

UPRM/UMASS Collaboration

ERC – CASA

Steps for Integration of UPRM into a
Research I Environment



UPRM/UMass Collaboration

Pre-ERC

- 9 undergraduate students from NSF SPUR at MIRSL.
- 4 UPRM MS students working in collaborative research projects with UMass
- 3 of the 4 MS students have participated in Graduate Summer Internships at MIRSL/UMASS
- Two UPRM professors were visiting faculty at UMass during Summer 2001
- Dr. Steve Sekelsky has taught a 1 credit short-course at UPRM
- One PhD student and one MS student graduated from UPRM pursuing degrees at UMass.
- MOU has been signed ! (PhD Students)



Dr. Steve Sekelsky and UPRM graduate student Jorge Trabal at 2002 SPUR Poster presentation



UPRM graduate student Leyda Leon operating UMass Radar at Oklahoma

UPRM Background

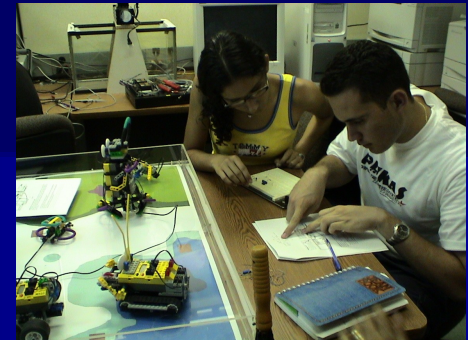
- S. Cruz Pol, J. G. Colom, R. Rodríguez Solís – Microwave circuits, systems, antennas, atmospheric modeling.
- 5 years at UPRM. Full academic load 4 courses each semester. First two years ECE provided 1/2 time release time (still two courses to teach!).
- First Five MS students just graduated in 2002. Two of them with UMass research thesis topics.
- Developed 4 Grad. Courses in Remote Sensing, Antennas, Radars, Microwave Circuits



Students of antenna course visiting Arecibo Observatory.

Publications/Grants

- Efforts has resulted in 1 MRI (Radiation Laboratory), 1 NASA FAR (Cruz-Pol/Sekelsky/Starr), 1 NSF CAREER (Rodriguez Solis)
- Others: Participating in NASA TCESS, NSF ERC CenSSIS (Education Component), Raytheon University Research Program (MMIC Modeling)
- 32 papers published in international conferences and journals. Research and education area.
- 7 UPRM/UMass co-authored papers in International Conferences.
- During our 4.5 yrs at UPRM, the 3 EE researchers together brought \$2.33M to the institution.



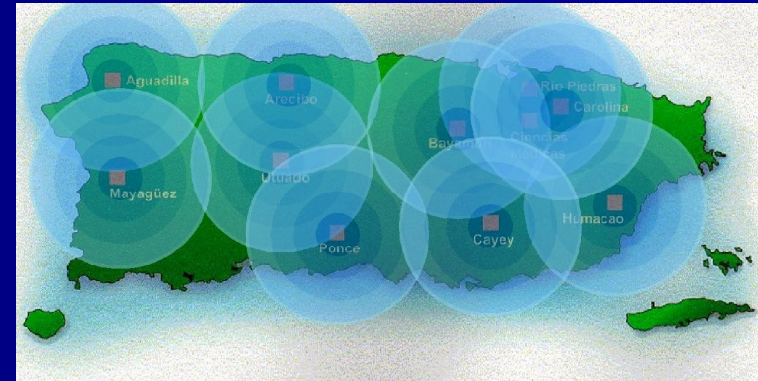
UPRM Freshmen students Pedro Falto and Neyka Ramos at the CenSSIS Tools and Toys Lab



UPRM MSEE graduate Jorge Villa working in atmospheric attenuation in convection clouds using scanning microwave radar

ERC- CASA/Support

- Facilities: Radiation Lab, CLIMMATE, Tools and Toys Lab (CenSSIS), Atmospheric Phenomenon Lab, CISA
- Research Boost: PhD Students (MOU UMASS/UPRM)
- UPR Providing 48% in-cash matching funds.
- Future MOU (OU/UPRM, CSU/UPRM)



Visualization of radar coverage of PR as a test-bed

PR South West Nodes - Survey

UPR Aguadilla



UPR Arecibo



UPR Mayaguez



UPR Ponce



*Jorge Trabal and Mireilly Rosado
working in survey for location of
UPRM Radar*

Panoramic view of possible radar location at 4 UPR campuses.

ERC – Steps towards a Testbed

- Exchange of Graduate students MS/PhD with partners.
- Will steadily increase research level at UPRM.
- **First Year:** Van acquisition/preparation for wireless data telemetry test, marine radar modification.
- **First Year:** 2 graduate students to work with Sekelsky (radars) and Janaswamy (Propagation).
- **Second Year:** Return of first group of graduate students to work with advisors in UPRM. Second group of 2 students to work with Pozar (antennas) and Chandra (Radar/atmospheric Science).
- **Second year:** Radar placed in van, wireless telemetry tests. Quantitative precipitation estimation. Modification of a second marine radar. Development of solid state radars.



Rafael Ramirez preparing radar for flight test. MIRSL Summer 1999.



Shannon Rodriguez BSEE '04. Undergraduate research student in ice crystal simulation for cirrus clouds.

ERC – Steps towards a Testbed

- **Third year** – Continue research and development of solid state radars. Installation of radar 2 on ECE building rooftop. (2 node NetRad – mobile and fixed nodes).
- **Third year** – One student to work with Jackson (MMIC design)
- **Fourth year** – Continue research and development of solid state radars.
- **Fifth year** – Install first generation solid state radar on West Coast. Start research and development of second generation solid state radars.
- **Fifth year** – 2 new PhD students to UMass



*Edna Prado at MIRSL,
SPUR 2001*

Conclusions

- Graduate student exchanges will help integrate UPRM into CASA research.
- Ph.D. students will help raise the level of research at UPRM.
- These steps set the foundation for the deployment of an islandwide testbed in Puerto Rico.