

PR-LSAMP LIAISON



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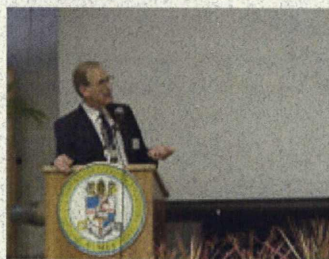
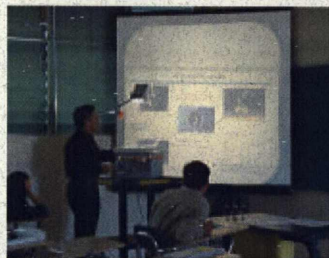
PRISM 2001 A SUCCESS!

The 21st Puerto Rico Interdisciplinary Scientific Meeting took place this year at the Pontifical Catholic University of Puerto Rico on March 10 with a total 722 participants. Two hundred twenty (220) students presented their research projects to faculty and peers. Dr. David Schlessinger, Chief of the Laboratory of Genetics in NIH was the main speaker with the topic "The Genome Project: Technology and Prospects".

The discipline with the highest number of presentations was Biology with Environmental Science showing the most increment from the past years. The UPR Mayaguez campus had the highest number of

student presentations followed by UPR-Rio Piedras and UPR-Humacao. Congratulations to all participants on a job well done! Our gratitude to all the people who worked so hard to make this event possible, the organization committee from the host institution; faculty members that served as judge/moderators; students that helped as ushers; the personnel from the Resource Center for Science and Engineering and all the collaborators that provided their time and support. To all of you...

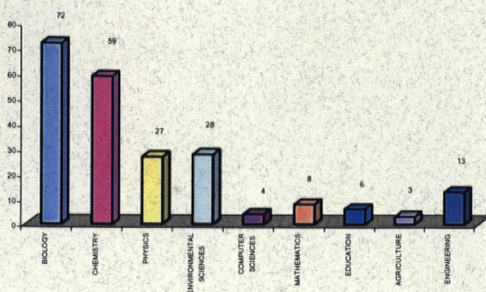
*Many, many
 THANKS*



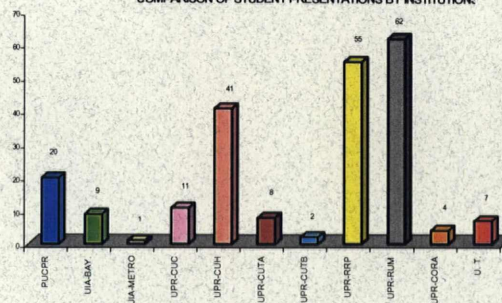
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PUERTO RICO INTERDISCIPLINARY SCIENTIFIC MEETING 2001
 COMPARISON OF STUDENT PRESENTATIONS BY DISCIPLINE



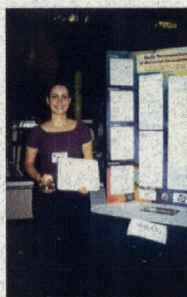
PUERTO RICO INTERDISCIPLINARY SCIENTIFIC MEETING 2001
 COMPARISON OF STUDENT PRESENTATIONS BY INSTITUTION



PUERTO RICO WINS FIRST PRIZE IN THE MATH/COMPUTER SCIENCE CATEGORY AT THE COLORADO ANNUAL RESEARCH CONFERENCE!

PR-LSAMP participated in the annual Research Conference sponsored by Colorado-LSAMP last July 27-30 at Fort Collins, CO. Three students from Puerto Rico presented their research projects in this activity:

Everilis Santana: Project: "Cyclic decomposition of Permutations given by Monomials"- Math/computer science category. This presentation won **First Prize** in this category.



Mit'el Santiago
Project:

"Photophysical and Photochemical Studies of Electropolymerized Ruthenium Polypyridyl Films" - Physical Science Category.



All three participants did an excellent job evidencing the high quality research initiatives of our institutions.

CONGRATULATIONS!

Jose A. Rodriguez Project: "Possible Source for the Tropical Submicron Organic Aerosol" - Life Science Category.



PR-LSAMP Students with Ana Feliciano, Management Coordinator for PR-LSAMP.

10TH ANNIVERSARY LSAMP PI/PD MEETING

Last March 26-27, The National Science Foundation held the annual PI Meeting for NSF sponsored diversity-focused programs, which included LSAMP directors. Among the topics covered by NSF Officials were: Developing Skilled IT Workforce; NSF Cross

Directorate Opportunities for Support; Review Panels at NSF; Fastlane Update; Accountability and Expectations, and NSF Expectations of Granties. NSF took the opportunity to celebrate the 10th anniversary of LSAMP and the six original LSAMP's, on behalf of all

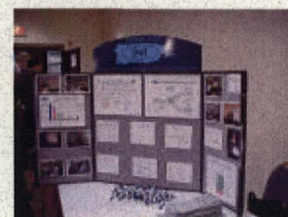
granties, recognized NSF leadership and commitment to enhance the quality of SMET education nationwide. PR-LSAMP representatives prepared and exhibit to highlight the accomplishments of the past 10 years.



Dr. Norman Fortenberry, Acting Division Director for HRD



Dr. A. J. Hicks
LSAMP Director



PR-LSAMP EXHIBIT

PR-LSAMP PHASE I AND II MAJOR ACCOMPLISHMENTS

- PR-LSAMP institutions have awarded 21,878 BS degrees in SMET from 1991 to 2000, a 62% annual increment from baseline figure of 1,709 annual degrees to 2,771 in 1999-2000.
- PR-LSAMP institutions have almost doubled their SMET enrollment from 12,572 in 1991 to 23,476 in 2000.
- The average graduation rate at UPR institutions increased from 48% to 62% in science, while the average graduation rate for engineering at UPR increased from 53% to 81%.
- Seventeen percent (17%) of the Hispanics that obtained a Ph.D. in a natural science field nationwide from 1993-1998, received their BS degree from a PR-LSAMP institution (202 out of 1,169). UPR-Rio Piedras and UPR-Mayaguez are the leading baccalaureate institutions on U.S. Hispanic Ph.D.'s in science. In Engineering, 11% of the Hispanics that obtained a Ph.D. in Engineering nationwide received their BS degree from a UPR Institution (37 out of 332). UPR-Mayaguez is the leading baccalaureate institution of U.S. Hispanic Ph.D.'s in Engineering.
- The SMET curriculum at PR-LSAMP institutions has been revised to: (1) emphasize for depth of understanding; (2) promote active learning based on inquiry and the use of interactive demonstrations; (3) incorporate technology to the learning process and (4) include teaching strategies that have proven successful in improving student performance, such as cooperative learning.
- A total of 2,363 stipends were awarded for undergraduate students to participate in research experiences.
- As of the year 2000, PR-LSAMP has awarded 2,363 stipends to undergraduate students to participate in research experiences; student's research presentations at the Puerto Rico Interdisciplinary Scientific Meeting, co-sponsored each year by PR-LSAMP has almost doubled, from 166 in 1991 to 325 in 2000. In addition, approximately 8,000 students have benefited from mentoring activities, providing for a more nurturing environment to successfully complete their undergraduate studies.

INSTITUTIONAL INITIATIVES TO STRENGTHEN SMET EDUCATION

PR-LSAMP has approved four institutional proposals to strengthen SMET education. UPR-Arecibo, UPR-Rio Piedras, UPR-Humacao and UPR-Cayey will each receive \$20,000 to implement their projects. The proposals are:

UPR-ARECIBO	Preparing Students for Academic Success in Science and Technology Courses
UPR-CAYEY	Chem-2-Chem: A Comprehensive Tutoring-Mentoring Program
UPR-HUMACAO	Strengthening the Learning Process in the Chemistry Department
UPR-RIO PIEDRAS	Improving Learning and Teaching in Precalculus

BRIDGING COMPONENT

The purpose of this component is to attract the best high school students to study careers in science, mathematics, engineering and technology. To achieve these objectives, 16 workshops have been offered to public schools around the Island that are participating in the Puerto Rico Statewide Systemic Initiative educational reform. On Saturdays, students receive the visit of a Puerto Rican scientist who offer them guidance on academic programs and



Students observing aerial pictures in 3 dimensions using a stereoscope

careers that can be pursued at the University of Puerto Rico related to SMET. Also, workshops are offered on chemistry, astronomy, earth sciences, and endangered species with emphasis on marine turtles. All these workshops are hands-on, minds-on.

Aerospace Science Workshops sponsored by PR-LSAMP and NASA. These workshops are offered by Dr. Gerardo Morell to students with high academic performance from the University Garden High School and the University of Puerto Rico High School. Twenty students meet during five Saturdays to participate in laboratories on physics and chemistry that emphasize conceptual learning and focus on scientific concepts that are not

covered in the high school curriculum. These students evidence a high degree of interest in studying careers in engineering and aerospace sciences.



Teachers describing a sample of granite rock from Utuado

Dr. Morell serves as an excellent role model of a young Puerto Rican scientist.

PR-LSAMP SUBMITS PROPOSAL TO NSF FOR A PHASE III AND DEVELOPMENT OF A RESEARCH PROJECT

Phase III of the Puerto Rico Louis Stokes Alliance for Minority Participation

On January 31, 2001, the UPR Resource Center for Science and Engineering submitted a proposal to the National Science Foundation (NSF) for a Phase III of the Puerto Rico Louis Stokes Alliance for Minority Participation (PR-LSAMP) Program. A total of \$2.5M was requested from NSF for the period of 2001-2006. UPR pledged a similar amount in matching funds and the participating private institutions will contribute \$2M to the implementation of the project activities.

The PR-LSAMP partners in Phase III will be UPR – Río Piedras, Mayaguez, Cayey, Humacao, Bayamón, Arecibo, Aguadilla, and Ponce, Inter American University – Bayamón and Metro-, the Pontifical Catholic University of Puerto Rico, and the Polytechnic University of Puerto Rico. The project will be coordinated by the UPR Resource Center for Science and Engineering and Dr. Manuel Gómez, the Center's Director and Vice President for Research and Academic Affairs for the UPR system, will be the Principal Investigator.

For Phase III PR-LSAMP is proposing the following strategies to complete the construction of permanent pathways to graduate studies in science, mathematics, engineering, and technology (SMET):

- 1) the development of interactive web-based learning to master hard to teach concepts in science and mathematics (UPR-Cayey will be the lead institution)
- 2) the development of electronic modules to expand the interdisciplinary capabilities of undergraduate SMET students to further enhance their preparation for graduate studies (UPR-Río Piedras will be the lead institution)
- 3) the scaling-up of the teaching/learning strategies that have proven successful in improving student performance in SMET courses, through ongoing academic and technical assistance to faculty and an Annual Best Practices Conference
- 4) the development of Information

Technology skills in SMET students so they are capable of making effective and more critical use of accurate and valid information in their professional lives (Inter-Bayamón will be the lead institution)

- 5) the development of a Pre-College to College Bridging Component that will induct students into research experiences to increase the number of

“Strengthening Undergraduate SMET Education to Promote High Levels of Learning”

- students pursuing undergraduate degrees in SMET, and
- 6) the expansion of the research and mentoring programs to further enhance the number of students entering graduate school and completing a Ph.D. in SMET, in coordination with the Alliance for Graduate Education and the Professoriate (AGEP) Program.

At the last national LSAMP Project Investigators' meeting, which took place March 26-28, 2001 in Washington, D.C., we were informed that the proposals have been evaluated by a peer review panel, and NSF expects to notify institutions by the end of June.

A Research Project to Identify ~~Room~~ Strategies and Departmental/ Institutional Factors that Increase Retention and Graduation Rates of Minority Students in SMEFields

Based on the accomplishments achieved in Phase I and II, PR-LSAMP responded to the opportunity provided by NSF for Phase III participants to conduct an educational research project to address two areas of interest outlined by NSF:

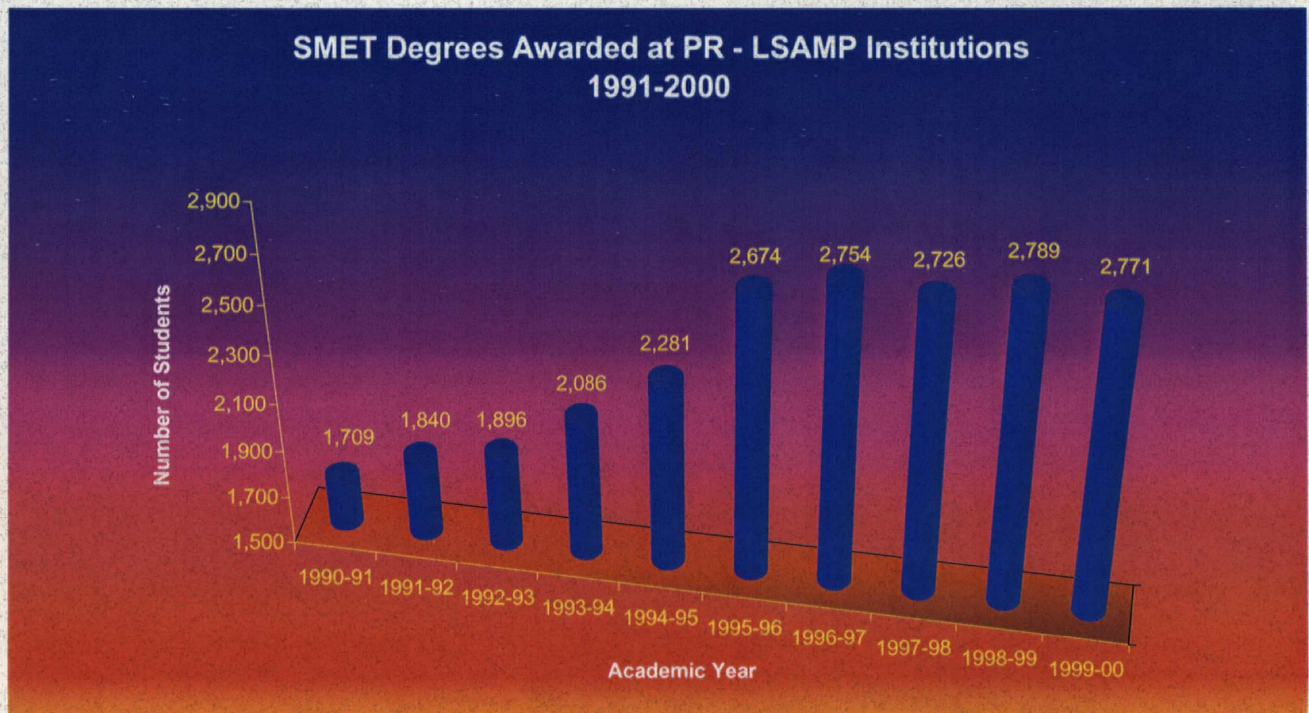
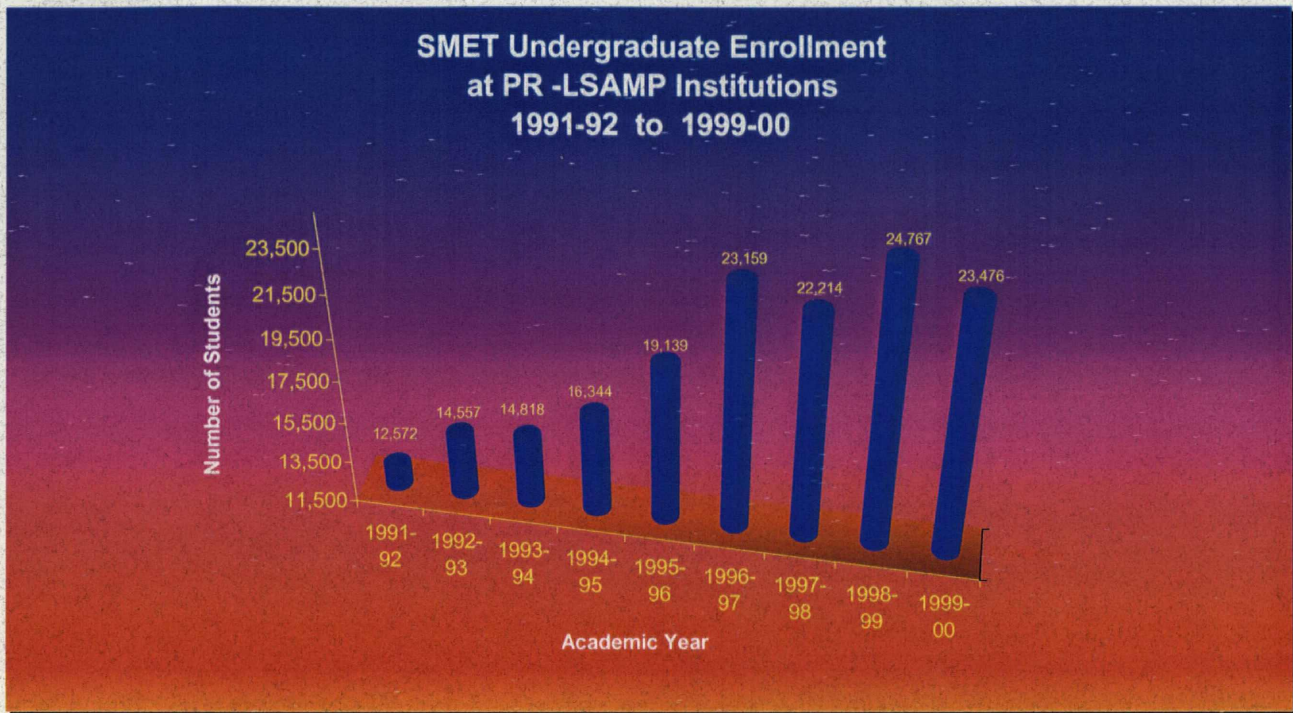
- (1) identification of departmental/ institutional factors facilitating undergraduate student retention in SMET fields, baccalaureate attainment, and persistence to graduate study, and

- (2) Identification of practical and successful strategies to promote broader adoption or adaptation of such factors within departments, within institutions across departments, and/or within disciplines across institutions.

PR-LSAMP will research these two areas in the participating PR-LSAMP institutions and in a sample of higher education institutions on the mainland that share a similar institutional profile, where Hispanic students are the majority and that are LSAMP participants. The research will establish SMET institutional profiles prior to and after the implementation of LSAMP; will identify successful reform strategies that may have contributed to changes in institutional profiles; will identify departmental/ institutional factors that support the broader adaptation or adoption of such strategies; and will analyze the potential transferability of these strategies and factors to other higher education institutions. Also, since PR-LSAMP believes that to increase the quality and quantity of minority students in the SMET education and workforce pipeline requires strategies that are truly systemic in nature, PR-LSAMP will identify those approaches taken by the institutions that not only foster institutional change by transforming the key components of undergraduate education, but also those that contribute to broader reformation of the K-16+ educational continuum.

A total of \$500,000 was requested from NSF and the University of Puerto Rico will provide a similar amount in matching funds. Dr. Ana C. Piñero, Associate Director of the UPR Resource Center for Science and Engineering will be the Principal Investigator for this project. Awards will be notified by NSF on or before June 30, 2001.

SMET UNDERGRADUATE ENROLLMENT AND BACCALAUREATE DEGREES AT PARTICIPATING PR-LSAMP INSTITUTIONS 1991-2000



UNDERGRADUATE RESEARCH

A total of 157 students received stipends from PR-LSAMP to participate in Undergraduate Research Opportunities during the second semester of the academic year 2000-01. The deadline for students who want to participate in the upcoming summer session and the first semester of the year 2001-02 is **MAY 15, 2001**.

Join others in this unique and rewarding experience!

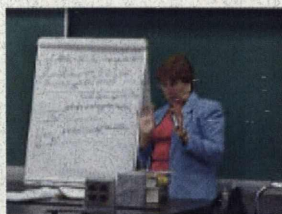
For more information about this activity visit our web page at <http://shuttle.uprm.edu/prlsamp>

or call the PR-LSAMP office: **765-5170 ext. 2013**



Ricardo Marti, a PR-LSAMP undergraduate research student working with Dr. Jose Luis Lasalde in Neurobiology lab.

TEACHER PREPARATION



Luz Nereida Perez offered a workshop on writing skills and styles.

This component promotes the certification of students majoring in natural sciences, as secondary school teachers in the fields of chemistry, physics, and mathematics. These students participate in a series of extracurricular seminars on innovative topics related to content and teaching methodology. During this semester the most successful workshops were: Geology of Puerto Rico (10 contact hours-including three in theory presentation and seven in a field trip). This workshop emphasizes the main geological formations of the island of Puerto Rico-igneous, metamorphic and sedimentary formations. Concepts such as tectonic plates, geological faults, rock cycle, geographical profiles, and the karstic region of northern Puerto Rico were discussed. Natural History of Puerto Rico: The birds of Puerto Rico. These workshops are highly important since Puerto Rico is rapidly losing ecosystems in which our native and endemic species inhabit. Strong emphasis on conservation of tropical ecosystems.



TP students taking a workshop on curriculum reform in science and math.

MENTORING: WORKSHOPS FOR STUDENTS

In 1999-2000 faculty and upper level students served as mentors to freshmen and sophomore students to motivate them to remain in SMET careers and assist them with their SMET courses. Twenty-one faculty members from 9 institutions served as mentors and 103 students as peer mentors. A total of 870 students benefited from the mentoring

program. This year UPR-Aguadilla has joined our program with 7 peer mentors and all of the Natural Science faculty members are working "ad honorem" in this activity. We congratulate them on this effort.

Welcome to our team !



Prof. Cedar Garcia offering a workshop to a group of peer mentors

NIST 2001: A SUMMER INTERNSHIP AT THE U.S. DEPARTMENT OF COMMERCE NATIONAL INSTITUTE FOR STANDARDS AND TECHNOLOGY

For the past 8 years, the National Institute of Standards and Technology (NIST) of the US Department of Commerce, has been a partner of PR-LSAMP, providing research opportunities to SMET undergraduate students. This year, 14 applications were submitted and 7 have been accepted. This is the largest number of students from the University of Puerto Rico ever accepted by NIST.



Congratulations to the students selected!!!

Good luck and keep up the good work!

WORKSHOPS ON TEACHING STRATEGIES

PR-LSAMP is sponsoring a series of workshops for SMET faculty to have the opportunity to explore successful teaching strategies and technological tools which have proven successful in improving students' performance in SMET courses. Mentor students are also being trained to have a leading role in these workshops and enhance their mentoring skills. The workshops have been scheduled, between March and May 2001 and will be held at different PR-LSAMP institutions. During the month of March two were offered: one at Interamerican University - Bayamón Campus, and the other at UPR-Cayey. These were:

Chem-2-Chem/Peer Leadership Training
Interamerican University-Bayamón Campus, March 23rd, 2001

Sixteen faculty members and thirteen mentor students attended this workshop offered by Prof. Rosa Báez. Prof. Baez demonstrated the effectiveness of this model which has been used at UPR-Cayey for over two years. Chem-2-Chem offers an individualized learning experience to General Chemistry Students with the participation of student tutors and mentors. Students and faculty participated in dynamic exercises that emulated the

environment and strategies that the tutors/mentors provide to the students. Prof. Baez also described a similar model, Peer Leadership Training, that has proven quite effective in improving student performance in different SMET disciplines at different universities.

For more information about these two strategies access the PR-LSAMP web page at: <http://shuttle.uprm.edu/prlsamp/>.

Electronic Learning Environments
UPR-Cayey March 30th, 2001

Professor Luis Pérez demonstrated different "ready to use" computer modules for Pre-calculus, Calculus, Mathematics, General Chemistry, Physics and Biology. These modules enable the professor to enhance the teaching/learning process by developing skills on how to take effective class notes, review of concepts, exercises, tests and on-line access to web sites that offer interactive demonstrations and exercises. Prof. Pérez illustrated the



Students and professors participating in the Chem 2 Chem Workshops

advantages of web-enhanced courses and shared his experience in the use of this tool using his Physics course as an example. A total of fourteen SMET professors, including two high school teachers participated in this activity. These had the opportunity to use the modules and practice with some exercises.

Next Scheduled Workshops:
April 27th- Chem-2-Chem/Peer Leadership Training - UPR-Arecibo
May 4th - Electronic Learning Environments - UPR-Cayey
May 4th - Creation of Web-Page for SMET Courses - UIA-Metro



Prof. Luis Pérez interacting with Liaison Officers in workshop

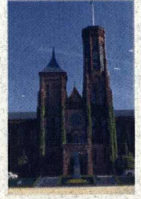
LSAMP AT THE SMITHSONIAN

The Research Program of the National Museum of Natural History (Smithsonian) and the National Science Foundation formed a consortium for students and administrators from all the Louis Stokes Alliances for Minority Participation Programs. The team from the PR-LSAMP was represented by professor Javier Figueroa, Assistant Coordinator and two students, Olaf Feliciano and Susan Baez. The objectives of the Winter Research Academy are to: Stimulate undergraduate students from minority groups to pursue graduate studies related to scientific research in natural history (evolution and plant systematics, taxonomy, evolution and vertebrate and invertebrate zoology, exobiology, anthropology, archaeology, and geology).



Olaf Feliciano with Dr. James Mead -
Morphometry of Birds

The students from Puerto Rico chose to do research in the areas of evolution and mammal ethology, and sedimentation in estuaries using remote sensing. The scientists in charge of the research evaluated the team from Puerto Rico as very enthusiastic and highly capable of analysis, and selected it as the highest performing team of all LSAMP representatives.



Smithsonian Museum

Congratulations!!!

WHERE ARE OUR SMET GRADUATES?

This year PR-LSAMP developed and pilot tested at three PR-LSAMP institutions a **Student Tracking System**. The questionnaire was sent to 1995, 1996, 1997 and 1998 SME graduates. The rate of response was 21% for UPR-Rio Piedras, 21% for UPR-Mayaguez and 28% for UPR-Humacao. Because of the difficulty in getting responses from students in the U.S. Mainland, the results are skewed toward those that remained in the Island. The aggregate results of the 960 respondents showed that:

- 54.6% of the BS graduates enrolled in graduate school. Of those that enrolled in graduate school, 29.8% are pursuing graduate studies in Science, 0.7% in Mathematics, 8.8% in Engineering and 15.6% in a non-SMET field (mostly medicine and business administration);
- 45.2% of those that opted for a job, secured employment in their field of studies. Of those that are currently working, 53.6% plan to pursue graduate studies in the future, and 46.7% are also considering obtaining a teacher certification.

The questionnaire will be placed in the PR-LSAMP web-page and SMET graduates from all participating institutions will be able to complete it on-line.

NEWSLETTER FOR THE PR-LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION

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