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TITLE OF PROPOSED PROJECT   **ITR - A Center for Internet Augmented Research & Assessment \(CIARA\) at FIU and UPR**

REQUESTED AMOUNT	PROPOSED DURATION (1-60 MONTHS)	REQUESTED STARTING DATE	SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE
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Project Summary

Center for Internet Augmented Research and Assessment (CIARA)

IT innovations are not being fully leveraged by minority serving institutions to enhance science and engineering research and education. There exists significant knowledge about network and computational IT innovations at Florida International University and the University of Puerto Rico, the two largest minority-serving institutions in the U.S. There is however a schism between this community and the majority of academic disciplines. Faculty members have established a *modus operandi* that is tailored to foster domain excellence. IT professionals are actively engaged in advancing applications of IT research. These applications are not effectively expanding the horizons for researchers and educators. The IT professionals lack a rich understanding of the domains they are targeted to serve. Faculty members are thus unable to see the full scope of opportunities enabled by IT.

We propose CIARA, a Center for Internet Augmented Research and Assessment, to be a new bridge between the existing disciplines and the IT community. CIARA will not be a locus for fundamental information technology research; it will create a new generation of scientists and engineers who are capable of fully integrating IT into the whole educational, professional, and creative process of diverse disciplines.

The goals are to increase the rate of discovery for faculty by augmenting their research with IT, to foster inter-disciplinary research, to improve the effectiveness of minority graduate education, and to institutionalize this change process.

The hypothesis is that evolving graduate student education to include a foundation of understanding in *research and education IT* will bridge the divide between the IT community and the disciplines. This will result in an improved system for the effectiveness, penetration, and interaction of IT with an underrepresented sector of our society.

Preliminary results indicate that the hypothesis has great potential for broad impact. At the core of the proposal is an opportunity for bringing together graduate students of diverse disciplines, and disparate academic communities. The larger the number of graduate fellows collaboratively building their understanding in research and education IT, the greater the opportunities are for cross discipline communication. By establishing two distributed and partnering CIARAs we propose to construct a matrix of these collaborations, with the expectation of exponentially increasing the benefits.

We are poised to succeed because of the expertise of the investigators, the commitment of the institutions, the clarity of the plan of work, and the positive preliminary results. The research scientists involved at UPR and FIU have substantial experience managing projects of this scale, and track records of success in both the IT community and as technical advisors to graduate students. The faculty investigators have demonstrated leadership in their respective fields, and will ensure the academic integrity of the computer science and pedagogy employed at the centers. Both Universities view CIARA as a key part of institutional improvement, and are committed to long-term success pledging institutional commitment and **10% matching funds.** Genuine enthusiasm is spread across the faculty, students, and administrators, involved in proposing CIARA.

The assessment process will be the key to CIARA. Each graduate student will collaborate to author a scholastically grounded case study. This project will be designed collaboratively by the graduate student's advisor, the student and the IT research scientists associated with CIARA. This understanding will be facilitated through both an academic certification program, and a project that fuses IT innovation with domain specific research.

C. Project Description

C.1 Overview

A significant challenge exists in widening the scope of impact for information technology research. We propose CIARA, a Center for Internet Augmented Research and Assessment, to be a new bridge between the existing disciplines and the IT community. CIARA will not be a locus for fundamental information technology research; it will create a new generation of scientists and engineers who are capable of fully integrating IT into the whole educational, professional, and creative process of diverse disciplines. CIARA will target minority students and faculty members, who otherwise would not be part of the excitement of information technology research.

The normative state is that research scientists (institutional information technology professionals with academic backgrounds) understand broadly applicable IT research. The research scientists are active in communities that transfer computer science from the labs to the networks. They work hard to ensure that institutional infrastructure is in place to maintain low barriers for use of these technologies. Early adopter faculty members are excited to see potential benefits in their research domains, and as such become active in the communities that transfer IT research from the labs on to the networks. These faculty members are the exception. Previous efforts have tried to work with these early adopters to become evangelists for IT in entire domains of science. That work did not have a long or broad impact, as it depended on enthusiasm without a system for substantive rejuvenation. (Cambre 1991; Pournelle 1994).

CIARA is a system that will effect sustained transfer of IT research, and as such will broaden the horizons for researchers and educators. The majority of faculty members do not see the applicability of IT research for their own investigations. Their research requires a detailed understanding of their domain. Scanning other domains for possible benefit and collaborations, is often a desired activity, but too much of a time burden, and often the technical material is difficult to apply (Hazemi, etc. 1998). The research scientists are institutionally positioned to help faculty who need to use infrastructure, but lack topical expertise to explain how IT research may be of benefit to faculty in their investigations.

This divide between faculty and the technical research scientist is so severe, that the full merits of IT research are rarely realized due to the paucity of adoptions. CIARA seeks to integrate IT into research projects today, provide a lifelong framework of understanding for tomorrow's faculty, to assess the effectiveness of applied IT research, and to demonstrate an effective, academically grounded, institutional model of support.

The "collisions of ideas" that Bruce Alberts, President of the National Academy of Sciences and a member of the Boyer Commission identified as requisite to faculty and student success, is the core tenant of CIARA (Boyer Report, 1998, p. 11). CIARA will explore ways to foster a richer understanding and a greater utility of IT research across domains.

C.2 Research

C.2.a Hypothesis

The CIARA proposes that graduate students engaged in inquiry based learning activities can effect transfer of information technology research and that this transfer will increase scientists' rates of discovery.

C.2.b Preliminary Research

We have engaged in six experiments that lead us to be confident of the hypothesis put forward. These experiments did not have the rich matrix of support infrastructure that the CIARA project proposes, and as such the scope of impact was significantly less than the proposed effort. The experiments did allow us to look at the fundamental issues of graduate student effectiveness, faculty willingness, and usefulness of the research scientists. However, the rigorous assessment models developed as part of the CIARA process were not used for these preliminary experiments.

First, an experiment conducted with maxillo-facial surgery. The Puerto Rico BRIN project, detailed in section C.5.c, currently funds an undergraduate CS student, Luis Velez, to work with Dr. David Singh, professor of the Anatomy Department, UPR Medical School. In this work, Luis worked with IT research scientists to bring software expertise to Singh's lab in order to adapt 3D volume reconstructions of infants with cleft palates and similar deformities. The goal of Luis' work is to use the UPR High Performance Computing facility's (HPCf) VizRoom's capabilities together with the IT research scientists' computational resources to help Singh with modeling and surgical planning. This experiment was largely successful. Dr. Singh feels that he is in the process of advancing his work significantly, and Luis will be pursuing graduate education. We feel that the rate of discovery for Dr. Singh we feel could have been enhanced significantly with a partnership with a graduate student in his own domain. These experiments lead to a design point used in CIARA.

Second, an experiment with assistive technologies. The Puerto Rico Assistive Technology Project is an NIH funded project through the National Institute of Disability and Rehabilitation Research. Its main focus is to provide all types of equipment and services that can be used to augment, maintain or improve the functional capabilities of people with disabilities. They wish to develop jointly with the UPR IT research scientists, a resource capitalizing on the HPCf VizRoom capabilities, together with control and feedback technologies taken from OpenSource projects, which would bring to wheelchair-bound children with limited motion, a means to learn the control of their chairs in a simulated area rather then taking their first tentative strolls in the real-world. The intended clientele are children with various palsies, paresis or plegia, exclusively able to control their chairs through limited-motion apparatus such as joysticks, mouthpieces or head-controls. The work commenced with only the UPR IT research scientists and has not significantly progressed. The need for a bridging between the domains was revealed. The assistive technology researchers and the IT research scientists do not share a technical vocabulary. The role of a graduate student, as proposed in CIARA would have significantly increased the rate of progress.

Third, an experiment with architecture. In order to effectively utilize the visualization capabilities residing at the High Performance Computing facility of the UPR, namely the VizRoom as well as a Silicon Graphics Onyx2 supercomputer, one of the IT research scientists, Yotuel Gonzalez created a three-dimensional walk-thru model of a unique architectural feature of the Río Piedras campus of the University of Puerto Rico. This scale accurate and detailed model represents the bell tower of the Río Piedras campus, designed by architect W. H. Schimmelpfenning, which combines elements of the Spanish Renaissance with the form of an Islamic minaret and the concept of a commemorative tower, popular in American collegial architecture of the beginning of the 20th Century. This initiative was under taken by an IT research scientist. The initiative has failed to reach its desired affect due to that lack of faculty participation. Because no faculty member entered into a partnership with a graduate student and the research scientist, the results were not as compelling as we believe they will be in a CIARA model.

Fourth, an experiment with the fine arts. The ITR funded Metaverse Lab of UKy wishes to develop the tools and resources necessary to create a digital library, working with the collection of paintings, sculptures and pottery of the "Instituto de Cultura Puertorriqueña", an important repository of cultural artifacts in Old San Juan, Puerto Rico. In its initial stages, this project is exploring the use of visualization technologies, to capture and display three-dimensional objects. In its expected final development phase, the project would require the participation of students from CS but also from such fields as art history and fine arts, creating and managing a digital library of high-resolution objects representing the collection of this important Puerto Rican museum. When working with the investigators associated with the project, a substantial question arose regarding the final stages of the project. The academic value of the experience for the students seemed to be too diffused. The activities were couched as simple labor, rather than being designed as part of a scholastic-research program. The CIARA model changed the tone and tenor of the activity. New plans have been designed that use the CIARA model to couple the graduate students, faculty and research scientist in a way that provides learning experiences fro the graduate students out of the active research program.

Fifth, an experiment with astronomy. Astronomy is an observational science that requires advanced instrumentation placed in the proper environment in order to do advanced, graduate-level research. FIU joined the SARA consortium in 1992 with the mission of building a remotely operated research-grade telescope at a dark site at Kitt Peak National Observatory. SARA became the first general purpose, remotely operated observatory at Kitt Peak in 1995. Ms. Emily Howard came to FIU first as a SARA REU intern, and then as a graduate student in the physics department. She chose FIU because of the access to the SARA observatory and her interest in the quasar research we carry out here using SARA. In order to construct these experiments, Ms. Howard and her faculty advisor Dr. James Web defined a project with an IT research scientist. The majority of the observations she used for her masters thesis were made using the SARA telescope remotely over the Internet. The application of the network connection made possible the data-acquisition she needed to carry out her research. Her masters was awarded in 2001, and she is currently working on her Ph.D. here, expanding her masters work, and using the technical competency she gained to expand her and Dr. Web's work.

Sixth, an experiment with experimental nuclear physics. A partnership between Dr. Pete Markowitz, graduate students and IT research scientists has allowed for efficient storage and retrieval of "large" data sets. The graduate students use the IT skills and knowledge they have developed as well as their knowledge of experimental nuclear physics to search for relatively infrequent scattering events, such as particular channels in strange quark electroproduction. Increases in networking and processing have let them to move data from national laboratories to their own laboratory. The combination of IT research scientist support and traditional faculty mentorship has allowed these students, and the research of the Dr. Markowitz to advance quantifiably.

C.2.c Assessment

Measuring sub-project successes will fall under a number of rubrics. When a project is begun with a faculty member, a graduate student, and an IT research scientist, the first course of action will be to document the normative state. As the metrics for progress vary significantly by domain, this will be a highly customized activity, but fundamental to the operation of CIARA. Different faculty members may choose to judge their progress in different ways even inside of domains. CIARA will document this, and then use it as a baseline. In a simple example, a faculty member might suggest that the number of peer reviewed journal articles that she publishes should be the metric for her success. CIARA will review the rate of publication for an appropriate amount of time (for example since being promoted from an assistant to associate professor.) This will be used as a normative measurement. The success of the CIARA project will then be an annual assessment of this metric.

The assessment of the scholastic and technological competency of the CIARAs will be annually assessed by an external review committee. The external review committee will be contracted to measure the pedagogy against best known practices, and the technology against the current work of the IT research community, as well as auditing the operations of the CIARA. A report from the external reviewers will be included in all annual reports to the NSF.

C2.e Learning sciences

The CIARA will fundamentally use "modeling" in instruction and learning. Mathematical modeling is a form of mathematical problem solving that produces solutions to complex and real, applied problems by creating theoretical representations of the real situation. In complex modeling situations, computer simulations of different ways of representing the mathematics are frequently generated. The inquiries that the CIARA fellows construct with their faculty advisors will model these connections. These depictions of the real situation frequently lead to underlying mathematical curve fitting, building of "wind tunnel" representations of the situation of the real problem, or the building of a real, scaled version of the objects of the problem. Technology permits teams of individuals, possibly in different locations and with different skills to enter into the work toward solution of the real problem. It is frequently a systems approach to solve a problem that requires the confluence of varied linked strategies. The Connected Mathematics and Core Plus curriculum projects are based on mathematical modeling as a fundamental teaching/learning strategy and provide two other examples of the potential of the modeling approach in teaching and learning. The COMAP project has demonstrated the effectiveness of modeling in problem solving in high school mathematics. The NCTM

"Mathematics as Problem Solving" Standard conceptualizes mathematical modeling using the following diagram (1989, p.138):
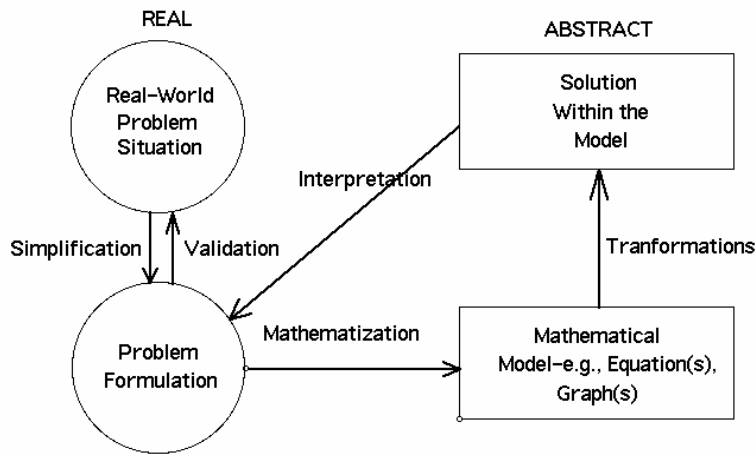
Figure 1 Mathematical Modeling

Research clearly indicates the high potential of the modeling approach for improving learning. Students learn best when the dynamic and developmental process of learning is guided by generalized principles applied to real-world problems or situations. Bruning, Schraw, and Ronning, (1995) highlight key themes relevant to teaching and learning found in cognitive psychology for, including the idea that learning is a *constructive process* and that meaningful learning is *contextual*. Learners are more highly motivated to learn when they can see that what they are learning is useful in their own lives. McCombs (1998) indicates that activities must encourage students to become personally and actively involved in their own learning. The modeling approach provides just such an atmosphere: an atmosphere in which students solve problems, make decisions, work with their peers, and pursue new learning as ideas evolve. We believe that graduate students constructing the models with faculty advisors and IT research scientists will provide the context, and the exploration of the inquiry will be an engaged - personal learning.

C.3 Implementation

C.3.a Continues Dialogue
CIARA will engage the heterogeneous faculty of Florida International University and the University of Puerto Rico. This engagement will consist of an open dialogue facilitated by the faculty investigators, with the full support of university administrators. This dialogue will foster CIARA fellowship proposals and projects. These proposals will come from any discipline on campus, from the physical sciences to the humanities. But each project will be faculty lead, and taken on as a result of dialogue with CIARA research scientists.

Part of this dialogue will take place with presentations to faculty department meetings. In these meetings the research scientists will present findings from NSF CISE, and ITR supported research in summary form. The findings will be digests from personal relationships the research

scientists have developed in the IT research community, through presentations at principle investigator meetings, and from publicly available quarter and annual reports. The purpose of the meetings will be to plant the seeds of possibility with the faculty members present. As the project advances, these faculty department presentations will include graduate students and faculty who have been involved in a collaborative project in a related domain. This affinity matching will be used to help make the IT research seem more applicable to the faculty. FIU and UPR will work collaboratively on these presentations. So if one month UPR-CIARA was presenting at a geology faculty meeting, the FIU geologist and graduate student that had already completed a project with the FIU-CIARA will video conference into the meeting and participate. The cross referencing of the CIARAs is a key strength, as it not only exposes the faculty to potential collaborators, but it allows for a larger matrix of engaged domains.

The research scientists will schedule one-on-one meetings with faculty members who are interested following the faculty department meetings. At this meeting the research scientist will bring relevant IT research to the faculty member. If the faculty member sees a potential benefit to their research at the time, then the research scientist will work with the faculty member to author a one-page CIARA fellowship proposal.

Faculty members who would like to learn about applications of IT research in more depth can participate in weekly brown bag lunches that the CIARAs will hold. At these lunches, the CIARA staff will present more in depth information about the applications of IT research. For example, the CIARAs would work collaboratively on a sensor networks lunch, where they presented the advances made by UCSD in self-configuring wireless networks, and discuss the applicability on projects, such as NEES. The goal of the lunches is to transfer knowledge from IT research to diverse disciplines, and to encourage faculty members to consider the applicability to their domain. The faculty members who are interested in exploring the applicability will be able to work with a CIARA research scientist to author a one-page CIARA fellowship proposal.

C.3.b Collaborative Proposal Writing

The early definition of individual CIARA projects will come from a one-page proposal document, collaboratively authored by the faculty member, and the IT research scientist. If the graduate student whom the faculty intends the fellowship for is known at that time, then the faculty will also be engaged in the authoring. The fellowship proposal will describe the nature of the domain specific problem and a particular inquiry into the problem that a graduate student can explore applicability of IT research. These proposals are not meant to be prescriptive. The use of IT research in the inquiry will be hypothetical. The graduate student will research and experiment to determine the veracity of the hypothesis. The one page document is meant to be a low enough barrier that many faculty members will explore fellowships early in their exploration of topics. These one-page proposals will also be used as a metric for CIARA success. The number of faculty members that have been engaged enough to author a one-page proposal is a quantitative measurement of CIARA staff outreach.

The average length of the fellowships will be one semester. Particularly challenging projects will be funded for two semesters. The faculty advisory board will determine if certain fellowships should be renewed, but it is anticipated that this will not be routine.

C.3.c Faculty review of proposals

The one page proposals will be brought forward to a committee of UPR and FIU faculty, chaired by Co-PI Dr. Oscar Moreno and Co-PI Dr. George O'Brien. The committee will evaluate the proposals based on the prospects for IT research augmentation, the chance of being replicated and the scholastic suitability of the proposed inquiry. The faculty committees will ensure that the nature of the proposed research can hold up to peer review. The committee will rank the proposals and offer written critiques.

C.3.d Normative assessment

The faculty members with accepted proposals will be asked to identify the graduate student who will be receiving the fellowships. The CIARA IT research scientist, with the graduate fellow and the faculty member, will document discipline specific metrics of success. Often these will be the same metrics used in tenure and promotion. There are often domain specific variants that will be taken into account. For example the rate of publications, the rate of discovery, and the success of presenting new work to peer review could be the metrics. The graduate fellow will use the agreed upon metric to establish a normative state document. This document might say that a particular faculty member has published 2.1 peer reviewed journal articles a year.

This normative document will be used at the conclusion of the fellowship period to explore potential changes. Every six months, the current and past projects will all be reviewed against the normative document. The CIARA will publish all of these detailed assessment activities.

C.3.e Nesting of Graduate Students in Lab

The graduate students will work with the IT research scientists to explore the challenge put forward in the one page proposal. This exploration will take place in a lab environment, where there are graduate students of various disciplines, all exploring applications of IT research into their domains. This multi-disciplinary environment is a fertile space for cross fertilization of approaches and understandings. Under the tutelage of the IT research scientists the graduate flows will be engaged in a rich inquiry-based learning experience. The lab facilities and environments at both FIU and UPR will offer a unique environment for unprecedented multi-disciplinary exchange.

The graduate fellows are paired with 'buddies' from each institution. The buddy teams will be designed so that the inquiries complement one another. The goal is to foster a distributed collaboration that will offer a sense of community to the fellow. We believe that this will further assist minority students in finding a home in the community of science.

C.3.f IT Scholastic Certification Program

The CIARA fellowship program will have two requirements, the inquiry based project that will involve the faculty sponsor, and a course of study leading to a certificate in scientific networking and computing. The certification program will require three, three credit courses. The courses will be drawn from the existing graduate catalog of courses, and a new seminar. The new seminar will be organized out of CIARA. The seminar will provide a solid foundation of understanding about how IT research takes place (Gelès, 2000), and how to be involved in the applications of it. While many faculty members today are not aware of NSF programs that have

historically funded research and infrastructure programs, the graduate fellows in their careers as faculty members will have a rich understanding of the IT community.

The certification program is an important tool for institutions apart from FIU and UPR to directly benefit from CIARA. As the graduate fellows interview for post-doctoral positions, outside programs will be able to determine if such expertise could be beneficial for their departments. This will exponentially increase the scope of impact of CIARA. The combination of an inquiry-based learning program, and the certification program will best prepare the next generation of scientists, engineers and educators to use and understand IT research.

C.3.g Challenge partnering

The investigators have developed relationships with the IT research community, and are active in working groups that seek to form applications of IT research. The CIARA inquiry-based projects will be example applications of existing or needed IT research. The CIARA research scientists will work with existing IT researchers, and program officers to find matches between research interests and CIARA projects. These collaborations will assist IT researchers in understanding needs, and confusions in applying their work.

C.3.h Case study package

The graduate fellows will work with the CIARA research scientists and the faculty advisors to author a case study package. This package will contain all of the assessment data, the domain specific challenge and history of the inquiry, and the technologies employed. The case study package will be detailed so that others can use it in the domain of the graduate fellow and faculty member to replicate the inquiry. The case study package will represent examples across the disciplines for applications of IT research.

"Best Practices" white papers have been useful conveying to large communities how to employ applications of IT research in video conferencing (Gemmil, etc 2003). The case study packages will be submitted to peer reviewed journals for publication. The full case studies will also be available on line. The case studies will be a reference that is technically accessible to the domains that they arrive out of. An inquiry, based in the humanities, will result in a case study package that is easily understood by other humanists. The case studies will themselves be mechanisms to effectively transfer IT research into the domains, in a widely available and applicable form.

C.4 Community Engagement and Participation

C.4.a Continuous Dialogue

The CIARA presentations to faculty department meetings and the brown bag lunches will foster an environment of continuous dialogue. The FIU and UPR faculty communities will be engaged creatively to understand applications of IT research. This environment will be a fertile space for multi-disciplinary research to be initiated. The open exchange will be a model for institutions that replicate the CIARAs.

C.4.b Student outreach

The graduate fellows will present their work with IT research to their peers. The graduate fellows will work with their peers to present the role of IT research to undergraduate classes. Having graduate students that are knowledgeable about a topic, acting as role models for undergraduate students, has proven to be effective in minority serving institutions (Stearns and Snyder 2002) Through the outreach work of the CIARA fellows, a large community will be engaged in reaching out to the student community. In disciplines that have not effectively appealed to minorities, we believe that IT research may offer a new perspective as to the excitement in those fields. By having role models convey their enthusiasm in using IT research in the humanities or physical sciences, the opportunity for impact is significant. (IBID 2002)

C.4.c In reach

The CIARAs at both FIU and UPR will have conferences each semester. At these conferences the case study packages from both universities will be presented. These events are designed to provide in-depth discussion of the application of IT research in the domains. The conferences will bring together the faculty, graduate fellows, and research scientist with external IT researchers, faculty in related field, and IT professionals. The events will provide extensive opportunity for exchange about the case study packages. The goal of these events is to provide long-lasting connections for the fellows and faculty members to the external community.

C.4.d Culture changing nature of work

The CIARA is asking faculty members to look at IT research in a new way. To see it not as simply a tool that is used in a predetermined manner, but as a domain of research itself. The goal is to change the culture of the faculty at UPR and FIU into one that sees working with technology as collaboration, rather than simply an application. The difference is profound. The systemic nature of IT research results in non-iterative change, which confounds faculty who are used to the iterative pace of discovery in other disciplines. This recognition of the dynamic of IT research and the desire to collaborate will affect the culture. The notion of infrastructure being a barrier to participation will no longer have a death grip on the creativity of the faculty. This shift will result in scientists, engineers, and educators who are fully integrating IT into their professions.

C.5 Related and Leveraged Work

C.5.a AMPATH

FIU's University Technology Services group has created with NSF funding the AMPATH international research network serving South and Central America, the Caribbean and Mexico, as well as a variety of US research programs in the region. This program is aided by the presence in the Miami area of one of only five Tier-1 Network Access Points (NAP) in the US. Over the last two years, FIU has developed an international, high-performance research connection point in Miami, Florida, called AMPATH (AMericasPATH). One of AMPATH's goals is to enable wide-bandwidth digital communications between the Abilene network and ten National Research and Education Networks (NRNs) in South and Central America, the Caribbean and Mexico, as well as a variety of US research programs in the region.

CIARA will leverage FIU's **networking** expertise, its membership in the International Virtual Data Grid Laboratory (iVDGL) and contribute with its partner, University of Puerto Rico to the development of a global Grid laboratory while extending the iVDGL to Puerto Rico through its AMPATH research network activities. The University will form an initial research partnership with UPR's Rio Piedras campus and High Performance Computing Facility, to nurture many forms of graduate student scientific and humanities collaboration partnerships, fulfilling the educational outreach goal of CIARA. FIU and UPR will use ITR advances in human-to-human collaboratory tools to hold joint workshops, and implement Grid computing testbed projects between our universities and FIU's immediate iVDGL and Grid collaborators including University of Florida and California Institute of Technology, as well as the State University of Rio de Janeiro (UERJ).

C.5.b Puerto Rico EPSCoR

Since 1985, Puerto Rico-EPSCoR has been the cornerstone of the Commonwealth's effort to build the research competitiveness of its universities through strategic support of research instruments and facilities, research collaborations, integrated education and research programs, and high-performance computer networks. Investments have allowed the program to: enhance and strengthen Puerto Rico's scientific infrastructure and research competitiveness in select areas that are in turn advancing the Island's economic development; increase the number and productivity of human resources needed to sustain a strong R&D enterprise; stimulate broad-based changes in university and state policies; instigate a "culture change" among science, technology, engineering and mathematics faculty, research institutions, government agencies, and industry; and promote and develop alliances and partnerships among academia, government and industry.

Specific objectives, of the latest research infrastructure improvement proposal, submitted to NSF in 2002, are the following: 1) increase human resource base and research capacity in targeted thrust areas; 2) strengthen institutional R&D infrastructure; 3) accelerate NSF co-funding and movement of PR researchers into mainstream programs; and 4) continue to transform the culture of Puerto Rican institutions. Three thrust areas have been clearly defined and will be fostered through this program, namely, Environmental Sciences and Engineering, Information Technology Research and Materials Science. It is to be noted that Dr. Guy Cormier will be Co-Lead of the Information Technology Research thrust area. Furthermore, the High Performance Computing facility of the University of Puerto Rico system is an important and integral part of the success of Puerto Rico EPSCoR. It is seen as the "glue" linking all three thrust areas through a common access to computational sciences resources, the ability to cross-link IT research with the other two thrust areas as well as maintaining the collaborative research support mechanisms delivered through their management of the advanced networking project for Puerto Rico.

C.5.c. Puerto Rico BRIN

The Biomedical Research Infrastructure Network in Puerto Rico (BRIN-PR) project seeks to enhance and strengthen the scientific infrastructure and research competitiveness of the Commonwealth of Puerto Rico in three specific research areas (neuroscience, mental health and medical biotechnology) deemed to be key to advance Puerto Rico's biomedical and behavioral

research capacity. The BRIN-PR network is a partnership among 12 public and private higher education institutions in Puerto Rico, amongst them the UPR-Río Piedras campus.

The BRIN-PR Program operates through a structure embodied in four core units, namely, an Administrative Core, a Bioinformatics Core, a Mentoring and Training Core and a Research Core. Of interest, the Bioinformatics Core is housed at the UPR-HPCf and provides technical expertise and data analysis tools for BRIN-PR researchers, whereas the Mentoring and Training Core has created programs and professional development opportunities to support junior faculty investigators as well as undergraduate and graduate students in the targeted research areas. Finally, the Research Core supports junior investigators' collaborative research within the BRIN-PR network together with collaborating institutions.

C.5.d The Partnership in Academic Communities in Excellence

Our research at FIU during the past nine years with grades 7-12 "at-risk" students of an urban public school district clearly indicate the strong potential that instructional technology used in mathematics and science contexts has in improving the academic success rates of this population. Recent national reports have indicated a continuing major problem of student drop out which particularly impacts underrepresented, minorities (National Center for Educational Statistics, 1999; Frase, Kaufman, & Klein, 1999). Schools often fail to address the special circumstances including community, economic, family, ethnic, and racial status that characterize students at risk to drop out (Natriello, McDill, & Pallas, 1990).

CIARA will serve a similar profile of graduate students. This work will be leveraged to allow us to design a nurturing environment for the CIARA graduate students, and a scholastic program tailored to this demographics' needs. The PAC program conclusions design and operational elements of CIARA are:

1. PAC program students are more able to work together collaboratively and systematically.
2. PAC program students are often more willing to take risks, to experiment and try out possibilities.
3. PAC program students tend to be more persistent in their pursuit, when the interest or challenge is there to make it worthwhile.

In this proposal, we would like to develop an active learning framework that seeks to establish a tight coupling of the research materials and projects for research
scientists, faculty members and graduate students. Sr. Personnel Shu-Ching Chen will be the designated manager for this component of the activity. He will base development on improvement with respect to the quality of education measured in terms of efficiency of instruction, effectiveness of pedagogical techniques, and the quality of testing and assessment.

C.6 Project and Management Plans

C.6.a Project Structure

The CIARA will be organized into two, symmetric laboratories at FIU and UPR. Each will be responsible for the outreach programs (department meeting presentations, brown bag lunches,

fellows undergraduate lectures, and conferences), soliciting fellowship proposals, administering the graduate certification program, and providing the IT tools and expertise for the structured inquiry projects. There will be one faculty board of solicitation review for both institutions, and one reporting and external audit functionality. The project is structured so that each graduate fellow will have a faculty advisor (typically their thesis advisor and one research scientist advisor, as well as a 'buddy' in a similar discipline at the partnering CIARA.)

Each year the project will offer 16 semester long fellowships. And two year long fellowships at each CIARA. Each fellowship will start with a normative analysis, then an inquiry project, followed with a case study package. In addition, each fellow will be required to successfully complete the certification program. Failure to complete the terms of the fellowship will result in a suspension of the fellowship. The inquiry-based project does not have to meet any prerequisite of success, rather thoroughness. The fellows are further required to participate in two undergraduate lectures on IT research in the domain, and one Case study conference.

The operational milestones of CIARA will come from the execution of the fellowship activities, and the annual assessment of the delta from the past normative states. Each semester, each CIARA will have at least 8 more case study packages, and an updated assessment from all past projects. After the first two years of the project, an institutional assessment report will be authored examining broader impacts. A similar report will be authored at the conclusion of the project.

C.6.b Management Structure

The PI, Heidi Alvarez will direct the activities at both CIARAs. In the center role, she will convene that faculty review panel, chaired by co-PIs George O'Brien and Oscar Moreno. The review panel will consist of faculty members nominated by the chairs, and approved by the FIU Vice Present of Research, Thomas Breslin, and UPR Graduate Dean of Research Rio Piedras, Ana Guadalupe. Co-PI Julio Ibarra will work as a research scientist for fellows at both CIARAs. Ibarra is the FIU Director of the AMPATH project, CIARA as a Type II State of Florida Center, and other advanced networking infrastructure activities for FIU. Furthermore, he will manage the external review process. External consultants will be engaged to annually review the progress of the CIARAs and further ensure academic integrity.

The PI Heidi Alvarez will be the operational director of CIARA-FIU, and the Co-PI Guy Cormier will be the operational director of CIARA-UPR. They will manage the research scientists associated with the center, both with NSF support, and institutional contributions. The PI will also bi-annually report the activities of the center to the faculty advisory board. The fellowship disbursements will be managed by the corresponding Offices of Research.

C.6.c Advisory Committees

The CIARA advisory committee will consist of a mix of eight UPR and FIU faculty that will represent a broad range of domains. The committee will have senior and junior faculty members. Each year, two more faculty members will be nominated from the group of CIARA fellows' advisors. After four years the committee will have sixteen members. The committee will annually work with the outside consultants to ensure the IT research being proposed by the CIARA research scientists is applicable and current.

C.6.e Schedule and milestones

September 1, 2003	Project starts
	Weekly brown bag lunches commence for entire project
	Weekly meeting with rotating faculty departments begin for entire project
October 15th, 2003	Solicitation for first fellowship posted
December 3rd 2003	Faculty committee selects first twenty fellowships
January 8th, 2004	CIARA fellowship program begins
May 2004	Case studies published
June 2004	CIARA Conference & Solicitations posted
August 2004	Advisory committee selects fellows
September 2004	CIARA fellowship program begins
October 2004	Fellowship solicitation begins
December 2004	Advisory committee selects fellows & Case studies published
January 2005	CIARA Conference & CIARA fellowship program begins
May 2005	Case studies published
June 2005	CIARA Conference & Solicitations posted
August 2005	Advisory committee selects fellows
September 2005	CIARA fellowship program begins
October 2005	Fellowship solicitation begins
December 2005	Advisory committee selects fellows & Case studies published
January 2006	CIARA Conference & CIARA fellowship program begins
May 2006	Case studies published
June 2006	CIARA Conference Solicitations posted
August 2006	Advisory committee selects fellows
September 2006	CIARA fellowship program begins
October 2006	Fellowship solicitation begins
December 2006	Advisory committee selects fellows & Case studies published
January 2007	CIARA Conference & CIARA fellowship program begins
May 2007	Case studies published
June 2007	CIARA Conference

C.6.f Sustaining the project beyond the funded period

The long-term vitality of the CIARA is dependent on the success of the graduate fellows. The assessment rubrics are in place to demonstrate a return on investment to the various disciplines. The CIARA is not proposing a budget for infrastructure - that is a responsibility of projects and the institutions. CIARA is demonstrating a system for using graduate fellowships to increase the rate of discovery. The research scientists are an essential part of the CIARA system. The faculty participants will determine the longevity of CIARA. If the faculty sees a significant return on investment, they will secure support for the fellowships and the research scientists. There are clear and direct funding mechanisms to ensure that CIARA operates beyond the length of NSF support. The same factors would lead to other institutions adopting the CIARA model. Both of these outcomes depend on CIARA's success.

CIARA is poised to succeed. The investment is directed primarily to graduate fellowships. They are the next generation of scientists, engineers and educators who will be nurtured in their explorations of IT. The methodology for fostering, inquiry based learning is sound (Bransford etc 1999), the IT research is compelling (Joy, Kennedy et al. 1999), the need is significant across the disciplines (Atkins, etc 2003) so CIARA has a mandate and a means to effect long-lasting change.

C.7 Broader Impacts of Proposed Activity

The smallest impact of CIARA will be a change in the way that two of the largest minority-serving institutions view information technology. The CIARA project represents an inclusion in the IT research community of benefits. Where ITR has raised the tide, not all vessels have been lifted. CIARA will bring the benefits to domains and groups that have yet to realize the fantastic impact. Over four years, CIARA will include underrepresented groups supported in areas of national importance. CIARA will impact the faculty doing research and teaching today, and the faculty of the future. This impact alone is significant to the U.S. society.

The CIARA model will likely have a much larger impact. Institutions across the country support information technology by investing in systems specialists and IT support staff. The application of IT research is limited to the vision of institutional information technology plans. There is a great divide between these plans, and the needs of the faculty. A successful CIARA, shown through the emphasis on assessment, will profoundly affect the national models for IT support. When institutions can effect more efficient IT transfer by investing closer, in graduate students, rather than farther, in systems analysts, to institutional missions, a substantial impact will occur. The re-focusing on institutional expenditures from tangential technology support functions, to synchronous fellowships will have profound impact on the effectiveness of our inquiries today, and the creativity and effectiveness of generations to come.

C.8 Results from Prior NSF Support

Heidi Alvarez: (ANI-0123388): **AMPATH Workshop to Identify Areas of Scientific Collaboration between the US and the AMPATH Service Area, April 15-17, 2001** (ANI-0220176): **First AMPATH International Conference, Valdivia, Chile, April 12, 2002** (ANI-0215434) **AMPATH StarLight Rio Grid Workshop, held February 7-8, 2002** resulted in forging the collaboration in the current proposal. Co-PIs Avery, Newman and Alvarez participated in two days of presentations and meetings with Alberto Santoro and others from Rio de Janeiro's and Sao Paulo's HEP collaboration. Newman and Alvarez worked with RNP, the National R&E Network for Brazil to test the COJAC application for HEP visualization. **STI - AMPATH Collaborative Research and Education Operational and Functional Support**, Co-PI for AMPATH (ANI-0231844) funded September 12, 2002, ongoing. Co-PI for (ANI-6188654) **AMPATH Workshop, Miami, January, 2003: Fostering Collaboration and Next Generation Infrastructure.** A white paper support from this conference will be turned in shortly. Preliminary results are available now at www.ampath.fiu.edu .

Julio Ibarra: (ANI-0123388): **AMPATH Workshop to Identify Areas of Scientific Collaboration between the US and the AMPATH Service Area**, **April 15-17, 2001** Report. (ANI-0220176): **First AMPATH International Conference, Valdivia, Chile, April 12, 2002** Report. (ANI-0215434). **STI - AMPATH Collaborative Research and Education Operational and Functional Support, PI for AMPATH** (ANI-0231844) funded September 12, 2002, ongoing. PI for (ANI-6188654) **AMPATH Workshop, Miami, January, 2003: Fostering Collaboration and Next Generation Infrastructure.** The workshop results can be found at www.ampath.fiu.edu and show a robust agenda, informative presentations, and a very well rounded participant list.

George O'Brien does not have ongoing NSF support, though he has several projects under consideration at this time.

Guy Cormier: (ANI-9976006) **Connection to NSF's vBNS Network: A proposal submitted by the University of Puerto Rico and the NAIC.** This proposal brought the Internet2 project to Puerto Rico, with the connection of the three graduate schools of the UPR as well as to the Arecibo Observatory. (EHR-9977805) **The Visualization Laboratory of the University of Puerto Rico High Performance Computing facility: Establishment of a HPCC Facility supporting scientific research in Puerto Rico.** This grant helped in developing a Visualization Laboratory within the UPR High Performance Computing facility to serve in a distributed and remote manner the research needs for scientific visualization across the UPR system.

Oscar Moreno: **NSF-CISE Infrastructure for a New Program in Computer Science at the University of Puerto Rico, Rio Piedras Campus**. Duration: 08/01/00 - 2005 for a new PhD program in CISE. This project also funds research in communication science and in the reverse engineering problem for genetic networks. For more information see www.uprr.pr.
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  Cyberinfrastructure: report of the National Science Foundation Blue-Ribbon Panel
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   education: A blueprint for America's research universities. Menlo Park, CA:
  Carnegie Foundation for the Advancement of Teaching.

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  Anglin (ed) *Instructional Technology, Past, Present and Future*. Englewood Cliffs:
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Academy*. Berlin: Springer-Verlag.

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Board: Report to the President*. Washington, D.C. National Coordination Office

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Strategies for increasing Student Motivation and Achievement.* Jossey-Bass.

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National Assessment of Educational Progress. Washington, DC: National Center for
Education Statistics.

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Racing against catastrophe*. New York: Teachers College Press.

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URL References for AMPATH Reports

AMPATH Valdivia Group Report, Valdivia, Chile, April 12, 2002
http://ampath.fiu.edu/Valdivia_Report.pdf

The AMPATH Workshop; *Identifying Areas of Scientific Collaboration Between the US and the AMPATH Service Area.* Florida International University
August 15-17, 2001. http://www.ampath.fiu.edu/Report%20Final.pdf

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Professional Experience:
Heidi L. Alvarez is an Associate Director at Florida International University (FIU) Technology Services, where she was responsible for working with the AMPATH principal investigator in the strategic planning and implementation of connecting high performance Research and Education (R&E) networks and US e-Science initiatives in South and Central America, Mexico and the Caribbean with US and Non-US National Research and Education Networks. She holds responsibility for researching and preparing technology grant opportunities as well as seeking out other funding sources to participate in furthering the goals of the AMPATH project and other related activities. Alvarez has served as Co-PI for AMPATH since April, 2000 and is currently PI for a project to assist in developing an advanced networking Grid connection for High Energy Nuclear Physics between Brazil, the US, and CERN.

Other appointments at Florida International University:
Assistant Director, Network Engineering and Telecommunications Florida International Alvarez performs business and project planning functions associated with AMPATH, assisting the Director with the flow of activities between existing and potential project participants, staffing issues, and other duties as required. She is also responsible for publications, web design and other dissemination activities related to the AMPATH project.
Adjunct Instructor, Freshman Composition, Academic Systems Multi-Media English: Essay Writing, and Technical Writing 1995-2000
Sr. Programmer Analyst (Temporary Appointment), Academic and Research Computing, 1998-1999. Responsible for policies and procedures in the areas of Computing Practices, Fair Use of Computer Resources, Academic and Research Computing, Electronic Messaging, Electronic Mail as Public Record, and World Wide Web resources at FIU.

Other Professional Appointments:
Chief, of Information Services, Miami-Dade Department of Solid Waste Management, 1992-1996. Responsible for directing, developing and implementing policies and procedures for applications, networking and telecommunications for the Department. Duties involved the formulation and supervision of an *Information Services Master Plan*, project management and reporting methodologies. Planned and administered of an information technology budget of between four to six million dollars annually.   Position responsibilities involved supervising a professional and technical staff, business and operational applications lifecycle administration, customer support, policy and procedure formulation. Manager,

Computer Services, Miami-Dade Department of Solid Waste Management, 1989-1992

Programming Systems Supervisor, Miami-Dade Transit Agency, 1988-1989
Sr. Systems Analyst, Miami-Dade Transit Agency, 1986-1988
Systems Analyst 1, Miami-Dade Transit Agency, 1985-1986
Programmer Analyst, Jordan Marsh Department Stores, 1984-1985

Professional Preparation:
PhD. in MIS, Florida International University, in progress
M.A. in English, Florida International University, 1999
B.S. in Education, University of Miami, 1979

Selected Publications/Presentations:
AMPATH Conference Valdivia Update, International Task Force, Spring02 I2 Members Meeting, Arlington, VA. May 6, 2002

AMPATH Scientific Applications Collaboration Update; First Int'l AMPATH Conference, Valdivia, Chile, April 10 -12, 2002

AMPATH Overview; University Technology General Meeting, FIU, April 26, 2002

AMPATH; Network of the Americas, LISHEP Grid Workshop, UERJ, Rio de Janeiro, Brazil, Feb 7-8, 2002

AMPATH Scientific Applications Overview; AMPATH Workshop, Miami, Florida August 15 – 17, 2001

AmericasPATH, STAR TAP Annual Meeting, INET 2001, Stockholm, Sweden June 5, 2001

AMPATH; International Connectivity Issues, Internet2 Fall Members Meeting, Atlanta, Georgia, October 31, 2001

Regional Aspects of Miami Crime Fiction; A Postmodern Frontier – Master's Thesis, 1999

Florida International University Information Resource Management Newsletter – Editor of the inaugural issue June 1999 and recurring article contributor.

Book Review: "Essays by Contemporary American Women," in Probable Cause, Spring, 1996.

Graduate Advisor: Kenneth E. Johnson, Assistant Vice President, FIU Academic Affairs & Associate Professor FIU English Department

Synergistic Activities:
FIU Academy for the Art of Teaching Grant Award; Innovations in Process Analysis Essay Writing

Chairperson, Miami-Dade County Information Systems Policy Committee Group

Miami-Dade County ESP Award for computer maintenance cost savings

Guy Cormier, Ph.D.

High Performance Computing facility
Vice Presidency for Research and Academic Affairs   tel.: (787) 753-1653
Central Administration   fax: (787) 758-3058
University of Puerto Rico   email: guy@hpcf.upr.edu
PO Box 23334, San Juan, Puerto Rico   web: http://www.hpcf.upr.edu/   00931-3334

Education and Experience

2001- to date	:	Puerto Rico Bioinformatics Resource Center, Project Director
1998- to date	:	UPR Internet2 Project Director
1997- to date	:	Director of the UPR High Performance Computing facility
1995-1997	:	Department of Chemistry, University of Cambridge, Visiting Scholar
1994	:	Department of Physics, University of Padova, Postdoctoral Research Associate
1993	:	Ph.D. Physical Chemistry – Department of Chemistry, Concordia University
1986	:	B.Sc. (Honors) in Chemistry – Université du Québec à Montréal

Awards and Scholarships

1996-1997	:	Postdoctoral Assistantship, *Engineering and Physical Sciences Research Council (UK)*
1994-1996	:	Postdoctoral scholarship, *Fonds pour la Formation de Chercheurs et l'Aide à la Recherche (Québec)*
1994	:	Prix d'Excellence de l'Académie des Grands Montréalais, Montréal, Canada
1994	:	Postdoctoral scholarship, *Consorzio Interuniversitario Nazionale per la Fisica della Materia (Italy)*
1987 – 1993	*:*	*Graduate scholarships (MS & PhD), Natural Sciences and Engineering Research Council of Canada (Canada)*
1987 – 1993	*:*	*Graduate scholarships (MS & PhD), Fonds pour la Formation de Chercheurs et l'Aide à la Recherche (Québec)*

Synergistic Activities

2003 – to date	:	Member, Information Technology Institutional Policy Development Committee, University of Puerto Rico – Central Administration
2002 – to date	:	Member, Internal Advisory Committee, RCMI Program, University of Puerto Rico – Medical Sciences campus
2002 – to date	:	Member, Steering Committee for the AmPath project, an international advanced connectivity project for research and education in Latin America, Florida International University
2002 – to date	:	Member, Steering Committee for Communications and Information Technology, PRIDCO, Government of Puerto Rico
2002 – to date	:	Member, pan-agency Advisory Board for Communications and Information Technology, Government of Puerto Rico
2002 – to date	:	Technology Advisor to the implementation committee for Computational Humanities program at the UPR-Río Piedras Campus
1998 – to date	:	Executive Liaison for Puerto Rico to the Internet2 International Community
1997 – to date	:	Technology Advisor to the Vice President of Research and Academic Affairs, University of Puerto Rico
1997 – to date	:	Founding Director of the High Performance Computing facility of the University of Puerto Rico. The HPCf presently has over 65 registered users in diverse fields of Science and Engineering.
1997 – to date	:	Mentorship of nineteen (19) undergraduate and graduate students in the fields of Computer Science, Electrical Engineering, Mathematics and Information Sciences
1997 – to date	:	Supervisor of eight (8) full-time employees in the fields of network engineering, programming, system administration and graphics design
1987 – 2000	:	Author and co-author of over 25 peer-reviewed papers in computational materials science and solid-state laser spectroscopy

Thesis and Postdoctoral Advisors

Dr. John A. Capobianco, Professor, Department of Chemistry, Concordia University, Montréal, Quebec, Canada
Dr. Marco Bettinelli, Department of Chemistry, University of Verona, Verona, Italy
Dr. Paolo Mazzoldi, Department of Physics, University of Padova, Padua, Italy
Dr. Stephen Elliott, Department of Chemistry, University of Cambridge, Cambridge, U.K.

Julio E. Ibarra
Director, AMPATH

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Miami, Florida 33199   www.ampath.fiu.edu

Professional Experience:
Julio E. Ibarra is Director of the Grants and Acquisitions Unit in the Florida International University Technology Services Division, where he holds responsibility for the strategic planning and development of advanced research networking infrastructure and services for the University.   He oversees the University's Internet and Internet2 services and the AmericasPATH (AMPATH) project.   Ibarra is the administrative and senior technical lead of Internet and Internet2 services for the University, and is responsible for the strategic planning and development of the regional GigaPOP.

Ibarra has been active in initiatives to advance networking and Internet technologies for the State of Florida. He served on the Governor's IT Florida Task Force subcommittee on Infrastructure and Technology Development, as a subject matter expert. He is co-author of the policy recommendation for the development of a Network Access Point (NAP) in South Florida to enhance the State's e-Commerce opportunities with Latin America. Mr. Ibarra is the founder and director of AMPATH: *a project to interconnect the research and education networks in South and Central America, the Caribbean and Mexico to Internet2 connected networks*. Ibarra has served as PI for AMPATH over the past two years, successfully securing in excess of $24M in active equipment and collocation space in the NAP of the Americas, and a significant donation of bandwidth (450 Mbps collectively) from Global Crossing to begin the AMPATH project.

Other appointments at Florida International University:
Director of Network Engineering and Telecommunications, 1998 - 2002
Associate Director, Department of Telecommunications, 1994 - 1998
Assistant Director, University Computer Services, 1989 - 1994
Systems Coordinator, University Computer Services, 1988 - 1989
Systems Coordinator, Academic Computer Services, 1984 - 1988
Scientific Programmer, Academic Computer Services, 1993 - 1994
Computer Programmer II, Academic Computer Services, 1982 - 1983

Education:
PhD. in MIS, Florida International University, in progress
M.S. in Computer Science, Florida International University, 1995
B.S. in Computer Science, Florida International University, 1983

Publications/Presentations:
International Committee for Future Accelerators (ICFA), Standing Committee on Inter-Regional Connectivity (SCIC), Digital Divide Executive Report, Digital Divide Working Group, February, 2003.
An Inter-Regional Grid-Enabled Center for Research and Educational Outreach at Florida International University; National Science Foundation grant proposal; January, 2003.
AMPATH Collaborative Research and Education Operational and Functional Support; Strategic Technologies for the Internet; National Science Foundation grant proposal; October, 2002.
AMPATH Project Status Report, GEANT Global Research Networking Summit, Brussels, Belgium, May 21-22, 2002.
AMPATH Project Status Report; First Int.l AMPATH Conference, Valdivia, Chile, April 10 -12, 2002.
AMPATH Presentation for the Joint Engineering Team, Supercomputing 2001, Denver, Colorado, November 15, 2001.
AmericasPATH Presentation to the Inter-American Development Bank, Washington D.C., March 9, 2001.
AmericasPATH Presentation to the Beacon Council, Miami, Florida, February 7, 2001.
AmericasPATH Presentation to the Internet2 Fall Members Meeting, Atlanta, Georgia, October 31, 2000.
Advanced Internet Connectivity in the Americas: AmericasPATH, RNP2 Meeting, Brazil, September 4, 2000.
AmericasPATH Presentation to CANARIE/Internet2/NLANR Joint Techs Conference, University of Toronto, Canada, August 20-24, 2000.
Gemini South / AMPATH Connection to Internet2 (Grant Proposal), National Science Foundation, Arlington, VA, June 23, 2000.
Advanced Internet Connectivity in the Americas Proposal, Miami, Florida and San Francisco, California, March 8-9, 2000.
Ibarra, Julio E. Ethernet Modeling--Simulation Tool;"Master of Science in Computer Science" Thesis (M.S.)--Florida International University, 1995.

Other Relevant Activities:
Technical Advisor for the .High Performance Connection for Florida International University,. NSF Grant Proposal 9876409

Graduate Advisor(s): David Barton and John Comfort

Curriculum Vitae
 Oscar Moreno

College: Natural Sciences, Mathematics Dept.
Academic Range: Professor
Highest Degree: Ph.D., Mathematics and Thesis in Mathematics and EE & Comp. Sciences, 1974 University of California at Berkeley

Publications:

A: Number of publications in refereed journals in the last 5 years: 34

B: Selected list of publications in the last 3 years:

1. (with D. Bollman and M.A. Aviñó), "Finite Dynamical Systems, Linear Automata, and Finite Fields", to appear Proceedings WSEAS International Conference on Applied Mathematics and Computer Science October 2002.
2. (With V. Leontiev), "On the Zeroes of Boolean Polynomials", in ZH Vychicsl. Mat. Fiz, No. 9, 1998.
3. (With Golomb, S.W. and Corrada, Carlos), "Extended Sonar Sequences", IEEE Transactions on Information Theory, Vol. 43, No. 6, November 1997, pp. 1999-2005.
4. (With Pedersen, JP and Polemi, D.), "An Improved Serre Bound for Elementary Abelian Extensions of Fq (x) and the Generalized Hamming Weights of Duals of BCH Codes", IEEE IT, Vol. 44, No. 3 May 1998, pp. 1291-1293.
5. (With Duursma, I.M. and Cherdieu JP and Edouard, A.), "Cyclic Subcodes of Generalized Reed-Muller Codes", IEEE IT, Vol. 44, No. 1, January 1998, pp. 307-311.
6. (With C. J. Moreno), "A padic Serre Bound", Finite Fields and their Applications, Vol. 4, No. 3, July 1998, pp. 201-217.

C: Additional 5 selected publications:

1. (With P. Vijay Kumar), "Poly phase Sequences with Periodic Correlation Properties better than Binary Sequences", IEEE IT Transactions, Vol. 37, No. 3, May 1991, pp. 603-616.
2. "Further Results on Quasiperfect Codes Related to the Goppa Codes", Congressus Numeration, Vol. 40, December 1983, Winnipeg Proceedings of Canada, pp 249-256 at the 14th S.E. Conference on Combinatrics, Graph Theory and Computing.
3. "On Primitive Elements of Trace=1 in GF (2m)", Discrete Mathematics, Vol. 41, No. 1, 1982, pp. 5356.
4. "Symmetries of Binary Goppa Codes", IEEE Trans. Inform. Theory, Vol. IT-25, No. 5, pp. 609-612, Sept. 1979.
5. (With E. Berlekamp), "Extended Double-Error Correcting Goppa Codes are Cyclic", IEEE Trans. Inform. Theory, 19 (1973), 817-818.

Presentations in Scientific Forums and Invited Lectures:

A: Presentations at national or international forums during the last 6 years:

1.   Number of invited: 16
2.   Number of Contributed: 27

B: Total presentations in the last 5 years: 43

C: Invited lectures at other institutions: 6

Special Distinctions (last 5 years)

1- Selected IEEE Fellow, January 1999.
2- Treasurer ACM Sig Group in Symbolic Computing
3- Member of the Editorial Board for the Designs, Codes and Cryptography Journal, Kluwer Academic Publisher.

4- Member of the Editorial Board for the Journal of Finite Fields and Applications (FFA), Academic Press.
5- EPSCoR SPA (Scholar Productivity Award) Prize of $5,000 each for 1988, 1989, 1990, 1992, 1993, 1994, 1998.
6- Visiting Professor: University of California at Berkeley, summer 1990. CUNY, academic year 1990-91.
7- Visiting Professor: University of Tunis (Ecole Superiore des Postes et Des Telecommunications de Tunis), May 1995.
8- Member of the International Advisory Committee of the IEEE International Symposium on Information Theory for 1988, 1986, 1985. Organizer of the Geometric Codes Section of Cornell IEEE Workshop in Information Theory.
9- Reviewer for National Science Foundation (NSF), Proposals and referee for several research journals.

Grants:
A. Total amount of grant funds received during the last 8 years: $5,373,706.
B. Grants approved in last 8 years:
1. "CISE MII: Infrastructure for a New Program in Computer Science at the University of Puerto Rico", National Science Foundation, PI, Oscar Moreno, Co-PI Jaime Seguel and Pedro Rivera, Award Number EIA-0080926, $1,499,999, August 2000-2005.
2. "Signal Pattern for Locating One or Multiple Targets", Office of Naval Research, $178,000, 1997-2000.
3. "Multimedia Transmission In Fiber- Optic Networks Using Optical CDMA", DEPSCoR, Office of Naval Research, $581,454, 1996-99, Grant Number N00014-96-1-1192.
4. "Infrastructure for Computer Science Research in Puerto Rico:, NSF CISE, $610,229 1994-00, Grant No. CDA-9417362.
5. "EPSCoR Research in Computational Mathematics" Intel Company, $816,200, 1993.
6. "EPSCoR II in the Area of Computational Mathematics and Computer Science", NSF, $828,000, 1993-95.
7. "Research in Goppa Codes in a Exponential Sums", National Security Agency, $26,572. 1991-10\994.
8. Subcontract of the Cornell University (Graduate Support in Symbolic and Stochastic Methods) Proposal to the Army Research Office. $130,949, 1993-1996.
9. Subcontract of the Cornell University MSI (Mathematical Science Institute) Proposal to the Army Research Office, $300,000, 1990-95.

Students Supervised and Thesis Work
1- Number of students whose thesis have been successfully supervised in the last 5 years: 4M.S 5 Graduate Non-thesis Research
2- Number of undergraduate research students supervised during the last 5 years: 11.
3- Post-graduate research associates/fellows: 2 last 3 years, now. 4.

E. BIOGRAPHICAL SKETCHES

George E. O'Brien   **Florida International University (FIU)**
Associate Professor of Science Education   ZEB 255B College of Education
Department of Curriculum and Instruction   University Park, Miami, FL 33199
(305) 348-2599   obrieng@fiu.edu

George E. O'Brien earned his Ph.D. in Science Education from The University of Iowa in 1985. He spent the next three years at the University of Pittsburgh as an Assistant Professor, heading the secondary science education program and researching technology applications in science teacher preparation. During the past 14-years, while at FIU, he has worked with colleagues to integrate mathematics, science, and technology in courses and programs; taught and researched issues in interdisciplinary studies; and studied constructivist-based instruction and learning. O'Brien has authored or co-authored over 50 published manuscripts, and he has presented at over100 international, national, and state conferences/meetings. O'Brien has reviewed papers for many professional publications and conferences including: AERA, NARST, AETS, SSMA, and NSTA. He has teamed with colleagues McClintock, Jiang, and others as PI and Co-PI for grant projects funded for $5.8 million during the past nine years. O'Brien was chairperson of the Elementary Education Department (1993-1998), and he is currently working with faculty from the Departments of Physics, Chemistry, Environmental Studies, Biology, and Mathematics in several funded and non-funded projects.

Professional Preparation

B.S.   Univ. of Massachusetts-Lowell   1974 Biological Sciences; minor in chemistry
M.A.   Columbia University   1979 International Education (Curriculum Development)
Ph.D. The University of Iowa   1985 Science Education

Appointments

1993-Present   Florida International University, associate professor of science education
1988-1993   Florida International University, assistant professor of science education
1985-1988   University of Pittsburgh, assistant professor of science education
1981-1985   The University of Iowa, graduate assistant, coordinator of secondary student science research program
1980-1981   Lawrence, MA, Public Schools, science teacher
1979-1980   Tampa, FL, middle school and high school, science chairperson and teacher
1978   Frankfort, IL education consultant
1975-1977   Francistown, Botswana, high school, science chairperson and teacher, U.S. Peace Corps
1975   Belo Horizonte, Brazil, Escola Americana, science student teacher

Publications

Jiang, Z., O'Brien, G., & McClintock, E. (2002, February). The mathematical modeling experience of pre-service
     teachers. Northwest NOVA Cyber-Conference, [paper online] http://nova.georgefox.edu/nwcc/arpapers/fiu.html
Alacaci, C., O'Brien, G. E., Lewis, S. L., & Jiang, Z. (2002, in press). Integrating mathematics and science in a pre-
     service elementary teacher education program. In S. McGraw (Ed.). Integrated mathematics: Choices and
      challenges. Reston, VA: National Council of Teachers of Mathematics.
O'Brien, G. E., Jiang, Z., Moseley, B., Alacaci, C., Lewis, S., McClintock, E., Park, D., & Chebbi, T. (2002, Spring).
     "What makes it go?" A look at the design and implementation of an interdisciplinary mathematics and science
     workshop for in-service and pre-service elementary teachers. Journal for the Art of Teaching, 9(1), 85-97.
Lewis, S. P., Alacaci, C., O'Brien, G. E., & Jiang, Z. (2002). Pre-service elementary teachers' use of mathematics in a
     project-based science approach. School Science and Mathematics, 102(4), 172-179.
Jiang, Z., O'Brien, G., & McClintock, E. (2000, July). Modeling in mathematics and science. An Internet-based,
     interdisciplinary course for secondary school students. Proceedings from the July 2000 Hong Kong International
     Conference on Geo-Spatial Education, 69-75.
Peters, J. M., O'Brien, G. E., Briscoe, C., & Korth, W. W. (1995). A long-term assessment of an integrated
     microcomputer component for pre-service secondary science teachers. Journal of Computers in Mathematics and
     Science Teaching, 14(4), 499-520.
O'Brien, G. E. (1991). Some recommended ways for including multicultural education in a pre-service science
     methods course. Science Education International, 2(1), 25-26.
O'Brien, G. E., & Korth, W. W. (1991). Videotaping: A tool for enhancing the teacher's understanding of cognitive

science and teacher self-development. <u>Journal of Science Teacher Education</u>, <u>2</u>, 90-93.

E. BIOGRAPHICAL SKETCHES

Soto, P. M., Parker, J. H., & O'Brien, G. E. (1997). Our forest, their forest – A project which stimulates long-term learning and community action, in Totten, S., & Pedersen, J. E. (Eds.). <u>Social issues and service at the middle level.</u> Boston, MA: Allyn and Bacon, 319-339.

Briscoe, C., Peters, J. M., & O'Brien, G. E. (1993). An elementary science program emphasizing teacher's pedagogical knowledge within a constructivist epistemologic rubric, Chapter 1 in Rubba, P. A., Campbell, L. M., & Dana, T. M. (Eds.). <u>1993 AETS yearbook: Excellence in educating teachers of science</u>, Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education, 1-20.

Synergistic Activities

Co-Founder and Co-Director of the Partnership in Academic Communities (PAC), co-sponsored FIU-MDCPS SMET project for grade 7-12 at-risk children in Miami-Dade County and Teacher Preparation at FIU (1994-present).

Workshop facilitator, Steering Committee, Writing Resource Team, and Planning and Implementation Committee member for Florida
   Mathematics and Science Professional Development Project (2000-present).

Served with international delegation for State of Qatar human resources strategy: UNESCO mission (1997-1998). Primary author
   of 1998 five volume Technical Support Services (TSS-1) Report, UNESCO (English and Arabic versions), Beirut, Lebanon.

Coordinator, NSF-funded "Community of Scholars" Project: supported teacher in-service and enhancement projects in
   fifteen participating school districts in Western Pennsylvania. The project sponsored by the University of Pittsburgh was led by
   "master" teachers (K-12) and university professors in the disciplines of mathematics, science, and math education with an
   emphasis on study of hands-on investigative and inquiry-based models of instructional practice. The thrust of the activities was
   to build a network of collaborative institutions that fostered development of teacher enhancement and local teacher professional
   organizations (1986-1988).

Recipient of NSTA-Gustav Ohaus Award for Innovations in College Science Teaching for paper titled "A model for
   integrating microcomputers into secondary science teacher preparation programs," 1988.

Professional Association Affiliations

   The Association for the Education of Teachers in Science (AETS)
   National Science Teachers Association (NSTA)
   School Science and Mathematics Association (SSMA)
   National Association for Research in Science Teaching (NARST)
   NASA Opportunities for Visionary Academics (NOVA)
   Florida Higher Education Consortium in Mathematics & Science (HEC)

Recently Funded Research (Co-PI of Projects)

(With Drs. McClintock and Jiang) "Mathematics Science Professional Development II," funded by Florida Legislature,
   June 2002-June 2003, $326,000.

(With Drs. McClintock, Lewis, Alacaci, Moseley and Jiang) "Mathematics Science Professional Development I,"
   funded by Florida Legislature, October 2000-June 2002, $378,340.

(With Drs. McClintock and Jiang) "ACEE/HEC Miami-Dade region VI Center," funded (4 years) FL DOE, September 1998-
   September 2002), $285,000 per year.

(With Drs. McClintock and Jiang) "Building Summer Bridges in Mathematics and Technology for Middle School Summer
   Programs," funded by the Florida Legislature, April-June 2002, $10,000.

(With Drs. Jiang, McClintock, C. Mendez, and others) "Promoting Equity in Preparing Secondary Teachers in Mathematics,
   Science, and Technology" NASA PEP-STMST Project, funded by NASA, August 2002 – August 2005 $200,000 per year.

(With Drs. McClintock, Aladro, Graves, and Jiang) "An Inquiry-based Interdisciplinary Course for Pre-service Secondary
   Mathematics and Science Teachers," funded by NASA NOVA May 2000 – June 2002, $30,000.

Biographical Sketches of Dr. Shu-Ching Chen

Education:

B.M.	Traffic & Transportation Engineering & Management	Feng-Chia University, Taiwan, R.O.C.	June 1986
M.S.	Computer Sciences	Purdue University, West Lafayette	Aug. 1992
MSEE	Electrical Engineering	Purdue University, West Lafayette	May 1995
MSCE	Civil Engineering	Purdue University, West Lafayette	Aug. 1996
Ph.D.	Electrical & Computer Engineering	Purdue University, West Lafayette	Dec. 1998

Professional Experience:

08/99-present	Assistant Professor, School of Computer Science, Florida International University (The State University of Florida at Miami)
10/01-present	Director, Distributed Multimedia Information System Laboratory School of Computer Science (SCS), Florida International University (FIU)
08/02-present	Associate Director, The Center for Advanced Distributed System Engineering, SCS, FIU
10/98-07/99	R&D Software Engineer, Micro Data Base Systems Inc., IN, USA.
06/96-10/98	Research Assistant, Center for Environmental and Regulatory Information Systems, Purdue University
11/88-07/90	System Engineer, United World Chinese Commercial Bank, Taiwan

Five Related Publications:

1. Shu-Ching Chen and R. L. Kashyap, "A Spatio-Temporal Semantic Model for Multimedia Presentations and Multimedia Database Systems," *IEEE Trans. on Knowledge and Data Engineering*, vol. 13, no. 4, pp. 607-622, July/August, 2001.

2. Shu-Ching Chen, R. L. Kashyap, and A. Ghafoor. *Semantic Models for Multimedia Database Searching and Browsing*, Kluwer Academic Publishers, September, 2000.

3. Keqi Zhang, Shu-Ching Chen, Dean Whitman, Mei-Ling Shyu, Jianhua Yan and Chengcui Zhang, "A Progressive Morphological Filter for Removing Non-Ground Measurements from Airborne LIDAR Data," *IEEE Trans. on Geoscience and Remote Sensing*, in press.

4. Mei-Ling Shyu, Shu-Ching Chen, and R. L. Kashyap, "Generalized Affinity-Based Association Rule Mining for Multimedia Database Queries," *Knowledge and Information Systems (KAIS): An International Journal*, Vol 3, No. 3, pp. 319-337, August 2001.

5. Shu-Ching Chen, Mei-Ling Shyu, Chengcui Zhang, and Jeff Strickrott, "A Multimedia Data Mining Framework: Mining Information from Traffic Video Sequences," *Journal of Intelligent Information System*, Special Issue on Multimedia Data Mining, vol. 19, no. 1, pp. 61-77, July 2002.

Five Other Publications:

1. Shu-Ching Chen, Mei-Ling Shyu, Chengcui Zhang, and R. L. Kashyap, "Identifying Overlapped Objects for Video Indexing and Modeling in Multimedia Database Systems," *International Journal on Artificial Intelligence Tools*, vol. 10, no. 4, pp. 715-734, December 2001.

2. Shu-Ching Chen, Mei-Ling Shyu, and R. L. Kashyap, "Augmented Transition Network as a Semantic Model for Video Data," *International Journal of Networking and Information Systems, Special Issue on Video Data*, vol. 3, no. 1, pp. 9-25, 2000.

3. Sheng-Tun Li, Shu-Ching Chen, and Mei-Ling Shyu, "A Snapshot Browsing Model for Web-based Surveillance System in Heterogeneous Computing Environment," accepted for publication, *Journal of Applied Systems Studies*, Special Issue on Distributed Multimedia Systems with Applications, vol. 2, no. 3.

4. Mei-Ling Shyu, Choochart Haruechaiyasak, Shu-Ching Chen, "Category Cluster Discovery from Distributed WWW Directories," accepted for publication, *Journal of Information Sciences*, special issue on Knowledge Discovery from Distributed Information Sources.

5. Choochart Haruechaiyasak, Mei-Ling Shyu, Shu-Ching Chen, "Identifying Topics for Web Documents through Fuzzy Association Learning," *International Journal of Computational Intelligence and Applications (IJCIA)*, Special Issue on Internet-Based Intelligent Systems, vol. 2, no. 3, pp. 277-285, September 2002.

Research and Education Activities:

- **Teaching Activities:** Taught four courses at FIU; Database Management, Distributed Computing, Expert Systems, Advanced Topics in Information Processing, and Advanced Topics in Concurrent and Distributed Systems .

- **Research Activities:** Research interests are multi-disciplinary and include distributed multimedia database systems, wireless communications, multimedia communications and networking, data mining, and intelligent transportation systems (ITS). Authored and co-authored more than 80 papers in refereed journals and conference proceedings such as IEEE Trans. on Knowledge and Data Engineering, Knowledge and Information Systems (KAIS), IEEE Trans. on Geoscience and Remote Sensing, IEEE International Conference on Data Engineering (ICDE), IEEE International Conference on Multimedia and Expo (ICME), ACM Multimedia Conference, ACM Workshop on Multimedia Data Mining (ACM MDM/KDD), IEEE International Conference on Tools with Artificial Intelligence (ICTAI), International Conference On Very Large Data Bases (VLDB), ACM International Conference on Information and Knowledge Management (CIKM), IEEE International Computer Software and Applications Conference (COMPSAC), and ACM GIS Conference.

- **Recent Professional Activities**

  - *Steering Committee:* 3rd International Conference on Information Reuse and Integration (IRI'2001).
  - *General Co-Chair:* IEEE 2003 International Conference on Information Reuse and Integration.
  - *PC Co-Chair:* The International Conference on Distributed Multimedia Systems (DMS'2003).
  - *PC Co-Chair:* The 10th ACM International Symposium on Advances in Geographic Information Systems (ACM GIS 2000).
  - *PC Co-Chair:* 2nd International Conference on Information Reuse and Integration (IRI'2000).
  - *PC Co-Chair:* The International Symposium on Information Systems and Engineering.
  - *Panelist:* IRI'99, IRI'01.
  - *Program Committee:* The Second International Workshop on Software Engineering and Multimedia Applications (SEMA2000), The International Conference on Distributed Multimedia Systems (DMS'2001 and DMS'2002), 3rd International Conference on Information Reuse and Integration (IRI'2001), First International Workshop on Web Geographical Information Systems (WGIS 2001).
  - *Session Chair*, CAINE-99, IEEE SMC2000, ISE02.
  - *Reviewer*, IEEE TKDE, IEEE Trans. on Computer, IEEE Transactions On Parallel and Distributed Systems, Journal, Information Sciences, Journal of Applied Systems Studies, The International Journal of Distance Education Technologies, IEEE ICTAI, Knowledge and Information System Journal, IFIP WCC, IEEE COMPSAC.
  - *Tutorial*, IRI-01 and ISE02.

List of Collaborators:
All the names in the publications.
Srinivas Peeta, Keqi Zhang, Kamal Premaratne, Peter Bauer, Borko Furht

Ph.D. Thesis Advisor:
R. L. Kashyap (IEEE Fellow), Purdue University

Thesis advisor and Postgraduate-Scholar Sponsor:
8 Master students graduated with theses; 26 M.Sc. Thesis Committee Membership; Currently supervising 9 Ph.D. and 7 M.S. students with theses;

UNIVERSITY OF FLORIDA

Institute for High Energy Physics and Astrophysics (IHEPA)
Department of Physics

P.O. Box 118440
Gainesville, Florida 32611-8440
(352) 392-9264
Fax (352) 392-8863

Feb. 9, 2003

Heidi Alvarez
Co-Principal Investigator, AMPATH
Florida International University
Miami, Florida

Dear Heidi,

I am very pleased to write this letter in support of your proposal to create the "Center for Internet Augmented Research and Assessment (CIARA)" at Florida International University and the University of Puerto Rico.

In my opinion, CIARA offers a unique model for speeding the integration of advanced information technologies (IT) with multidisciplinary collaborative and individual research. Your focus on discipline-based fellowships for graduate students offers the right incentives, and the provision of an IT-rich environment that fosters contact between students in many fields should accelerate the adoption of powerful enabling technologies by participating disciplines at these institutions.
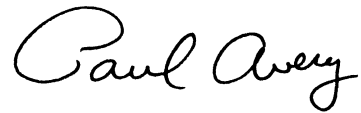
As you know, I direct two national Grid projects, GriPhyN and the International Virtual Data Grid Laboratory (iVDGL), both of which are deeply involved in the development and deployment of Grid infrastructure for four frontier experiments in high-energy physics, gravitational wave research and full-sky digital astronomy. I see several areas where our projects could collaborate. We have many experts in GriPhyN/iVDGL who are developing and packaging a wide range of Grid technologies and who could contribute lectures and work with your center through collaborative joint projects, documentation, packaging, etc. In return, CIARA participants at FIU and UPR could provide valuable feedback on our Grid tool packaging, and help us extend these tools to new scientific fields, by participating in our WorldGrid effort.

Another area of fruitful collaboration lies in education and outreach, where your emphasis on minority serving schools blends well with our GriPhyN/iVDGL outreach program, which also has a significant minority serving component. In fact, the potential for E/O collaboration is particularly promising since both of our outreach efforts are based on information technologies and could be extended to new target audiences.

The CIARA model has the potential to be successful in a variety of institutional situations, so it is important that this initial implementation be done right. Your tremendous leadership along with others at FIU in developing the AMPATH network and other programs to reach minority students and underserved regions give me every confidence that you will drive the project to success.

Sincerely,

Paul Avery

Paul Avery
Professor of Physics
Director, GriPhyN and iVDGL

FIU

FLORIDA INTERNATIONAL UNIVERSITY
Miami's public research university

February 6, 2003

Gautam Sen, Ph.D.
Professor of Earth Sciences
Director, Florida Center for Analytical Electron Microscopy (FCAEM)
Florida International University
11200 SW 8th St ; PC 314A
Miami, FL 33199

Subject: CIARA NSF Medium Information Technology Research Program

Dear Heidi,

I am delighted to write this letter of support for the CIARA ("The Center for Internet Augmented Research and Assessment") proposal that you (and O'Brien et al.) plan to submit to NSF. FCAEM is a Florida wide Center that was created with NSF-MRI support and houses two "high tech" instruments, namely, a 5-WDS Electron probe and a SEM-LV. Our instruments are highly versatile and used by material scientists, chemists, biologists, physicists, geologists and others. You are perhaps aware that FCAEM's plan is to extend its access to users outside of Miami via the Internet. As of today, University of South Florida's faculty and students run our microprobe via the I-2. However, our long-term plan is now on hold because of the lack of resources. Graduate student support is particularly lacking, and needless to say that no lab can run without some high caliber graduate students. Your proposal to NSF, if funded, will provide a very needed and timely resource to further Internet technology research in a multi-disciplinary environment by making available graduate student fellowships to many different domains throughout both FIU and UPR. I appreciate the fact that CIARA will act as a catalyst to institutionalize next generation Internet application development.

I wholeheartedly endorse your proposal and my graduate students will be happy to respond to the CIARA Board request to participate in CIARA. Furthermore, I am willing to serve on the faculty board of review and be a Faculty Associate of this center. Best of luck with your proposal!

Sincerely,

Gautam Sen

FIU

February 7, 2003

Heidi L. Alvarez
Associate Director
University Technology Services
Florida International University
University Park
11200 SW 8th St, PC 307
Miami, FL 33199

Subject: CIARA NSF Medium Information Technology Research Program

Dear Heidi:

The Center for Internet Augmented Research and Assessment (CIARA) that you propose along with your Co-Principal Investigators George O'Brien, Julio Ibarra, Guy Cormier and Oscar Moreno will provide a very needed resource to further Internet technology research in a multi-disciplinary environment by making available graduate student fellowships to many different domains throughout both FIU and UPR. CIARA will act as a catalyst to institutionalize next generation Internet application development.

I strongly support this proposal and intent to encourage my graduate students to respond to the CIARA board request for proposal process to participate in CIARA. Furthermore I am willing to serve on the faculty board of review and be a Faculty Associate of this center.

Sincerely,

Fernando Gonzalez-Reigosa
Director
Madrid Center

CALIFORNIA INSTITUTE OF TECHNOLOGY
CHARLES C. LAURITSEN LABORATORY OF HIGH ENERGY PHYSICS
PASADENA, CA 91125

February 8, 2003

Heidi Alvarez
Co-Principal Investigator
AMPATH
Florida International University
Miami, Florida

Re: NSF ITR: CIARA Interdisciplinary Program

Dear Heidi,

I am pleased to provide this letter in support of your proposal to establish an ITR Center for Internet Augmented Research and Assessment (CIARA), working with your Co-Principal Investigators George O'Brien (FIU COE), Julio Ibarra (FIU AMPATH), Guy Cormier (UPR HPCF) and Oscar Moreno (UPR CS). CIARA will be an important multidisciplinary resource that further both education and advanced Internet technology research, by making graduate student fellowships available in many fields at both FIU and UPR. By bringing students together with experts in physics, astronomy, networks and Grid-related technologies, for focused individual and collaborative projects, CIARA will act as a catalyst that will spark and help disseminate widely next generation Internet application development.

The involvement of students directly in leading edge developments and the use of a diverse set of current technologies, is particularly important since the students will gain first-hand knowledge and insight into the vital process that takes up rapidly from one knowledge generation (of concepts and technologies) to the next. This process is even more effective, we have found, when the technical goals are intertwined with a mission in basic science or computer science. One example with which I am familiar is particle physics, where we are involved in the exploration for new interactions and/or new constituents of matter at the high energy frontier.

In working with both you and Julio Ibarra in recent years, I have greatly appreciated the depth of your commitment, both to developing and maintaining relationships within the High Energy Physics, Astrophysics and Advanced Networking research communities. Your active role in bringing together the Internet2 HENP working group with the AMPATH/Internet2 Astronomy Working Group at the Miami Workshop last month is an excellent example of both vision and practice, and your ability to create synergies among scientists, technologists and educators on a national and international, as well as a regional scale. This will ensure your success with CIARA.

Graduate students at both FIU and UPR will reap substantial benefits by participating in application-specific inquiry based projects using existing and emerging research concepts and systems, some of which have been developed by our teams in the Particle Physics Data Grid,

FAST TCP, VRVS and other projects that I lead. As PI of CIARA, you will be able to make available, with our help. I and my research group of physicists, computer scientists, software and network engineers, are ready to contribute to CIARA seminars, both in person and through VRVS videoconferencing.

We expect the CIARA model of be of considerable value to minority serving research institutions in California in the future. Setting up CIARA at Florida International University is the right first step, that will maximize the chance that the project will have a substantial, broad impact in the future.

Sincerely,

Harvey B. Newman
Professor of Physics
Chair, Caltech Committee on Exchange
   Programs and Study Abroad
PI: PPDG, LHCNet and VRVS Projects
Chair, ICFA Standing Committee on
   Inter-regional Connectivity

February 10, 2003

Ms Heidi Alvarez
University Technical Services
Florida International University
11200 SW 8th St
Miami, FL 33199

Subject: CIARA NSF Medium Information Technology Research Program

Dear Heidi,

The Center for Internet Augmented Research and Assessment (CIARA) that you propose along with your Co-Principal Investigators George O'Brien, Julio Ibarra, Guy Cormier and Oscar Moreno will provide a very needed resource to further Internet technology research in a multi-disciplinary environment by making available graduate student fellowships to many different domains throughout both FIU and UPR. CIARA will act as a catalyst to institutionalize next generation Internet application development.
I strongly support this proposal and intent to encourage my graduate students to respond to the CIARA board request for proposal process to participate in CIARA.
Furthermore I am willing to serve on the faculty board of review and be a Faculty Associate of this center.

Sincerely,

==
Prof Ronald M. Lee
Ryder Eminent Scholar of Decision Sciences and Information Systems
College of Business, RB354B
Florida International University
11200 SW 8th Street
Miami, Florida 33199 USA
email: R.Lee@FIU.EDU
secretary (FIU): +1.305.348-6843

February 10, 2003

Subject: CIARA NSF Medium Information Technology Research Program

Dear Heidi,

I would like to offer you this letter of support for the medium ITR Center for Internet Augmented Research and Assessment (CIARA). This is both a timely and innovative approach to insure that the next generation of scientists will have first hand information technology research experience to leap-frog discovery in their chosen field. CIARA is the essential vehicle to help FIU and UPR develop a nexus of next generation Internet application development. This proposal builds synergistically on our proposed Inter-regional Grid-Enabled Center for High-Energy Physics Research and Education Outreach (CHEPREO). CHEPREO utilizes Internet and grid-based resources in support of physics research for the CMS experiment at the CERN laboratory along with significant education and outreach activities. CIARA will provide a natural extension for our CHEPREO efforts.

In addition to supporting the ITR CIARA I would be honored to serve on the faculty board of review and be a Faculty Associate of this center.

Sincerely,

Laird Kramer
Associate Professor of Physics

Department of Physics
College of Arts and Sciences
University Park, Miami, FL 33199 • Tel: 305-348-2605 • Fax: 305-348-6700 • www.fiu.edu/physics
Florida International University is an Equal Opportunity/Access Employer and Institution • TDD via FRS 1-800-955-8771

FIU

February 6, 2003

S. K. Saxena,
Director, Center for the Study of Matter at Extreme Conditions
Florida International University
11200 SW 8th St <your room>
Miami, FL 33199

Subject: CIARA NSF Medium Information Technology Research Program

Dear Heidi,

I am pleased to see your proposal on creating the Center for Internet Augmented Research and Assessment (CIARA) in collaboration with your Co-Principal Investigators George O'Brien, Julio Ibarra, Guy Cormier and Oscar Moreno. As you know, I have always appreciated your efforts in providing a very needed resource to further Internet technology research in a multi-disciplinary environment. The availability of graduate student fellowships in many different fields throughout both FIU and UPR will be a great help in institutionalizing next generation Internet application development.
I strongly support this proposal and will encourage my graduate students to respond to the CIARA board request for proposals to participate in CIARA.
Furthermore I will be happy to serve on the faculty board of review and be a Faculty Associate of this center.

Surendra K. Saxena

February 10, 2003

Subject: CIARA NSF Medium Information Technology Research Program

Dear Heidi,

The Center for Internet Augmented Research and Assessment (CIARA) that you propose along with your Co-Principal Investigators George O'Brien, Julio Ibarra, Guy Cormier and Oscar Moreno will provide a very needed resource to further Internet technology research in a multi-disciplinary environment by making available graduate student fellowships to many disciplines throughout both FIU and UPR. CIARA will act as a catalyst to institutionalize next generation Internet application development.

I strongly support this proposal and intent to encourage my faculty and graduate students in the School of Computer Science to respond to the CIARA board request for proposal process to participate in CIARA.

Sincerely yours,

Yi Deng, Ph.D, Director
School of Computer Science
Florida International University
University Park
Miami, FL 33199

February 7, 2003

Hugh. E. Willoughby
Research Professor
International Hurricane Center
Florida International University
University Park, MARC 360
Miami, FL 33199

Subject: CIARA NSF Medium Information Technology Research Program

Dear Heidi,

The Center for Internet Augmented Research and Assessment (CIARA) that you, along with your Co-Principal Investigators George O'Brien, Julio Ibarra, Guy Cormier and Oscar Moreno, propose will prove to be an invaluable resource to FIU and UPR. It will advance multi-disciplinary Internet technology research. The graduate student fellowships across a range of disciplines will advance next-generation Internet application development and facilitate implementations in fields in which the Internet is not yet exploited fully.

I strongly support this proposal and will encourage my graduate students to respond to the CIARA board request for proposals. I would be pleased to serve on the faculty board of review and be a CIARA Faculty Associate.

Warm Regards,

Hugh E. Willoughby

February 10, 2003

David W. Lee
Professor
Florida International University
11200 SW 8th St., HLS-218aiami, FL 33199

Subject: CIARA NSF Medium Information Technology Research Program

Dear Heidi,

The Center for Internet Augmented Research and Assessment (CIARA) that you propose along with your Co-Principal Investigators George O'Brien, Julio Ibarra, Guy Cormier and Oscar Moreno will provide a very needed resource to further Internet technology research in a multi-disciplinary environment by making available graduate student fellowships to many different domains throughout both FIU and UPR. CIARA will act as a catalyst to institutionalize next generation Internet application development.

I strongly support this proposal and intent to encourage my graduate students to respond to the CIARA board request for proposal process to participate in CIARA.

Furthermore I am willing to serve on the faculty board of review and be a Faculty Associate of this center.

February 9, 2003

Subject: CIARA NSF Medium Information Technology Research Program

Dear Heidi,

I reviewed the ITR proposal for the Center for Internet Augmented Research and Assessment (CIARA). The CIARA program would provide a great service to our department's medium term and long-term objectives. As you know we have a new Master's Degree program emphasizing Information Systems (IS). We are also about to launch a new Ph.D. program in our department focused on Enterprise Systems. The CIARA Center will provide excellent opportunities for our graduate students in these two programs to do cross-disciplinary research, introduce them to the latest technological developments, and further enhance their studies. As the advisor to the IS students I will encourage them to participate in CIARA. I am also willing to serve on the faculty board of review and be a Faculty Associate of this center. I believe FIU needs programs like this to continue to grow our graduate programs in both quantity and quality.

Regards,

Ronald Giachetti
Assistant Professor and Coordinator Information Systems Track
Department of Industrial & Systems Engineering
Florida International University
10555 W. Flagler Street
Miami, FL 33199

February 10, 2003

Dr. Heidi Alvarez
Associate Director
University Technology Services
Florida International University
11200 SW 8th Street PC307
Miami, FL 33199

Dear Dr. Alvarez:

The Office of the Dean of Graduate Studies and Research at the Río Piedras Campus of the University of Puerto Rico fully endorses the partnership between Florida International University and our campus in their intention to submit an IT proposal to the National Science Foundation for the creation of a Center for Internet Augmented Research and Assessment. The objectives of the proposal to expose our faculty and graduate students to the extensive and existent knowledge on computational and network IT innovations will allow them to take full advantage of this knowledge to foster and expand their research, creative, and professional work.

This Office will commit the equivalent of two Research Assistantships as matching funds ($27,072) for this project and will collaborate fully with PIs and the Dean of Natural Sciences in our campus toward the successful implementation and institutionalization of this initiative.

The establishment of two distributed and partnering CIARA centers in the two largest, minority-serving institutions in USA will significantly contribute to create a new cadre of IT professionals in different disciplines with a solid foundation both in the discipline and IT that will continue to foster cross-disciplinary research and creative work beyond the academic environment. This initiative then has a tremendous potential to develop entrepreneurship skills among our faculty and graduate students, and to advance Puerto Rico economic development.

Decanato de
Estudios Graduados
e Investigación

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00931-1790

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        4943, 3617
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Correo electrónico:
correo@degi.upr.clu.edu

Página electrónica:
http://degi.upr.clu.edu

Looking forward to collaborative and successful partnership between our institutions,

Cordially,

Ana R. Guadalupe, Ph.D.
Dean of Graduate Studies and Research

AG-nic-heidialvarezfiuguy

February 10, 2003

Dr. Heidi Alvarez
Associate Director
University Technology Services
Florida International University
11200 SW 8th Street PC307
Miami, FL 33199

Dear Dr. Alvarez:

As Chancellor of the Río Piedras Campus of the University of Puerto Rico, I fully endorse a partnership between this campus and Florida International University to submit an Information Technology (IT) proposal to the National Science Foundation for the creation of a Center for Internet Augmented Research and Assessment (CIARA). As stated in the proposal objectives, faculty and graduate students of all disciplines need to become fully aware and knowledgeable about computational and network IT innovations to effectively apply them and expand their research, educational and creative work. In addition, a long tradition of undergraduate students collaborating in research with faculty and graduate students in our campus, allows us to consider that this student population will also greatly benefit from this initiative.

Our Campus's commitment is expressed by our dedication to this initiative of matching funds (10%) in the form of two Research Assistantships provided by the Dean of Graduate Studies and Research for a total amount of $27,072 including a tuition waiver. The Faculty of Natural Sciences also agrees to provide in-kind matching through full access to its existing Computer Center and a new computer laboratory, which is currently in the construction bid process. The cost of the new laboratory is approximately $40,000. Overall, the total amount of matching funds will be $67,072.

I strongly believe that the establishment of two distributed and partnering CIARA centers in the two largest, minority-serving institutions in USA will broaden and enhance knowledge about IT and its potential applications. This expanded knowledge should foster cross-disciplinary research and faculty outreach, improve IT literacy among our under-represented groups and will improve the overall campus climate at our institutions.

Looking forward to a successful proposal and a long-term collaboration between our institutions,

Cordially,

Gladys Escalona de Motta, Ph.D.
Chancellor

AG-nic-heidialvarezfiurectora

FIU

February 10, 2003

Subbarao V. Wunnava, Ph.D.,P.E.,
Professor and Consulting Engineer,
Electrical & Computer Engineering; Room EAS 3912
Florida International University
10555 W.Flagler Street, Miami, FL 33174
(305) 348 2807/3018; Fax (305) 348 3707; subbarao@fiu.edu
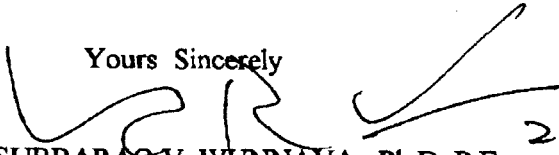
Subject: CIARA NSF Medium Information Technology Research Program

Dear Heidi:

Thank you for briefing me on the CIARA project and the associated objectives. The project is very informative and interesting, and in institution like our FIU should be getting involved. The Center for Internet Augmented Research and Assessment (CIARA) that you propose along with your Co-Principal Investigators George O'Brien, Julio Ibarra, Guy Cormier and Oscar Moreno will provide a very needed resource to further Internet technology research. I perceive this to be a truly multi-disciplinary activity. I also believe that this project would provide graduate student fellowships to many different domains including our department of Electrical and Computer Engineering. This will provide much needed exposure to the student community and the faculty at large. CIARA will act as a catalyst to institutionalize next generation Internet application development, especially dealing with interactive multimedia and the security.

I strongly support this proposal and intent to encourage my graduate students to respond to the CIARA board request for proposal process to participate in CIARA. Also, it will be my pleasure to to serve on the faculty board of review and be a Faculty Associate of this center. If you need further information, please feel free to contact me at (305) 348 2807.

Yours Sincerely

SUBBARAO V. WUNNAVA, Ph.D.,P.E   2/10/2003
Professor and Consulting Engineer

FIU

February 10, 2003

Dr. James R. Webb
Director, SARA Observatory
Associate Professor of Physics
Florida International University
11200 SW 8th St   CP 222
Miami, FL 33199

Subject: CIARA NSF Medium Information Technology Research Program

Dear Heidi,

The Center for Internet Augmented Research and Assessment (CIARA) that you propose along with your Co-Principal Investigators George O'Brien, Julio Ibarra, Guy Cormier and Oscar Moreno will provide a very needed resource to further Internet technology research in a multi-disciplinary environment by making available graduate student fellowships to many different domains throughout both FIU and UPR. CIARA will act as a catalyst to institutionalize next generation Internet application development.
I strongly support this proposal and intend to encourage my graduate students to respond to the CIARA board request for proposal process to participate in CIARA.
Furthermore I am willing to serve on the faculty board of review and be a Faculty Associate of this center.

February 10, 2003

Shu-Ching Chen, Ph.D.
Associate Director
The Center for Advanced Distributed System Engineering
Florida International University
11200 SW 8th St, ECS 362
Miami, FL 33199

Subject: CIARA NSF Medium Information Technology Research Program

Dear Heidi,

The Center for Internet Augmented Research and Assessment (CIARA) that you propose along with your Co-Principal Investigators George O'Brien, Julio Ibarra, Guy Cormier and Oscar Moreno will provide a very needed resource to further Internet technology research in a multi-disciplinary environment by making available graduate student fellowships to many different domains throughout both FIU and UPR. CIARA will act as a catalyst to institutionalize next generation Internet application development.

As a FIU School of Computer Science faculty member, I can see that the CIARA model will help CS educators have a much stronger and systematic impact on graduate students and their faculty advisors in all domains. I am personally very interested in developing multi-disciplinary collaborations that will utilize information technology research developed by some of the NSF premier ITR programs such as in grid computing and advanced networking.

I strongly support this proposal and intent to encourage my graduate students to respond to the CIARA board request for proposal process to participate in CIARA.
Furthermore I am willing to serve on the faculty board of review and be a Faculty Associate of this center.

Sincerely yours,

Shu-Ching Chen

11 February 2003

Heidi Alvarez
University Technology Services
Florida International University
Miami, FL 33199

Dear Dr. Shearer:

As the Lead Principal Investigator on our Florida Coastal Everglades Long Term Ecological
Research (FCE LTER) program, I was excited to hear of your proposal for a Center for Internet
Augmented Research and Assessment (CIARA) based here at FIU. Your proposed center will
will provide a very needed resource to further Internet technology research in a multi-
disciplinary environment by making available graduate student fellowships to many different
domains throughout both FIU and the University of Puerto Rico (UPR). Notably, UPR is also
host to a Long-Term Ecological Research program—The Luquillo LTER Program
(http://luq.lternet.edu/). CIARA will act as a catalyst to institutionalize next generation Internet
application development. The FCE LTER Program strongly support this proposal. Should you
be funded, we will encourage all of our graduate students to respond to the CIARA board request
for proposal process to participate in CIARA. If there is anything more I can do to support your
proposal and your proposed research, please let me know.

Sincerely yours,

Signature on file at NSF

Daniel L. Childers, Ph.D.
Associate Professor
Lead PI, FCE LTER

Southeast Environmental Research Center
University Park, OE 148, Miami, FL 33199 • Tel: 305-348-3095 • Fax: 305-348-4096 • www.fiu.edu
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February 11, 2003

Ms. Patricia R. Alvarez
Division of Sponsored Research
Florida International University
11200 SW 8 Street
MARC 430
Miami, FL 33199

Re: Collaboration on Proposal Titled, "ITR-Center for Internet
      Augmented Research and Assessment "CIARA" at FIU and
      UPR"
      PI: Dr. Heidi Alvarez

Dear Ms. Alvarez:

Please accept this letter as the University of Puerto Rico's support of
Dr. Guy Cormier's participation in the above-mentioned project. The
University of Puerto Rico supports Dr. Cormier's collaboration with
Florida International University in submitting this proposal.

Best wishes with this submission. Should you have any questions,
please phone at 787-764-8369.

Cordially,

Manuel Gómez, Vice President
for Research and Academic Affairs

mag/g:/crci-dir/vicep/2003/03-006

February 10, 2003

Guy Cormier
High Performance Computing Facility
University of Puerto Rico
San Juan, Puerto Rico

Dear Dr. Cormier:

As Dean of the College of Natural Sciences of the Río Piedras Campus of the University
of Puerto Rico, I am very pleased to support the joint proposal with Florida International
University to form the Center for Internet Augmented Research and Assessment
(CIARA). This Center will develop in Puerto Rico needed expertise in the use of
advanced information technology in various disciplines, and help to move teaching and
research in Puerto Rico to the frontiers of these areas of endeavor.

As the match for this proposal, the College is allocating one fourth of the new addition to
the existing space for Computer Sciences, or $40,000 for the computer laboratory for the
graduate fellows funded under this proposal. The lab will be equipped with up-to-date
information technology and provide an interactive environment conducive to gaining
experience with applications of this technology. The graduate fellows will also have
available to them the Virtual Visualization Laboratory at the Library of the College of
Natural Sciences. Students will be thus equipped with a breadth of knowledge and
experience to use state-of-the-art information technology in their own areas of endeavor.

We look forward to welcoming the first CIARA graduate fellows to the facilities of the
College of Natural Sciences.

Sincerely,

Brad R. Weiner
Dean

FIU

FLORIDA INTERNATIONAL UNIVERSITY
Miami's public research university

February 11, 2003

Ms. Heidi Alvarez
Co-Principal Investigator
AMPATH
Florida International University
Miami, FL 33199

Subject: CIARA NSF Medium Information Technology Research Program

Dear Heidi,

I am most pleased to provide this letter in support of your proposal to establish a Center for Internet Augmented Research and Assessment (CIARA) at FIU through the NSF ITR program, working with Co-Principal Investigators George O'Brien (FIU CoE), Julio Ibarra (FIU AMPATH), Guy Cormier (UPR HPCf) and Oscar Moreno (UPR CS). CIARA will provide a much needed resource to further Internet technology research in a multi-disciplinary environment by making available graduate student fellowships to many different domains throughout both FIU and UPR. CIARA will act as a catalyst to institutionalize and disseminate widely next-generation Internet application development.

For some time, I've observed that not enough faculty investigators are reaping the benefits of FIU's accomplishments in advanced research networking activities, such as Internet2 and AMPATH. CIARA will create an environment where faculty investigators from FIU and UPR, and graduate students of diverse disciplines and disparate academic communities can interact with the IT community to create a synergistic experience through the integration of the research discipline and the technology: FIU's Inter-Regional Grid-Enabled Center for Research and Educational Outreach (CHEPREO) is an excellent example of this synergy. The results will no doubt increase the rate of discovery for faculty by augmenting their research with IT.

I fully endorse the proposal of the Center for Internet Augmented Research and Assessment. One of the reasons I accepted the position of CIO at FIU was because of its accomplishments with Internet2 technologies, such as AMPATH. CIARA, and the work you, Julio and Eric are doing, demonstrate FIU's commitment to the advancement of next-generation Internet technologies and to serving its mission as the Top, Urban, Public university of South Florida and the international community.

Sincerely,

John P. McGowan

February 11, 2003

Heidi Alvarez
Associate Director
Florida International University Grants & Acquisitions
11200 SW 8th St. PC 307
Miami, FL 33199

Subject: **CIARA NSF Medium Information Technology Research Program**

Dear Heidi,

The Center for Internet Augmented Research and Assessment (CIARA) that you propose along with your Co-Principal Investigators George O'Brien, Julio Ibarra, Guy Cormier and Oscar Moreno will provide a very needed resource to further Internet technology research and 3D visualization for the School of Architecture, as well as the FIU campus at-large. CIARA will act as a catalyst to institutionalize next generation Internet application development, and more importantly, allow graduate students from the School of Architecture the opportunity to explore new innovative ways to merge 3D visualization content with Internet-related communication methods.

In my opinion, CIARA would be an instrumental part in helping make the FIU School of Architecture a recognizable leader in the United States in regards to providing cutting-edge technologies to graduate architecture students. Our University needs to become first on the map of choices for an advanced IT-based educational experience. We need to stand out as being a step above and beyond in regards to digital technology. From my perspective as an educator in the field of architecture, the following is a list of objectives that I envision coming from both CIARA and the collaborations with the School of Architecture:

Be the premier catalyst for the advancement of computer visualization
  ▫ Be a leader for research and development in the field of computer graphics and interactive techniques on campus.
  ▫ Introduce innovative products and cutting-edge technologies into the university environment and local community.

Foster the innovative and creative application of computer visualization
  ▫ Attract new students and practicing professionals to the school of architecture, as well as from other disciplines
  ▫ Provide networking opportunities between the two to enable cross-fertilization.

- Foster collaborations and interdisciplinary interactions on campus and in the professional environment that will advance architectural visualization and interactive technologies.

Bring more exposure to the University through a strong presence on the web.

- Break away from the static HTML text-based web pages that we're accustomed to seeing. We need to offer an optional 3D experience. As architects, we think in 3D and experience our surroundings in the third dimension. Why would we want to display our University online in any other way?

Thinking outside of the box-beyond the physical campus and into a virtual world we can call our own.

- Members of our campus and extended communities should experience FIU as a beautifully designed, shared on-line environment that provides effective access to educational materials, renders true value to the students, and creates a sense of belonging to the school at large. Prospective students would be able to get a virtual tour of the campus, interact and collaborate with other departments on campus, and chat with existing students and faculty members.

All of the objectives I have listed could certainly be realized through the help of CIARA and the interaction with the faculty and graduate student body within the School of Architecture. I strongly support this proposal and intent to encourage my graduate students to respond to the CIARA board request for proposal process to participate in CIARA. Furthermore, I am willing to serve on the faculty board of review and be a Faculty Associate of this center.

Respectfully submitted,

[signature: Kevin Smith]

Kevin M. Smith
Computer Director/Assistant Professor
Florida International University School of Architecture

February 11, 2003

Heidi L. Alvarez, Associate Director
UTS – Grants & Acquisitions Unit
Florida International University
11200 SW 8th St.
Miami, FL 33199

Subject: CIARA NSF Medium Information Technology Research Program

Dear Heidi:

I strongly support your proposal or the Center for Internet Augmented Research and Assessment (CIARA) that you propose along with your co-principal investigators – George O'Brien, Julio Ibarra, Guy Cormier, and Oscar Moreno. The Center will provide valuable resources that are much needed at FIU to further multidisciplinary research in Internet technology and to provide graduate student fellowships to many different units throughout both FIU and the University of Puerto Rico. CIARA will certainly contribute to the institutionalization of next generation Internet application development.

In support of this proposal, I will actively encourage graduate students in the College of Arts & Sciences to participate in CIARA and to apply for fellowships when requests for proposals are announced. I also would be glad to serve on the CIARA faculty board of review and be a Faculty Associate of this center.

Good luck in the application process and let me know if I can be of further assistance.

Sincerely,

Kelsey R. Downum, Ph.D.
Professor of Biological Scicneces &
Associate Dean of Research

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University Park, Miami, FL 33199 • Tel: 305-348-2864 • Fax: 305-348-4172 • www.fiu.edu
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February 12, 2003

Heidi Alvarez, Associate Director
Grants & Acquisitions
University Technology Services
Florida International University
11200 SW 8th St
Miami, FL 33199

Re: CIARA NSF Medium Information Technology Research Program

Dear Heidi,

Thank you for the opportunity to be involved with in the program proposed. I am writing in support of your proposed Center for Internet Augmented Research and Assessment (CIARA). This center will provide a much needed resource within the University and beyond and will further Internet technology research in a variety of disciplines and, in particular, in multi-disciplinary environments through the graduate student fellowships made available. As you are aware, there are a multitude of departments and interdisciplinary programs in the College of Arts and Sciences which will benefit from this program and I am exited to participate in this program.

I am willing to serve on the faculty board of review and be a Faculty Associate of this center. I will also encourage our graduate students to respond to the CIARA board request for proposals.

Overall, I believe that CIARA will be an extremely valuable program and I very strongly support this proposal. Please feel free to contact me at 305-310-6546 or Ken.Furton@fiu.edu if I can provide any additional information.

Sincerely yours,

Dr. Kenneth G. Furton, Ph.D., C.Chem., M.R.S.C.
Professor of Chemistry and Associate Dean, College of Arts & Sciences
Director, International Forensic Research Institute (www.ifri.fiu.edu)

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FIU

February 12, 2003

Ms. Heidi Alvarez
Co-Principal Investigator
AMPATH
Florida International University
Miami, FL 33199

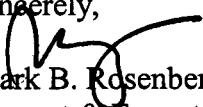Subject: CIARA - NSF Medium Information Technology Research Program

Dear Heidi,

It is my pleasure to provide this letter of support to establish a Center for Internet
Augmented Research and Assessment (CIARA) at Florida International University and at
University of Puerto Rico. Both FIU and UPR are the two largest Hispanic minority-
serving universities in the United States, making them excellent locations to start CIARA
as a multi-disciplinary activity that will integrate education and advance Internet
technology research with a significant impact on both improving science and minority
education outreach.

As Chief Academic Officer of FIU, I am particularly interested in seeing CIARA
stimulate cross-disciplinary interaction among our investigators, as well as enable them to
augment their research capabilities through the effective use of technology. CIARA
offers a novel approach that increases the rate of discovery for faculty by augmenting
their research with IT, fosters inter-disciplinary research and improves the effectiveness
of minority graduate education.

FIU has greatly benefited from its investments in advanced Internet technologies, such as
Internet2 and AMPATH. FIU has established a notable presence in this global
community, which has resulted in attracting investigators to FIU who are leaders in their
disciplines, provided them with an advantage in competitive funding opportunities and
enabled them to extend FIU's reach into the global community through the use of the
Internet technologies we have played a part in advancing.

I fully endorse the proposal of the Center for Internet Augmented Research and
Assessment. CIARA's goals are consistent with FIU's goals of a Top, Urban, Public
Research University that strives for excellence through Competitiveness, Quality and
Accountability.

Sincerely,

Mark B. Rosenberg
Provost & Executive Vice President

Florida International University Personnel Associated with the Proposal

1. Heidi Alvarez, FIU – Primary thesis advisor Kenneth Johnson. Collaborators: Harvey Newman, Caltech; Paul Avery, UF; Vasken Hagopian, FSA; Donald (Chip) Cox, Vanderbilt
2. Julio Ibarra, FIU – Advisors: David Barton and John Comfort; Collaborators: Harvey Newman, Caltech; Paul Avery, UF; Vasken Hagopian, FSA
3. George O'Brien, FIU – Collaborators; Edward McClintock, Zhonghong Jiang
4. Guy Cormier, UPR – Thesis and Postdoctoral Advisors, Dr. John A. Capobianco, Professor, Department of Chemistry, Concordia University, Montréal, Quebec, Canada, Dr. Marco Bettinelli, Department of Chemistry, University of Verona, Verona, Italy, Dr. Paolo Mazzoldi, Department of Physics, University of Padova, Padua, Italy, Dr. Stephen Elliott, Department of Chemistry, University of Cambridge, Cambridge, U.K.
5. Oscar Moreno, UPR – D. Bollman and M.A. Avino

February 11, 2003

Heidi Alvarez,
Co-Principal Investigator, AMPATH
Florida International University
11200 SW 8ᵗʰ St PC307
Miami, FL 33199

Subject: CIARA - NSF Medium Information Technology Research Program

Dear Heidi,

I am pleased to provide this letter in support of the proposal to establish the Center for Internet Augmented Research and Assessment (CIARA), working with your Co-Principal Investigators George O'Brien (FIU COE), Julio Ibarra (FIU AMPATH), Guy Cormier (UPR HPCf) and Oscar Moreno (UPR CS). CIARA will provide an important multi-disciplinary environment by making available graduate student fellowships to many different domains throughout both FIU and UPR, and a multi-disciplinary resource to further both education and advanced Internet technology research. By bringing minority students together with experts from multiple disciplines and exposing them to next-generation Internet technologies, for focused individual and collaborative projects, CIARA will act as a catalyst that will help institutionalize next generation Internet application development.

It is of strategic importance that new approaches and methods be applied to augment faculty investigators' capabilities in search and discovery through the effective use of technology. CIARA offers a novel approach that can help increase the rate of discovery for faculty by augmenting their research with IT, fosters inter-disciplinary research and improves the effectiveness of minority graduate education. Establishing CIARAs at FIU and UPR, two of the largest minority-serving institutions in the United States, will result in a collaborative system for the effectiveness, penetration, and interaction of IT with an underrepresented sector of our society.

I strongly support this proposal and intend to guide our faculty investigators to cultivate partnership relationships with CIARA to help augment their research at FIU, UPR and with other minority serving institutions. FIU is providing approximately 10% cost-sharing on the proposal request, even thought there is no requirement to do so on this program solicitation, because we believe strongly in the CIARA concept and are willing

to invest in it. We are also pledging 1000 square feet of laboratory space in the Primera Casa building on the third or forth floor to house CIARAs collaborative activities.

Sincerely,

Thomas A. Breslin
Vice President for Research