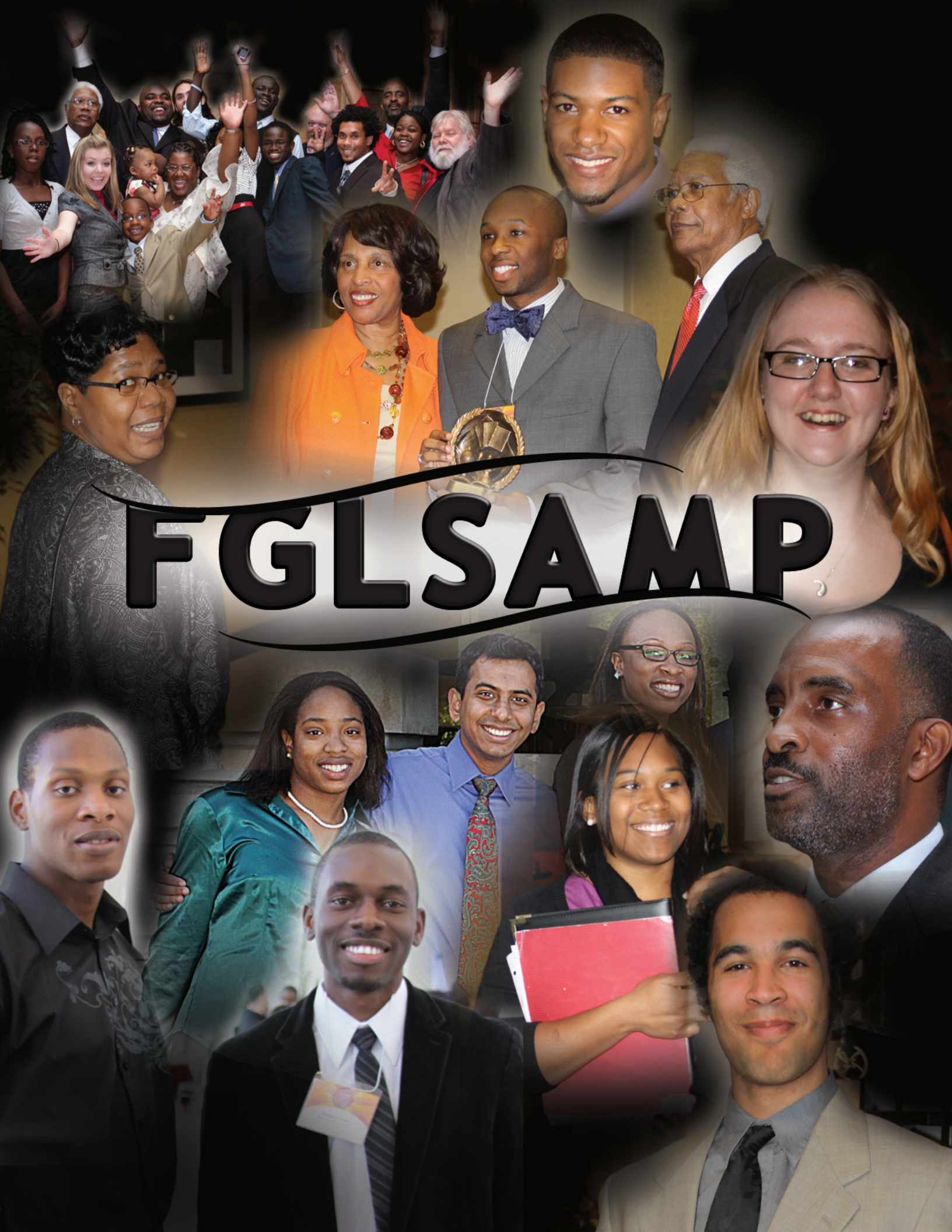
Florida Georgia Louis Stokes
Alliance for Minority Participation

2011 Impact Report

Positively Impacting and Expanding the Nation's S.T.E.M. Talent Pool

Illuminating the value of the FGLSAMP to the national mission to broaden participation in the science, technology, engineering, and mathematics disciplines via institutions of higher education within the U.S.

FGLSAMP
FLORIDA
GEORGIA
LouisStokesAlliance
for Minority Participation
in Science, Technology, Engineering, and Mathematics


FGLSAMP

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The Impact of FGLSAMP Upon the S.T.E.M. Workforce

POSITIVELY IMPACTING AND EXPANDING THE NATION'S S.T.E.M. TALENT POOL

Forward

For the past 20 years the Louis Stokes Alliance for Minority Participation (LSAMP) has strategically been developed the human capital needed for the advancing of science, technology, engineering, and mathematics (STEM) within the United States of America (U.S.). LSAMP was created and established by the National Science Foundation (NSF) division of Human Resource Development in 1991. The far reaching impact of scientific discoveries has been associated with the health and sustainability of wellbeing and welfare; economy; and national security for the citizens of this great nation and even beyond its borders.

To address this national need for greater numbers of scientists and researchers, it was determined that America should look to its own citizenry as its primary resource to expand the STEM talent pool. Thus LSAMP plays a major role in this initiative because it is design to strengthen the STEM pipeline by reaching out and embracing populations within the U.S. that have historically underrepresented in STEM fields of endeavor.

Born out of the LSAMP were regional LSAMP designed to reach and serve geographic regions of institutions of higher education (IHEs) that would work together to recruit, retain, and graduate underrepresented minorities (URM) in STEM disciplines.

The Florida-Georgia Louis Stokes Alliance for Minority Participation (FGLSAMP) was created to have such an impact upon undergraduate students pursuing STEM baccalaureate degrees. Since the inception of FGLSAMP in 1992, it has evolved in a manner that has yielded significant influence and impact upon the various stakeholders:

- Students
- STEM Faculty/Departments
- Institutions of Higher Education
- STEM Research Communities
- U.S. STEM Enterprise

You the reader, will find within the pages of this publication, a story that illustrates and illuminates the positive impact, influence and role of FGLSAMP upon the climate and culture which serve as the basis of the program's ability to achieve its goals and objectives for the purpose of increasing the U.S. talent pool of scientists and researchers.

This publication will also demonstrate the exponential potential of the holistic approach utilized by FGLSAMP to enhance the academic and professional preparation of FGLSAMP scholars. The FGLSAMP approach has resulted in the advancement of science and research while contributing to the United States' role as a global leader in STEM.

Executive Summary

The Florida Georgia Louis Stokes Alliance for Minority Participation was established to impact the institutions of higher education in such a manner that it would yield a significant increase in the enrollment and graduation of among historically underrepresented minorities (URM) in science, technology, engineering, and mathematics disciplines. Florida A&M University of selected as the lead institutions of this 13 member alliance at its inception in 1992. FGLSAMP has experienced great overall success, with an exceptional growth in the number of baccalaureate degrees awarded to underrepresented minorities in STEM disciplines. With a baseline of 416 STEM baccalaureate degrees awarded in 1992 and has increased to 2242 in 2010, a 450% increase from 1992, FGLSAMP has indeed been a contributor to this phenomenal success. . FGLSAMP has chosen to employ a holistic approach to the academic enhancement and professional development of its program participants. This approach was designed after gaining a greater insight

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to and understanding of the contributing factors of attrition among underrepresented minorities pursuing STEM baccalaureate degrees. Thus FGLSAMP has chosen to address and assist student participants from the point of view of a continuum, looking to significant progression benchmarks and thus preparing participants for success along the academic continuum and helping them to meet the benchmarks signifying healthy progression and time to graduation.

The major areas of focus for the holistic approach employed by FGLSAMP are:

- Progression – within the undergraduate academic pipeline
- Persistence – within STEM disciplines
- Graduation – preparation for STEM careers; STEM graduate education; and time to graduation

It is through the prism of these guiding principles that the success and impact of the FGLSAMP program can be evidenced. To reduce attrition and ensure the success of URMs pursuing STEM baccalaureate degrees the FGLSAMP model incorporates the following components into its "best practices for program success:

- Peer Mentoring/Tutoring
- Faculty Mentoring
- Learning Communities within STEM Depts.
- Disciplinary/Professional Socialization
- Academic Enhancement Activities

Underrepresented Institutional STEM Enrollment

Race/Ethnicity	1993-1994	2009-2010
Black or African American	5854	8364
Hispanic or Latino	6094	17222
Native American	108	222
Native Hawaiian or Pacific Islander	53	58
	12109	25868

Through these programmatic components FGLSAMP can thus impact and influence the academic environment in such a way that it has a positive impact on student retention and graduation among its participants. As a result of these activities FGLSAMP can cultivate and develop highly motivated; academically astute; and well prepared students eager to engage in science and research needed to sustain and secure the wellbeing for the citizens of the U.S.

FGLSAMP began with a mission and focus upon impacting URM students pursuing the STEM baccalaureate degree. After experiencing and achieving sustained success at the undergraduate level, NSF rolled out a new initiative to extend the academic pipeline for success with the inception of the Bridge to the Doctorate (BD) initiative. The BD effectively began in 2003 and continues to contribute to remarkable increase of URMs continuing their educational pursuits to attain the STEM Ph.D.

The success of FGLSAMP is due to the confluence of components that make up FGLSAMP and the discrete values derived from the holistic approach employed. The factors dictate and influence programmatic success almost inextricably link and not always easily identified or measureable.

This report will examine the various key factors that contribute to program success. The areas of impact highlighted in this report are:

- STEM Human Resource Development
- Institutional STEM Faculty/Departments
- Research Culture Community
- Professional Development
- STEM Graduate Education
- Institutional Culture

Over 90% of the FGLSAMP scholars graduate within six years. This rate exceeds the graduation rate for the rest of the institution.

- **Dr. Willis Walter**, Vice President of Institutional Research, Planning and Accreditation, BCU

FGLSAMP Mission

To significantly increase the number of degrees awarded to underrepresented minorities in science, technology, engineering, and mathematics.

Impact upon Student Success

The holistic approach to consistently diminish the factors of attrition of URM students within STEM disciplines is at the heart of all FGLSAMP activities. Giving students a sense of place and community is the welcoming experience of each student participant. Many of the students seemed either enthusiastic or amazed that there is a family of students and faculty that actually care about their STEM experience. This welcoming engagement with the new FGLSAMP students lays the foundation for effective training and development of students into a motivated and talented group of individuals ready for graduate school and/or careers in STEM.

FGLSAMP employs a tremendous amount of departmental socialization and engagement to assist new student to become familiar with their respective major departments. Students are exposed to workshops and seminars that introduce and acquaint students with STEM faculty members. When necessary a faculty mentor is provided for students as a means of impacting STEM retention. Students then become familiar and comfortable as they begin to adapt to their respective STEM departments.

Research shows that the impact of intentional socialization (departmental and professional) has positive correlation and thus FGLSAMP makes a strong effort to develop that attachment and engagement by the student to their STEM department. Academic socialization takes many forms and thus is one of the discrete values that is hard to singularly identify, yet is a major contributor to the impact upon FGLSAMP student preparation.

FGLSAMP activities have tremendous positive impacts upon student academic experiences because the program gives student great exposure to:

- Faculty Mentors
- On-Campus Research Opportunities
- Learning Communities
- STEM Lectures and Presentations
- Research Internships
- Graduate School Recruitment
- Targeted Professional Conferences

The impact of FGLSAMP experience upon student participants is:

- A higher propensity to remain in STEM disciplines
- Enhanced academic performance
- Engage in research during the academic year
- Learning best practices for success in the classroom
- Access to study groups (formal and informal)

FGLSAMP Impact - A Snapshot

- Average Time to Degree : 5.73 years
- Average STEM Retention: 91.6%
- Increase from 416 URM Baccalaureate Degree Awards in 1992 to 2427
- The number of UREP STEM Institutional Ph.D. degrees earned has increased from 19 in 1993 to 257 in 2011.
- Research Internship Experiences: Over 1,690 since 2002
- STEM Baccalaureate Degree Awards in 2010
- The number of UREP STEM Institutional Masters degrees earned has increased from 171 in 1993 to 474 in 2010.

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- Learning to develop research presentations (oral and poster)
- Access to cutting edge research organizations and top STEM graduate programs
- The opportunity to develop into a top candidate for a career in STEM
- Talented and motivated future professionals ready to step up and make real contributions to research being conducted
- Students who have the STEM intellectual understanding and technical skill sets needed for serious research at all levels
- Greater research productivity
- Great investment for STEM organizations and STEM graduate programs

FGLSAMP students have immediate access to STEM departments of 7 universities with STEM graduate programs. This is very important as access to many Research Experiences for Undergraduates (REU) are hosted at these institutions and can also be a means of insight for selected students to 1) conduct high level research and 2) gain insight and connection to a STEM graduate program while on internship. Often the FGLSAMP undergraduate student will have opportunity to interact with graduate students working with the research, who can help to de-mystify aura of the STEM Ph.D. These experiences have exponential impacts upon:

- STEM retention
- STEM graduation
- STEM graduate education

Impact of Research

FGLSAMP encourages and facilitates research experience for student participants because we have found the research experience to be one of most significant factors of student progression to STEM graduate degrees", says the FGLSAMP Program Manager. Because we feel research plays such a major part of the overall STEM academic experience, FGLSAMP community college partners are also conducting summer research experiences that are coordinated through the FGLSAMP Coordinator. Here again the impact of FGLSAMP can be evidenced, as Tallahassee Community College conducts a STEM Summer Research program that invites non-FGLSAMP STEM students to participate. The institution has also recognized this FGLSAMP initiative as such a critical component of STEM retention, that it provides the facilities and equipment for this summer research experience.

Community College Participants

Institution	No. of Students	DOE National Lab
Florida State College of Jacksonville	1	Oak Ridge
	1	Brookhaven
Miami Dade College	1	Oak Ridge
Tallahassee Community College	12	Brookhaven

FGLSAMP has had 15 community college participants to participate in summer research at the U.S. Department of Energy –National Laboratories:

Through FGLSAMP students gain access to opportunities to engage cutting edge research at national facilities like:

- U.S. Dept. of Energy
- National Institutes of Health
- Centers for Disease Control

FGLSAMP student participants also engage in research with numerous REU programs at research universities across the nation. FGLSAMP students have participated in research. Research is a major factor in sustaining high STEM retention rates. FGLSAMP students are strongly encouraged to engage in undergraduate research opportunities early in their academic careers.

FGLSAMP coordinators assist students in securing academic year and summer research opportunities. The number of FGLSAMP students engaged in on-campus academic year research has steadily increased over the past

eight (8) years. Initially juniors and seniors were encouraged to embark upon academic year research, now sophomores and advanced freshman are encouraged to participate. Our informal findings indicate that student participation in research of any type has a positive impact upon student academic performance, STEM retention, and graduate school interest.

The effort of the FGLSAMP Central Office to broker and secure research has yielded in an upward trend over the past few years for the number of students participating in extramural research experiences.

For the past eight (8) years (2002-2010), FGLSAMP Institutions have shown a steady increase in participants engaging in summer research internships annually. The table below depicts this increasing trend.

FGLSAMP Increase Trend

Summer	No. of Participants
2003	167
2004	175
2005	183
2006	194
2007	211
2008	231
2009	247
2010	284

FGLSAMP Impact on STEM Graduate Education

Due to the impact of the FGLSAMP model and associated program activities on STEM retention and graduation rates of URMs, FGLSAMP student participants are more likely to obtain some level of STEM graduate education. In an informal survey conducted we found that approximately 77% of those surveyed had enrolled and/or completed various levels of STEM graduate study. This can be directly attributed to the experience and exposure students receive as a member of FGLSAMP.

Many students who also come into college with the idea of pursuing a medical degree often learn of the wide ranging fields of endeavor afforded to those who study life sciences. It is through experiences with FGLSAMP that many students in this category will re-think medical school and migrate to the pursuit of a STEM graduate degree. FGLSAMP program activities are a portal through which students learn of the many STEM professions and career paths available, that they may not ever have realized without their participation in programs like FGLSAMP.

Graduate Mentors

At the 7 FGLSAMP partner institutions with STEM graduate programs, graduate students were encouraged to become FGLSAMP graduate mentors to the FGLSAMP undergraduate scholars. This type of mentoring has had a tremendous impact upon the not only the retention and graduation rates, but has also impacted the decision by many FGLSAMP undergraduate scholars to make the decision to enroll in graduate level coursework, and ultimately pursue STEM graduate degrees.

The use of graduate mentors has historically served a very important role, giving FGLSAMP the ability to impact FGLSAMP undergraduate scholars with "ready-made role models". The graduate mentor relationship flourished as students as FGLSAMP undergraduates had direct and immediate access and insight to the life of a STEM graduate student.

FGLSAMP graduate mentors often under the direction of the FGLSAMP Institutional Coordinator developed and facilitated group meetings; study/tutorial sessions; lab tours; community/civic activities; and social functions. It was determined that our FGLSAMP undergraduate scholars communicated with the graduate mentors in a much different and /or informal manner than with faculty and program administrators,. This scenario proved to be a boon for FGLSAMP Coordinators as it provided a truer picture of the undergraduate students. With this type of insight the **FGLSAMP model with its holistic driven approach could better address the needs of student participants and develop a trouble- shooting mechanism on an individual basis,** thus assuring a greater propensity for academic progression toward the STEM baccalaureate degree.

There has also been a noticeable impact upon the FGLSAMP graduate mentors in that they take pride in the undergraduate scholars and ownership of the FGLSAMP program. A great example of this is that until the year 2008,

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FGLSAMP received a special funding appropriation awarded by the Florida State Legislature and the graduate mentors received stipends from that allocation. Hence though FGLSAMP no longer receives this allocation, the FGLSAMP graduate mentors continue be a part of the FGLSAMP program. They cite the reason for continuing there work is because they know the difference FGLSAMP can make in the lives of the undergraduate students and that they simply enjoy being a part of the program.

FGLSAMP Bridge to the Doctorate

In addition to the utilization of FGLSAMP graduate mentors, the NSF LSAMP Office introduced a new initiative entitled the **LSAMP Bridge to the Doctorate Initiative (BD)** which began in 2003. The BD continues to thrive providing tremendous opportunities and support for students who wish to pursue and attain the STEM Ph.D. The Bridge to the Doctorate provides stipend; tuition; healthcare; and other associated costs of education for the 1st two years of graduate work. This program has had a tremendous impact upon STEM graduate degrees attained by URMs.

Each of the 3 BD institutional sites have also provided funding to support additional students to participate in this program. This is indeed recognition that the LSAMP/FGLSAMP model is one to be immolated and is admission to the fact that FGLSAMP has an impact that reaches beyond simply those who receive direct support from FGLSAMP.

The Bridge to the Doctorate has been hosted by 3 different FGLSAMP research intensive universities within the State of Florida. The BD sites are:

- Florida State University - 1 cohort
- University of Florida - 2 cohorts
- University of South Florida - 4 cohorts

The FGLSAMP BD can boast of an eighty-two percent retention rate. One contributing factor to the successful outcomes stems from the academic support structure provided by the host institutions in properly addressing and anticipating the stumbling blocks for many graduate students looking to attain Ph.D. degrees in STEM disciplines.

Another contributing factor is that the institutions have embraced and are committed to the success of BD fellows in a holistic manner; providing support mechanisms that are designed for every stage of the graduate education process.

FGLSAMP Host Sites

BD Site	Cohort/ Years	NSF Fellows	Match Fellows	Total Fellows
FSU	2003-2005	12	4	16
USF	2004-2006	12	8	20
USF	2005-2007	12	6	18
USF	2006-2008	12	4	16
UF	2008-2010	12	4	16
UF	2009-2011	12	4	16
UF	2010-2012	12	4	16

FGLSAMP BD Ph.D Recipients

FGLSAMP BD Fellow	Alliance Inst.	Discipline
Charmane Caldwell	FSU	Engineering
John Williams	FSU	Biology
Quenton Bonds	USF	Electrical Engineering
Joniqua Howard	USF	Civil /Env.l Engineering
Warner Guzman	USF	Marine Science
Javier Pulecio	USF	Electrical Engineering
Al-Aakhir Rogers	USF	Mechanical Engineering
Yolaine Jeune Smith	USF	Material Science

"…FGLSAMP has produced several outstanding graduates, enabling them to realize their dreams of earning a STEM Ph.D. and beginning promising careers in their chosen professions."

- James H. Ammons, President - Florida A&M University

The FGLSAMP BD Program continues to be successful in that eight (8) former BD fellows at Florida State University (FSU) and the University of South Florida (USF) completed their doctoral degrees this year.

BD Profiles in Academic Achievement

One of the academic achievement and success is BD Fellows securing fellowships to continue their pursuit of the STEM Ph.D degree after the initial 2 years of funding. BD fellows have been successful in obtaining funding through a number of sources such as:

- Alfred P. Sloan Minority Fellowship - $34,000/annual
- McKnight Doctoral Fellowship - $12,000/annual (3-years)
- USF Multidisciplinary Fellowship - $20,000/annual (2years)
- USA Scuba Scouts Fellowship - $22,000/annual (3-years)
- USF Graduate Fellowship - $12,000/annual (3-years)
- NSF G-K12 Fellowship
- GEM Fellowship - $20,000/annual
- FSU Graduate Fellowship - $18,000/annual
- NASA Fellowship - $30,000/annual (3years)
- NSF Graduate Research Fellowship- $40,000/annual
- Joint Oceanographic Institute Fellowship - $20,000/annual

FGLSAMP BD at Univ. of Florida

BD Research Experiences

FGLSAMP BD Fellows have also engaged in a variety of research throughout the nation and abroad.

- Brookhaven National Laboratory
- NASA Ames Center
- NASA Langley Center
- Oak Ridge National Laboratory
- National Institutes of Standards and Technology
- NASA Johnson Space Center
- National Institutes of Health
- NSF PASI

> "BD's excellent structure allowed me to take full advantage of workshops, seminars and lectures that enhanced my professional development."
> - **Eloy Martinez-Rivera**, M.S. student, Biological Oceanography

Beyond Borders

FGLSAMP International Research

Recognizing that the STEM challenges we face are not always exclusive to the U.S., but indeed are often times global, NSF and the LSAMP Office encouraged each alliance to foster and encourage an international component to student research experiences. It is important for students to embrace the global community and not think of their work as mutually exclusive from those neighbors outside of our national borders. The institutions within FGLSAMP have also worked to establish opportunities for students to engage in international research experiences often through the respective Offices of International Affairs at their respective institutions. Several of the FGLSAMP BD Fellows have conducted research abroad also.

The impact of the international experience by FGLSAMP student participants has been has been phenomenal as it has served to boost the presence of FGLSAMP among the existing STEM student populations as well as giving the new perspective and image for the institutions they represent.

To "kick start" this new initiative, the 2009 FGLSAMP EXPO committee solicited Mr. Hilarion Martinez, diplomat to the

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Secretary of State, present a workshop regarding international opportunities. (see EXPO 2009 EXPO agenda). The Education Abroad Office at USF currently administers a variety of international study abroad and research programs across 28 countries that range in length from one week to one year. The international research internships usually last from eight to twelve weeks. Funding for students to attend one of these internships is provided by scholarships (such as Touchton Global Passport Scholarship and the Compass Study Abroad Scholarship), departments (such as the College of Public Health and College of Arts & Sciences), and outside sources (such as the Ministry of Education of China and Moffitt Cancer Center) with an interest in seeing that students gain a broader perspective when it comes to STEM research.

The Center for Global Security and International Affairs (IC-CAE) at Florida A&M University (FAMU) was established in the fall of 2009 to address the disparity in the number of students opting for careers in the STEM disciplines and intelligence community. It is believed that exposure to international research will have a positive impact.

FGLSAMP International Research

Year of Internship	Alliance Institution	Student	Country
2008	ASU	Diane Render	Prague, Czechoslovakia
2009	UF	Veronica Llaneza	China
		Lemis Tarajano	Puerto Rico
	USF	Darius Wynn	Bolivia
	FIU	Marlon Bright	Mexico
2010	UF	Alex Arias	Bolivia
	USF	Rodriguez Lopez	Puerto Rico
	FAMU	Emmanuella Rony	Ghana
		Winter Walker	Costa Rica

With the implementation of the alternative strategy, nine (9) the number of students participating in international research and/or experiences from 2008 to 2010 has increased. Below is a table indicating the number of FGLSAMP students / associates that have participated in an international research experience.

The FGLSAMP – BD at University of South Florida has extended it BD graduate student development to include international research-training. To date BD Fellows have participated in research in places like Tanzania, China, Taiwan, New Zealand, Bolivia, Guyana, Antarctica, and Puerto Rico among other locations around the globe.

The impact of international research is Dr. Howard is a postdoctoral fellow with the Puerto Rico Testside for Exploring Contamination Threat (PROTECT) program at the University of Puerto Rico-Mayagüez Campus; and Dr. Ithier-Guzman is an environmental science officer at the University of Puerto Rico -Rio Piedras Campus.

Socialization into STEM

The overwhelming contributing factor in the success and impact of FGLSAMP is the socialization of our students into STEM. The ability and influence of FGLSAMP to impact this process is a confluence of discrete value systems that greatly impact the longitudinal and latitudinal span upon the STEM academic and professional careers of the student participants. It is often difficult to identify the value components singularly, yet when combined with various value activities, the best practices of FGLSAMP become very clear.

Students of FGLSAMP respond to the STEM socialization efforts of FGLSAMP and recognize the real value of the program. The experiences provided through FGLSAMP expose students to a world they often never knew existed or to which they would ever have had access by simply attending classes during their academic careers. Participation in FGLSAMP brings the student participants "front and center" with the world of STEM at the professional level. The

> "The BD Fellowship has been an incredible resource, not only because of the much needed financial aid, but also because of the support system it provides through the staff and other BD fellows. This award has been a great help for me to accomplish my academic goals and I am very grateful for it."
>
> -**Karyna Rosario**, Ph.D. student, Biological Oceanography, University of South Florida, FGLSAMP-BD cohort IV (2006-2008)

true impact of FGLSAMP as the evidence stated throughout this report is that FGLSAMP gives students greater awareness of the opportunities and the options available to them; along with the self-confidence to pursue to their loftiest ambitions. Thus the FGLSAMP experience gives student participants greater autonomy over the trajectory of their careers as STEM professionals.

Building a STEM Pipeline

In addition to the professional socialization and academic enhancement components of FGLSAMP, n organizational structure the alliance is was designed for the purpose of creating a STEM Pipeline to engage students where ever they may be along higher education continuum. Thus the FGLSAMP partner institutions are comprised of:

- Community College Institutions
- Undergraduate Institutions
- Graduate Institutions

The inclusion of the varied institutions of higher education provides an excellent means for FGLSAMP institutions to interact and collaborate on activities and/or research. For instance, FGLSAMP community college students are afforded the opportunity and even encouraged to participate in activities of FGLSAMP four year institutions within their proximity. The upper- division and graduate institutions often host FGLSAMP/STEM events that open to the community college and baccalaureate degree seeking students within the alliance. This organizational structure allows for STEM peer socialization and informal mentorship to take place among students.

This is type of inter-institutional relationship tends to generate an intangible benefit that often yields tangible results to both the FGLSAMP program and the respective institutions involved. Having FGLSAMP students from different institutions together is a great means of recruitment. Collaborative activities of this sort are an excellent venue for lower level students can thus become familiar with students and faculty at an upper division or graduate institution where that individual may wish to continue his/her educational pursuits.

The FGLSAMP organizational structure allow for program awareness; program elements and best practices to be easily disseminated between participating FGLSAMP institutions. Through collaborative activities between partner institutions, FGLSAMP can effectively impact the STEM academic socialization of students, providing them with to develop STEM a sense of awareness along with peer and professional networks that would not ordinarily be available to them.

FGLSAMP EXPO

As stated previously STEM socialization in all of its forms is what gives FGLSAMP such an incredible impact upon student participants. The culminating force behind this success is due in large part to the FGLSAMP Annual Career Exposition, also known FGLSAMP EXPO. Each year FGLSAMP EXPO plays host to more than 500 participants for this annual conference showcasing the research of not only FGLSAMP students, but many students from LSAMP programs across the nation. EXPO has been recognized by the National LSAMP Office as one the most outstanding LSAMP Conferences, the nation over. Thus EXPO crowds seem to grow with each passing year with exhibitors from academia; industry; and government to recruit among this large group of talented STEM scholars. The impact of this conference is almost immeasurable.

EXPO is an experience tailor made for students and includes recruitment by government research laboratories; STEM industry; STEM graduate programs. Student will engage an array of activities that included STEM related academic and professional development workshops; hands – on STEM projects; and keynote speakers from renowned STEM professionals from all sectors. The impact of the conference upon the students is tremendous as it is a venue where they meet there STEM peers from other universities who will one day be their colleagues. The conference experience is all about motivating students to be major

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contributors in STEM and expose them to top professionals that look like them. This is very important as shared identities and experiences that run along socio/ethnic lines can be a powerful motivating force for students. This is the impact of FGLSAMP EXPO.

FGLSAMP EXPO also serves to impact STEM faculty at numerous institutions of higher education as STEM faculty and FGLSAMP graduate students facilitate judging and scoring of the research presentations given during the conference. The discrete value of this interaction is that creates dialogue among a very diverse and disparate group of STEM educators, allowing for networking and possible collaborative research activities.

Over the 3 days of EXPO a scholarly community is developed providing for the sharing of ideas and dissemination and discussion of pedagogical practices within STEM. The benefit of this convening of diverse STEM faculty for a shared experience is difficult to measure as the impact resides in the exchange of intellectual ideas and discourse.
In addition to the academic enhancement and professional development benefits to student participants; exhibitors; and other conference attendees, FGLSAMP EXPO contributes to economic activity of national and state economies (airline industry) and also the local economy of the host city for this event.

By conservative calculations the economic activity generated is as follows:

- Approximately $200,000.00 for hotel lodging; food; and other related expenses
- Approximately $141,375.00 for travel expenses (airline and motor coach)
- Approximately $ 112,000.00 for non-conference meals; taxi service; tourist attractions; and miscellaneous purchases

By conservative estimates, the FGLSAMP EXPO generates over $450,000 in direct economic activity.

U.S. Congressman Louis Stokes and FGLSAMP Students in Washington D.C.

FGLSAMP Impact Summary

The impact of FGLSAMP upon the entire gamut of institutional STEM culture; departments, and communities is both conspicuous and discrete, a confluence of factors that make for successful outcomes in the areas of:

- Student Progression within the academic pipeline
- STEM retention and graduation
- Socialization into STEM departments
- Socialization into STEM professional communities
- Exposure to cutting edge STEM research experiences

FGLSAMP has also been significant in the overall increase of baccalaureate degrees awarded to URMs in STEM, due to its ability to enhance the learning experience of STEM students during their academic careers.
There have been significant increases in STEM enrollment at both the undergraduate and graduate levels. The successful matriculation from undergraduate FGLSAMP scholars to STEM graduate programs the is due in large part to the components and activities outlined within this document, but also in no small part; to the dedicated faculty, staff and institutional administrators who believe in the mission of FGLSAMP.

Participating institutions of FGLSAMP have acknowledged through its continued support of FGLSAMP on the respective campuses that FGLSAMP is in alignment with institutional STEM goals and objectives, creating an environment for a seamless integration into institutional efforts to broaden participation and expanding the talent pool of underrepresented minorities in science, technology, engineering, and mathematics.

> "FGLSAMP provides a pipeline of qualified and well-trained students that can attend various types of professional and graduate schools. Consequently, FGLSAMP activities have helped broaden the exposure and capabilities of under-represented populations in the under-represented careers in the STEM fields."
>
> - **Dr. Willis Walter**, Vice President of Institutional Research

FGLSAMP Students: Profiles of Success

MS. ANDREA ROCHA

A FGLSAMP Bridge to the Doctorate doctoral candidate in Engineering Science within the Department of Civil and Environmental Engineering at the **University of South Florida**, will complete her dissertation in Spring 2011. In addition to NSF, her research-training has been supported by the **U.S. Department of Energy's Oak Ridge National La*b***. Ms. Rocha's dissertation research is utilizing an integrated computational systems biology approach to identify metabolic components related to hydrogen-producing bacteria.

MR. ROBERT DONATTO

A junior in the **Department of Electrical Engineering at the University of South Florida** in Tampa, FL, was the recipient of a national undergraduate scholarship from the U.S. Department of Homeland Security (DHS). The prestigious scholarship program provides a monthly stipend of $1,000 from September to May, full payment of tuition and fees, and a paid summer research internship at a DHS-affiliated facility. The Department of Homeland Security Scholarship Program is intended for undergraduate students (sophomores and juniors) interested in pursuing the basic science and technology innovations that can be applied to the DHS.

MS. JAMI M. VALENTINE

Period of Participation: 1992-1996
Graduated: Spring 1996
Graduate Degree Earned:
M.S. Brown University, Physics,1998
Ph.D. Johns Hopkins University, Physics, 2007
Current Status: Employed with the US Patent and Trademark Office as a Patent Examiner
Personal Statement:
The FGLSAMP program was an excellent program that helped me to prepare for the rigors of graduate school.

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MR. JACOB BILLINGS (Physics)

Period of Participation: 2007 - 2011
Graduated: Spring 2011
Community College Attendance: Tallahassee Community College (TCC)
Current Status: Ph.D. Program, Emory University, Neuroscience, August 2011
Personal Statement:
Through FGLSAMP's many opportunities I gained a worldly view of who I can become through science. Such eye opening experiences; seen by someone who had never known how excellent the scientific community is, forged my resolve to perform well academically and to keep abreast of my research. The correlate to FGLSAMP's drive to gain an internship, its social and monetary encouragement of student success, cleared the way for my invigorated goals to materialize.

MS. SHANI LEWIS (Electrical Engineering)

Period of Participation: 1995-2000
Graduated: Spring 2000
Graduate Degree Earned: M.S. Degree, Electrical Engineering, Florida State University, Tallahassee, FL, Spring 2002
Current Status: Allegation Coordinator for the US Nuclear Regulatory Commission. Manage the agency's allegations of wrongdoing against licensees for the Atlanta regional office (Region II) and coordinate investigations.
Personal Statement:
If it wasn't for FGLSAMP, I don't know how I would've made it through school. FGLSAMP not only provided me with much needed funds for school, but also tutoring when I needed it, and an office position to help supplement my living expenses. Mr. Black was also a great supporter and mentor for me.

MR. DEONTE THOMPSON (Electrical Engineering)

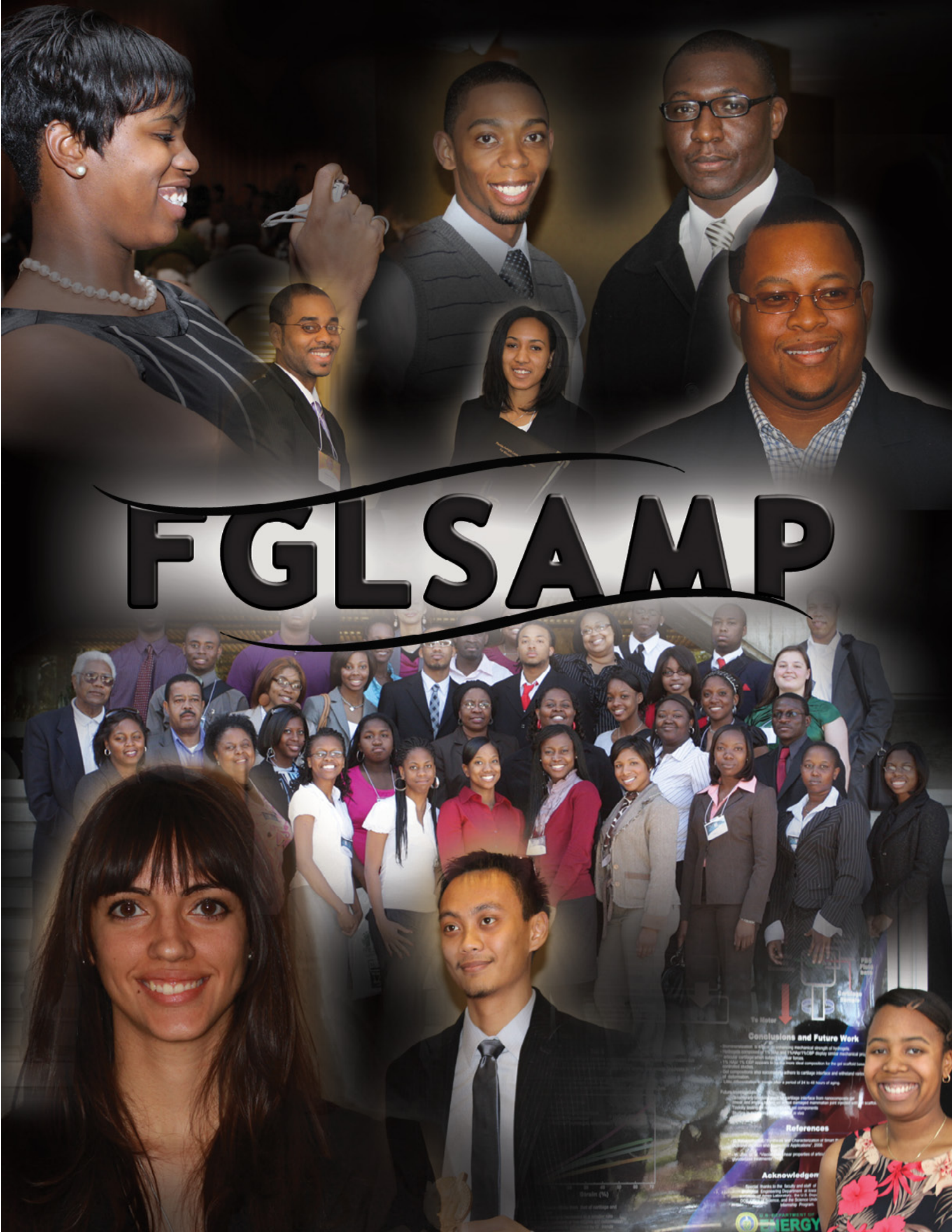
Period of Participation: 1996-2001
Graduated: Spring 2001
Graduate Program/Degree Earned: MBA, Letourneau University, Longview, TX , Spring 2004
Current Status: Employed at Dell Computers for 10 year (5 years in engineering and 5 years in Program Management), Austin, TX
Personal Statement:
FGLSAMP had a tremendous impact on my life and growth as an individual. I graduated from High School when I was 16 years old and I was not mentally ready for college. The summer program gave me the tools that I needed to help make a smooth transition from High school to College. In addition, I met other students from all over the country that encouraged me and inspired me to not just finish college but also to finish on top. The camaraderie that I gained through FGLSAMP still lives on today as I keep in touch with the majority of my classmates. In addition, the financial assistance that FGLSAMP provided allowed me to get through the tough days as a student. FGLSAMP has helped to shape me into the person that I am today.

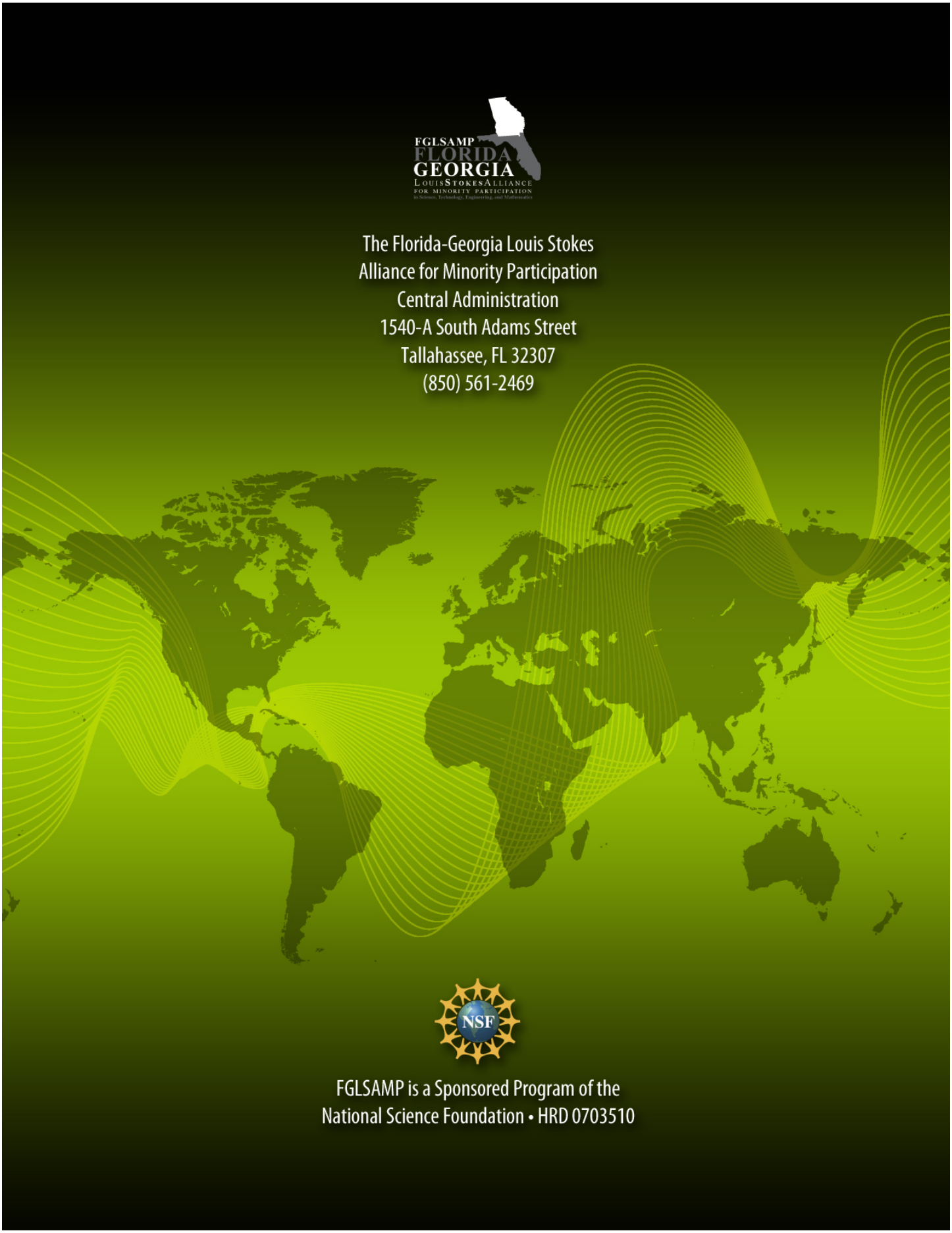
Roles and Expectations of FGLSAMP Institutional Partners

	Community Colleges	Undergraduate Institutions	Graduate Institutions
Primary Focus	To recruit and cultivate student interest in pursuing STEM undergraduate degrees. Development of a FGLSAMP Club as the primary means of stimulating and nurturing student interest in STEM majors.	To recruit, retain, and ultimately graduate students pursuing STEM B.S. degrees. FGLSAMP undergraduate institutions are to organize a tightly structured program and employ the services of a Science Academic Coordinator to oversee and implement the FGLSAMP model and program elements.	To recruit and cultivate student interest in pursuing STEM undergraduate degrees. Development of a FGLSAMP Club as the primary means of stimulating and nurturing student interest in STEM majors.
	Institutions can establish a FGLSAMP Club (retention focused - providing workshops, seminars, tutorial services, etc.) or adopt the program model employed by the FGLSAMP undergraduate institutions (academic enhancement focused- student financial assistance based on G.P.A. and other performance based criteria). FGLSAMP Community Colleges are also expected to develop relationships with FGLSAMP undergraduate institutions. These relationships should be the basis for creating academic pipelines for FGLSAMP participants to utilize in pursuing STEM baccalaureate degrees.	FGLSAMP **must** be a tightly structured organization. Program activities should include (but not limited to) the following: Recruitment Academic Enhancement Professional Development Undergraduate Research and/or STEM Internship experiences. Tracking STEM retention and graduation rates. Graduate School preparation. FGLSAMP undergraduate programs are also charged with increasing the number of FGLSAMP undergraduate participants that enter STEM graduate school.	Institutions can establish a FGLSAMP Club (retention focused - providing workshops, seminars, tutorial services, etc.) or adopt the program model employed by the FGLSAMP undergraduate institutions (academic enhancement focused- student financial assistance based on G.P.A. and other performance based criteria). At the graduate level: To provide financial support (from FGLSAMP and Institutional Matching funds) to STEM graduate students that participated with FGLSAMP during their undergraduate careers. Graduate students are to assist in stimulating interest in STEM degrees among FGLSAMP undergraduate participants.

Roles and Expectations of FGLSAMP Institutional Partners

	Community Colleges	Undergraduate Institutions	Graduate Institutions
Recruitment	X	X	X
Academic Enhancement Activities	X	X	X
Provide Research Opportunities		X *if available	X
Professional Development Activities	X	X	X
Secure Undergraduate Research		X	X
Graduate School Preparation		X	X
STEM Retention Activities	X	X	X
Establish FGLSAMP Program w/Sc. Acad. Coordinator support undergraduate students		X	
Establish FGLSAMP Club	X		X
Provide Support for Graduate School			X
Establish FGLSAMP Advisory Board	X	X	X


FGLSAMP
Conclusions and Future Work
References
Acknowledgem



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