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11 Years of Accomplishments 1983-94 LBL/JSU/AGMUS Science Consortium

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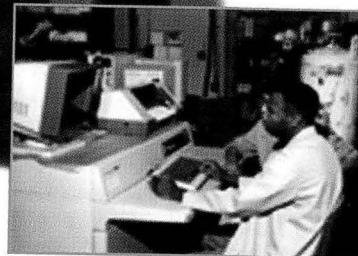
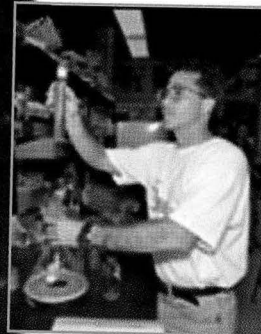
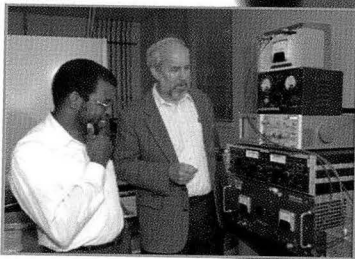
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The LBNL/JSU/AGMUS Science Consortium



11 Years
of
Accomplishments
83-94



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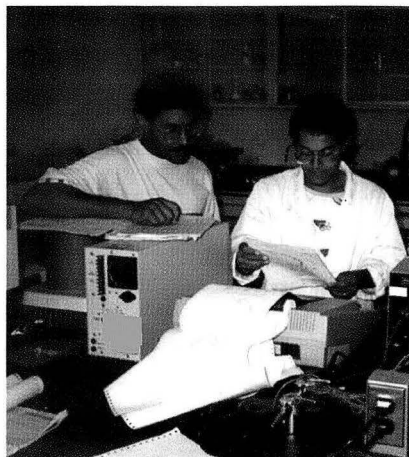
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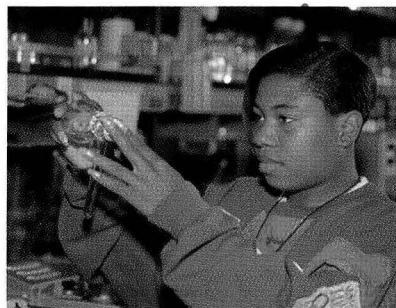
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Evidence of Our Success

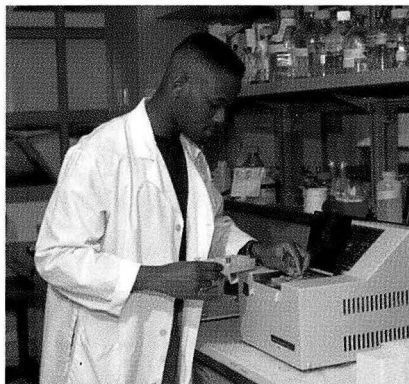


Left, Andrés Polanco, AGMUS graduate, now a toxicology student at Universidad de Puerto Rico, Medical Campus.

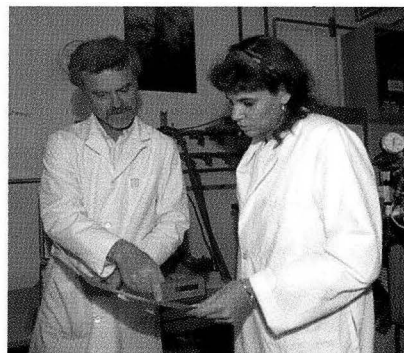


Right, Melanie Ratliff, JSU graduate, will begin graduate studies at the University of Illinois in the Fall of 1995.

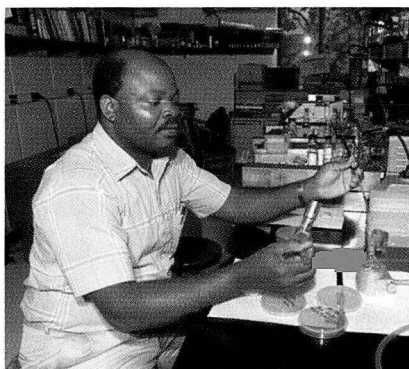
Below, Cedric Buckley, JSU graduate, currently at Michigan State University-East Lansing Graduate School.



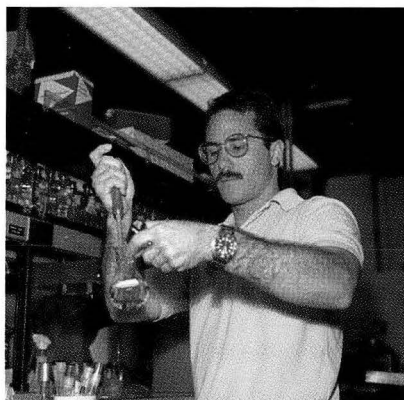
Right, Jeanette Gómez, AGMUS graduate, now a graduate student of toxicology at Univ. of Pittsburgh.



Right, Ricardo Pérez, AGMUS alumnus, now a graduate student at Universidad de Puerto Rico, Medical Sciences campus.



Left, Stephen Ekunwe, a JSU alumnus, now a graduate student Michigan State University-East Lansing.

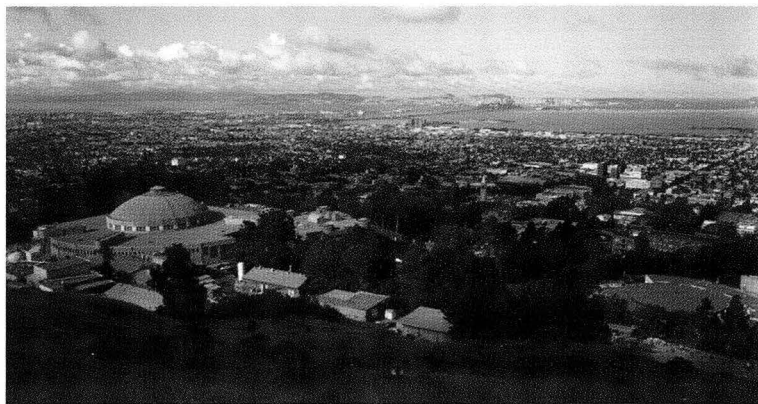


The LBNL/JSU/AGMUS Science Consortium

In 1983 the Lawrence Berkeley National Laboratory/Jackson State University/Ana G. Méndez University System Science Consortium (LBNL/JSU/AGMUS) developed strategies to strengthen JSU and AGMUS's science and technology education programs and their scientific

research capacities. Today the Science Consortium has surpassed its goals and is now prepared to assist other minority institutions. We plan to do this with the help of information networks, such as the World Wide Web, and through formal partnerships.

Right, Lawrence Berkeley National Laboratory, Berkeley, California, on the hills behind the campus of the University of California at Berkeley.

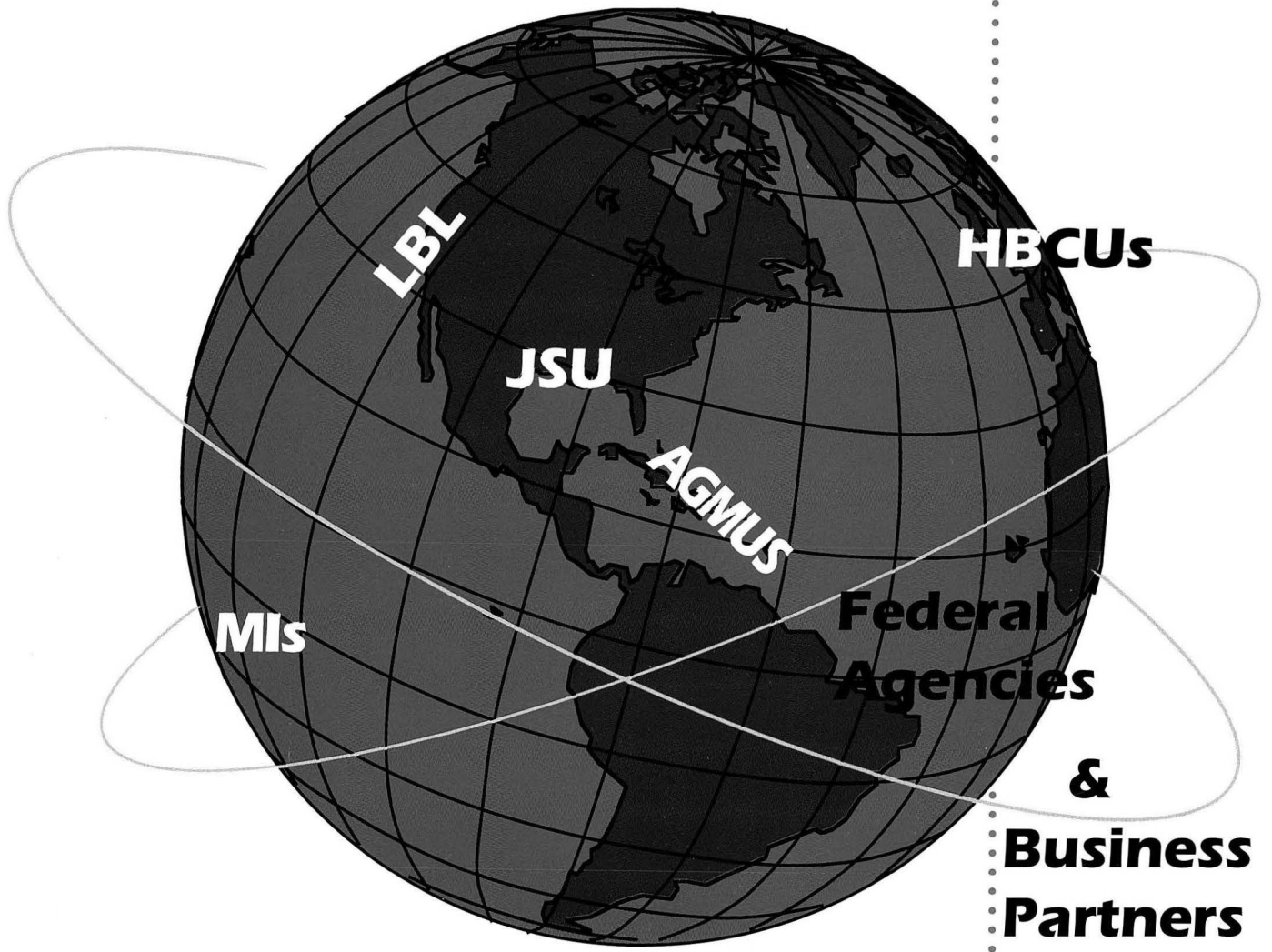


Left, Science Education & Research building, recently built, at Universidad Metropolitana, one of the schools that constitute the Ana G. Méndez University System in Río Piedras, Puerto Rico.

Right, The John Peoples building, where several departments of the School of Science & Technology are housed—Jackson State University, Jackson, Mississippi.



The Science Consortium reaches out
to others through
information networks



In 1994, the Science Consortium embarked on its second decade of fostering minority participation in the sciences. A collaboration between Jackson State University (JSU), the Ana G. Méndez University System (AGMUS), and Lawrence Berkeley National Laboratory (LBNL), the Consortium provides opportunities in the sciences for people who have traditionally been underrepresented in scientific fields. Jackson State is a Historically Black College and University (HBCU) in Jackson, Mississippi; AGMUS is an Hispanic university system with three campuses in Puerto Rico. The universities partner with LBNL, one of the Department of Energy's (DOE) national laboratories. The Science Consortium was the first cooperative venture to link a national laboratory, a Historically Black College and University, and a predominantly Hispanic university system. The partnership has three clear goals: to help AGMUS and JSU provide broad, high-quality academic offerings in natural and computer sciences; to increase the number of minority students entering scientific disciplines; and to advance scientific knowledge and the U.S. government's science

mission through research. The three institutions act as equal partners in these efforts. The 1983 Memorandum of Understanding and Intent between LBNL, JSU, and AGMUS (then known as AGMEF) formalized the Consortium.

In the past decade, hundreds of Science Consortium students, both precollege and university, have been touched by the magic of science. Many have been motivated to continue their studies in pursuit of a master's degree or a doctorate. Faculty at JSU and AGMUS have earned advanced degrees with the Consortium's help. The increase of faculty with terminal degrees has created opportunities for the development of graduate programs in the sciences. New university buildings have sprung up to accommodate the growth. Enhanced network connectivity, conferences, and seminars have fostered collaboration. And through it all, program participants have been contributing to the world's scientific knowledge through active research. The Science Consortium models for strengthening Student, Faculty, Research, Precollege, Curriculum, and Infrastructure have yielded the results which appear in the following pages.

Student Development Accomplishments

The Science Consortium involves students in cutting edge research and students work with nationally and internationally known scientists. These scientists are trained and experienced mentors who are committed to working with minority students.

The Science Consortium reaches out to students primarily through its research programs, encouraging scholars to learn by doing. Research activities are supported both at LBNL and at students' home universities. The goal of these activities is to encourage more JSU and AGMUS students to seek advanced degrees or careers in science or engineering. When the Consortium began its work, only a handful of students at either university participated in research. JSU targeted research opportunities at LBNL for only a few students in computer science, and AGMUS did not have a research agreement with any national laboratory. Over the years, the annual number of Science Consortium student researchers at LBNL has remained constant.

By the end of its first decade, the Science Consortium had arranged numerous student research appointments at the laboratory. The appointments are now divided almost perfectly in half between students from AGMUS and those from JSU. Today, the student research-

ers come from a wide variety of scientific disciplines. They major in mathematics, general sciences, chemistry, life and medical sciences, and physics as well as in engineering and technology. Undergraduates, graduate students, and those in between can all take part, and return appointments are common. Many students at either AGMUS and JSU now have the choice to conduct scientific research at their home institution. Some elect to work at national laboratories, like Lawrence Berkeley National Laboratory.

The Science Consortium makes it possible for these students to fulfill their research goals. The Consortium also has helped numerous students earn advanced degrees. Some AGMUS graduates have chosen to study at JSU. With Consortium help, JSU has expanded its course offerings in the sciences and now offers the doctorate degree in Environmental Sciences. AGMUS now offers courses specifically geared to train students for work in the national laboratories. Conferences and seminars also contribute to student development. Collaboration with other researchers is a basic part of the Science Consortium's approach. Participants publish their results and present them at scientific meetings. With the help of mentors, budding researchers begin to function as members of the scientific community.

Student Development Accomplishments

- Eighteen students are presently pursuing Ph.D degrees.
- Presently there are 17 Science Consortium students pursuing an M.S. degree.
- Several majority graduate schools are committed to enrolling Science Consortium students
- More than 300 students have received support for research at their school.
- More than 250 student research appointments at Lawrence Berkeley National Laboratory
- Fifty five students have received consortium support to pursue Master's degrees
- Since 1990, over 250 students have participated in national science research conferences
- Several students have co-authored articles in scientific professional journals.

“It gave me the confidence and maturity I needed to continue my studies. It was definitely of major influence on my decision to continue graduate studies.”

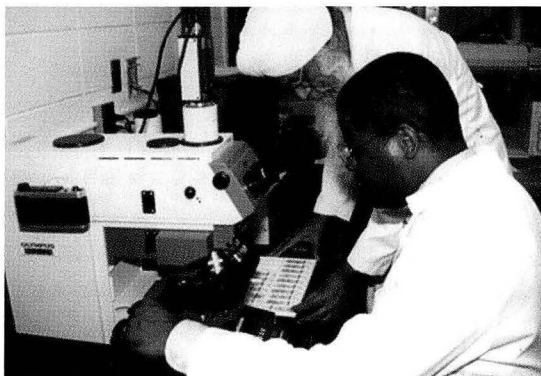
— Luis Benítez Bibiloni, Universidad del Turabo graduate, doctor of veterinary medicine.



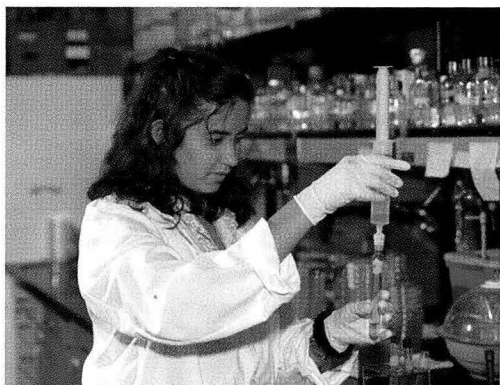
Main entrance of Universidad del Turabo.

Our Students Learn Science through Practice

Right, JSU student
Louis Hall at JSU with
Prof. Balwant Sekhon.



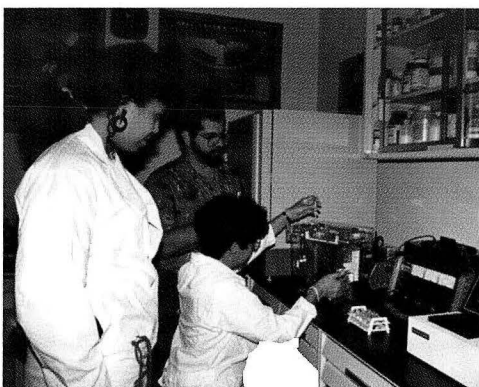
Left, Betsy Martinez, AGMUS
student at Universidad del
Turabo, at work in Dr.
Leighton's U.C. Berkeley
laboratory. Betsy will be
entering the University of
Minnesota on full
scholarship in the fall of
1995.



Right, JSU
student at JSU



Left, AGMUS students in
Bioremediation Environmental
Science research laboratory,
Lawrence Berkeley Laboratory, with
Dr. Edgar Resto, a professor at
Universidad del Turabo.



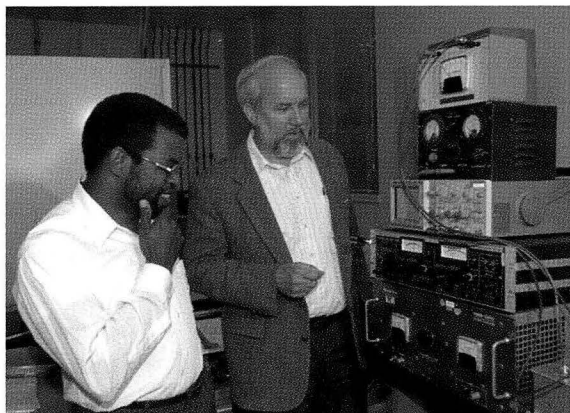
Faculty Development

Through its faculty development activities, the Science Consortium has helped to increase faculty members' capability to teach and perform research. All the institutions of the Consortium have benefited from the resulting relationships between LBNL, JSU, and AGMUS scientists.

In 1983, only two science faculty member from AGMUS held a Ph.D. Now, 35% of the science faculty hold a doctorate in either natural or allied health sciences. Also, in the past decade, the proportion of JSU faculty members holding doctorates was brought up to more than three fourths. Participation in workshops and conferences has also blossomed. In the last decade, 129 faculty members have attended 175 professional conferences, 102 have participated in 106 specialized workshops, and 113 have made presentations at professional

meetings. Research opportunities at LBNL have contributed significantly to several instructors' participation in scientific training and research. Some 57 faculty members from the Consortium's schools have taken advantage of the chance to work at a distinguished scientific institution. The

laboratory also lends equipment and provides consultants to aid Consortium faculty in developing their own laboratories.



Above, Prof. Floyd James, of JSU at work in Paul Berdahl's laboratory at Lawrence Berkeley National Laboratory, during the 1990 Summer Faculty collaborative research campaign.

- Over 75 publications have been published in refereed journals.

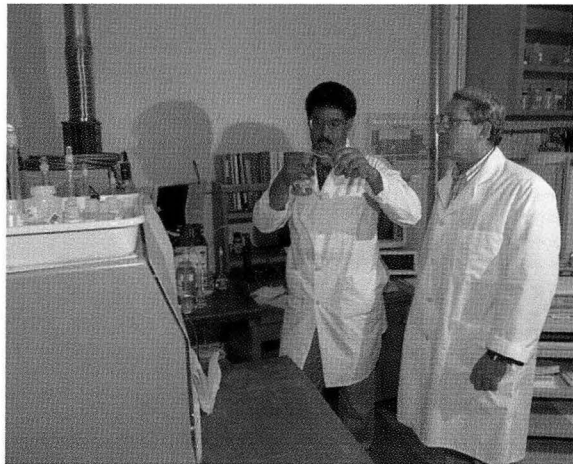
- Collaborative research has resulted in AGMUS and JSU faculty receiving

support from other federal agencies and business and industry.

- Faculty are now skilled in using information networks and have included them in their collaborative research and student development activities.
- More than 57 faculty have worked at national laboratories.

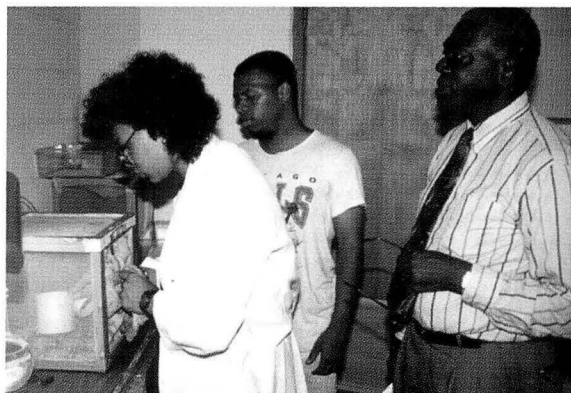
AGMUS and JSU Faculty Collaborate in Cutting Edge Research with LBNL Scientists

Right, Prof. Luis Feliú,
of the Universidad
Metropolitana, working in
his laboratory with
student Andrés Polanco,
now a graduate student
at the Univ. of Puerto
Rico, Medical Sciences
campus.



Left, Prof. W.-S. Yang,
of the Biology
Department at JSU
teaching in his
laboratory.

Right, Dr. Fred
Nelson, JSU
professor,
mentoring two
graduate students.



“It is just a
matter of being
exposed to the
pertinent
information, and
also having a
mentor willing to
teach one how
to do science.”

— Stephen
Ekunwe, JSU
Graduate, Ph.D.
student at Michigan
State University.

Research

Research is at the core of the Science Consortium's activities. Students as well as faculty members participated in research projects. This work is directed toward strengthening and expanding the energy and environment related research capabilities of LBNL, JSU, and AGMUS. The Consortium schools had little research capability when the consortium was founded. Jackson State University conducted little energy research, and its participation in collaborative projects was limited. At AGMUS, no research was conducted in science or computer science. All of this changed with the efforts of the Science Consortium. Scientific collaborations between the universities and LBNL have received national recognition, and some have earned follow-on research grants from federal agencies. AGMUS' initiatives to increase the amount and quality of research include: workshops in the use of the Internet for research, technical manuscript preparation, monthly journal club, and establishment of an external research committee for the selection of research projects.

Examples of our Successful Collaborative and Campus Research Activities

- Luis Feliú (AGMUS/UMET), Dale Perry (LBNL), and Andrés Polanco (UMET), Vibrational Spectroscopic Studies, Paper selected as one of the top ten best for the 1993, and 1994 ACS Conferences.
- Bob Buchanan (UCB/LBNL), Terrance Leighton (UCB/LBNL), Wen Sun-Yung (JSU) collaborating on the BEST Project
- Rolf Melhorn (LBNL), Jeanette Gómez (AGMUS graduate), collaborating on the BEST Project. Ms. Gómez has since been admitted to University of Pittsburgh's Graduate School program in toxicology. She has been acknowledged as one of the two top graduate researchers in her department.
- Bill Johnston (LBNL) & Keshea Williams (JSU student), collaborating on the Whole Frog Project. Developed computer model of frog dissection for current teaching of biology through the World Wide Web.

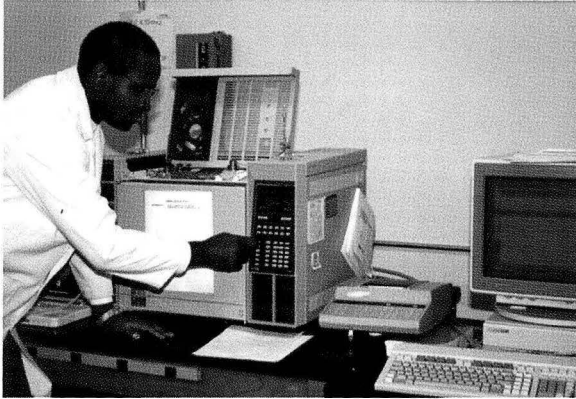


Above, LBNL researcher, Rolf Melhorn, with Ms. Jeanette Gómez in Dr. Melhorn's lab during the 1991 summer internship program.

"The experience!

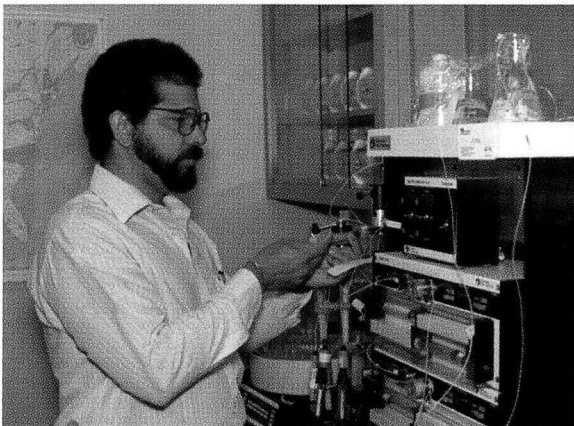
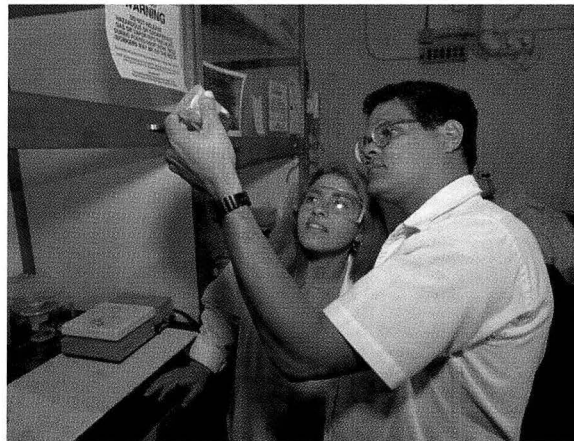
I gained technical knowledge and skills."

— Clara Henderson, JSU, computer scientist at Pacific Bell.



Left, Jackson Ombaba, JSU professor, at his laboratory. He carried out research at Armed Forces Institute of Pathology in the summer of 1994 to build a new collaboration between the Science Consortium and DOD laboratories.

Right, Prof. Cesar Lozano of the Universidad del Turabo, with Univ. del Turabo undergraduate Adeliz Bezares, in Dale Perry's laboratory at Lawrence Berkeley National Laboratory, Summer 1994.



Left, Resto, Universidad del Turabo professor, conducting research in the field of bioremediation.

The BEST Program

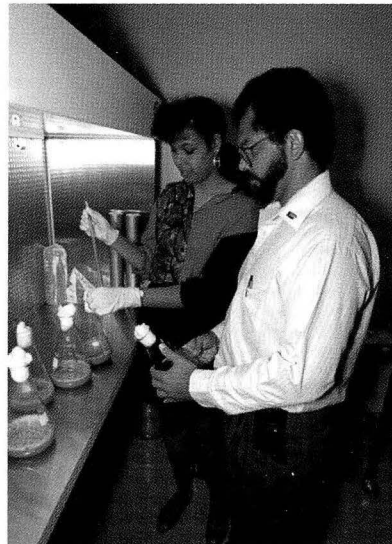
The Bioremediation Education, Science and Technology (BEST) project is the first independent program to grow out of the efforts of the Science Consortium. BEST was established in 1992 to provide opportunities in the interdisciplinary field of bioremediation. It addresses two national needs: educating researchers to develop innovative methods of waste management and increasing the representation of women and under-represented minorities in cutting-edge science.

The idea of establishing centers for bioremediation education and research came out of a collaboration between investigators at the University of California, Berkeley (UC Berkeley) and the schools of the Science Consortium. The participating scientists found evidence for the usefulness of a new approach to toxic metal bioremediation. The centers were started to fulfill the promise of the new technique and develop other waste management solutions.

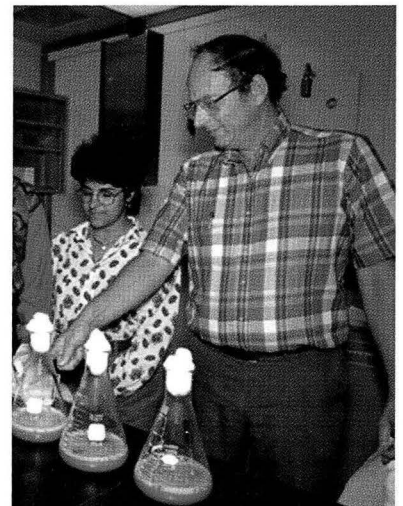
BEST centers have been established at the participating institutions. Each one addresses the bioremediation needs of its lo-

cal environment. At UC Berkeley, research is focused on the problems of the San Francisco Bay area, including removal of toxic metals from San Francisco Bay and the Kesterson Reservoir region. Work at JSU focuses on pollution in the Mississippi River, including metallic contaminants that

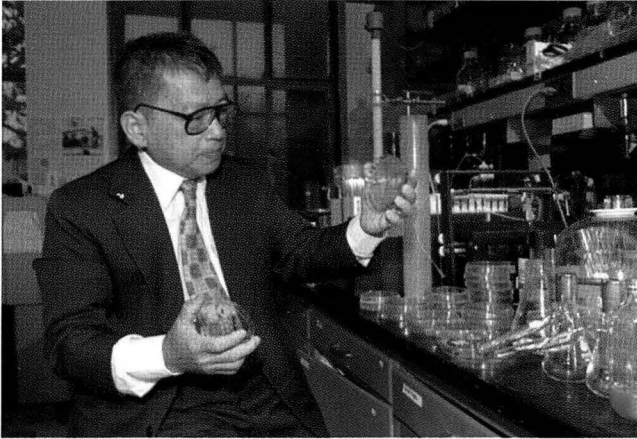
originate in neighboring industrial areas. The center at AGMUS conducts research on the environmental problems of Lake Cidra and San Juan Bay, both of which receive pollutants from the surrounding industrial areas. It will also develop new methodologies for the analysis of toxic pollutants, both organic and metallic.



Above, Edgar Resto at LBNL with BEST student.

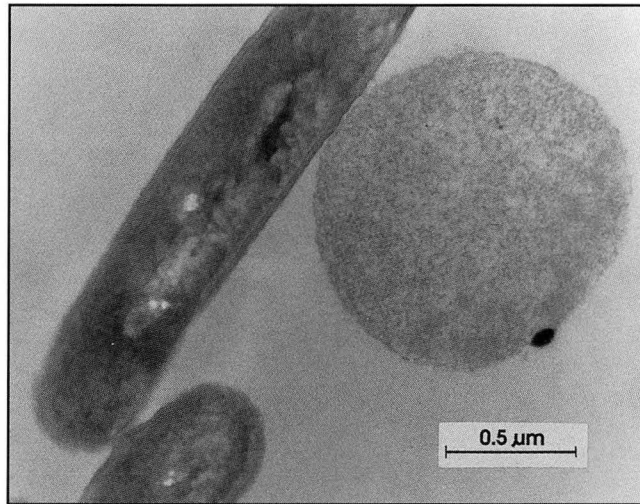


Right, Bob Buchanan at UCB's BEST lab.



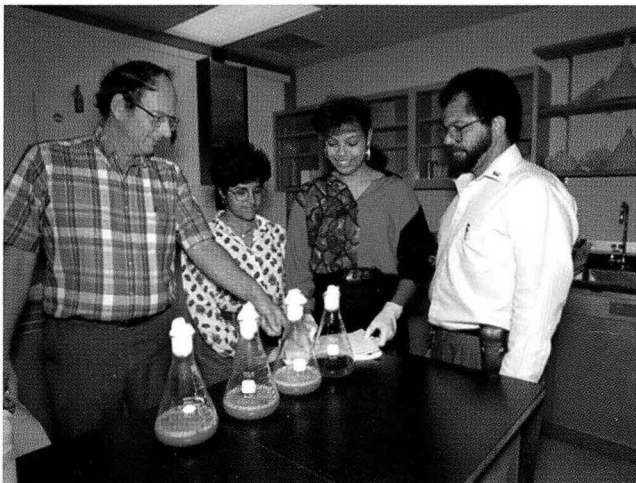
Right, WenSu-Yang
at his JSU lab.

Right, Selenium detoxifying body adjacent to normal rod-shaped *Bacillus subtilis* cell. The use of this bacterium for detoxifying selenium was developed through a collaboration of scientists at the UC Berkeley and JSU and AGMUS scientists.



“Participation in the program has helped me realize how important it is to take part in helping the environment.”

— Adis Y. Umpierre,
Universidad
Metropolitana, 1994
graduate.



Right, BEST students
at LBNL.

Curriculum Development

Over the years, the Science Consortium has made steady improvements in the science curricula of its member schools. Both AGMUS and JSU have developed more diverse course offerings in scientific disciplines and have begun offering more degrees at higher educational levels.

When it joined the Consortium, AGMUS offered only an associate's degree in the natural sciences. In the last decade, it has added a host of new courses of study: A.S. in pharmacy assistance, technological radiology, medical records, general science, computer science, nursing, and ultrasound diagnosis; B.S. in biology, chemistry, computer science, general and natural sciences, applied mathematics, nursing, respiratory therapy, sales and distribution of pharmaceutical and chemistry products, and applied mathematics.

A decade ago, JSU lacked the necessary computers and laboratory equipment to effectively support its bachelor of science programs. Now, the school is offering the doctorate degree in Environmental Sciences. The School of Science and Technology has also expanded its curriculum to offer courses in cryptography, mathematical modeling and biotechnology. The computer science curriculum has been reviewed and restructured. Lawrence Berkeley National Laboratory has provided VAX computer terminals and computer science staff, bringing JSU's computing resources up to date. The university now offers seminars in the use of information networks.

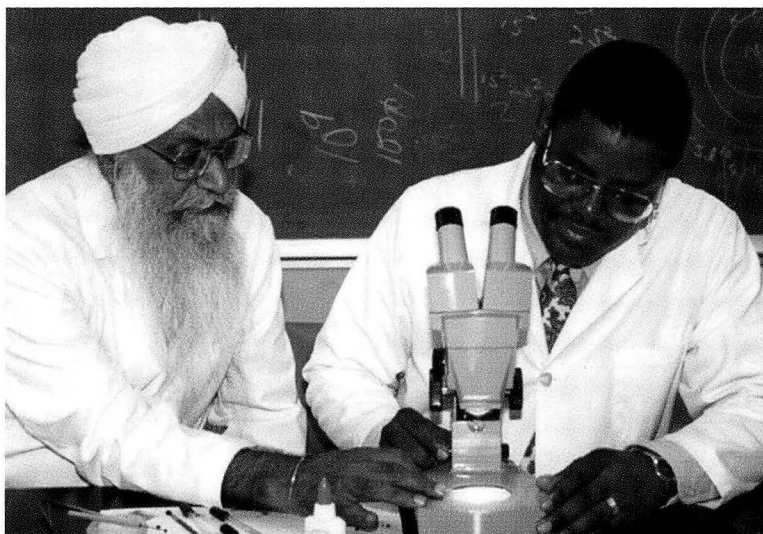
The Science Consortium offers important resources for institutions that are in-

terested in developing science curricula. It maintains a comprehensive curriculum development resource library. It also provides models for curriculum development. Its work has spurred the growth of a community of scientists who are committed to sharing their knowledge through seminars and lectures at minority institutions.

- JSU development of the Ph.D. in Environmental Science - currently 30 students are enrolled
- AGMUS development of Turabo's B.S. in Chemistry
- Seminars and short courses at JSU and AGMUS
- Luis Feliú's collaboration with LBNL contributed to curriculum development: High Performance Liquid Chromatography - Organic Studies
- Colegio Universitario del Este - A.S. in natural sciences, pharmacy assistance, radiologic, medical records, ultrasound diagnosis and computerized tomography technology.
- Universidad Metropolitana - A.S. in general science, computer science, and nursing, and B.S. in biology, computer science, general natural science, nursing, respiratory therapy, and sales and distribution of pharmaceutical and chemistry products.
- Universidad del Turabo - B.S. in biology, chemistry, applied mathematics, and natural sciences.
- M.S. degree program in Hazardous Material Management was approved at JSU.



Above, AGMUS faculty at meeting.



Above, JSU faculty and student.

//////
“It is through the support of your office that I have obtained the necessary training to be competitive in the area of molecular biology.”

— Barbara Chapman, JSU graduate, medical technologist at Silas Beach Hayes Hospital.



Precollege Programs

In 1983, none of the schools of science and technology in the Science Consortium conducted Precollege outreach activities. Now, the Consortium reaches hundreds of teachers and students with programs at all its member institutions. The hope is to increase the number of incoming freshmen that have the potential to carry their interest in science into a career or into post-graduate studies.

- Comprehensive Activities to Upgrade Science Academics (CAUSA) was established through the Carnegie Foundation to help develop the precollege programs of the Science Consortium at AGMUS. Since 1984, more than 2,000 students have participated, and many have been accepted to top universities. Of these CAUSA graduates, 771 have chosen science-math based programs. Of the total students, 741 CAUSA graduates have expressed a desire to pursue graduate studies after their undergraduate experience. Approximately 50 teachers, 9 laboratory technicians, 7 counselors, 6 tutors, and 1 coordinator have participated each year.

- In 1990, Great Explorations in Math and Science (GEMS) began at the Lawrence Hall of Science. Puerto Rican high school teachers attending this program translated modules into Spanish and adapted them for use in high school biology classrooms in Puerto Rico.

- In 1991, a pre-freshman engineering program started at Turabo University and in-service teacher programs started at Metropolitan University, strengthening instruction in Puerto Rico's public schools.

- In 1991, the Consortium initiated a pre-college program at UT and UMET-both

AGMUS schools. The programs are oriented to increase the number and quality of undergraduate minority students entering the science and technology fields.

- In 1993, 90 high school students attended the precollege program at Turabo University and 45 students attended the program at Metropolitan University. Twenty three of a total 135 participants (17%) applied to one of the science and technology programs offered by AGMUS.
- The Mississippi QEM Network Alliance was formed in the spring of 1991. It includes representatives from universities, precollege educational systems, business and industry, government, and community/professional organizations.
- Beginning in 1990, special emphasis was placed on Summer Residential Science Academies, a precollege initiative of the School of Science and Technology. This program includes follow-up during the academic year. Since 1990, the program has supported approximately 250 middle school and high school participants, 12 counselors, and 16 instructors. A Parent Advisory Group was formed in the summer of 1992 to support the precollege program.
- The School of Science and Technology received \$1,180,000 from the National Science Foundation for a "Comprehensive Regional Center for Minorities Program" to increase the number of Mississippi minority students studying math and science in middle/high school and those choosing to major in math and science in college. The funding period is from September 1, 1993 to August 31, 1995.



Left, Pre-college program at Universidad Metropolitana under the supervision of Dr. Doris Caro.



Left, Pre-college participants on field trip at John C. Stennis-NASA Space Center.



Left, LBNL's pre-college activity.

Infrastructure

“Back in 1986,
LBL offered me
the opportunity
to experiment in
a new world. ...

It was the
beginning of a
wonderful
journey.”

— Jacqueline Colón
Sánchez,
Universidad
Metropolitana
graduate, computer
scientist at Digital
Equipment
Corporation.

The Science Consortium has been crucial in the efforts of JSU and AGMUS to improve and enhance teaching and research, laboratory and computer facilities, and library resources. JSU and AGMUS developed computing and networking capability to support scientific research and science and technology education.

AGMUS has facilities for faculty and student research. JSU and AGMUS have state-of-the-art computing systems. By 1994, both institutions had local area networks, and many faculty members were using the Internet.

- A five-year plan was prepared to define and broaden the Consortium’s focus through outreach to other institutions and partnerships.

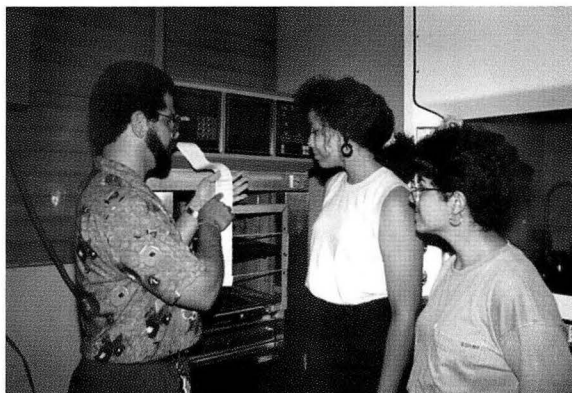
- The Consortium supported consultants to assist in the design and development of AGMUS’s new science building, which was inaugurated in

1990. This building contains the organic, analytical, and environmental chemistry laboratories, and the molecular biology laboratories.

- AGMUS and JSU increased considerably their library holdings,

especially their collections of scientific journals.

- Local area network and connectivity to Internet was supported by the Science Consortium at AGMUS.
- Internet connectivity was established at JSU.
- The Consortium worked with other JSU science and technology partnerships to establish and pay for implementation of JSU’s local area network.



Above, a laboratory at Universidad del Turabo.



Left, a laboratory at JSU.

Reaching out to the Future

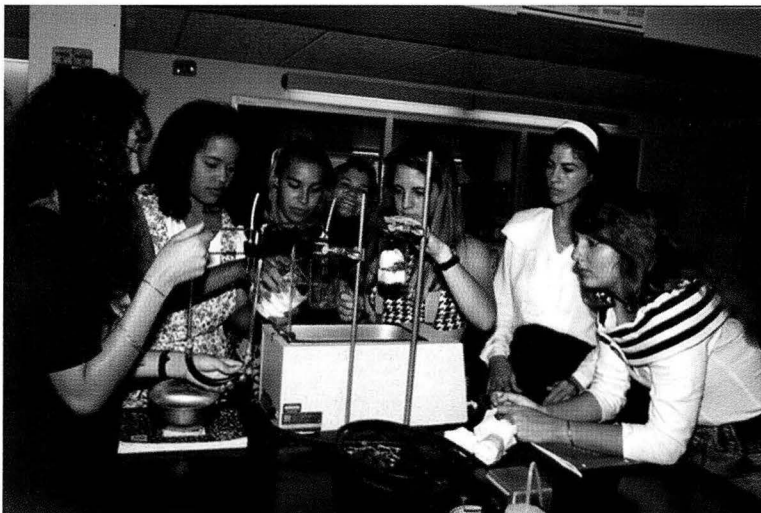
The Science Consortium made remarkable progress in the eleven years of its existence. Its member institutions gained new capabilities, and their students and staff made good use of the opportunities created.

What we have developed over the years is an efficient collaborative model that has provided access to information and equipment as well as opportunities. The programs of the Science Consortium can now theoretically aid a single student from his or her first contact with the sciences through postgraduate research. Through this comprehensive pipeline, we ultimately produce more minority scientists and engineers to meet the scientific challenges of the future.

As we begin our second decade, we are setting our sights on a broader approach. The Consortium is gearing its

future activities toward reaching out to other minority institutions. We feel that the advancements made at our member institutions should be pursued at others like them. As we expand our scope, we can reach out to even more students, effectively increasing the flow of students in the science pipeline.

Our efforts to date have shown that sharing resources through a collaborative model works. Others have recognized this and modeled their own programs after ours. What is more, the Science Consortium itself has begun to generate new organizations based on the collaborative approach. Establishing new collaborations with other institutions continues this trend of reaching out, ultimately helping more and more students to find fulfilling careers in the sciences.



Above, a group of UMET students at one of its science laboratories.

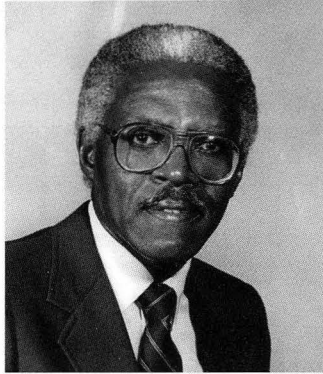
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“When I first arrived at LBL, I was somewhat apprehensive about my abilities. When I left LBL, I believed there was nothing I couldn’t do.”

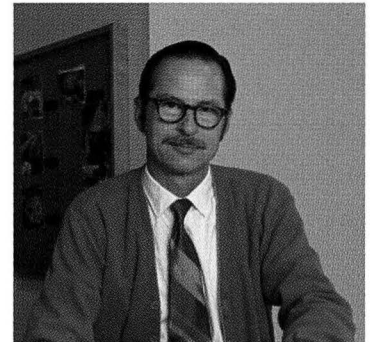
—Michael Garner,
JSU graduate,
computer scientist at
AT & T Bell
Laboratories.



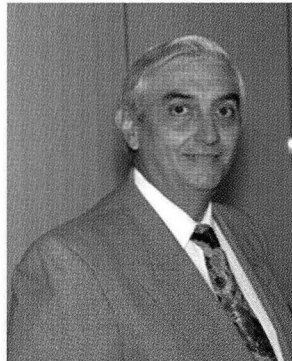
Science Consortium Founders



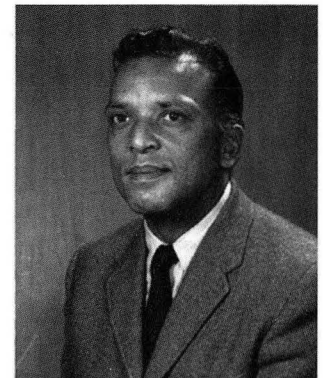
John Peoples, former President of JSU—The School of Science & Technology was dedicated in his honor.



Walter Hartsough, former Associate Laboratory Director for Engineering and Technical Services at Lawrence Berkeley Laboratory.



José F. Méndez, President of the Ana G. Méndez University System.



Harold Wilson, former head of minority student services at Lawrence Berkeley Laboratory.



James Perkins, first Dean of Jackson State University's School of Science and Technology.

Words from Key Science Consortium Supporters

Dr. Juan Bonnet

Through the Consortium, there has been access to a pool of resources for faculty and student development, collaborative research, curriculum and infrastructure development.

Dr. James Perkins

The institutional changes at JSU and AGMUS have provided places of excellence in education and research where minority students can attend. The faculty of these institutions have a gateway for collaborative research with world class scientists in cutting edge areas of science and engineering. Many of these faculty are minorities who can make their presence and contributions known in scientific circles. Students attending JSU or AGMUS who have participated in this program have gone on for terminal degrees and will serve as role models for future generations of students of color at all levels of education.

Ms. Míriam Cruz

The two minority institutions have the opportunity to increase the number of students and they have diversified their academic programs. They also increased the number of advanced degrees among their faculty. The quality of their programs definitely has been strengthened as a result of this.

Mr. Harold Wilson

JSU and AGMUS had different institutional goals and could not be treated like small liberal arts colleges. The Science Consortium influenced the way federal government agencies dealt with HBCUs and MIs.

Additional Publications

- J.M. Pridemore, G.B. Begonia and M.L. Salin, "Characterization of an Iron-Containing Superoxide Dismutase from the Unicellular Alga, *Chlamydomonas moewusii*." *Plant Physiology (Life Sci. Adv.)*. 10:131-137; 1992.
- R. Karim, "A New Diagnostic Instrument for PBX-M Utilizing an Optical Multichannel Analyzer." *Bulletin of the American Physical Society*; 37(6), 1393; 1992.
- J. Lezczynski, "Tautomers of 6-Thioguanine: Structures and Properties," *Journal of Physical Chemistry*; 97; 3520; 1993.
- J. Lezczynski, "Ab Initio Hartree-Fock and Post-Hartree-Fock Study of Molecular Structures and Vibrational Spectra of Thioformaldehyde and Its Fluoro, Chloro and Bromoderivatives." *Journal of Physical Chemistry*; 97: 1845; 1993.
- J. Lezczynski, "Molecular Structures and Properties of Phosphine Selenide and Seneophosinuous Acid Revealed by ab initio Post-Hartree-Fock Studies." *Journal of Physical Chemistry*, 97; 1364; 1993.
- J. Lezczynski, "Molecular Structures and Vibrational Spectra of Selenoketene and Its Thio- and Oxo-Analogs by ab initio Post-Hartree-Fock Study." *Chemical Physics Letters*. 901; 79; 1993.
- J. Lezczynski, "Harmonized Infrared Spectrum of Formaldehyde: Experiment and Theory." *Journal of Molecular Spectroscopy*. 157: 540; 1993
- J. Lezczynski, "Temperature-Dependent Thermodynamic Contributions to the Relative Tautomeric Stabilities of Nucleic Acid Bases." *Chemical Physics Letters*. 204:430; 1993.
- H.R. Shih. "Approximation and Substructuring Techniques in Structural Optimal Design Using Boundary Elements." *Computer Applications and Design Abstraction*; 49: 111-116; 1993.
- E. Noe. "Conformational Studies of Alkyl Nitrites Using Low-Temperature ^{13}C , ^{17}O and ^{14}N NMR Spectroscopy. ^{17}O NMR of N-Substituted Formamides." *Journal of Chemical Physics*. (In Press)
- J. Leszczynski & L. Goodman. "Importance of Polarization and Correlation Effects in Ab Initio Prediction of the Acetaldehyde Methyl Torsional Barrier." *Journal of Chemical Physics*. 99, 4867, 1993.
- J. Leszczynski and J. S. Kwiatkowski. "Molecular Structure and Vibrational IR Spectrum of Formamide Revisited: Ab Initio Post-Hartree-Fock Study." *Journal of Molecular Structure*; 297, 277; 1993.
- Hui-Ru Shih and V. Brewer. "Development of an Experimental Method to Determine the Axial Rigidity of a Strut Node Joint." *NASA CP-3201*; pp. 37-41, 1993.
- Hue-Min Hwang, R. Hodson, D. Lewis, and R. Scholze. "Microbial Activity in Ground Water at a Chemical Waste Disposal Site." *Bulletin of Environmental Contamination and Toxicology*; 1993.

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