacher Professional Development

- Community Building
- National and State Standards
- Research/Assessment
- Partnership Coordination
(Systemic Approaches)





Modeling Workshops

- Expand and Extend Scope
- Two workshops July 12-30, Both I and II
 - 2 New / 2 Previous Leaders
 - Mechanics / Models of Light
- Participants:
 - I: 24 New teachers, Students, FIU Physics Faculty
 - II: 18 Teachers / Students / Faculty from 2003
- 2 New Physics Faculty: Expand Undergraduate Modeling Offerings (2 Sections Fall/Spring)
- CoE and Physics Students:
 - Study Group Leaders and Lab Assistance





Year 2 QuarkNet

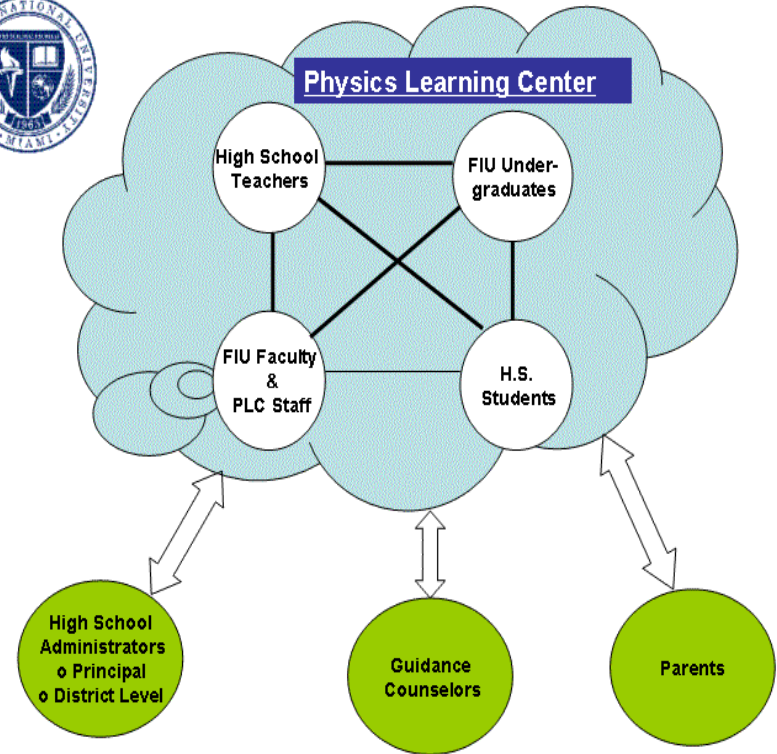
- Associate Teachers Institute June 21-July 2
 - 11 New Associate Teachers, 2 Lead Teachers
 - 6 from Modeling 2003 / 10 in Modeling 2004
 - Activities / Lectures / NAP Tour
 - Next Meeting Saturday , September 18
 - Build & Take
 - Cosmic Ray Grid
- Year 3: 1 Week Institute 2005





BUILDING A COMMUNITY 2003-2004

- 5 Partner Schools (Test Bed Schools)
- 12 Other MDCPS Participating Schools
- 14 Additional Local Participating Schools
- 9 Schools From Outside Miami Region
- 58 Teachers Participated in Summer Workshops
- 25 School Visitations by Faculty
- 18 Undergrads From Partner Schools Supported AY 2003-04





Test-Bed Status

- 5 Schools
- 18 teachers attended workshops 2003
 - 4 Physics
 - 10 Math
 - 4 Chemistry / Physical Science / Biology
- Continuing Interactions with Teachers
 - CoE Modeling Curriculum Course
 - School / FIU Visits
- Continuing with School Administrators, Counselors, Teachers
- Evolving into More Horizontal Than Vertical Integration





MDCPS PARTNER SCHOOLS

(ESTABLISHING TEST BED SCHOOLS)



Barbara Goleman Senior High School
American Senior High School
Felix Varela Senior High School



M-DCPS PARTNER SCHOOLS

(ESTABLISHING TEST BED SCHOOLS)

- Miami Southridge Senior High School

Coral Park Senior High School

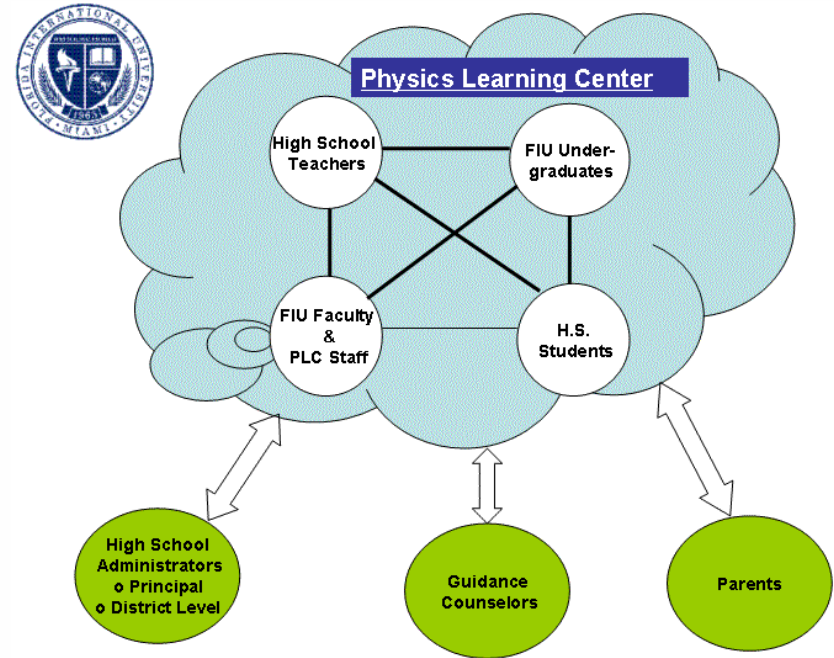




BUILDING A COMMUNITY 2003-2004

Partner Schools (Test-bed Schools)

- 18 Teachers in Summer 2003 Hestenes Workshops
 - 11 of these teachers are enrolled in 1 or more 2004 Summer workshops
 - Additionally, 7 New Teachers Participating in 2004 Summer Workshops

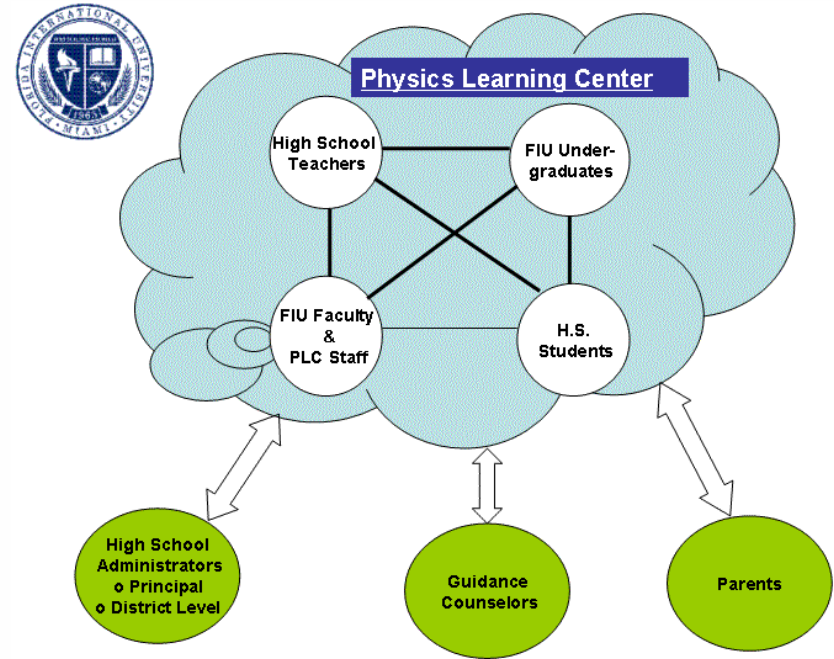




BUILDING A COMMUNITY 2003-2004

2003 Summer Hestenes Participants (on-going data collection)

- 2004 returning participants self-reporting status
 - To what extent were you able to integrate new ideas/strategies in your 2003-2004 classroom?
 - physics teachers (7) 1: 20% / 1: 40% / 2: 60% / 3: 80%
 - math teachers (5) 1: 20% / 4: 40%
 - other teachers (1) 1: 20%





Community Building

- Consortium for Mathematics and its Applications (COMAP)
 - National Facilitators
 - MDCPS Partner Schools





Community Building

COMAP I

-2004 Summer Workshops

- 5 teachers (5 participated in Summer 2003 Hestenes I Workshop)
- 4 partner schools
- 3 other schools
- 5 undergrads (4 participated in physics modeling courses & Treisman groups)





Community Building

COMAP II

-2004 Summer Workshops

- 10 teachers (of 15 participated in Summer 2004 COMAP I Workshop)
- Working at 2 schools
- 30 high school students
- Practicing new modeling lessons/teaching skills





Community Building

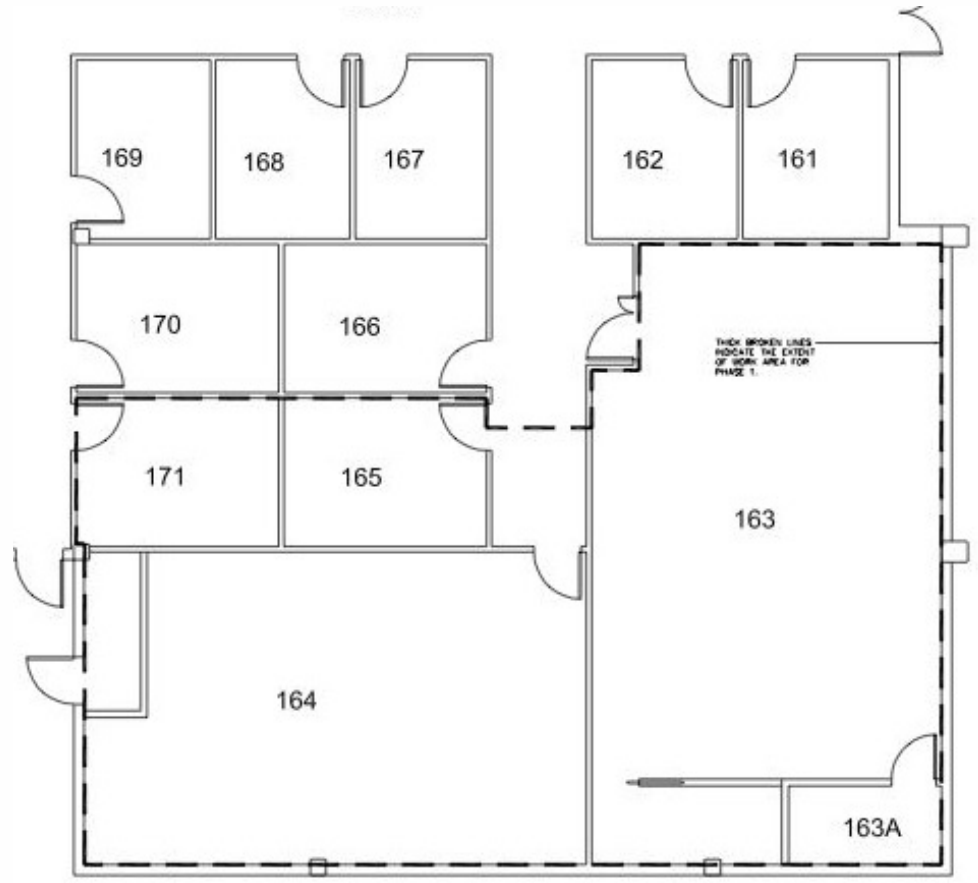
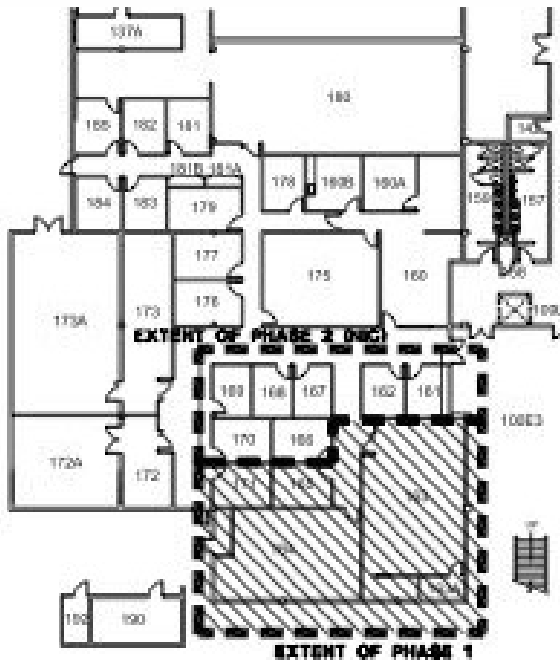
COMAP
-Follow-up





New Facilities-Physics Learning Center

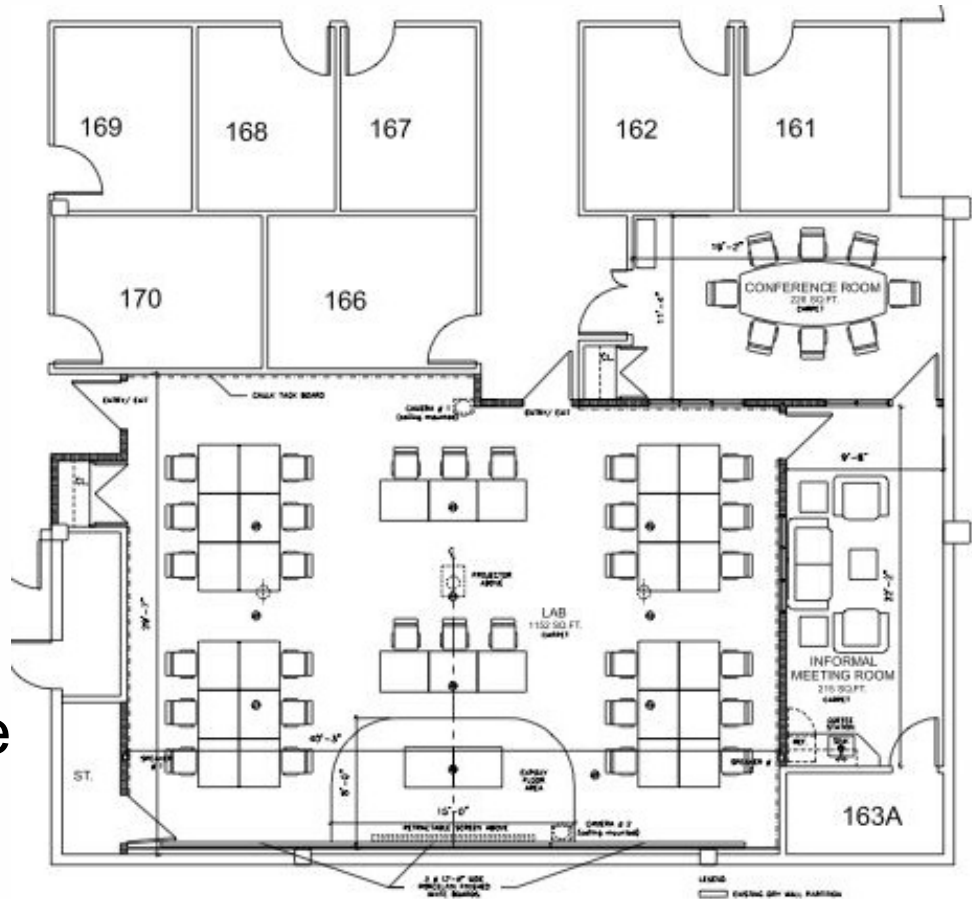
- VH Building





PLC Lab Mode

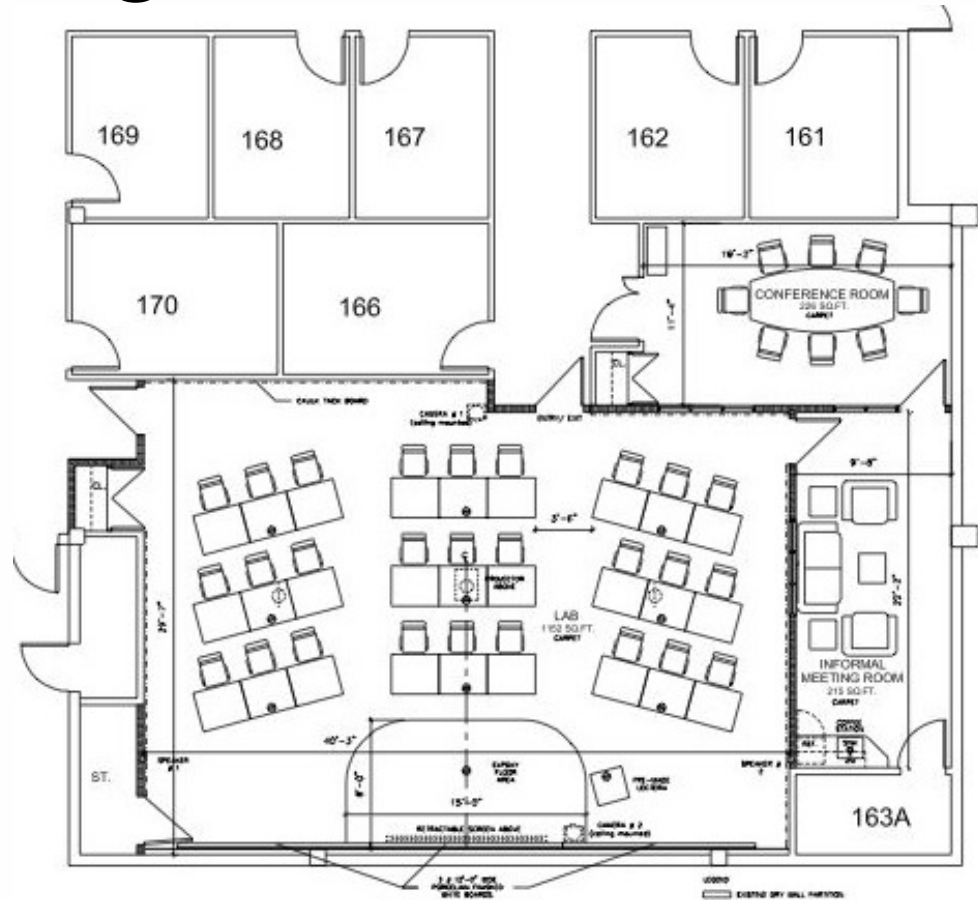
- Cyber Classroom
 - Conference Room
 - Informal Room
 - Research Lab
- Phase 2:
 - Lab / Studying Space





Meeting Mode

- Flexible Space
- Workshop
- Video Conference





Physics Education Researcher

- Hiring Planned for September/October
 - Final Push for Applicants through AAPT Meeting
- Parallel Effort to Attract Upper Level Candidates
 - Query Physics Faculty Support of Tenured Position
 - Strong Dean Support
 - Spring Hiring Optimistic





Evaluation of Educational and Outreach Activities (Ongoing data collection)

- Evaluation activities will be coordinated at the Physics Learning Center (PLC)
- Evaluation targets include:
 - Undergraduate students at FIU with special interest in SMET programs (particularly students enrolled in introductory level physics, including Fellows and prospective science and math teachers)
 - Teachers in test-bed schools and from other participating schools
 - High school students from test-bed schools



Evaluation of the PLC (On-going data collection)

Evaluation Questions include:

- How did the project impact the academic achievement of undergraduate students including physics and intended physics majors, prospective mathematics and science teachers, and undergraduate Fellows?
- How did the project increase minority participation in CA&S math and science and COE teacher education programs?
- How did the project establish a system to promote equity and select participants with great potential to be successful and graduate from the program?
- How did the project create opportunities for underrepresented, disadvantaged students?





Evaluation of the PLC (ongoing data collection)

Evaluation Questions (cont):

- How did the project measure students' progress *every semester* to stay on target and make necessary remedies when the expected results are not achieved?
- To what extent can the model be replicated in other urban settings?
- How did the project impact the partnership between the collaborators and to what extent can the model be sustained at the completion of the grant period?





Evaluation of the PLC

Evaluation Questions (cont):

- How did the project impact teacher instructional practices in high school physics?
- To what extent did the project impact student achievement in test-bed schools?
- How did the project impact the partnership between the collaborators and to what extent can the model be sustained at the completion of the grant period?





Needs Assessment Workshop: Grid Techniques in Classroom

- Seek input from teachers on appropriate ways to bring grid technology into the classroom
- 1 Day Workshop at FIU (Jan 29, 2004)
 - Followed January AAPT Meeting
- Supported by NSF / iVDGL
- QuarkNet, FNAL, iVDGL, CHEPREO Collaboration
- Mix of Physics and Technology Teachers and Developers





Grid Developer's Workshop

- Begin to Define Common Environment to Bring Grid Technologies into Classroom
- Written Report
- Workshop @ FIU (Jan 30, 2004)
 - Followed Needs Assessment Workshop
- ~ 10 developers
- FNAL, QuarkNet, CHEPREO, iVDGL





Future Focus Areas

- Integrate HEP into Curriculum
- Extensive Research Base
- Extend Scope
 - Across FIU Sciences
 - International Collaboration





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Building Community – Steady Development





Building Community – Partnership in Action





Students Engaged in Active Learning





Hands-on Mentorship





E/O Funding Schedule

	Y1	Y2	Y3	Y4	Y5
Modeling Workshop		X	X	X	X
QuarkNet Research			X	X	X
CMS Fellowships	0	5	5	5	5
Graduate Students	0	1	1(1)	1	1
Physics Educator		X	X	X	X





Year 1 Milestones

Educational Outreach	Responsible	Cost
Y1.1 - Organize PLC Board of Directors, Task Force Focus Groups; Faculty summer salary and release time	P. Markowitz	\$16,292
Y1.2 - PLC Inauguration; Establishment Facilities, Purchase Materials, Establish Peer Tutoring, Pilot Modeling Workshop	L. Kramer	\$46,264
Y1.3 - Recruit One Graduate Student / Recruit First Group of Fellows	E. McClintock	\$0
Y1.4 - Pre-assessment Activities Completed	E. McClintock	\$0
Y1.5 - Test-Bed School Negotiation / Selection	E. McClintock	\$0
Y1.6 - Recruit 2-3 Lead Teachers for QuarkNet	L. Kramer	\$0
Y1.7 - Hire PLC Coordinator / Science Educator	L. Kramer	\$0
Y1.8 - Year 1 PLC E & O Activity Assessment	L. Kramer	\$0
Total Y1		\$62,557





Year 2 Milestones

Y2.1 - Faculty summer salary and release time		\$259,594
Y2.2 - PLC Operational	L. Kramer	\$184,825
Y2.3 - First Fellows Matriculate / Recruit Add'l Fellows, 1 Grad Student	E. McClintock	\$118,421
Y2.4 - Pilot Introductory Modeling University Class at FIU in PLC	L. Kramer	\$52,048
Y2.5 - One Test-Bed High School Operational	E. McClintock	\$0
Y2.6 - Increase Participants in QuarkNet (2nd Year)	L. Kramer	\$0
Y2.7 - Standard Modeling Workshops Begin	L. Kramer	\$88,000
Y2.8 - Introduce Participants from Brazil to QuarkNet and Modeling Workshops	H. Alvarez	\$15,455
Y2.9 - Year 2 Assessment and Reporting, Outside Evaluator Report	L. Kramer	\$28,100
Y2.10 Develop Grid Computing Curriculum for mainstreaming in CS Courses	P. Avery	\$49,232
Total Y2		\$795,675





Year 3 Milestones

Y3.1 - Revise PLC Board, Re-Organize Task Force Focus Group; Faculty summer salary and release time	P. Markowitz	\$91,232
Y3.2 - PLC Continuation and Scale-up in New Facility – Higher Occupancy, Additional Courses	P. Markowitz	\$142,032
Y3.3 - Second Fellows Matriculate / Grads Students Continue / Recruit Additional Fellows	E. McClintock	\$37,942
Y3.4 - Introductory Modeling Classes Continue / Expand	L. Kramer	\$0
Y3.5 - Continue Test-Bed School Development & Expansion of Feeder Pattern School Network (Add development of 4th Test-bed site)	E. McClintock	\$0
Y3.6 - Continue Development of Year 3 QuarkNet Program	L. Kramer	\$22,480
Y3.7 - Standard Modeling Workshops Continue	L. Kramer	\$88,000
Y3.8 - Expand MA Degree course opportunities in Physics and Mathematics for Teachers	L. Kramer	\$0
Y3.9 - Year 3 Assessment and Reporting, Outside Evaluator Report	L. Kramer	\$28,100
Y3.10 Mainstream grid computing in course 1. Invite selected FIU students for conducting summer research at UF. Initiate student research on Storage-to-Storage High Bandwidth Transfer	P. Avery	\$67,738
Total Y3		\$477,525





Year 4 Milestones

Y4.1 - Faculty summer salary and release time		\$167,914
Y4.2 - PLC Operations Continue / Expand	P. Markowitz	\$138,249
Y4.3 - 3rd Class of Fellows Matriculate (others advance), Grad Students	Z. Jiang	\$91,093
Y4.4 - Introductory Modeling Classes Continue, Add'l Sections, Equip 2nd Classroom	P. Markowitz	\$27,701
Y4.5 - Continue Test-Bed School Development & Expansion of Feeder Pattern School Network (including recruitment of more HS graduates to FIU Physics program)	G. O'Brien	\$0
Y4.6 - Continue Development of Year 4 QuarkNet Program	L. Kramer	\$22,480
Y4.7 - Standard Modeling Workshops Continue	L. Kramer	\$88,000
Y4.8 - Increased PLC Use By Teachers & Pre-Collegiate Students along with Undergraduates	G. O'Brien	\$0
Y4.9 - Year 4 Assessment and Reporting, Outside Evaluator Report	L. Kramer	\$28,100
Y4.10 Mainstream grid computing in course 2. Refine material for transfer to FIU. Invite selected FIU students for conducting summer research at UF. Begin transferring grid computing material to FIU curriculum. Develop software for Storage-to-Storage High	P. Avery	\$69,431
Total Y4		\$632,968





Year 5 Milestones

Y5.1 - Faculty summer salary and release time		\$24,669
Y5.2 - PLC Operations Continue / Expand	P. Markowitz	\$145,162
Y5.3 - 4th Class of Fellows Matriculates (others advance)	Z. Jiang	\$48,784
Y5.4 - Introductory Modeling Classes Continue, Add'l Sections & Courses	P. Markowitz	\$19,971
Y5.5 - Continue Test-Bed School Development & Expansion of Feeder Pattern School Network (including recruitment of more HS graduates to FIU Physics program)	G. O'Brien	\$0
Y5.6 - Continue Development of Year 5 QuarkNet Program	L. Kramer	\$25,290
Y5.7 - Standard Modeling Workshops Continue	L. Kramer	\$88,000
Y5.8 - Increased PLC Use By Teachers & Pre-Collegiate Students along with Undergraduates	G. O'Brien	\$0
Y5.9 - Exchange of Students, Teachers, & faculty USA & Brazil	H. Alvarez	\$2,828
Y5.10 - Begin expansion of Test-bed (feeder pattern) model to other regional schools	G. O'Brien	\$0
Y5.11 - Develop next 5 year plan for PLC & E & O Activities	P. Markowitz	\$0
Y5.12 - Year 5 Assessment and Reporting, Outside Evaluator Report, 5-Year Summary Report	L. Kramer	\$28,100
Y5.13 Publish grid computing material for wider dissemination including demo applications. Complete transferring grid computing material to FIU curriculum. Apply software for Storage-to-Storage Transfer to HEP analysis	P. Avery	\$71,167
Total Y5		\$453,971



ESIE Budget Y1-3

ESIE Budget by Activities	
Year 1:	
1. Pilot Modeling workshop	\$40,000
2. Evaluation Plan Development	\$20,000
3. Administrative Costs	\$12,500
4.A science educator skilled in IT, handling large data sets, and sensitive to the needs of students and teachers from groups currently under represented in STM	\$89,250
Sub Total Direct Costs	\$161,750
Sub Total Indirect Costs	\$49,309
Total Year 1	\$211,059
Year 2:	
1.Pilot Modeling Workshop	\$16,000
2.Evaluation	\$20,000
3.Standard Modeling Workshop	\$88,000
4.QuarkNet Program	\$16,000
5.Science educator	\$93,713
Sub Total Direct Costs	\$233,713
Sub Total Indirect Costs	\$59,014
Total Year 2	\$292,726
Year 3:	
1.Introductory Modeling Workshop Support	\$16,000
2.Evaluation	\$20,000
3.Standard Modeling Workshop	\$88,000
4.QuarkNet Program	\$16,000
5.Science educator	\$98,398
Sub Total Direct Costs	\$238,398
Sub Total Indirect Costs	\$60,911
Total Year 3	\$299,309





ESIE Budget Y4-5

Year 4:	
1.Introductory Modeling Workshop Support	\$12,000
2. Evaluation	\$20,000
3.Standard Modeling Workshop	\$88,000
4.QuarkNet Program	\$18,000
5.Science educator	\$103,318
Sub Total Direct Costs	\$241,318
Sub Total Indirect Costs	\$62,094
Total Year 4	\$303,412
Year 5:	
1.Introductory Modeling Workshop Support	\$8,000
2.Evaluation Plan Development	\$20,000
3.Standard Modeling Workshop	\$88,000
4.QuarkNet Program	\$20,000
5.Science educator	\$108,484
Direct Cost Sub Total	\$244,484
Indirect Cost Sub Total	\$63,376
Total Year 5	\$307,860
Years 1-5 Direct Cost	\$1,119,663
Years 1-5 Indirect Cost	\$294,703
Years 1-5 TOTAL COST	\$1,414,366



South Florida

- 4th Largest: Miami-Dade
 - 380,000 students
 - 333 schools
 - 3,000 teachers needed
- 5th Largest: Broward
 - 261k students (68k HS)
 - 238 schools (25 HS)
- Large Diverse Urban Pool

